Asian Journal of Economics and Empirical Research
Vol. 13, No. 1, 58-66, 2026
ISSN(E) 2409-2622 / ISSN(P) 2518-010X
DOI: 10.20448/ajeer.v13i1.8834

Orchestrating internal resource management: The sensing, shielding, and shifting roles of internal audit in Ghanaian listed companies

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Abstract

This study reconceptualizes the internal audit function as an orchestration capability comprising sensing, shielding, and shifting roles. It examines how these roles drive effective internal resource management (IRM) and sustainable value creation in Ghana's listed companies. A mixed-method design was employed, combining survey data from 300 principal officers across 30 listed firms with interviews conducted with internal auditors and audit committee chairs. Quantitative data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test the relationships between orchestration capabilities and internal resource management. The results show that all three orchestration capabilities significantly enhance internal resource management. However, internal auditors place greater emphasis on shielding routines than on sensing and shifting, revealing technical skill gaps in predictive analytics and value chain analysis. These findings extend the Resource-Based View and Dynamic Capabilities Theory by positioning internal audit as a frontline strategic partner. Capacity building in analytics, real-time monitoring, and value chain tools is needed to enable internal auditors to evolve beyond compliance toward proactive resource orchestration. Enhancing the internal audit's orchestration role would promote efficient resource use, resilience, and long-term value creation, thereby strengthening economic sustainability.

Keywords: Corporate governance, Dynamic control, Internal audit, Internal resource management, Orchestration capabilities, Resource redeployment, Sustainable value creation.
JEL Classification: M42; M41; D23; L25; G34.

Citation | Dawuda, A., Ataribanam, S., Mahama, F., Luqman, A., & Anyass, S. M. I. (2026). Orchestrating internal resource management: The sensing, shielding, and shifting roles of internal audit in Ghanaian listed companies. *Asian Journal of Economics and Empirical Research*, *13*(1), 58–66. 10.20448/ajeer.v13i1.8834
History:
Received: 16 April 2026
Revised: 21 May 2026
Accepted: 2 June 2026
Published: 19 June 2026

Publisher: Asian Online Journal Publishing Group

Funding: There is no funding for this research.
Institutional Review Board Statement: The study was conducted with ethical approval by the Ethics Committee of Bolgatanga Technical University, Ghana, with Protocol Number BTU/EC/2024/006. Date of approval: 10 May 2024.
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.
Disclosure of AI Use: We wish to emphasise that the Grammarly Premium Version and Subscription-based ChatGPT were used to improve language quality, not for idea generation or writing.

Contents

Contribution of this paper to the literature
This study is original in conceptualizing internal audit as a dynamic capability that orchestrates internal resources through sensing, shielding, and shifting roles. It extends resource orchestration theory by demonstrating how internal audit actively drives resource redeployment and sustainable value creation, moving beyond its traditional compliance-focused function.

1. Introduction

Rapid technological change, heightened risks, and increasing stakeholder expectations characterize today's business environment, compelling organizations to rethink governance and resource management practices. Organizational success is largely determined by how effectively internal resources, such as human, financial, physical, and technological assets, are identified, protected, and optimized (Barney, 1991; Zahra, Syah, Indradewa, & Fajarwati, 2021). The Resource-Based View (RBV) emphasizes that valuable, rare, inimitable, and non-substitutable (VRIN) resources provide a competitive advantage (Wernerfelt, 1984) while Dynamic Capabilities Theory (DCT) highlights the need for continuous sensing and adaptation in rapidly changing environments (Teece, Pisano, & Shuen, 1997). These perspectives underscore the importance of resource orchestration for sustained performance and value creation (Jaber, Shah, Johari, & Mustapha, 2024).

Although the Resource-Based View and Dynamic Capabilities Theories emphasize the importance of internal resources and the need for resource optimization (Teece et al., 1997), they provide limited insight into who orchestrates these processes. This creates a professional role gap within organizations regarding responsibility for internal resource management, potentially leading to role conflict. While management accountants are typically regarded as strategic resource managers, internal auditors remain largely confined to traditional roles, especially in emerging economies. To address this role conflict, Sirmon, Hitt, Ireland, and Gilbert (2011) argue that internal resource orchestration should be the responsibility of all organizational members.

