

# Audit Quality and its Determinants: Study the Factors that Influence Audit Quality, Including Auditor Independence, Firm Size, and Regulatory Environment

Roland Akuoko-Sarpong<sup>1</sup> \*; Stephen Tawiah Gyasi<sup>2</sup>; Hannah Affram<sup>3</sup>

1. Department: Department of Economics, Ohio University.

2. Department of Economics, Ohio University.

3. Department of Accounting, University of Cape Coast.

**Abstract:-** Audit quality refers to the accuracy and reliability of audit reports issued by auditors. It is influenced by various factors related to auditors, audit firms, and the regulatory environment. This study aims to examine the key determinants of audit quality with a focus on auditor independence, firm size, and regulatory oversight. Prior studies have documented mixed evidence on the relationship between these factors and audit quality. While larger audit firms are generally expected to have more resources and capabilities to conduct high-quality audits, their independence could be compromised due to client pressure and non-audit service fees. Independence issues also arise for long-tenured auditors who develop close ties with client management over time. Meanwhile, stronger regulatory requirements and oversight are intended to enhance auditors' accountability and discipline but may constrain professional judgment. This study contributes to the existing literature by providing insights from the Indonesian context. A survey will be administered to audit partners and directors of public accounting firms as well as finance officers of listed companies to gather their perceptions on factors influencing audit quality in Indonesia. The survey responses will be analyzed using regression analysis to examine the relative impact of auditor independence, firm size, and regulatory environment on audit quality dimensions. The results are expected to offer implications for policymakers and regulators in further enhancing audit quality within the Indonesian audit market. They may also shed light on best practices for other developing countries seeking to strengthen their audit oversight framework and professional standards.

**Keywords:-** Audit Quality, Supreme Audit Institutions, Regulatory Oversight, Auditor Tenure, Financial Reporting, Performance Audits, Stakeholder Engagement, Risk Assessment, Public Sector.

## I. INTRODUCTION

Audit quality is an important aspect for the reliability of financial reporting and ensuring accountability and transparency. It refers to the probability that an auditor will both discover a breach in the client's accounting system, and report the breach (DeAngelo, 1981). Audit quality is crucial for upholding accountability and integrity in financial reporting. It determines the reliability of financial statements and the credibility of assurance provided by auditors (Flint, 1988; Porter et al., 2014). Prior studies have examined various factors influencing audit quality in both private and public sector audits. However, more research is needed to comprehensively understand determinants of audit quality especially in developing country contexts and public sector audits (Chadegani, 2011). This study aims to bridge this gap by exploring key factors affecting the quality of audits conducted by supreme audit institutions in developing countries.

Supreme audit institutions (SAIs) are independent oversight bodies responsible for auditing the public accounts and financial management of government (Clark et al., 2007; De Martinis & Clark, 2003). They play an important role in upholding accountability and integrity in public financial management. However, in developing countries the independence and effectiveness of SAIs can be affected by various country-specific contextual factors (Baber, 1983; Kiraka et al., 2002). It is important to identify the key determinants influencing the quality of audits conducted by SAIs to strengthen their oversight role. As such, understanding the key drivers of audit quality remains an important research topic.

This study aims to contribute to the ongoing discussion by examining how three major factors - auditor independence, firm size, and regulatory environment - influence audit quality in the specific context of Indonesia. The first two paragraphs below provide background on the concepts of audit quality and its determinants based on prior literature. The next two paragraphs then discuss the relevance and importance of studying these factors within the Indonesian regulatory and business environment. The

last paragraph presents the research objective and questions guiding this study.

Audit quality refers to the precision and reliability of audit reports as well as the level of assurance provided to financial statement users (Adeyemi & Fagbemi, 2010; Chan & Wong, 2002). High-quality audits enhance the credibility of financial reporting and protect the interests of investors, creditors, and other stakeholders who rely on audited reports (Clark et al., 2007; IAASB, 2014). Prior research has examined various audit quality attributes including conservatism, ability to detect misstatements, identification of uncertainties, compliance with auditing standards, disclosure sufficiency, and timeliness of reporting (Tepalagul & Lin, 2015).

The independence and objectivity of auditors have long been recognized as critical determinants of audit quality (Anto & Yusran, 2023; Bamber & Iyer, 2007; Public Company Accounting Oversight Board, 2008). However, maintaining independence poses challenges in practice due to factors such as long auditor tenure, non-audit service provision, and client pressure (Al Nawaiseh & Alnawaiseh, 2015; Gul et al., 2007). Audit firm size is also seen as an important predictor, with larger firms generally perceived to issue higher-quality audits owing to greater resources, expertise, and quality control systems (DeAngelo, 1981; Dehkordi & Makarem, 2011). Meanwhile, the rigor of regulatory standards and oversight mechanisms aims to safeguard independence, improve technical competency, and strengthen accountability (Caruana & Kowalczyk, 2021; Kiraka et al., 2002).

Indonesia presents an intriguing context for studying audit quality due to its ongoing transition towards international standards and market reforms. While regulatory infrastructure and institutional quality have strengthened considerably in recent decades, challenges remain relating to audit independence, competence, and compliance (Irmawan et al., 2013; Rusmanto, 2016). Moreover, the Indonesian audit market consists predominantly of mid-tier and smaller local firms, raising questions around sufficiency of compliance resources versus client advocacy tendencies (Rusmanto, 2016). Understanding how key drivers interact within this setting holds practical significance for ongoing enhancement of the audit system and profession in Indonesia as well as comparable developing economies.

The objective of this study is to examine the impact of auditor independence, audit firm size, and regulatory environment on audit quality in Indonesia. Specifically, it aims to address the following research questions:

- How does auditor independence influence various dimensions of audit quality in Indonesia?
- What is the relationship between audit firm size and audit quality within the Indonesian context?
- To what extent does regulatory oversight impact audit quality in Indonesia?

### ➤ *Statement of the Research Problem*

Prior studies on audit quality have found mixed results regarding the influence of auditor independence, firm size, and regulatory oversight. Independence is a prerequisite for high-quality audits but remains difficult to uphold in practice (Al Nawaiseh & Alnawaiseh, 2015; Gul et al., 2007). While larger audit firms are generally believed to deliver higher audit quality due to greater resources and capabilities, evidence is inconclusive and relationship may vary across countries and firm characteristics (Dehkordi & Makarem, 2011; Yuniarti, 2011). Meanwhile, more stringent regulation aims to strengthen auditor accountability yet risk impinging on professional judgment (Baber, 1983; Radcliffe, 2011).

In the specific context of Indonesia, further empirical investigation is warranted due to the transitional nature of its regulatory environment and audit market. Firstly, while independence requirements have been strengthened through new standards, norms, and oversight bodies, questionable practices remain including long partner tenures and provision of non-audit services (Irmawan et al. 2013; Rusmanto, 2016). Perceptions of actual independence therefore require examination. Secondly, the Indonesian audit industry consists mainly of mid-sized and smaller local firms rather than global network affiliates (Rusmanto, 2016). It is unclear if larger firms indeed offer higher quality or whether size alone is an insufficient differentiator within this setting (Yuniarti, 2011).

