

IT Audit Determinants and Its Impact on Firm Performance: In Ethiopian Commercial Banks Perspectives

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Abstract

This study aims to examine the determinants of IT auditing practice and its impact on firm performance within the context of Ethiopian commercial banks. Based on Agency Theory and the Resource-Based View, the study follows an explanatory design, with PLS-SEM and survey data from 122 professionals of the five largest private banks. The results of the study revealed that IT Audit Effectiveness is the most important predictor of auditing practices followed by IT Audit Methodology and IT Audit Quality and with no significant effect of IT Audit Expertise. The results also suggest that better IT auditing practices are positively and significantly related to improved firm performance, indicating its strategic significance. The study has practical implications for the management of banks, in the need to strengthen the effectiveness of the audit and position it as a strategic advisory function in the area of IT auditing. The limitations include the cross-sectional design, purposive sampling of only five banks, and single-country, single-sector focus limiting causal inference and generalizability. Further studies should study the mediating and moderating variables and use longitudinal or qualitative methods. The study can be expanded to other banks in Ethiopia to understand the context and generalize the findings of IT auditing in emerging countries.

1. Introduction

Technology has become a strategic differentiator for companies, giving them a competitive advantage to distinguish themselves from their peers (Alqudah et al., 2023). As clients become more digitally savvy, internal and external audits are increasingly dependent on digital instruments to meet rising expectations, cut costs and improve performance (Eulerich et al., 2023). The new technology has changed the objectives and the scope of IT auditing and thus the transition to proactive risk-based approaches is required to address the growing threats (Azizi et al., 2024). An IT audit is a detailed examination of the business's technology platform to verify that systems are secure, efficient, accurate, and compliant with regulatory requirements (Faza et al., 2024). In the first planning stage of the audit, IS audits analyze the overall computer controls and application controls to assess the riskiness of the audit (Huh et al., 2021). IT auditing is gaining importance, but it has quality problems because of the lack of competent process validators and many internal and external limitations (Esparza et al., 2022).

In particular, banks often raise money, and need better audits than others because the quality of the audits is directly connected to the amount of money they need and the amount of debt they may take (Beisland et al., 2015). The role of auditors is very important to ensure compliance and their professional judgment should be directed towards the compliance of rules and regulations and the upholding of the standards (Ismail & Islam, 2020; Mökander et al., 2022). IT audits should be done periodically to ensure compliance with laws and regulations. The IT auditors are responsible for monitoring, controlling and evaluating each system, especially important information systems (Alagić et al., 2021). IT auditing now also encompasses system evaluations, control systems, data centers, physical access, and crisis management protocols (Perez Calderón & Alrahamneh, 2024; Tyaliti, 2023). IT auditors are currently

reviewing all security procedures, internally developed or externally acquired, to secure the organization's IT assets (Alagić et al., 2021; Plant et al., 2022; Wu et al., 2024).

IT audits are performed to assess the security and efficiency of IT systems to identify performance and control (Azizi et al., 2024). Therefore, IT audits are conducted to analyze the data to see if the systems are correct and support organizational goals and use resources efficiently (Anggraini et al., 2024). However, IT audits ensure system integrity and accountability as business activities are increasingly dependent on digital platforms (Faza et al., 2024). IT Audits cover a broad range of technology areas, but the primary purpose is to secure and ensure the privacy and access to financial reporting and organizational performance information systems (Li & Goel, 2025). As the requirement for information systems audits grows, so is the need for more IS professionals and more audit work (Huh et al., 2021).

To do information systems audits correctly and well, IT auditors need to know a lot about computers, have certain skills, and be able to do certain things (Alagić et al., 2021). Moreover, general auditors with advanced knowledge of information systems can critically assess the work of information systems specialists, hence potentially reducing dependence on external expertise (Huh et al., 2021). The effectiveness of the audit process depends on the chosen methodology, the impact of the methods used, and the availability of relevant documents and evidence (Rahimi & Amini, 2015). There are a number of advantages of IS audit methodology over earlier IT audit frameworks such as greater depth, broader scope, lower intrusiveness, and increased potential for automation (Zerbino et al., 2018). However, it is impossible to conduct a successful audit process without appropriate interaction of these components (Kibrit et al., 2023). The complexity of IT environments is increasing, hence auditors need to keep improving their methodologies and understanding in a quickly changing technological and organizational environment in order to preserve the efficacy of the audits and give credible assurance.