However, the role of internal audit in internal resource management remains underexplored. The empirical literature has predominantly framed internal audit within compliance, risk management, and internal control functions (Bozkus Kahyaoglu & Caliyurt, 2018; Inyang, Enya, & Otuagoma, 2021; Nwadike & Wilkinson, 2022). Internal auditors' privileged access to process data and organizational systems positions them uniquely to orchestrate internal resources by anticipating risks, designing adaptive controls, and facilitating resource optimization (Alles, Dai, & Vasarhelyi, 2021; Shaban & Barakat, 2023). However, Shaban and Barakat (2023) argue that internal auditors often face limited budgets, staffing, and technological resources, which constrain their ability to perform duties beyond financial and compliance audits, thereby limiting their involvement in operational performance audits.

In Ghana and similar contexts, where regulatory requirements for listed companies are stringent and stakeholder scrutiny is high, examining the strategic role of internal audit in internal resource management is both timely and necessary. There are notable theoretical and practical gaps. Theoretically, there is limited clarity regarding who orchestrates internal resources, while in practice, internal auditors often lack the technical capacity to extend their roles beyond compliance. This study addresses these gaps by reconceptualizing internal audit as an orchestration capability comprising sensing (resource identification), shielding (adaptive controls), and shifting (resource optimization). It argues that positioning internal audit within this framework enhances effective internal resource management and sustainable value creation. Accordingly, the study has two main objectives: first, to examine internal audit orchestration capability practices among Ghana's listed companies; and second, to establish the strategic significance of internal audit as a driver of sustainable value creation. The study contributes to the literature by extending the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT) into the internal audit domain, demonstrating how internal audit routines reconcile managerial opportunism with adaptive governance. Practically, it provides evidence from an emerging economy, highlighting how strengthening internal audit capacity can enhance competitiveness and long-term organizational sustainability.

2. Literature Review

2.1. Theoretical Framework

This study draws on the Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), Resource Dependence Theory (RDT), Agency Theory, and Stewardship Theory. From these perspectives, it reconceptualizes the internal audit function as an orchestration capability for managing internal resources.

The RBV posits that organizations achieve sustained competitive advantage by leveraging valuable, rare, inimitable, and non-substitutable resources (Barney, 1991). However, RBV has been criticized for its relatively static treatment of resources. In contrast, DCT emphasizes the ability of firms to continuously sense opportunities, seize them, and reconfigure resources to maintain competitive advantage in dynamic environments (Helfat & Peteraf, 2009; Teece et al., 1997). Internal audit can reconcile these perspectives by acting both as a safeguard of existing assets and as a facilitator of adaptive resource deployment.

RDT complements this view by emphasizing that organizations must actively manage their dependencies on external actors to secure critical resources (Pfeffer, 1987). While RBV focuses on internal resources, RDT highlights the importance of external adaptation. Internal auditors, with their cross-functional visibility, are well-positioned to balance these demands by safeguarding internal resources while ensuring alignment with external stakeholder expectations. Similarly, Agency Theory and Stewardship Theory present contrasting views of managerial behavior. Agency Theory highlights the risk of managerial opportunism, thereby justifying monitoring and control mechanisms (Jensen & Meckling, 1976), whereas Stewardship Theory assumes that managers act as trustworthy custodians aligned with long-term organizational goals (Davis, Schoorman, & Donaldson, 1997). Internal audit orchestration reconciles these perspectives by combining adaptive governance mechanisms with more collaborative and enabling approaches.

2.2. Empirical Literature and Hypotheses Development

This study builds on the Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), Resource Dependence Theory (RDT), Agency Theory, and Stewardship Theory to reconceptualize the internal audit function

as an orchestration capability for managing internal resources. The RBV emphasizes that firms gain sustained advantage through valuable, rare, inimitable, and non-substitutable resources (Barney, 1991), but it has been criticized for its static perspective. DCT addresses this limitation by highlighting the need for firms to sense, seize, and reconfigure resources in dynamic environments (Helfat & Peteraf, 2009; Teece et al., 1997). Internal audit can bridge these perspectives by both safeguarding existing resources and facilitating their adaptive deployment. RDT complements this view by emphasizing the management of external dependencies (Pfeffer, 1987), while Agency Theory and Stewardship Theory offer contrasting views of managerial behavior: opportunism requiring monitoring and control (Jensen & Meckling, 1976), versus stewardship aligned with long-term value creation (Davis et al., 1997). Internal audit orchestration reconciles these tensions by blending adaptive governance mechanisms with collaborative assurance. Internal Resource Management (IRM) integrates these perspectives by systematically identifying, protecting, and optimizing human, financial, physical, and technological assets to deliver sustainable value (Barney, 1991; Eccles, Ioannou, & Serafeim, 2014). From RBV and DCT standpoints, IRM depends on discovering VRIN resources, safeguarding them through adaptive controls, and redeploying them to align with strategic opportunities (Adner & Kapoor, 2010; Porter, 1985). The Knowledge-Based View emphasizes deliberate management of intellectual and technological assets (Grant, 1996). Internal auditors contribute by ensuring economy, efficiency, and effectiveness in resource use, positioning IRM as a pathway to sustainable value creation (Ariani et al., 2021; Hart & Zingales, 2017; Jaber et al., 2024; Khan, Yu, & Farooq, 2023; Zioło, Bąk, & Spoz, 2023).