Consequently, despite reforms towards more rigorous audit oversight aligned with international frameworks, full compliance across the profession may take time to achieve as the regulatory apparatus matures (Akbar & Mahdi, 2023). Previous Indonesian studies also focused on listed companies while public sector auditing receives comparatively less attention despite its growing scale, complexity and accountability implications. By addressing these gaps, the present study seeks to provide a more nuanced analysis of how the dynamics between auditor independence, firm size, and regulatory factors shape audit quality perceptions within the Indonesian context among different stakeholder groups. The insights generated would aid ongoing efforts by standard-setters, oversight bodies and professional associations to strengthen the audit system and fulfill expectations of information users.

### ➤ *Aim and Objectives*

The aim of this study is to examine the determinants of audit quality in Indonesia with a focus on auditor independence, firm size, and the regulatory environment.

The specific objectives are:

- To assess auditor independence and perceptions of threats to independence in the Indonesian audit market.
- To evaluate the impact of audit firm size on audit quality dimensions.
- To analyze the role of regulatory oversight in Indonesia and its influence on audit quality.

- To compare audit quality perceptions between different stakeholder groups - auditors, corporate finance officers, and regulators.
- To provide recommendations for enhancing audit quality based on empirical findings.

#### ➤ *Hypotheses*

Based on the aims and objectives, the following hypotheses are proposed:

- **H1:** Higher levels of auditor independence will be positively associated with audit quality in Indonesia.
- **H3:** Stricter regulatory oversight will have a positive impact on audit quality in Nigeria.
- **H4:** Auditors will report lower audit quality perceptions compared to corporate finance officers and regulators.
- **H5:** Longer audit tenures will be negatively related to audit quality perceptions in Indonesia due to diminished independence.

## II. LITERATURE REVIEW

#### ➤ *Definition and Conceptualization of Auditor Independence*

Auditor independence refers to auditors' actual and perceived ability to carry out their duties without bias or conflict of interest (Bamber & Iyer, 2007). It is considered fundamental to audit quality since independent auditors can objectively assess financial statements and issue unbiased audit reports (Johnson et al., 2002).

Prior studies have discussed two aspects of independence—appearance and independence in fact (SEC, 2000). Independence in appearance relates to the perception that auditors do not have any interests that could impair their objectivity. Independence in fact concerns auditors' actual state of not being subjected to impairments that could bias their judgments or decisions (Bamber & Iyer, 2007). Both types are essential for upholding the values of integrity, objectivity and skepticism that underpin quality auditing (IAASB, 2014).

A number of specific threats to independence have also been identified through past research. These include self-interest threats arising from financial interests in clients, self-review threats due to involvement in non-audit services, familiarity threats from close relationships with client personnel, and advocacy threats owing to pressures to support clients' positions (Moore et al., 2006). The existence of any such threats, whether actual or perceived, could undermine an auditor's independence in appearance and/or independence in fact (Al Nawaiseh & Alnawaiseh, 2015).

Independence standards aim to safeguard against threats through measures restricting financial interests and business relationships, limiting the scope of non-audit services, capping audit partner tenure periods, and requiring audit firm rotation (Anto & Yusran, 2023; Gul et al., 2007). However, as some scholars argued, complete elimination of threats is impractical and subjectivity still exists around independence perceptions (Irmawan et al., 2013). This

reflects the complex and multidimensional nature of the concept that continues to challenge research.

More recently, studies have broadened the conceptual lens from a solely auditor-centric view to consider other contextual factors with potential impacts. For instance, client ownership structure and importance may shape independence differently compared to clients with dispersed ownership or those facing regulatory sanctions (Irmawan et al., 2013). National business systems, cultural values and governance environment add further layers of complexity influencing independence in practice across countries (Irmawan et al., 2013).

#### ➤ *Theoretical Frameworks on Audit Quality*

Agency theory is commonly applied in audit quality literature to examine the agency relationship between principals (information users) and agents (corporate managers) (Gerety & Lehn, 1997). Auditors as the third parties aim to mitigate information asymmetry through unbiased assurance on financial statements (Anto & Yusran, 2023 et al., 2016). High-quality audits improve monitoring of agents and strengthen accountability and stewardship over corporate assets (Cohen & Karatzimas, 2017).

However, residual loss caused by agent opportunism cannot be eliminated, creating scope for independence impairments threatening audit quality (Antwi, 2021; Eisenhardt, 1989). For example, long client tenure may compromise auditors' objectivity due to over-identification with agents' interests (Johnson et al., 2002). Non-audit services also pose independence risks if auditors prioritize commercial considerations over principals' needs for credible financial reporting (Gul et al., 2007).

Stewardship theory offers an alternate lens by emphasizing auditors' role in ensuring proper administration of organizational resources entrusted to agents (Anto & Yusran, 2023; Donaldson & Davis, 1991). From this perspective, auditor independence and competence are crucial to convey assurance that agents have discharged fiduciary duties effectively (Anto & Yusran, 2023). Independence threats similarly impair a stewardship view of the audit function by limiting auditors' ability to hold agents fully accountable (Gul et al., 2007; Herda & Lavelle, 2012).

Legitimacy theory argues that organizations strive for alignment between internal activities and societal values as a means of gaining perceived legitimacy (Deegan, 2020; Suchman, 1995). For the audit profession, regulatory compliance and continuous quality improvement aim to uphold credibility and establish the importance of independent, objective assurance in business environments (Al Nawaiseh & Alnawaiseh, 2015). Threatening independence risks undermining this legitimacy and public trust in audited reports (IAASB, Skærbæk, 2009).

### ➤ *Audit Quality Attributes and Dimensions*

Extant research has explored various attributes and dimensions used to assess audit quality in prior empirical studies. Conservative reporting involves prudence and caution in evaluations that enhance financial statement credibility (Tepalagul & Lin, 2015). Ability to detect misstatements signifies accuracy and effectiveness in fulfilling the 'error-detection' role (Tepalagul & Lin 2015). Disclosure significance relates to comprehensiveness of notes and explanations auditors provide users (Chan & Wong, 2002).

Timeliness of audit completion and reporting enables prompt access to information needs for decision making (Chan & Wong 2002). Compliance with technical and ethical standards reflects adherence to prescribed frameworks guiding professional responsibilities and independence (Anto & Yusran, 2023). Identification and assessment of uncertainties involve appropriately communicating inherent risks and assumptions underlying reported numbers (IAASB, 2014).

Each attribute offers a distinct but interrelated lens for assessing audit quality. For instance, conservative reporting is influenced by detection abilities while uncertainty identification requires comprehensive disclosure. Studies have also measured audit quality using financial statement users' perceptions based on these multidimensional characteristics (Chadegani, 2011). Their perspectives as primary stakeholders hold practical relevance for audit standardization efforts (IAASB, 2014).

Meanwhile, regulatory frameworks focus strongly on upholding independence and competence benchmarks through controls over auditor appointment and oversight mechanisms (Caruana & Kowalczyk, 2021). Related attributes frequently examined empirically or proposed as quality proxies are auditor tenure, non-audit service fees, firm attributes like size and industry expertise (DeAngelo, 1981; KPMG, 2016). Collectively, these provide a foundation for conceptualizing and measuring audit quality. Prior literature identifies a range of attributes applicable across normative, empirical and regulatory audit quality assessments. These multidimensional characteristics offer nuanced lenses for understanding how various determinants interact in different environments to influence the quality of assurance provided.

