Internal Controls vs. External Audit: Optimal Complementarity for Loss Minimization

DANIELA CRISTINA ABREU JOVÉ DE ARAÚJO

Abstract- ***This paper examines the optimal complementarity between internal controls and external audit in minimizing organizational losses and achieving efficient allocation of control resources. Drawing on economic modeling and empirical findings, it highlights how internal controls serve as preventive mechanisms that reduce the incidence and magnitude of losses, while external audits provide independent validation and assurance to stakeholders. The analysis integrates agency theory and audit economics to demonstrate that neither mechanism alone suffices; rather, the optimal mix emerges when both are calibrated to the firm's risk profile, control environment, and cost constraints. Empirical evidence from prior studies confirms that robust internal controls not only improve financial reporting quality but also enhance the effectiveness and efficiency of external audits. The findings suggest that organizations minimize total costs—including internal control costs, audit fees, and expected losses—when they balance preventive investments with independent oversight. This approach provides theoretical and practical insights into resource allocation strategies for corporate governance and risk management.***

Index Terms- ***Internal Controls; External Audit; Complementarity; Audit Economics; Agency Theory; Loss Minimization; Corporate Governance; Resource Allocation.***

I. INTRODUCTION

The interplay between internal controls and external audit embodies a delicate and essential balance within organizations striving to minimize losses and allocate control resources efficiently. Internal controls, as defined by Ashbaugh-Skaife, Collins, and LaFond (2009), encompass the system of policies, procedures, and environment deliberately designed by management to achieve organizational objectives through the safeguarding of assets, accuracy of records, and compliance with legal mandates. Their strength is consistently linked to reduced fraud and enhanced reliability of financial information; indeed, the Association of Certified Fraud Examiners (2020) reports that strong internal controls reduce median losses by 54 % and detect fraud twice as fast.

External audit, by contrast, serves as an independent attestation mechanism, providing assurance to external stakeholders regarding financial statements and control effectiveness—particularly under regulations such as the Sarbanes–Oxley Act (SOX) Section 404 (Doyle, Ge, & McVay, 2007). From an economic standpoint, classical theories such as Simunic (1980, 1984) suggest a substitution effect: organizations with robust internal controls can reduce reliance on substantive external auditing, potentially lowering audit fees. However, empirical evidence is mixed. While some studies find audit fees decline with stronger internal audit functions (a proxy for internal control), others report no significant relationship or even positive correlations, particularly when governance mechanisms are stronger and demand both rigorous internal and external oversight (Wallace, 1984).

Agency and information economics provide a richer lens for understanding the optimal mix. Under the principal-agent framework (Jensen & Meckling, 1976), internal controls, internal auditors, audit committees, and external auditors collectively function as monitoring and bonding mechanisms that mitigate information asymmetries and moral hazard. While internal controls flag and prevent errors or fraud, external auditors validate these assessments and provide an independent viewpoint that may uncover deficiencies missed by internal systems. This complementary relationship is further reinforced: high-quality internal control systems enhance external

audit efficiency and effectiveness, whereas external auditors, in turn, pressure management to maintain strong internal systems (Altamuro & Beatty, 2010).

More refined economic models, such as "audit games," formalize this resource allocation interplay. In such models, organizations face trade-offs in allocating resources between preventive internal controls and external audit enforcement, seeking to deter wrongdoing cost-effectively (Blocki, Christin, Datta, Procaccia, & Sinha, 2013). Similarly, dynamic modeling of internal fraud in banking contexts underscores how internal factors—like worker ethics and control strength—influence operational loss frequency and severity (Paredes & Vega, 2020). These approaches affirm that neither internal controls nor external audit alone suffice; an optimal mix arises when both are calibrated to organizational risk exposure, control environment, and cost constraints.

Empirical findings support this synergy. Altamuro and Beatty (2010) observe that in the banking sector, more frequent monitoring of internal control correlates with higher financial reporting quality. Doyle et al. (2007) and other studies show that weak internal controls invite both intentional earnings management and unintentional errors, impairing financial reliability. COSO's Internal Control–Integrated Framework (2013) further emphasizes that strong monitoring and continuous evaluation through internal controls reduce reactive costs and support proactive risk management.