We extend this foundation by conceptualizing Internal Audit Orchestration Capability (IAOC) as three interrelated routines. Sensing involves continuous scanning and the use of predictive analytics to identify emerging risks and opportunities (Alles et al., 2021; Betti & Sarens, 2021; Internal Audit Foundation, 2024; Teece et al., 1997). Accordingly, we hypothesize.

H_1: Continuous sensing capability of the internal audit function is positively associated with effective resource management.

The shielding refers to adaptive, co-created governance mechanisms that protect resources. Traditional audits often rely on static controls, but dynamic control matrices co-designed with line managers better align with evolving risks (Jensen & Meckling, 1976; Young, Van der Stede, & Gong, 2006). We hypothesize.

H_2: The degree of adaptive control co-creation by the internal audit function is positively associated with effective resource management.

Shifting emphasizes resource redeployment through value-chain analysis and scenario-based simulations (Adner & Kapoor, 2010; Porter, 1985). Internal auditors can guide cross-functional teams in reallocating resources toward activities that yield greater efficiency and differentiation. We hypothesize.

H_3: The extent to which internal auditors employ value-chain analysis and facilitate resource redeployment is positively associated with effective resource management.

2.3. Conceptual Framework

In this study, we introduce an Internal Audit Orchestration Capability (IAOC) that serves as the central mechanism for optimizing internal resources to create sustainable value. Figure 1 below presents the details.

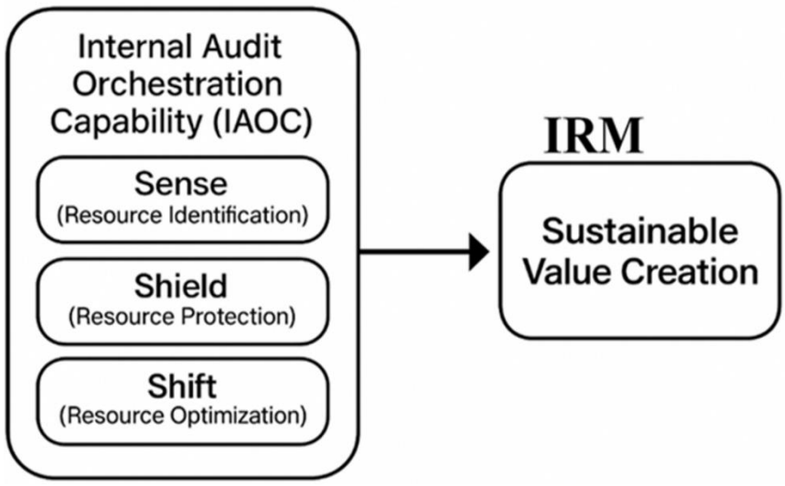

Figure 1. Conceptual framework.

From Figure 1 above, Internal Audit Orchestration Capability (IAOC) is treated as the independent variable, while effective internal resource management is the dependent variable, measured through sustainable value creation. Conceptually, IAOC comprises three audit-enabled micro-routines: sensing (resource identification), shielding (resource protection), and shifting (resource optimization). These roles of internal auditors align with the core processes of internal resource management within a resource-based, dynamic capabilities perspective (Barney, 1991; Teece et al., 1997).

Effective internal resource management (IRM) is measured by the extent to which companies achieve sustainable value creation for all stakeholders. Empirical evidence suggests that effective internal resource management leads to sustainable business value (Naseer, Song, Adu-Gyamfi, Abbass, & Naseer, 2023; Wang, Zhang, & Xu, 2022; Xiong & Wei, 2025; Zaid, Jaaron, & Bon, 2018). Theoretically, this conceptual framework integrates the Resource-Based View (Barney, 1991) by specifying which internal resources must be surfaced (Identification), Agency Theory (Jensen & Meckling, 1976) by clarifying how governance and adaptive control mechanisms safeguard these assets (Protection), and Resource Dependence or orchestration logic (Adner & Kapoor, 2010; Pfeffer, 1987) by explaining why purposeful redeployment and recombination (Optimization) are necessary for effective internal resource management. It also extends Dynamic Capabilities Theory (Teece et al., 1997) by assigning internal audit a concrete organizational role within the micro-foundations of sensing, protecting, and optimizing.