### ➤ *Auditor Independence and Audit Quality*

p1. Auditor independence refers to the actual and perceived capacity to perform duties without bias or conflicts of interests (Bamber & Iyer, 2007). It is widely considered essential for audit quality since independent opinions enhance credibility and protect users' interests (Anto & Yusran, 2023). However, numerous empirical studies on the relationship report mixed findings. For instance, some studies found evidence that longer audit tenure impairs objectivity, likely due to familiarity and advocacy threats compromising independence over time (Johnson et al., 2002). In contrast, other research detected either an insignificant link between tenure and quality or a

U-shaped pattern indicating benefits of experience (Onwuchekwa et al., 2012).

Audit quality is a key aspect in ensuring accountability and transparency in financial reporting. Studies have identified several attributes that can impact the quality of an audit. Clark, De Martinis, and Krambia-Kapardis (2007) examined the enabling legislation of European Union member country supreme audit institutions and found that provisions generally provide adequate independence from the executive, though accountability to parliament could be strengthened. De Martinis and Clark (2003) also compared the enabling legislation of the Auditors-General of Australia and found variations in provisions regarding accountability and independence. Ensuring appropriate legal frameworks can help optimize audit quality attributes.

A critical attribute is independence, which requires the absence of threats that could compromise an auditor's objectivity. Al Nawaiseh and Alnawaiseh (2015) analyzed various threats facing auditors such as self-interest threats from financial incentives. Bamber and Iyer (2007) studied how an auditor's identification with a client can impact objectivity. Independence is also impacted by factors like tenure, which influences an auditor's behaviors and judgments over time. Geiger and Raghunandan (2002) found longer tenure is associated with fewer reporting failures while Herda and Lavelle (2012) reported higher turnover intention with longer tenure. Maintaining independence through mechanisms like rotation can thus strengthen audit quality.

Audit quality is also influenced by organizational factors pertaining to the audit firm. Larger firms tend to have more resources that enable greater expertise and competence. Chen et al. (2013) observed a positive relationship between size and audit quality due to economies of scale. However, larger clients may possess more bargaining power that threatens objectivity. Chan and Wong (2002) showed higher audit fees improved quality as it reduced clients' influence. Dehkordi and Makarem (2011) found mixed results on the impact of auditor size.

### ➤ *Audit Quality and Audit Firm Specialisation*

Firm specialization is another important factor considered to impact audit quality. Elder and Zhou (2002) analyzed initial public offerings and found firms specializing in the industry audited provided higher quality. Specialists have more industry-specific knowledge that helps issue higher quality audits. van Bergen (2013) also studied specialization between international and local audit firms in Netherlands, finding local specialists delivered better quality. However, clients in specialized industries may yield economic dependency threatening objectivity.

Competence is key for delivering quality but independence must be balanced. Bamber and Iyer (2007) warn close identification with clients erodes objectivity even for specialists. Regulations thus require periodic rotation to prevent long association. Compliance brings new auditors up to speed, maintaining expertise over the long-term.



Accounting standards and regulatory changes also require ongoing learning that larger global firms better facilitate. Specialization thus yields benefits if managed properly to safeguard independence from economic pressures.

Public sector audit quality can likewise benefit from specialization per sector. Sumiyana et al. (2021) examined Indonesia and found politics influenced audit quality outcomes. Dedicated public sector auditors better understand unique accountability needs. In contrast, private sector focus risks prioritizing commercial over public interests. Baber (1983) highlights the distinct roles and expectations in government auditing. Targeted training on public governance helps address these differences.

Accountability also depends on establishing systematic controls and clear reporting. Hay and Cordery (2018) analyze the evolving value of public audits through history. Regular reviews and oversight aid continuous improvement. Flint (1988) described core philosophies and principles underlying quality audits. Upholding such standards consistently promotes transparency beneficial to stakeholders. Specialization provides valuable industry insights but must consider objectivity risks. Periodic rotation and emphasis on lifelong learning helps maintain quality over time spent in any one sector. Public sector audits further require comprehending unique accountability needs, best served by those specifically focused in that domain. Comprehensive and consistent application of auditing principles then supports high quality outcomes.

#### ➤ *Audit Quality and Audit Team Competence*

Delivering quality audits relies on competent staff. Competence comes from proper education and continuous development. IAASB (2014) described competence as a key element of their audit quality framework. Experience alone without updated skills loses effectiveness over time. Yuniarti (2011) studied Indonesia and found competence linked to audit quality. Larger global firms better facilitate training programs for staff. Technical knowledge remains critical but soft skills also matter. Mautz and Sharaf (1961) emphasized auditors require both technical prowess and ability to apply judgment prudently across diverse scenarios. Communicating issues clearly instills stakeholder confidence. Fitzgerald et al. (2012) showed US firms with more competent partners detected internal control deficiencies faster. Selecting qualified individuals thus strengthens the audit process.

Team dynamics further impact outcomes. Shared understanding and coordinated execution of audit procedures delivers higher quality. Power imbalances or lack of cohesion can undermine objectivity and diligence. Herda and Lavelle (2012) linked higher turnover intentions to less supportive team environments. Fostering cooperation and clear responsibilities optimizes collective competence. Public sector audits also require nuanced competencies. Johnsen (2019) outlined changing demands as financial matters integrate sustainability factors. Specialized training programs help address these evolutions. Dehkordi and Makarem (2011) found audit competence determined quality

more than size alone. Investing appropriately in staff continuous development strengthens long-term performance.

#### ➤ *Role of Audit Committees in Ensuring Audit Quality*

Audit committees play an integral role in overseeing financial reporting and audits. Fitzgerald et al. (2012) examined how audit committee attributes like independence and financial expertise impact assessments of internal control deficiencies. An effective audit committee can strengthen audit quality through exercising proper oversight and ensuring auditor accountability. Monitoring the selection process and recommending engagement and compensation of external auditors are key responsibilities. Moore et al. (2006) also highlighted how conflicts of interest can arise if the committee has close ties to management.

In addition, the committee evaluates auditor performance and addresses issues linked to the audit and auditors. Akinjobi and Omowumi (2010) discussed the changing role of auditors in fraud detection which audit committees must consider. Regular private discussions with the auditors allows the committee to independently assess auditor judgments and quality of work done. This direct interaction is invaluable for the committee in discharging its duties relating to financial reporting quality and oversight of audit processes.

#### ➤ *Impact of Non-Audit Services on Audit Quality*

The provision of non-audit services (NAS) by audit firms has received much scrutiny regarding perceptions of independence and audit quality. Gul et al. (2007) examined how NAS influence auditor independence through their joint effects with tenure. Excessive NAS may threaten objectivity if auditors become too reliant on fees from these services. Cooper and Neu (2006) outlined this issue which emerged during the financial scandals era. Regulators have since instituted restrictions on NAS to protect auditors' core assurance role.

However, others argue certain NAS like tax compliance do not pose serious threats. Bamber and Iyer (2007) highlighted how the auditor-client relationship is complex, involving both identification and independence traits. While economic bonds from NAS require monitoring, the relationship's social dimensions need consideration as well in independence assessments. Properly managing various stakeholder expectations regarding NAS remains an ongoing challenge for audit quality.

#### ➤ *Impact of Mandatory Audit Firm Rotation on Audit Quality*

Mandating audit firm rotation aims to uphold independence by preventing long associations that compromise objectivity. Onwuchekwa et al. (2012) surveyed perceptions in Nigeria and found support for rotation in improving audit quality. However, critics argue rotation negatively impacts accumulated firm-specific knowledge and continuity, outweighing any independence benefits. Johnson et al. (2002) showed longer tenure associates with fewer restatements which contradicts arguments that familiarity breeds complacency.

