

An Analysis of Factors Affecting Auditor Independence in Small and Medium Accounting Firms

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1 Introduction

The preservation of auditor independence represents a cornerstone of financial reporting integrity and capital market confidence. While extensive research has examined independence issues in large audit firms, the distinctive dynamics within small and medium accounting practices remain comparatively underexplored through computational and systems-oriented approaches. Small and medium accounting firms operate within unique environmental constraints characterized by limited client portfolios, resource constraints, and personalized professional relationships that create independence challenges qualitatively different from those faced by their larger counterparts. Traditional research paradigms have typically approached auditor independence as a compliance issue analyzable through survey methods or archival studies of regulatory violations. This paper introduces an innovative methodology that reconceptualizes auditor independence as an emergent property of complex adaptive systems, where multiple factors interact in non-linear ways to produce outcomes that cannot be fully understood through reductionist analysis of individual variables.

Our research addresses several critical gaps in the existing literature. First, we move beyond the predominant focus on economic dependencies to examine how cognitive, social, and organizational factors collectively shape independence judgments. Second, we employ computational simulation techniques that capture the dynamic evolution of independence

risks over time, rather than treating independence as a static condition. Third, we develop a novel framework for assessing independence on a continuum rather than as a binary state, reflecting the nuanced reality of professional practice. The central research question guiding this investigation is: How do economic, social, cognitive, and organizational factors interact within small and medium accounting firms to produce emergent patterns of auditor independence compromise?

This research makes several distinctive contributions to both accounting scholarship and computational social science. Methodologically, we demonstrate the value of agent-based modeling for understanding complex professional judgment processes in regulated environments. Theoretically, we develop a systems-based framework for conceptualizing auditor independence that accounts for the interconnected nature of influencing factors. Practically, our findings offer insights for regulators, professional bodies, and accounting firms seeking to develop more effective independence safeguards in small and medium practice environments.

2 Methodology

Our research employs a mixed-methods approach combining computational modeling with qualitative analysis to examine the complex dynamics of auditor independence in small and medium accounting firms. The foundation of our methodology is an agent-based model that simulates the decision-making environments of 150 virtual accounting firms operating over a five-year period. Each firm is represented as an autonomous agent with attributes including size, client concentration, specialization, geographic location, and financial health. Within each firm, we model individual auditor agents characterized by professional experience, ethical orientation, cognitive style, and social networks.

The model incorporates four primary categories of factors influencing auditor independence. Economic factors include client importance metrics, fee dependence, non-audit service revenue, and financial pressure indicators. Social factors encompass professional relation-

ships, alumni networks, community ties, and referral sources. Cognitive factors integrate findings from behavioral accounting research, including confirmation bias, anchoring effects, and motivated reasoning. Organizational factors include firm culture, quality control systems, partner compensation structures, and professional development investments.

We developed a novel natural language processing algorithm to analyze textual data from actual audit documentation, quality control manuals, and regulatory inspection reports. This analysis informed the parameterization of our simulation model by identifying patterns in how independence considerations are documented and addressed in practice. The algorithm employed transformer-based architecture specifically fine-tuned for accounting domain language, enabling extraction of implicit independence concerns that may not be explicitly stated in formal documentation.

Our simulation approach incorporates dynamic network analysis to model how social and professional relationships evolve over time and influence independence judgments. The model captures both formal relationships (such as referral networks and professional affiliations) and informal connections (including community involvement and personal friendships) that may create subtle pressures on auditor objectivity. We implemented a unique reinforcement learning mechanism that allows auditor agents to adapt their behavior based on perceived outcomes of previous independence decisions, reflecting the experiential learning that occurs in professional practice.

Validation of the model involved multiple approaches. We conducted structured interviews with 35 partners from small and medium accounting firms to assess the face validity of the simulated environments and decision processes. Additionally, we performed historical validation by comparing simulation outputs with known independence violations documented in regulatory records over the past decade. The model demonstrated strong predictive accuracy in identifying firms with elevated independence risks based on their structural characteristics and environmental conditions.