Empirically, prior studies examine these variables separately: real-time auditing enhances early risk detection (Alles, Kogan, & Vasarhelyi, 2008); adaptive controls co-created with line managers improve relevance (Young et al., 2006); and the strategic advisory involvement of internal audit is increasing (Arena, Arnaboldi, & Azzone, 2010; Brown-Liburd & Vasarhelyi, 2015). However, no published work unifies these elements as a single orchestration capability to ensure effective resource management. Practically, the framework justifies expanding internal audit mandates. Without the internal audit's cross-process visibility, resource identification may remain partial, protection may be inadequate, and optimization may devolve into ad hoc reallocations lacking evidence. The model provides a testable pathway, showing that superior sustainable value creation emerges not merely from possessing resources but from an orchestrated audit capability that transforms isolated internal resource management activities into sustained value.

3. Methodology

A mixed-method design was adopted to ensure triangulation and enhance validity. The population comprised all 37 companies listed on the Ghana Stock Exchange (GSE) as of 31 December 2023. A multistage sampling strategy was employed: companies were stratified by sector (services, manufacturing, and trading), and 30 firms were randomly selected across these sectors. Within each firm, 10 principal officers directly involved in internal resource management and audit activities were purposively selected, resulting in a total of 300 respondents. The focus on listed companies reflects their stronger regulatory oversight, higher transparency requirements, and more formalized audit structures, making them appropriate for examining internal audit orchestration in relation to sustainable value creation. To complement the survey data, in-depth interviews were conducted with 10 Chief Internal Auditors and 10 Audit Committee Chairs, whose strategic oversight roles provided contextual insights into resource identification, protection, and optimization. Interview evidence was further supplemented by a review of the 2020–2024 annual audit work plans of the participating auditors, enabling an assessment of the coverage of resource-related areas. Quantitative data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) in XLSTAT, which is well-suited to complex models with both reflective and formative constructs (Hair et al., 2021).

The questionnaire was adapted from established studies (Abbas, Ismail, Taqi, & Yazid, 2022; Jaber et al., 2024; Teece et al., 1997) and reviewed by three academic experts in auditing and governance to ensure content validity. A pilot test with 15 respondents confirmed clarity and theoretical alignment, with Cronbach's alpha values ranging from 0.787 to 0.865, indicating satisfactory internal consistency. Construct validity was supported by prior research on resource orchestration, adaptive governance, and sustainable value creation (Adner & Kapoor, 2010; Eccles et al., 2014; Porter, 1985; Young et al., 2006).

4. Results and Discussion

4.1. Descriptive Statistics

Table 1 below presents the orchestration capabilities of internal auditors in internal resources management.

Table 1. Descriptive statistics.

Construct	Variable	Min.	Max.	Mean	Std. deviation
Sense (Resource Identification)	Continuous Audit Analytics (CAA)	1.000	5.000	3.013	1.146
	Forward-Looking Reporting (FLR)	1.000	5.000	3.117	1.110
	Capability Mapping (CAM)	1.000	5.000	3.085	1.074
Shield (Resource Protection)	Dynamic Control Frameworks (DCF)	1.000	5.000	3.291	1.100
	Stakeholder Alignment Processes (SAR)	1.000	5.000	3.516	0.993
	Adaptive Control Matrices (ACM)	1.000	5.000	3.244	1.078
Shift (Resource Optimisation)	Audit-Facilitated Redeployment (AFR)	1.000	5.000	2.632	1.058
	Value-Chain Focused Reviews (VCFR)	1.000	5.000	2.857	1.070
Internal Resource Management	Sustainable Value Creation (SVC)	1.000	5.000	3.126	1.157

Table 1 above summarizes the level of internal audit orchestration practices across companies on a five-point scale. Internal auditors scored highest on shielding routines, with mean values ranging from 3.24 (Adaptive Control Matrices) to 3.52 (Stakeholder Alignment Processes). Sensing activities, comprising Continuous Audit Analytics (M = 3.01), Forward-Looking Reporting (M = 3.12), and Capability Mapping (M = 3.09), occupy a mid-range position, while shifting routines lag, averaging 2.63 for Audit-Facilitated Redeployment and 2.86 for Value-Chain-Focused Reviews.