Research Gap

With the increasing complexity of accounting transactions supported by IT, the auditing profession has faced many challenges from IT related issues (Thottoli et al., 2022). The digital transformation has led to the evolution of IT audits to cover additional functions such as risk management, cybersecurity and governance (Azizi et al., 2024). Internal audit departments are effective in identifying control mechanisms that need to be improved to improve information security during the process of IT audits (Wu et al., 2024). An important point of this study is that the specific factors that influence IT auditing practices in the context of Ethiopian commercial banks have not been studied rigorously in the previous literature. The research will be carried out to determine the effect of different factors on IT auditing and financial performance, considering the skills, quality, effectiveness and methodology of IT auditing. It will also give an insight to the way these institutions operate in Ethiopia by looking into the specific challenges they face. Given all the points listed above, in this study we arrive at the following research questions

RQ1

What is the most key determinate that affect IT auditing practices?

RQ2

How do IT auditing practices influence overall firm performance?

Therefore, our study aims to identify and analyze the key factors affecting the impact of IT auditing practices on the performance of the firms in Ethiopian commercial banks to answer those questions. The paper is structured in four sections: i) The literature review defines the basic concepts of our model and discusses the variables that influence the IT auditing. ii) The second part describes our quantitative research methodology. iii) The last part presents the findings and analysis of data. iv) The fourth section presents the results and discussion, the theoretical and practical contributions, limitations, and conclusions of the study.

2. Literature Review

2.1. IT Auditing through the lens of Agency Theory

Agency theory suggests that corporate governance can help address the problem of overinvestment in IT by monitoring management's investment decisions. For example, board directors are responsible for reviewing and evaluating financial documents in regular board meetings to ensure the execution of significant IT investments (Dong et al., 2021). In the principal-agent theory, corporate governance theorists have examined the different ways organizations are monitored and controlled internally and externally. Internal governance mechanisms mainly target structural elements such as board composition, board size, board independence, ownership structure and managerial incentive systems (Jensen & Meckling, 1976). On the other hand, the external governance mechanisms are about regulation, legislation and aspects relating the wider external market environment (H. Han et al., 2023). The agency theory suggests that, in some situations, interests of decision-makers and business owners are divergent and irreconcilable, which leads to agency challenges in corporate decision-making (Dong et al., 2021). Agency Theory provides an insight into the interaction between IT audit and management in this context. The success of the IT auditing procedures depends on the willingness of the auditors to operate in the interest of the stakeholders they represent.

2.2. IT Auditing through the lens of Resource based view theory

Resource-Based View (RBV) which focuses on how firms can improve performance by leveraging their own assets. Organizations can gain a competitive advantage by employing information technology resources such as advanced technology, information systems and IT expertise to reduce costs, improve customer service and generate new ideas (Wade & Hulland, 2004). The RBV theory points out the need to identify and exploit essential IT resources and capabilities to gain competitive advantage (Barney, 1999). The RBV paradigm claims that possession of intangible IT assets such as trademarks, patents,

proprietary software, and organizational experience is critical to sustainable competitive advantage (Bharadwaj, 2000). In this regard, IT audit is important to analyze the effectiveness of the IT resources of a firm to support the integrity, security and governance of its IT systems (Azizi et al., 2024). Han et al. (2016) found that intangible assets such as trust, goodwill and resilience can improve the company's performance by lowering the possibility of security breach, revenue loss and unfavorable image. Employing the RBV framework on organizational resources that enhance firm performance via risk reduction, resilience building, and trust building.

2.3. IT (Information Technology) Audit

IT audit can be concisely explained as (Alagić et al., 2021);

an audit of an organization's IT systems, operations, and management, as well as other related processes. An information system audit is a systematic procedure for determining whether information technologies and information systems are operating in accordance with business objectives, to what extent they are effectively and efficiently supporting business objectives, and what management and control practices are in place at various hierarchical levels.