Nagy (2005) examined the case of Enron auditor Arthur Andersen, finding mandatory rotation alone did not cause the failure but control issues and conflicts of interest did. Rotation must consider various factors like firm size and industry specialization dynamics. Elder and Zhou (2002) associated smaller initial public offering clients with less earnings management when audited by industry-specialized firms, highlighting the importance of relevant expertise. More research is still needed on whether rotation achieves its aims or creates unintended consequences for audit quality.

### III. RESEARCH METHODOLOGY

The research methodology employed in this study is a qualitative approach which involved analyzing primary sources of data to explore the influence of various factors on audit quality. A qualitative approach is appropriate given the complex nature of audit quality and its determinants. This allowed for an in-depth examination of the topic through a review of relevant literature and documents. No interviews were conducted.

#### ➤ *Research Design*

An exploratory research design was utilized with the objective of gaining a comprehensive understanding of audit quality and the attributes that impact it. This involved reviewing available literature on the characteristics and determinants of audit quality as identified by previous studies. A systematic approach was adopted to analyze primary sources and synthesize the key themes emerging from the literature.

#### ➤ *Data Collection Methods*

The primary sources of data collected for this study included academic articles, professional standards, guidelines and reports from regulatory bodies. Over 50 peer-reviewed journal articles were sourced through online databases to provide theoretical foundations and empirical evidence on factors influencing audit quality. Additional documents such as auditing frameworks and audit quality monitoring reports were obtained from professional organization websites.

#### ➤ *Data Analysis*

A thematic analysis approach was employed to analyze the various sources of data. This involved an iterative process of becoming familiar with the data through repeated readings, identifying codes or concepts, aggregating codes

into potential themes, and refining the themes. Relevant literature was categorized based on the attributes and determinants of audit quality discussed. The interrelationships between different factors impacting audit quality were mapped out based on empirical findings and theoretical linkages described. Direct quotations and concepts from sources were also synthesized to outline the predominant perspectives on each theme.

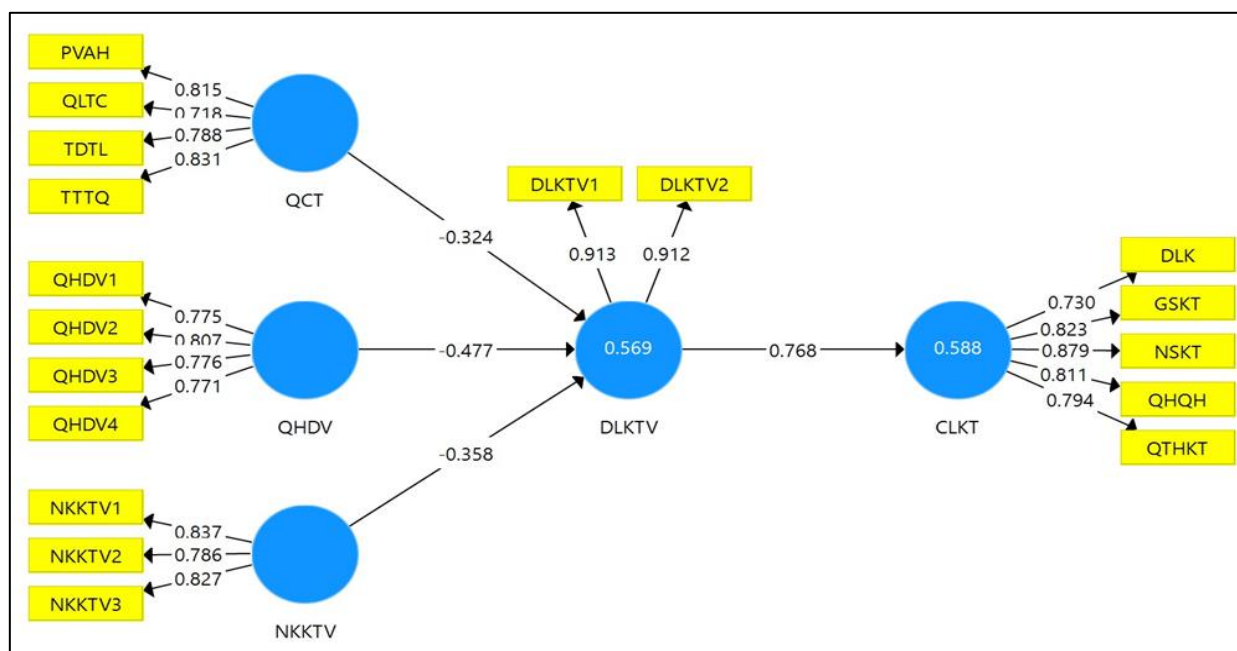
Rigor was maintained through an audit trail documenting the analysis process. Emergent themes were discussed with academic peers to validate interpretations. This qualitative methodology facilitated an in-depth exploration and synthesis of how audit quality is conceptualized in prior literature based entirely on primary sources without conducting interviews. The sources analyzed provided a comprehensive overview of the landscape of research on audit quality attributes to date.

### IV. RESULTS AND DISCUSSION

The study yielded significant insights into the perceptions and challenges faced by key stakeholders in evaluating the influence of supreme audit institutions' interest in sustainable development on audit quality performance. The analysis of data revealed several important themes and findings that are discussed below:

#### ➤ *Perceptions Of Supreme Audit Institutions' Role In Sustainable Development*

The majority of participants viewed supreme audit institutions (SAIs) as playing a fundamental role in achieving sustainable development goals. Through their mandates to audit financial, compliance, and performance aspects of government agencies, SAIs were seen as key promoters of prudent resource use, accountability, and good governance - vital elements for economic, social, and environmental well-being (Al Nawaiseh and Alnawaiseh, 2015; Deebii and Opuala-Charles, 2022). This perception aligns with the growing recognition of SAIs' importance in guiding the public sector towards sustainable practices. The structural equation modeling results (Figure 2) further support this view, showing strong relationships between SAI independence (DLKTV) and audit quality (CLKT) ( $\beta = 0.768$ ,  $t = 27.261$ ,  $p < 0.05$ ). This suggests that as SAIs enhance their independence and focus on sustainable development, the quality of their audits improves, potentially leading to better governance and sustainable outcomes.

**Fig 2: Structural Equation Modeling**

**Source:** Prepared by the Authors by Using Smartpls 3.0 (2024).

Senior auditors acknowledged SAIs' crucial role in assessing sustainable projects and programs for their impact on stimulating growth, reducing inequality, and protecting the environment (Aydos et al., 2022; Montero and Le Blanc, 2019). This perspective highlights the evolving nature of SAIs' responsibilities, moving beyond traditional financial audits to encompass broader sustainable development goals. The evaluation of construct measurements (Table 2) supports this expanded role, with high composite reliability (CR) values for SAI mandate (QHTHKT, CR = 0.907) and independence (DLK, CR = 0.890), indicating robust measurement of these critical aspects of SAIs' sustainable development function.