Internal Resource Management, measured by Sustainable Value Creation (SVC), recorded a moderate mean of 3.13. These results indicate a strong emphasis on resource protection, with limited engagement in proactive resource identification and optimization. Interview evidence confirms this imbalance. Respondents explained that many auditors lack the technical skills required to conduct value chain mapping or lead resource redeployment, leaving opportunities for strategic alignment untapped.

A review of audit work plans further revealed a narrow, finance-centric focus, prioritizing financial reporting, compliance, and asset safeguarding, while neglecting forward-looking reporting, operational risk assessments, and performance analytics.

This misalignment underscores the need for the internal audit function to evolve from a predominantly protective role toward a strategic partner in value creation. Expanding audit mandates and investing in predictive analytics, value chain tools, and cross-functional training would equip auditors to fully engage in sensing and shifting routines. Without such reforms, internal audit risks reinforce a compliance-oriented paradigm that overlooks resource optimization and undermines sustainable value creation.

4.2. Measurement Model Assessment

Before evaluating the structural hypotheses, we confirmed that our latent constructs meet the necessary reliability, validity, and collinearity criteria. Table 2 below displays the details.

Table 2. Measurement model and collinearity diagnostics.

Construct	Sense	Shield	Shift	IRM
# Items	3	3	2	8 (indicators)
Cronbach's α	0.602	0.633	0.663	
ρ_A	0.791	0.804	0.856	
Comp. Reliability	0.868	0.804	0.856	
AVE	0.563	0.563	0.747	
√AVE	0.75	0.75	0.864	
Cond. No.	2	1.744	1.722	
VIF Range	1.114–1.664	1.359–1.408	1.339–1.865	1.114–2.018
Sense	0.75	0.51	0.214	0.55
Shield	0.51	0.75	0.161	0.36
Shift	0.214	0.161	0.864	0.309
IRM	0.55	0.36	0.309	1

From Table 2, Cronbach's alpha values ranged from 0.602 for Sense to 0.663 for Shift, meeting the minimum threshold for research. Dijkstra–Henseler's rho_A coefficients (0.791–0.856) and composite reliabilities (0.804–0.868) exceeded the recommended threshold of 0.70, confirming adequate internal consistency. Convergent validity was demonstrated by average variance extracted (AVE) values above 0.50 for each construct (Sense = 0.563; Shield = 0.563; Shift = 0.747), while the square roots of these AVEs (0.75–0.864) exceeded the highest inter-construct correlation (maximum = 0.55), satisfying the Fornell–Larcker criterion for discriminant validity. A multicollinearity test was also performed, with variance inflation factors (VIFs) ranging from 1.11 to 2.02 across all constructs, and condition numbers for the reflective blocks below 2.0. These values are well below thresholds (VIF < 3; condition number < 5), indicating no problematic collinearity.

To further establish discriminant validity, Table 3 presents each manifest indicator's loading on its assigned construct alongside its cross-loadings on all other constructs. As recommended by Hair, Hult, Ringle, and Sarstedt (2017), an indicator should load more strongly on its latent variable than on any other construct.

Table 3. Cross-Loading.

Manifest Variables	Sense	Shield	Shift	IRM
CAA	0.842	0.648	0.433	0.584
FLR	0.409	0.286	0.106	0.215
CAM	0.901	0.608	0.407	0.727
DCF	0.665	0.842	0.348	0.595
SAR	0.441	0.669	0.229	0.311
ACM	0.449	0.730	0.309	0.371
AFR	0.303	0.237	0.850	0.455
VCFR	0.489	0.446	0.879	0.503
SVC	0.742	0.600	0.555	1.000

From Table 3, in every case, each indicator's primary loading exceeds its highest off-diagonal cross-loading by at least 0.200, thereby satisfying the strict cross-loading criterion. These results, along with the Fornell–Larcker and reliability analyses, confirm that all indicators are both reliable and empirically distinct. Based on this, we conclude that the measurement model demonstrates strong discriminant validity and is appropriate for testing the structural hypotheses.

4.3. Model Evaluation and Hypothesis Testing

To evaluate Hypotheses H1–H3, we estimated a PLS-SEM model where the three IAOC micro-routines (Sense, Shield, and Shift) predict effective internal resource management (IRM). Detailed results are presented in Table 4 and Figure 2.