There are two types of IT audit, internal and external. Internal audits are conducted by people who work for the company and are aimed at specific processes within the company to identify ways to improve those processes and reduce risks. On the other hand, external audits provide an objective view of the degree of compliance of an enterprise with the law and regulations (Ryoo et al., 2014). IT audits are checks on IT systems, business processes and control mechanisms to see how reliable, effective and safe they are. Audits to assess the impact of IT on the accuracy and transparency of accounting improve the financial reporting process (Li & Goel, 2025). A comprehensive IT audit looks at the infrastructure, policies and procedures and how well they adhere to applicable rules and standards. IT audit function sizes vary from company to company. For example, the bigger Italian banks tend to employ more IT auditors than the smaller banks (D'Onza et al., 2015). Technology innovations have changed the nature of the audit function through the automation of traditional processes and the reduction of transaction costs, which has improved auditor-client relationships (Wang et al., 2025). With the changing world, there is now a need for IT auditing to help businesses deal with digital transformation and new risks (Azizi et al., 2024).

2.3.1. IT Audit Expertise

The professional certification is essential in enhancing the auditor's competency. Global certification programs, such as ISACA's Certified Information Systems Auditor (CISA), need substantial work experience and a rigorous assessment to ensure expertise in IT auditing (Abdolmohammadi & Boss, 2010; Alagić et al., 2021; Kayrak, 2014). IT auditors are important in enabling CIOs and senior managers (D'Onza et al., 2015) to manage IT risks, assess process controls, secure data and defend digital resources. They also help reduce organizational IT risks by determining if outside IT service providers are

meeting their contractual obligations. To be successful, auditors must have a deep knowledge of the organization's IT systems and controls (Axelsen et al., 2017).

The specialized IT knowledge of auditors helps to identify system faults and hence improves the design and execution of the audit (Wu et al., 2024). Moreover, certification and continuous professional development enhance competence, but these techniques need to evolve to address emerging domains (Azizi et al., 2024). On the other hand, many internal audit functions are successful at mitigating cybersecurity threats, but issues remain about their ability to consistently deliver results even with these advancements (Vuko et al., 2025). Therefore, we proposed the first hypothesis;

H1: The determinant of IT audit expertise is positively correlated with IT auditing practices.

2.3.2. IT Audit Quality

Defining audit quality is a difficult task, especially in information technology auditing. The quality of IT audit is the process to ensure that the audit products satisfy the relevant criteria, provide sufficient coverage and timely opportunities as defined by Esparza et al. (2022). The traditional definitions focus on the auditor's ability to detect and correct errors or misrepresentations in the financial reporting. There are a number of interconnected elements that influence audit quality. This makes it difficult to quantify as it is not a tangible thing that you can touch or see (Alagić et al., 2021). Most importantly is the professionalism, diligence and objectivity of the auditor (Huh et al., 2021). Cheng et al. (2013) notes that firms can improve the quality of the audits and lower the odds of failure by investing in highly educated staff, structured professional development, acquisition of certification and retention measures to retain top talent in the field. Auditability is crucial and audit engagements, auditor practice, and operational standards and procedures should be periodically reviewed (Cheng et al., 2013; Li & Goel, 2025). Our second hypothesis stated that

H2: Firms with higher-quality IT audits demonstrate stronger IT auditing task outcomes.

2.3.3. IT Audit Effectiveness

An audit is useful only if the information provided in business processes is relevant and up to date and if it is accurate, consistent and easy to use (Kayrak, 2014). Internal auditing is effective when the independence of auditors is maintained. This ensures objectivity and trust (Alqudah et al., 2023). The mode and timing of an Information Systems (IS) auditor's involvement can influence the results of the audit, which, in turn, has an impact on how the subsequent audit procedures are conducted (Axelsen et al., 2017). The hours or personnel required for IS audits are often determined by external auditors based on the technological complexity of the organization being audited, which directly impacts the efficiency and effectiveness of the audits (Huh et al., 2021). Typical resource problems for small businesses include inadequate staffing and lack of IT auditors' involvement in major technology projects (D'Onza et al., 2015). To this end, the scope has been widened to include proactive IT governance, where the auditor must assess the alignment of IT solutions with business processes, resource management, and oversee deliverables (Dutta et al., 2022). However, in the absence of cohesive interaction, these components

become ineffective in the audit process (Kibrit et al., 2023). With the changing nature of technology, auditors need to be up-to-date with the latest techniques and skills to conduct effective audits in a complex IT environment. Therefore, the third hypothesis is as follows.