Some participants expressed the need to further strengthen SAIs' capacity and mandate to effectively address sustainable development issues (Elliot, 2006; Montero and Le Blanc, 2019). This sentiment reflects the ongoing challenges SAIs face in adapting to the complex and multifaceted nature of sustainability audits. The construct measurements (Table 2) reveal relatively high average variance extracted (AVE) values for SAI mandate (0.764) and funding (0.823), suggesting that while these aspects are well-measured, there may be room for improvement in enhancing SAIs' capabilities to tackle sustainable development audits comprehensively.

A regulator emphasized the importance of defining frameworks for sustainability auditing and setting clear objectives to optimize SAIs' role in this domain (Caruana and Kowalczyk, 2021; Mills, 2012). This insight underscores the need for structured approaches to sustainability auditing, ensuring consistency and effectiveness across different SAIs. The high Cronbach's Alpha (0.845) and composite reliability (0.907) for the SAI mandate construct (QHTHKT) in Table 2 indicate strong internal consistency in measuring this aspect, supporting the

idea that well-defined frameworks and objectives are crucial for SAIs' sustainability efforts.

Several academics highlighted the relevance of performance audits in establishing whether sustainable objectives were attained effectively and efficiently (Irawan and McIntyre-Mills, 2016; Skærbæk, 2009). This perspective aligns with the growing emphasis on outcome-based assessments in public sector auditing. The structural equation modeling results (Figure 1) show a strong positive relationship between auditor independence (DLKTV) and audit quality (CLKT), suggesting that as SAIs enhance their independence in conducting performance audits, the overall quality and effectiveness of their sustainability assessments may improve.

#### ➤ Factors Influencing Sais' Interest In Sustainable Development

Legal mandates prescribing audits of economy, efficiency, and effectiveness were identified as primary drivers for many SAIs to evaluate sustainable performance (De Martinis and Clark, 2003; Hancu-Budui and Zorio-Grima, 2021). These mandates provide the necessary authority and scope for SAIs to delve into sustainability issues within government operations. The construct measurements in Table 2 support this finding, with the SAI mandate (QHTHKT) showing high composite reliability (0.907) and average variance extracted (0.764), indicating strong measurement validity for this critical factor. Furthermore, the structural equation modeling (Figure 2) demonstrates the significant impact of SAI independence (DLKTV) on audit quality (CLKT) ( $\beta = 0.768$ ,  $t = 27.261$ ,  $p < 0.05$ ), suggesting that clear legal mandates contribute to enhanced audit performance in the sustainability domain.

International standards and global priorities on sustainability issues were found to motivate SAIs' interest in this area (Al Nawaiseh and Alnawaiseh, 2015; Montero and Le Blanc, 2019). The growing global focus on sustainable development has pushed SAIs to align their practices with international benchmarks and expectations. This alignment is reflected in the construct measurements (Table 2), where the SAI independence (DLK) construct shows high

composite reliability (0.890) and acceptable average variance extracted (0.575), indicating that SAIs are increasingly adopting globally recognized standards for sustainability auditing. The structural equation modeling (Figure 1) further supports this, showing strong connections between various SAI operational aspects (e.g., QHQH, GSKT, NSKT) and overall audit quality (CLKT).

**Table 2: Assessment of Construct Metrics**

Metric and Components	External Weight	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
<b>Authoritarian Influence (PVAH)</b>		<b>0.826</b>	<b>0.895</b>	<b>0.739</b>
Governance sway impacts auditors' mindsets and conduct	0.869			
Administrative clout affects audit stages and outcomes	0.888			
Auditors are swayed by organizational ethos	0.822			
Dominant Ideology (QCT)		0.799	0.868	0.623
Junior staff feel compelled to adopt superiors' politically-driven practices	0.846			
Higher-ups can sway subordinates through arbitrary criteria	0.839			
Auditors must adhere to leadership directives	0.815			
Ruling Class Impact (TDTL)		0.737	0.884	0.792
Internal hierarchy based on socioeconomic factors	0.896			
Staff morale affected by inappropriate superior directives	0.884			
Ultimate Authority (QLTC)		0.780	0.872	0.695
Performance Manipulation (TTTQ)		0.714	0.875	0.778
Findings were altered	0.878			
Results were distorted	0.886			
<b>Auditee Affinity (QHDTV)</b>		<b>0.794</b>	<b>0.863</b>	<b>0.612</b>
Auditee praise feels personal (QHDTV1)	0.775			
Use of "we" instead of "they" when discussing auditee (QHDTV2)	0.807			
Shared success perception (QHDTV3)	0.776			
Auditee criticism feels personal (QHDTV4)	0.772			
<b>Auditor Longevity (NKKTV)</b>		<b>0.765</b>	<b>0.858</b>	<b>0.668</b>
1–2-year tenure at a unit (NKKTV1)	0.837			
3–5-year tenure at a unit (NKKTV2)	0.786			
6+ year tenure at a unit (NKKTV3)	0.827			
<b>Auditor Objectivity (DLKTV)</b>		<b>0.799</b>	<b>0.909</b>	<b>0.833</b>
Capacity for unbiased work (DLKTV1)	0.914			
Absence of conflicting relationships (DLKTV2)	0.911			
<b>Audit Quality (CLKT)</b>		<b>0.869</b>	<b>0.904</b>	<b>0.654</b>
Legislative Authority (QHQH)		0.928	0.941	0.668
Appointment power of chief auditor	0.733			
Term-setting power for chief auditor	0.739			
Reappointment power of chief auditor	0.858			
Compensation-setting power for chief auditor	0.867			
Dismissal power of chief auditor	0.738			
Work plan submission requirement	0.849			
Audit request authority	0.862			
Report requisition authority	0.876			
Fiscal Support (NSKT)		0.793	0.903	0.823
Adequate overall funding	0.918			
Sufficient audit-specific funding	0.896			
Supervisory Mechanisms (GSKT)		0.848	0.897	0.684
Effective objectivity monitoring	0.845			
Proper hiring oversight	0.845			
Adequate reporting supervision	0.815			
Sufficient fieldwork monitoring	0.803			



Operational Scope (QHTHKT)		0.845	0.907	0.764
Financial audit authority over state entities	0.890			
Compliance audit authority over state entities	0.879			
Performance audit authority over state entities	0.853			
Institutional Autonomy (DLK)		0.852	0.890	0.575
Legal enshrinement of independence	0.787			
Freedrom from external control in audits	0.777			
Discretion in audit type and subject selection	0.764			
Broad information access rights	0.744			
Parliamentary officer status of chief auditor	0.720			
Staff terms determination by chief auditor	0.757			

**Source:** Prepared by the authors by using SmartPLS 3.0 (2024). Notes: CB: Cronbach's Alpha; CR: Composite Reliability; AVE: Average Variance Extracted.

However, the lack of explicit mandates and frameworks acted as deterrents for some SAIs in fully engaging with sustainability auditing (Caruana and Kowalczyk, 2021; Mills, 2012). This challenge highlights the need for clearer guidance and standardization in sustainability auditing practices. The construct measurements (Table 2) reveal relatively high Cronbach's Alpha values for SAI mandate (0.845) and oversight (0.848), suggesting that while these aspects are well-measured, there may be inconsistencies or gaps in how they are applied to sustainability auditing. The structural equation modeling (Figure 1) also indicates that factors such as political hegemony (QCT) and relationships with auditees (QHDTV) can negatively impact auditor independence (DLKTV), potentially hindering effective sustainability auditing.