Table 4. Model evaluation and hypothesis testing.

Metric	IRM	Sense	Shield	Shift
R^2	0.594			
R^2 (Bootstrap)	0.596			
Standard error (R^2)	0.038			
Critical ratio (CR) (R^2)	15.777			
Lower bound 95% (R^2)	0.529			
Upper bound 95% (R^2)	0.675			
Path coefficient		0.361	0.292	0.270
Path coefficient (Bootstrap)		0.359	0.291	0.271
Standard error (Path)		0.018	0.018	0.026
Critical ratio (CR) (Path)		19.815	16.082	10.594
Lower bound 95% (Path)		0.324	0.248	0.217
Upper bound (95%) (Path)		0.400	0.327	0.332
Correlation		0.742	0.6	0.555
Correlation × Path coefficient		0.268	0.175	0.15
Contribution to R^2 (%)		45.136	29.559	25.305
Cumulative contribution to R^2 (%)		45.136	74.695	100

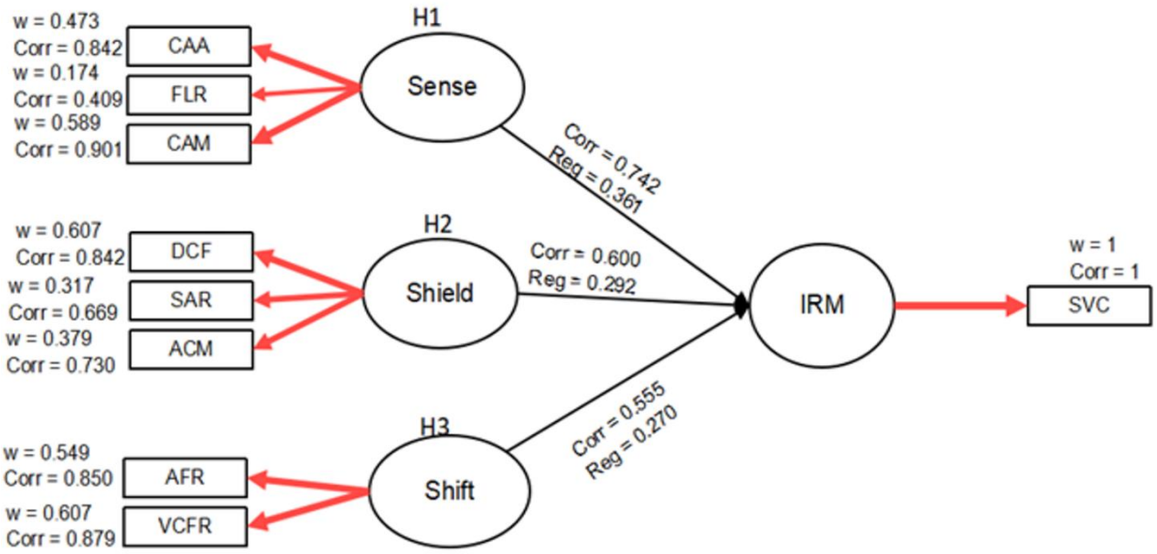

Figure 2. Structural Model of Internal Audit Orchestration Capabilities.

From Table 4, the model explains a substantial proportion of the variance in IRM ($R^2 = 0.594$; bootstrapped $R^2 = 0.596$; CR = 15.777; 95% CI [0.529, 0.675]), indicating that nearly 60% of IRM is attributable to the combined effects of Sense, Shield, and Shift. This suggests that internal audit orchestration capabilities play a significant role in shaping effective internal resource management, with the three micro-routines jointly providing strong explanatory power. The narrow confidence interval further indicates the stability and robustness of the model estimates. This level of explanatory power implies that the model is well specified and suitable for further structural analysis. It provides a solid basis for examining the individual contributions of each micro-routine, assessing their relative importance, and interpreting their directional effects on IRM. Moreover, the results justify proceeding with hypothesis testing and effect size analysis, as the model demonstrates sufficient predictive capability to support meaningful interpretation of the relationships among the constructs.