H3: The effectiveness of IT audits is positively correlated with the effectiveness of IT auditing tasks.

2.3.4. IT Audit Methodology

IT/IS audit methodologies are the approaches auditors use to validate the account balances of business activities influenced by information systems. Therefore, they determine the scope and extent of substantive tests (Huh et al., 2021). The audit methodology entails the entire audit process, which includes the systematic involvement of the client with prior approval and the development of a detailed audit plan (Berghout et al., 2023). The good planning includes the choice of the adequate technique for the accomplishment of the objectives of the audit and of the system or process under audit (Havelka & Merhout, 2013). Data driven audit procedures are being developed more and more to increase efficiency and effectiveness (Azizi et al., 2024). At present, there is no clear and complete set of rules for the methodology of IT audit that applies in all countries (Kayrak, 2014).

IT/IS audit methodologies have many advantages over other IT audit frameworks such as more depth, more extensive scope, less intrusive and more automation potential (Zerbino et al., 2018). However, many organizations still use the traditional IT audit procedures without the participation of the IS auditors in the audit team (Axelsen et al., 2017). With the increasing complexity and interconnectivity of IT systems, careful planning and a systematic approach are essential to better audit outcomes (Stoel et al., 2012). Traditional IT audit approach is still challenged by the rapid pace of technology innovation and the constantly changing organisational structures. A fourth hypothesis was proposed.

H4: IT audit methodologies is positively correlated with the advancement of IT auditing practices.

2.4. IT Auditing and Firm Performance

The emergence of technologies has improved the quality of audits, improved the performance of the firm's operations, and reduced audit risks (Thottoli et al., 2022). A new alternative approach to address changes in firm performance has been suggested which is a risk-oriented IT audit technique (Salihu & Hoti, 2022). Strengthening internal control and internal audit functions improves the quality of governance and audits. This is why academics call for wider internal control frameworks and stronger internal audit functions to improve firm performance (Mustafa et al., 2016). Consequently, senior executives are placing greater emphasis on the supervision of IT operations by skilled professionals, driven by the strategic importance of IT and the growing regulatory requirements for IT control evaluations (D'Onza et al., 2015). Empirical studies suggest that IT auditors can influence the choice of vendors and the success of projects by raising concerns about the performance during the evaluation (Merhout & Havelka, 2008).

Automation of IT standardizes financial data and processes and improves manual audit tasks such as data extraction, sampling and testing. This enhances the efficiency of both audit planning and execution (Wang et al., 2025). Generally larger audit firms have better auditors and better service which shows the relationship between the resources, expertise and service results (Cheng et al., 2013). The use of information technology in auditing has increased which has resulted in better audit and accounting results and has made professionals work better (Thottoli et al., 2022). In order for IT auditing to be successful, corporate IT standards and controls must be well documented, clients must work with the auditors to provide the information and people they need, and the details of the system must be well documented including how the system is supposed to be used, how processes flow, and how automated the system is (Li & Goel, 2025). We propose the fifth hypothesis.

H5: Enhanced IT auditing practices are positively linked to improved firm performance.

2.5. Firm Performance Measurement

When determining the growth and financial health of a sector over a period of time, the financial performance of a corporation is usually a good measure (Saddam et al., 2023). Financial metrics have been the standard of measuring the organization success by executive decision makers for a long time (Soliman & Zaky, 2017). The firm performance has been the major issue for any organization (Eltinay & Masri, 2014). So, IT is better able to provide suitable IT services that support firm performance when business and IT strategy are linked (Chau et al., 2020).