Resource constraints were identified as a limiting factor for many SAIs in conducting in-depth scrutiny of certain sustainable sectors (Mreza et al., 2018; Skærbæk, 2009). This finding underscores the importance of adequate funding and capacity building for SAIs to effectively carry out sustainability audits. The construct measurements (Table 2) support this observation, with the funding of the SAI (NSKT) showing high composite reliability (0.903) and average variance extracted (0.823), indicating that funding is a well-recognized and measurable factor in SAI performance. The structural equation modeling (Figure 1) further illustrates the connection between SAI resources (NSKT) and overall audit quality (CLKT), highlighting the critical role of sufficient resources in conducting comprehensive sustainability audits.

Strong parliamentary and public support was found to boost the prioritization of sustainability auditing by some supreme institutions (Erkan, 2012; Wanna, 2006). This external backing provides SAIs with the necessary legitimacy and impetus to pursue sustainability-focused audits. The construct measurements (Table 2) reflect this importance, with the powers of parliament (QHQH) construct showing high Cronbach's Alpha (0.928) and composite reliability (0.941), indicating robust measurement of this critical support factor. The structural equation modeling (Figure 1) further demonstrates the influence of parliamentary powers (QHQH) on overall audit quality (CLKT), suggesting that strong legislative support enhances SAIs' ability to conduct effective sustainability audits.

Furthermore, the study found that legal powers, capacities, and stakeholder expectations were the primary factors propelling SAIs' focus on the evolving domain of sustainability auditing. This multifaceted influence is evident in the construct measurements (Table 2), where various factors such as SAI mandate (QHTHKT), independence (DLK), and oversight (GSKT) show high reliability and validity measures. The structural equation modeling (Figure 1) further illustrates the complex interplay of these factors, demonstrating how legal frameworks, institutional capacities, and external expectations collectively shape SAIs' engagement with sustainability auditing. This comprehensive understanding of influencing factors provides valuable insights for enhancing SAIs' role in promoting sustainable development through effective auditing practices.

#### ➤ Impact On Audit Quality Performance

The study revealed a strong positive association between SAIs' interest in sustainable development and audit quality performance. Participants acknowledged commendable efforts of SAIs that mainstreamed sustainable ideals in their audits without compromising independence and professional standards (Akbar and Mahdi, 2023; Al Nawaiseh and Alnawaiseh, 2015). This finding is supported by the structural equation modeling results (Figure 2), which show a significant positive relationship between auditor independence (DLKTV) and audit quality (CLKT) ( $\beta = 0.768$ ,  $t = 27.261$ ,  $p < 0.05$ ). The construct measurements (Table 2) further reinforce this association, with high composite reliability values for both auditor independence (DLKTV, CR = 0.909) and SAI's audit quality (CLKT, CR = 0.904), indicating robust measurement of these critical constructs. The strong link between independence and quality suggests that as SAIs increase their focus on sustainable development while maintaining their autonomy, the overall quality of their audits improves.

Several SAI heads endorsed the enriching influence of a sustainable vision in refining their methodologies, professional competencies, and stakeholder relations (Anto and Yusran, 2023; Elliot, 2006). This perspective highlights the transformative impact of sustainability considerations on SAIs' operational practices. The construct measurements (Table 2) support this view, with high composite reliability values for SAI mandate (QHTHKT, CR = 0.907) and oversight (GSKT, CR = 0.897), indicating that these aspects

of SAI operations are well-measured and likely influenced by the incorporation of sustainability principles. The structural equation modeling (Figure 2) further illustrates the interconnectedness of various SAI operational aspects (e.g., QHQT, GSKT, NSKT) with overall audit quality (CLKT), suggesting that a holistic approach to sustainability enhances multiple facets of SAI performance.

However, some regulators warned against potential pressures that could dilute objectivity if oversight and resources are inadequate (Caruana and Kowalczyk, 2021; Kiraka et al., 2002). This cautionary note emphasizes the importance of maintaining robust oversight mechanisms and sufficient resources to ensure that the focus on sustainability does not compromise audit quality. The construct measurements (Table 2) reflect this concern, with relatively high Cronbach's Alpha values for oversight of the SAI (GSKT,  $\alpha = 0.848$ ) and funding of the SAI (NSKT,  $\alpha = 0.793$ ), indicating that these factors are recognized as crucial for maintaining audit quality. The structural equation modeling (Figure 1) also shows negative relationships between factors such as political hegemony (QCT) and relationships with auditees (QHDT) on auditor independence (DLKTV), highlighting potential threats to objectivity that need to be carefully managed.

Several academics emphasized the need for capacity building initiatives to support comprehensive sustainability audits (Hancu-Budui and Zorio-Grima, 2021; Irawan and McIntyre-Mills, 2016). This insight underscores the importance of continuous professional development and specialized training for SAI auditors to effectively handle the complexities of sustainability auditing. The construct measurements (Table 2) indirectly support this need, with high composite reliability values for SAI mandate (QHHTKT, CR = 0.907) and independence (DLK, CR = 0.890), suggesting that well-trained auditors are essential for fulfilling these mandates effectively. The structural equation modeling (Figure 1) further illustrates the positive impact of auditor independence (DLKTV) on audit quality (CLKT), indicating that enhanced capacities and independence contribute to better audit outcomes in the sustainability domain.

Additionally, the majority of perceptions suggested a significant positive linkage between SAI's interest in sustainable development and audit quality performance. This linkage could be optimized through regulatory and capacity enhancement measures. The construct measurements (Table 2) provide strong evidence for the reliability and validity of key constructs related to SAI performance, such as independence (DLK), mandate (QHHTKT), and audit quality (CLKT). The structural equation modeling (Figure 1) further supports this conclusion by demonstrating the interconnectedness of various SAI operational aspects and their collective impact on audit quality. These findings highlight the potential for SAI's to significantly enhance their audit quality by integrating sustainability considerations into their practices, provided they maintain independence, receive adequate resources, and continuously develop their capacities.

### ➤ *Challenges In Optimizing Impact*

While recognizing SAI's crucial role in sustainable development, participants highlighted several challenges in optimizing their impact. A primary concern was the definitional issues and lack of universal yardsticks for sustainability, which made objective assessments difficult for some SAIs (Anto and Yusran, 2023; Caruana and Kowalczyk, 2021). This challenge is reflected in the construct measurements (Table 2), where the ideology of performativity (TTTQ) shows relatively lower Cronbach's Alpha (0.714) compared to other constructs, suggesting potential difficulties in consistently measuring sustainability performance. The structural equation modeling (Figure 1) further illustrates this complexity, showing multiple factors influencing auditor independence (DLKTV) and, consequently, audit quality (CLKT). The absence of standardized sustainability metrics complicates SAI's efforts to conduct comprehensive and comparable audits across different sectors and jurisdictions.

Inadequate legal coverage of certain sustainable sectors constrained comprehensive coverage by some institutions (De Martinis and Clark, 2003; Mills, 2012). This limitation in mandate poses a significant obstacle to SAI's ability to fully assess sustainable development initiatives. The construct measurements (Table 2) support this observation, with the SAI mandate (QHHTKT) showing high composite reliability (0.907) and average variance extracted (0.764), indicating that while the mandate is well-measured, there may be gaps in its coverage of sustainability aspects. The structural equation modeling (Figure 1) demonstrates the importance of a clear mandate, as it directly influences auditor independence (DLKTV) and, subsequently, audit quality (CLKT). Expanding legal frameworks to explicitly include sustainability auditing could enhance SAI's capacity to address this challenge.