4.3.1. Hypothesis 1

Hypothesis 1 predicted that the proactive, continuous sensing capability of internal audit would be positively associated with effective resource management. This expectation builds on the dynamic capabilities framework of Teece et al. (1997), which positions sensing at the core of organizational adaptability, and extends it by recognizing the internal audit function, alongside senior management, as a frontline unit that gathers and interprets technological and market signals. The PLS-SEM results, presented in Table 4, strongly support this proposition. Sense exhibits a significant positive effect on IRM ($\beta = 0.361$; $t = 19.815$; $SE = 0.018$; $p < 0.001$), with a bootstrapped confidence interval of [0.324, 0.400] and a high zero-order correlation with IRM ($r = 0.742$). Moreover, Sense alone accounts for 45.1% of the explained variance in resource management. Based on these results, H1 is supported. These findings indicate that continuous sensing by internal auditors materially enhances the firm's ability to identify and allocate both tangible and intangible resources. The results support the positions of Alles et al. (2021) and Betti and Sarens (2021) extend them by demonstrating empirical linkages between predictive audit routines and effective internal resource management. Accordingly, the sensing role of internal audit emerges as a critical driver of effective resource management in dynamic environments.

4.3.2. Hypothesis 2

Hypothesis 2 proposed that the degree of adaptive control co-creation by the internal audit function (Shield) would be positively associated with effective resource management (IRM). Consistent with this prediction, Shield exerts a robust positive effect on IRM ($\beta = 0.292$; $t = 16.082$; $SE = 0.018$; $p < 0.001$), and the bootstrapped 95% confidence interval [0.248, 0.327] confirms the stability of this relationship, as presented in Table 4 and Figure 2. The zero-order correlation between Shield and IRM is moderately strong ($r = 0.600$), indicating that higher levels of audit-led adaptive control co-creation are associated with improved resource protection practices. Notably, Shield alone accounts for 29.6% of the explained variance in IRM, a substantial proportion that underscores the unique contribution of dynamic, collaboratively designed controls. These empirical results reaffirm foundational insights from Agency Theory (Jensen & Meckling, 1976), which emphasize the role of governance mechanisms in constraining opportunistic behavior. The findings also build on the pioneering work of Young et al. (2006) on dynamic control matrices.

4.3.3. Hypothesis 3

Building on Dynamic Capabilities Theory (Teece et al., 1997) and the resource orchestration perspective (Sirmon, Hitt, & Ireland, 2007), we define the Shift micro-routine as the internal audit's ability to reconfigure and optimize resource bundles in real time, redeploy underutilized staff, rationalize capital investments, and streamline processes to meet evolving strategic demands. Hypothesis 3 posited that this resource optimization capability would be positively associated with effective resource management (IRM).

The PLS-SEM results fully support H3. The path coefficient from Shift to IRM is significant ($\beta = 0.270$; $t = 10.594$; $SE = 0.026$; $p < 0.001$), with a bootstrapped 95% confidence interval of [0.217, 0.332]. The moderate zero-order correlation ($r = 0.555$), together with Shift's unique contribution of 25.3% to the explained variance in IRM, confirms that auditors' orchestration of resource optimization is a key driver of effective internal resource management.

4.4. Discussion of Results

This study examined how internal audit orchestration capabilities, Sense (resource identification), Shield (adaptive controls), and Shift (resource optimization), enhance internal resource management (IRM) and sustainable value creation. Consistent with Dynamic Capabilities Theory (Teece et al., 1997) and the resource orchestration perspective (Sirmon et al., 2007), all three routines exert significant positive effects on IRM. The findings extend dynamic capabilities research, which traditionally situates sensing at the executive level, by demonstrating that internal auditors can function as frontline sensors. By embedding predictive analytics and continuous scanning into audit activities, organizations can detect opportunities and risks earlier, thereby identifying both tangible and intangible resources that compliance-focused audits may overlook. This provides empirical support for audit-driven sensing as a driver of resource orchestration, reinforcing Alles et al. (2021)'s call for real-time "Reporting 4.0" and aligning with Betti and Sarens (2021) insights on the role of digitalization in reshaping audit practices.

The results further confirm that adaptive, co-created controls significantly enhance resource protection, thereby addressing a key limitation in earlier conceptual work (Jensen & Meckling, 1976; Young et al., 2006). While Agency Theory emphasizes the need for monitoring mechanisms to constrain opportunistic behavior, it offers limited guidance on how such controls should evolve in dynamic organizational environments. The present findings extend this perspective by demonstrating that controls designed collaboratively and updated in real time are more effective than static, compliance-oriented mechanisms. This shifts the understanding of internal audit from a passive compliance function to an active participant in dynamic risk governance. More specifically, the evidence that collaboratively designed governance mechanisms outperform traditional checklists highlights the importance of adaptability and organizational learning in control systems. In this regard, the study extends the framework of Young et al. (2006) by empirically demonstrating that internal audit contributes to the continuous recalibration of governance structures, ensuring that both physical and intangible assets are effectively protected. This reinforces the view that internal audit plays a critical role not only in enforcing control but also in shaping responsive and context-sensitive governance practices.