3 Results

The simulation results reveal complex, non-linear relationships between factors affecting auditor independence that challenge conventional understanding of independence risks. Our analysis identified several emergent patterns that cannot be adequately explained through traditional linear models. First, we observed threshold effects where minor increases in economic dependence, when combined with specific social network configurations, produced disproportionate increases in independence compromise risk. For example, firms with client concentration ratios exceeding 15

Second, the results demonstrate the significant moderating effect of organizational factors on economic pressures. Firms with strong ethical cultures, measured through implemented tone-at-the-top initiatives and formal ethical infrastructure, exhibited remarkable resilience to economic pressures that typically compromise independence. Specifically, firms in the top quartile of ethical culture measures maintained independence compliance rates above 90

Third, our temporal analysis revealed path dependency in independence judgments. Early independence compromises, even minor ones, significantly increased the likelihood of subsequent, more serious violations. This erosion effect operated through multiple mechanisms, including normalization of deviance, cognitive dissonance reduction, and changes in perceived professional norms within the firm. The simulation showed that firms experiencing an initial independence compromise in the first year of operation had a 67

Fourth, we identified distinctive risk profiles associated with different growth strategies. Firms pursuing rapid expansion through acquisition of other practices demonstrated unique vulnerability to independence compromises during integration periods. The disruption of established quality control systems, cultural clashes between merging firms, and pressure to retain acquired clients created conditions where economic considerations frequently overrode independence safeguards. These firms showed a characteristic pattern of independence issues emerging 6-18 months post-acquisition, suggesting a critical window for targeted interventions.

The natural language analysis component yielded additional insights into how independence considerations manifest in audit documentation. We identified linguistic markers associated with elevated independence risk, including increased use of justification language, defensive documentation patterns, and subtle shifts in uncertainty expression when discussing sensitive audit areas. These linguistic features, when combined with structural risk factors from the simulation, provided powerful predictive indicators of independence concerns often preceding formal violations.

4 Conclusion

This research makes several original contributions to the understanding of auditor independence in small and medium accounting firms. Methodologically, we have demonstrated the value of complex systems approaches for modeling professional judgment environments characterized by multiple interacting influences. Our agent-based modeling framework captures the dynamic, emergent nature of independence judgments in ways that traditional research methods cannot, providing new insights into how seemingly minor factors can combine to create significant independence risks.

Theoretically, our findings challenge the predominant binary conceptualization of auditor independence as either compromised or maintained. The continuum-based assessment framework developed through this research better reflects the nuanced reality of professional practice, where independence exists along a spectrum influenced by the complex interplay of economic, social, cognitive, and organizational factors. This conceptual shift has important implications for how independence is regulated, monitored, and strengthened within accounting firms.

Practically, our results offer specific guidance for accounting firms, regulators, and professional bodies seeking to enhance independence safeguards. The identification of threshold effects suggests the importance of monitoring combinations of risk factors rather than in-

dividual metrics in isolation. The demonstrated protective effect of strong ethical cultures underscores the value of investments in ethical infrastructure beyond mere compliance with regulatory requirements. The path dependency findings highlight the critical importance of early intervention when minor independence concerns arise, before patterns of compromise become established.

Several limitations should be acknowledged in interpreting these results. The simulation, while rigorously validated, necessarily simplifies the complex reality of professional judgment. The parameterization relies on available data, which may not capture all relevant influences on independence decisions. Additionally, the model focuses on small and medium firms in developed markets, and the findings may not fully generalize to other contexts.

Future research should extend this work in several promising directions. Longitudinal studies tracking actual independence decisions over time would provide valuable validation of the temporal patterns identified in our simulation. Cross-cultural comparisons could examine how different regulatory environments and professional traditions influence the dynamics of independence judgments. Research exploring the application of similar modeling approaches to other professional judgment contexts in accounting and beyond would further demonstrate the utility of complex systems methodologies for understanding regulated professional environments.

In conclusion, this research reframes auditor independence as an emergent property of complex adaptive systems rather than merely a compliance obligation. By illuminating the dynamic interactions between multiple influencing factors, we provide a more comprehensive understanding of how independence risks develop and propagate within small and medium accounting firms. This systems-oriented perspective offers novel insights for strengthening the foundation of audit quality and maintaining public trust in financial reporting.

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