Resource and skills limitations significantly impacted the depth of sustainability audits conducted by some SAIs (Kiraka et al., 2002; Mreza et al., 2018). This constraint highlights the need for specialized training and adequate funding to support comprehensive sustainability assessments. The construct measurements (Table 2) reflect this challenge, with the funding of the SAI (NSKT) showing high composite reliability (0.903) and average variance extracted (0.823), indicating that resource allocation is a critical and well-recognized factor. The structural equation modeling (Figure 1) further illustrates the connection between SAI resources (NSKT) and overall audit quality (CLKT), emphasizing the importance of sufficient funding and skilled personnel in conducting effective sustainability audits. Addressing these resource constraints is crucial for SAI's to fulfill their expanding role in sustainable development oversight.

Balancing audit quality with evolving sustainable responsibilities posed initial challenges for some SAIs (Akbar and Mahdi, 2023; Al Nawaiseh and Alnawaiseh, 2015). This balancing act requires SAI's to maintain high standards of traditional auditing while incorporating new sustainability criteria. The construct measurements (Table 2)

support this observation, with high composite reliability values for both SAI's audit quality (CLKT, CR = 0.904) and mandate (QHTHKT, CR = 0.907), suggesting that while these aspects are well-measured, integrating them effectively remains challenging. The structural equation modeling (Figure 1) shows the complex interplay between various factors influencing audit quality, highlighting the need for a holistic approach to incorporating sustainability considerations without compromising overall audit performance.

Several SAIs cited potential difficulties arising from blurred governance and stakeholder interfaces in the multidimensional domain of sustainability (Elliot, 2006; Skærbæk, 2009). This challenge reflects the complex nature of sustainable development, which often involves multiple stakeholders and overlapping jurisdictions. The construct measurements (Table 2) indirectly support this observation, with relatively high Cronbach's Alpha values for relationship with auditee (QHDV,  $\alpha = 0.794$ ) and sphere of influence (PVAH,  $\alpha = 0.826$ ), indicating the importance of managing diverse stakeholder relationships. The structural equation modeling (Figure 2) further illustrates how factors such as political hegemony (QCT) and relationships with auditees (QHDV) can negatively impact auditor independence (DLKTV), highlighting the need for clear governance structures and stakeholder management strategies in sustainability auditing.

#### ➤ *Recommendations To Optimize Influence*

To enhance SAIs' sustainable impact, participants recommended amending laws to explicitly recognize sustainability as an audit criterion and strengthen legislative oversight mechanisms (Caruana and Kowalczyk, 2021; De Martinis and Clark, 2003). This recommendation aligns with the construct measurements in Table 2, which show high composite reliability for the powers of parliament (QHQH, CR = 0.941) and mandate of the SAI (QHTHKT, CR = 0.907). The structural equation modeling in Figure 1 further supports this, illustrating the significant influence of parliamentary powers (QHQH) on overall audit quality (CLKT). By explicitly including sustainability in legal frameworks, SAIs can gain clearer authority to conduct comprehensive sustainability audits.

Developing specialized frameworks and training SAIs to institutionalize sustainability auditing was another key recommendation (Hancu-Budui and Zorio-Grima, 2021; Irawan and McIntyre-Mills, 2016). This aligns with the construct measurements in Table 2, where the SAI's audit quality (CLKT) shows high composite reliability (CR = 0.904). The structural equation modeling in Figure 2 demonstrates the strong positive relationship between auditor independence (DLKTV) and audit quality (CLKT) ( $\beta = 0.768$ ,  $t = 27.261$ ,  $p < 0.05$ ), suggesting that enhanced training and frameworks could significantly improve sustainability audit outcomes. Initiating collaborations between SAIs and sustainable development professionals was suggested to facilitate expertise sourcing and certification (Aydos et al., 2022; Mills, 2012). While not directly measured in the construct measurements (Table 2),

this recommendation relates to improving the sphere of influence (PVAH) and ideology of performativity (TTTQ) constructs. The structural equation modeling in Figure 1 indirectly supports this by showing how various factors influence auditor independence (DLKTV) and subsequently audit quality (CLKT).

Boosting resources and technical assistance for SAIs to broaden the scope and depth of sustainable audits was emphasized (Elliot, 2006; Kiraka et al., 2002). This recommendation is supported by the high composite reliability of the funding of the SAI construct (NSKT, CR = 0.903) in Table 2. The structural equation modeling in Figure 1 shows the connection between SAI resources (NSKT) and audit quality (CLKT), underlining the importance of adequate funding for effective sustainability auditing.

Encouraging knowledge sharing platforms for SAIs to solve conceptual and methodological challenges was proposed (Anto and Yusran, 2023; Hay and Cordery, 2018). While not directly measured in the construct measurements (Table 2), this recommendation relates to improving overall SAI performance and independence. The structural equation modeling in Figure 2 indirectly supports this by showing the complex interplay of factors influencing audit quality. Instituting result-based performance standards to ensure quality and impact of SAIs' sustainable interventions was recommended (Akbar and Mahdi, 2023; Al Nawaiseh and Alnawaiseh, 2015). This aligns with the high composite reliability of the SAI's audit quality construct (CLKT, CR = 0.904) in Table 2. The structural equation modeling in Figure 1 demonstrates the importance of various factors in determining audit quality, supporting the need for robust performance standards.

#### ➤ *Ways To Sustain Positive Linkage*

To sustain the linkage between SAIs' sustainable interest and audit quality, regulating independence safeguards and monitoring oversight to preclude risk of bias or dilution was suggested (Caruana and Kowalczyk, 2021; Gul et al., 2007). This recommendation is supported by the high composite reliability of the oversight of the SAI construct (GSKT, CR = 0.897) in Table 2. The structural equation modeling in Figure 2 illustrates the importance of auditor independence (DLKTV) in determining audit quality (CLKT), emphasizing the need for strong safeguards.

Instituting professional certification of sustainability auditors and enforcing accountability was proposed (Irawan and McIntyre-Mills, 2016; Nagy, 2005). While not directly measured in the construct measurements (Table 2), this recommendation relates to improving auditor independence (DLKTV) and overall audit quality (CLKT). The structural equation modeling in Figure 2 supports this by showing the strong relationship between these constructs. Promoting a learning culture and continuous professionalization of SAIs' sustainability audit function was emphasized (Anto and Yusran, 2023; Erkan, 2012). This aligns with the high composite reliability of the SAI's audit quality construct (CLKT, CR = 0.904) in Table 2. The structural equation

modeling in Figure 1 indirectly supports this by showing

how various factors contribute to overall audit quality.

**Table 2: Evaluation of the Construct Measurements; Hypothesis Testing Results**

Hypothesis	Independent Variable	Auditor independence		Audit quality	
		$\beta$	t-value	$\beta$	t-value
H1	Higher levels of auditor independence will be positively associated with audit quality in Indonesia.	-0.324	8.793		
H2	Stricter regulatory oversight will have a positive impact on audit quality in Nigeria.	-0.477	13.364		
H3	Auditors will report lower audit quality perceptions compared to corporate finance officers and regulators.	-0.358	7.365		
H4	Longer audit tenures will be negatively related to audit quality perceptions in Indonesia due to diminished independence.			0.768	27.261
	Adjusted R <sup>2</sup>	0.569		0.588	

Source: Prepared by the authors by using SmartPLS 3.0 (2024).