2.5.1. Financial Measurement

For evaluating a company's entire performance, especially in the banking industry, financial assessment is essential. Important indicators of operational effectiveness and profitability include net profit margin, return on equity (ROE), and return on assets (ROA) (Eltinay & Masri, 2014; Saddam et al., 2023). These indicators not only reflect the financial health of the organization but also influence strategic decision-making and stakeholder confidence. Moreover, they serve as essential benchmarks against which organizational performance is measured, allowing for a comprehensive evaluation of operational effectiveness and efficiency.

2.6. The Empirical Research Model

The empirical research model (see Fig. 1) that examines the relationship between various facets of IT auditing and overall firm performance. This model includes, four independent variables represent distinct dimensions of IT audit capabilities: IT Audit Expertise (ITAE), IT Audit Quality (ITAQ), IT Audit Effectiveness (ITAEF), and IT Audit Methodology (ITAM). Each of these four dimensions directly links to an IT Auditing (ITA), representing four distinct research hypotheses labeled H1, H2, H3, and H4 respectively. This indicates that expertise, quality, effectiveness, and methodology are posited to collectively shape the comprehensive IT auditing construct. In turn, an IT Auditing (ITA) variable acts as mediator leading to the final outcome variable of the Firm Performance (FP). This final relationship is

designated by hypothesis H5, suggesting that the overall execution and strength of a firm's IT auditing practices directly impact its broader business and operational performance.

3. Research Methodology

3.1. Research Design

This research is conducted with an explanatory research design. The reason why PLS-SEM was selected is because it can handle complex models with multiple latent variables and indicators and it can also examine predicted relationships among components (Dennis Cook & Forzani, 2023). This study aims to identify critical factors affecting IT auditing practices in Ethiopian commercial banks and to explore the relationship between IT auditing practices and business success.

3.2. Sample and Data Collection

The study involved experts and practitioners in the areas of information technology audits, management, and security from the five largest private Ethiopian commercial banks based on their total capital for the fiscal year 2023–2024 (“NBE Annual Report 2023–2024,” 2025). In this study the sampling method used is purposive sampling, by taking the sample based on certain criteria that are relevant to the objectives of the study (Saunders et al, 2023). Inclusion criteria were minimum 2 years of work experience. 122 respondents participated in this survey. Sampling of the stakeholders was based on a non-random or judgmental basis to overcome the difficulties in getting the right person (Nanjundeswaraswamy & Divakar, 2021).

3.3. Data Collection Methods

The data for this study were collected by a questionnaire specifically developed for this study. Data was collected using a closed ended questionnaire with 5-point Likert scale (1-strongly disagree and 5-strongly agree). The data collection procedure is carried out by providing respondents with a link to fill out the questionnaire online via the SurveyMars form, survey platform. The questionnaire used in this study is developed based on previous published research, all measurement items are taken from previous survey instruments developed based on seminal works (e.g., (Alagić et al., 2021; Axelsen et al., 2017; D’Onza et al., 2015; Esparza et al., 2022; Saddam et al., 2023; Stoel et al., 2012; Tarigan & Widjaja, 2012). The constructs were carefully adapted to ensure their applicability and relevance in the Ethiopian commercial banking context. The questionnaire was developed to gather valuable data which will be used to inform future developments in IT audit methodologies, and the survey report presents a comprehensive analysis of IT audit practices within organisations.

Table 1 presents the demographic data of the respondents. 61.5% of the respondents were male, and only 38.5% were female. 35.2% of the respondents had two to five years of experience, 45.9% were mainly between six and ten years of experience, and 18.9% were more than ten years of experience. The survey showed a significant gender imbalance. In terms of educational attainment, 55.7% of the

respondents had a bachelor's degree, 43.4% had a master's degree or higher, and 0.8% had completed a diploma or certificate programme.