Modeling and data converge on the conclusion that the mix minimizing losses is one where internal controls are designed to be robust and preventive—lowering the incidence and magnitude of loss events—while external audits provide independent validation and correction. Economically, the marginal benefit of strengthening internal controls (in terms of loss reduction) should be balanced against the marginal cost saved in external audit scope. When internal controls are strong, external auditors can reduce substantive testing, thereby lowering audit costs without compromising assurance. Conversely, when internal control is weak or control risk high, greater external audit effort is warranted to compensate—and thereby preserve loss minimization.

The flowchart illustrates the decision-making process for achieving the optimal balance between internal controls and external audit. It begins with defining organizational objectives and risk profiles, followed by collecting inputs such as risk assessments, governance conditions, and cost data. Internal controls are then designed or strengthened as preventive measures, while external audit is planned to provide independent assurance. A cost model combines the expenses of controls, audit fees, and expected losses, leading to a trade-off analysis between reinforcing controls or expanding audit testing. The cycle iterates until the total cost is minimized, after which the chosen mix is implemented. Finally, continuous monitoring and feedback ensure that both controls and audits remain effective in minimizing risks and resource inefficiencies.

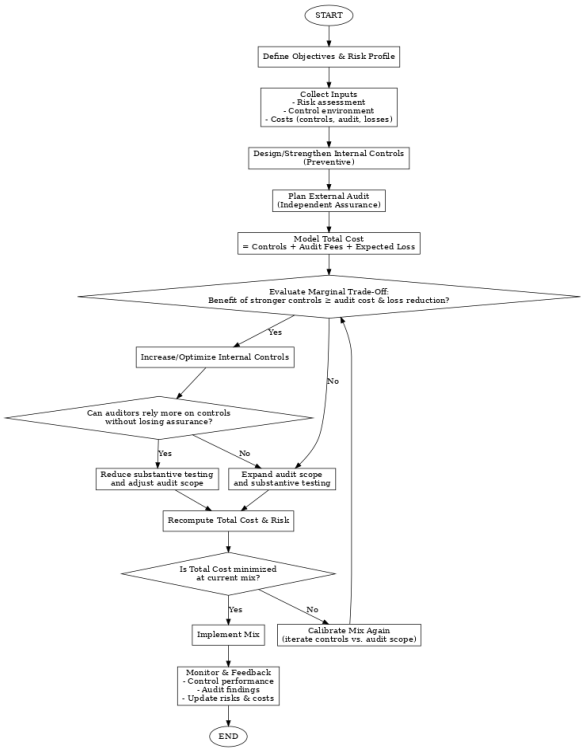

Figure 1. Optimal Complementarity Between Internal Controls and External Audit.

Source: Created by author.

To achieve efficient allocation of control resources, organizations should implement this mix: invest in control environments that limit fraud and error reliably, but also maintain an external audit regime

capable of validating and enforcing these controls. In cost-benefit terms, the optimal mix occurs where the sum of control costs (internal and external) plus expected loss is minimized.

REFERENCES

[1] Altamuro, J., & Beatty, A. (2010). How does internal control regulation affect financial reporting? *Journal of Accounting and Economics, 49*(1–2), 58–74.

[2] Ashbaugh-Skaife, H., Collins, D. W., & LaFond, R. (2009). The effects of SOX internal control deficiencies and their remediation on accrual quality. *The Accounting Review, 84*(1), 217–250.

[3] Association of Certified Fraud Examiners (ACFE). (2020). *Report to the Nations: 2020 Global Study on Occupational Fraud and Abuse.* Austin, TX: ACFE.

[4] Blocki, J., Christin, N., Datta, A., Procaccia, A. D., & Sinha, A. (2013). Audit games. *International Conference on Decision and Game Theory for Security (GameSec 2013)*, 98–117. Springer.

[5] Committee of Sponsoring Organizations of the Treadway Commission (COSO). (2013). *Internal Control – Integrated Framework.* COSO: New York.

[6] Doyle, J., Ge, W., & McVay, S. (2007). Accruals quality and internal control over financial reporting. *The Accounting Review, 82*(5), 1141–1170.

[7] Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305–360.

[8] Paredes, R., & Vega, M. (2020). A dynamic model of internal fraud in retail banking. *arXiv preprint arXiv:2002.03235.*

[9] Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. *Journal of Accounting Research, 18*(1), 161–190.

[10] Simunic, D. A., & Stein, M. T. (1987). Product differentiation in auditing: Auditor choice in the market for unseasoned new issues. *Canadian Certified General Accountants Research Monograph.*

[11] Wallace, W. (1984). Internal auditors can cut external audit costs. *Harvard Business Review, 62*(2), 16–20.