Furthermore, the findings show that audit-enabled redeployment of resources has a direct and significant effect on effective internal resource management. While resource orchestration theory (Sirmon et al., 2007) conceptualizes resource reconfiguration at a broad strategic level, the present study provides concrete evidence of how this process is operationalized within organizations. Internal auditors facilitate value chain reviews, identify underutilized capacities, and support the reallocation of resources toward higher-value activities.

The findings advance theory by repositioning internal audit as a strategic orchestrator of organizational resources, rather than merely a compliance-oriented mechanism. By demonstrating how internal audit engages in sensing, shielding, and shifting activities, the study extends existing governance and resource management frameworks, highlighting the function's active role in enabling adaptive decision-making and value creation. From a practical perspective, the findings show that investments in predictive analytics, collaboratively designed control systems, and active participation in value chain processes can significantly enhance the contribution of internal auditors to organizational performance. Such capabilities enable internal auditors to move beyond traditional assurance roles and engage directly in identifying opportunities, safeguarding resources, and facilitating their optimal deployment. In doing so, internal audit becomes a key driver of sustainable value creation, organizational resilience, and long-term competitiveness.

5. Conclusion

This study demonstrates that internal audit-enabled orchestration routines transform the function from a compliance safeguard into a proactive driver of effective internal resource management and sustainable value creation. By integrating audit-enabled analytics, co-created governance mechanisms, and real-time resource alignment, internal audit not only safeguards organizational resources but also facilitates the optimization of both tangible and intangible assets. This integrated Internal Audit Orchestration Capability (IAOC) repositions internal audit as a strategic partner in internal resource management and value creation. The findings highlight the importance of embedding sensing, shielding, and shifting routines within standard audit cycles to enhance organizational adaptability and performance. From a practical perspective, internal auditors should be actively involved in control design and resource alignment processes. In addition, investment in predictive monitoring systems and advanced analytical tools is essential to support a transition from a retrospective, compliance-focused role to a forward-looking function that contributes to organizational resilience and long-term sustainability.

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6. Policy and Practical Implications

Based on the conclusions, we offer the following recommendations for practitioners, boards, regulators, and future researchers.

1. Auditors should strengthen predictive analytics and real-time monitoring to anticipate risks, embed themselves in control design, and participate in cross-functional forums to align and redeploy resources effectively.
2. Executives should reposition internal audit as a strategic partner by broadening its charter to include sensing, shielding, and shifting activities. Boards should monitor audit performance on orchestration capabilities and allocate budgets for analytics tools, automation, and staff training.
3. Professional bodies such as the Committee of Sponsoring Organizations of the Treadway Commission (COSO), The Institute of Internal Auditors (IIA), International Organization for Standardization (ISO), and the Institute of Chartered Accountants, Ghana (ICAG), should update frameworks to recognize continuous monitoring and adaptive controls within the audit mandate. Regulators should also promote transparency by encouraging disclosure of orchestration practices in governance and sustainability reports.
4. Further studies should employ longitudinal designs to establish causal effects of audit orchestration on sustainability, examine moderators such as culture, digital maturity, and industry dynamics, and explore organizational enablers and barriers to sensing, shielding, and shifting routines. Comparative research across

regulatory and cultural contexts would refine the understanding of how internal audit orchestration builds global resource resilience.

7. Contribution of the Study

This study is original in conceptualizing internal audit as a dynamic capability that orchestrates internal resources through sensing, shielding, and shifting roles. It extends resource orchestration theory by demonstrating how internal audit actively drives resource redeployment and sustainable value creation, moving beyond its traditional compliance-focused function.

8. Originality of the Study

To the best of our knowledge, this is the first study in Ghana and one of the few worldwide to investigate internal audit orchestration capabilities through the micro-routines of sensing, shielding, and shifting.

9. Limitations of the Study

This study focused only on companies listed on the Ghana Stock Exchange, selected for their stronger regulatory oversight, transparency, and formalized audit structures. While this context was suitable for evaluating internal audit as a strategic resource, it limits generalizability to SMEs, unlisted firms, and public sector organizations that operate under different conditions. Although Ghana adheres to international governance and audit standards, results should be applied cautiously in other countries due to variations in regulation and culture, especially across emerging markets.

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