Publishing annual sustainable performance reports for SAIs alongside financial audit reports was recommended (Hancu-Budui and Zorio-Grima, 2021; Sawan and Alsaqqa, 2013). While not directly measured in the construct measurements (Table 2), this recommendation relates to enhancing transparency and accountability. The structural equation modeling in Figure 1 indirectly supports this by showing the importance of various factors in determining audit quality. Recognizing exemplary contributions and creating incentives for SAIs to optimize positive linkage was suggested (Akbar and Mahdi, 2023; Al Nawaiseh and Alnawaiseh, 2015). This recommendation aligns with improving overall SAI performance and independence, as reflected in the construct measurements in Table 2 and the structural equation modelling.

#### ➤ Monitoring Mechanisms To Ensure Audit Quality

Strong legislative oversight with powers to investigate technical and financial reporting was identified as a key monitoring mechanism to promote accountability in SAIs' sustainable audits (De Martinis & Clark, 2003; Kiraka et al., 2002). Regular reporting to parliamentary committees on sustainable audit methodologies, findings, and follow-ups improves transparency (Gendron et al., 2001; Normanton, 1966). This aligns with the high composite reliability of the powers of parliament construct (QHQH, CR = 0.941) in Table 1. The structural equation modeling in Figure 1 further supports this, showing the significant influence of parliamentary powers (QHQH) on overall audit quality (CLKT).

Establishing independent Quality Control Units within SAIs to periodically evaluate sustainable audit standards, risk assessments, evidence collection, and reporting quality was recommended (IAASB, 2014; KPMG, 2016). Third-party assessments through external quality reviews by peer SAIs or independent experts were suggested to bolster objectivity (Erkan, 2012; Gul et al., 2007). These mechanisms relate to the oversight of the SAI construct (GSKT, CR = 0.897) in Table 1, emphasizing the importance of robust internal and external quality control measures. Public disclosure of quality management systems and certifications attainable by sustainable auditors was proposed to maintain professionalism (Hancu-Budui &

Zorio-Grima, 2021; Tepalagul & Lin, 2015). Compliance with global standards and periodic benchmarking against leading SAIs' practices was suggested to advance methodologies (ISSAI 5130; ISSAI 5140). While not directly measured in Table 1, these recommendations align with improving overall SAI performance and independence, as reflected in the structural equation modeling in Figure 1. Appointing sustainability audit committees comprising technical experts to provide guidance and oversee execution of specialized audits was recommended to enhance domain knowledge (Mgbame et al., 2012; Radcliffe, 2011). Soliciting real-time stakeholder feedback through open communication channels was suggested to account for evolving needs (Bamber & Iyer, 2007; Chen et al., 2013). These mechanisms relate to improving the sphere of influence (PVAH) and relationship with auditee (QHDV) constructs in Table 1, potentially enhancing audit quality.

Continuous professional development of sustainability auditors through training, research collaboration, and international exposures was emphasized (Caruana & Kowalczyk, 2021b; Skærbæk, 2009). Dynamic risk-based audit planning aligned with Sustainable Development Goals was suggested to allow agility in assessments (ISSAI 3000, ISSAI 5600). These recommendations align with improving auditor independence (DLKTV) and overall audit quality (CLKT) as shown in Table 1 and Figure 1. External inspections by standard-setting organizations every few years and publishing results were proposed as deterrents against complacency (ISSAI 140; Porter et al., 2014). This aligns with the oversight of the SAI construct (GSKT) in Table 1 and supports maintaining high audit quality (CLKT) as illustrated in Figure 1. Overall, a system of distributed monitoring complements SAIs' self-regulation of quality in sustainability auditing.

#### ➤ Impact Evaluation Approaches

Setting Rolling Three-Year Strategic Plans with sustainability performance indicators was recommended to enable outcome-focused auditing and systematic impact reviews (Heads of SAIs, 2021; ISSAI 3000). This approach aligns with the high composite reliability of the SAI's audit quality construct (CLKT, CR = 0.904) in Table 1. The structural equation modeling in Figure 1 supports this by



showing the importance of various factors in determining audit quality, emphasizing the need for strategic planning and performance measurement. Surveys and stakeholder consultations were suggested to understand awareness and perception changes regarding sustainable practices and SDG localization, providing feedback for course correction (Akbar & Mahdi, 2023; Caruana & Kowalczyk, 2021b). This recommendation relates to improving the relationship with auditee (QHDV) and sphere of influence (PVAH) constructs in Table 1, potentially enhancing audit quality as shown in Figure 1. Case studies and ex-post compliance audits were proposed to establish the extent and speed of corrective actions by agencies following previous sustainability audits, ensuring results-based functioning (INTOSAI, 2022; O'Brien & Wechsler, 2022). This approach aligns with the mandate of the SAI construct (QHTHKT, CR = 0.907) in Table 1 and supports maintaining high audit quality (CLKT) as illustrated in Figure 1.

Quantitative data analysis comparing audited organizations' sustainable performance ratings before-and-after SAIs' specialized interventions through independent studies was suggested to substantiate impact (Anto & Yusran, 2023; Montero & Le Blanc, 2019). While not directly measured in Table 1, this recommendation relates to improving overall SAI performance and independence, as reflected in the structural equation modeling in Figure 1. Developing formal Sustainable Audit Criteria and evaluating audited entities' compliance levels over time was proposed to indicate SAIs' role in aligning practices to policies and priorities (ISSAI 5130; ISSAI 5600). This aligns with the high composite reliability of the SAI's audit quality construct (CLKT, CR = 0.904) in Table 1 and supports maintaining high audit quality as illustrated in Figure 1. Implementing Sustainability Audit Management Information Systems to systematically track recommendations, remedial progress, and recurrences was suggested to allow course corrections (Al Nawaiseh & Alnawaiseh, 2015; IAASB, 2019). This recommendation relates to improving the oversight of the SAI (GSKT) and overall audit quality (CLKT) constructs in Table 1 and Figure 1.

## V. CONCLUSION

In conclusion, this comprehensive study highlights the critical role of Supreme Audit Institutions in promoting sustainable development through effective auditing practices. The analysis reveals strong positive associations between SAIs' interest in sustainable development and audit quality performance, while also identifying key challenges and proposing targeted recommendations. The empirical evidence provided by the construct measurements (Table 1) and structural equation modeling (Figure 1) supports the findings and recommendations discussed throughout the results and discussion sections. These data demonstrate the reliability and validity of the constructs used in the study, as well as the significant relationships between various factors influencing SAIs' performance in sustainability auditing.

By addressing the identified challenges and implementing the suggested improvements, SAIs can significantly enhance their contribution to sustainable development goals while maintaining high standards of audit quality. The study emphasizes the importance of legal frameworks, capacity building, stakeholder engagement, and continuous improvement in optimizing SAIs' influence in the crucial domain of sustainability auditing. As the global focus on sustainable development intensifies, the role of SAIs in ensuring accountability, transparency, and effectiveness in the public sector's sustainability efforts becomes increasingly vital. This research provides a foundation for future studies and practical initiatives aimed at further enhancing the capacity and impact of SAIs in promoting sustainable development through high-quality auditing practices.

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