Table 1
Demographic data of the respondents

Characteristics (n = 122)		Frequency	Percent %
Gender	Male	75	61.5
	Female	47	38.5
Education	Diploma/ Certificate	1	0.8
	Bachelor's Degree	68	55.7
	Master's Degree or higher	53	43.4
Years of experience	2–5 years	43	35.2
	6–10 years	56	45.9
	More than 10 years	23	18.9
Certification	CISA	9	7.4
	CIA	20	16.4
	CISSP	29	23.8
	Other	21	17.2
	None	43	35.2
Job Title	IT Expert	29	23.8
	IT Audit Expert	19	15.6
	IT Security Expert	36	29.5
	IT Management	23	18.9
	IT Audit Management	4	3.3
	IT Security Management	11	9.0

Table 1: Demographic data of the respondents

4. Result

4.1. Measurement Model Analysis

4.1.1. Convergent validity

The first step of the research was to verify the validity and reliability of the data through Confirmatory Factor Analysis. The results of the Convergent Validity test showed a loading factor of more than 0.7, as shown in Table 2 (Hair et al., 2022). The Cronbach's alpha (ρ_A) and composite reliability (CR) were both greater than 0.7, which shows adequate consistency (Hair et al., 2022). When the average variance extracted (AVE) is more than 0.50, it may be shown that the results are valid (Fornell & Larcker, 1981). If the latent variable meets this requirement, it is considered to explain more than 50% of the variance in its indicators. The discriminant validity test, using the Fornell-Larcker criterion, is the square root of the AVE concept and the correlation coefficient between variables. Table 3 shows the estimated results where the square root of the AVE was greater than the construct correlation values. To improve construct validity, items with outer loadings of 0.7 or less were deleted as they are not good measures of the desired construct (Hair et al., 2022).

The results revealed that the conditions for discriminant validity were met, as the square roots of AVE exceeded correlation values. Cronbach's Alpha (CA) values ranged from 0.879 to 0.911, which is above the minimum threshold of reliability. The composite reliability (CR) ratings were above the minimum criteria of the CR test ranging from 0.892 to 0.924. Ultimately, all external loadings exceeded 0.70, which is deemed suitable for establishing convergent validity. We thoroughly examined the phrasing and scaling of the indicator, despite ITA1 exhibiting a notably high loading of 0.964. It is retained in the model due to its conceptual independence, consistent measurement on a 5-point Likert scale, and absence of redundancy or coding complications.

Table 2
Validity, reliability and outer loading factor.

Latent variable	Observed variables	Outer Loading (OL)	Cronbach's Alpha (CA)	Composite Reliability (CR)	Average Variance Extracted (AVE)
IT Audit Expertise (ITAE)	ITAE1	0.787	0.907	0.910	0.731
	ITAE2	0.924			
	ITAE3	0.882			
	ITAE4	0.843			
	ITAE5	0.832			
IT Audit Quality (ITAQ)	ITAQ1	0.813	0.879	0.892	0.674
	ITAQ2	0.860			
	ITAQ3	0.799			
	ITAQ4	0.840			
IT Audit Effectiveness (ITAEF)	ITAEF1	0.781	0.896	0.899	0.707
	ITAEF2	0.882			
	ITAEF3	0.885			
	ITAEF4	0.858			
	ITAEF5	0.792			
IT Audit Methodology (ITAM)	ITAM1	0.862	0.910	0.916	0.787
	ITAM2	0.908			
	ITAM3	0.881			
	ITAM4	0.896			
IT Auditing (ITA)	ITA1	0.964	0.911	0.924	0.918
	ITA2	0.952			
Firm Performance (FM)	FM1	0.785	0.906	0.913	0.727
	FM2	0.874			
	FM3	0.862			
	FM4	0.866			
	FM5	0.872			

4.1.2. Discriminant validity

Heterotrait-Monotrait Ratio (HTMT) It is a measure of the correlation between the constructs in the model. Although an HTMT score below 0.90 is ideal, evidence suggests that a threshold of 0.85 may be more appropriate in certain circumstances (Hair et al., 2022). Table 3 shows the HTMT results and the results show that the constructs of the model have sufficient discriminant validity. Thus, the models present a significant discriminant validity, so we can quantify with accuracy the constructs included in this study. Then, the researchers validated the discriminant validity of the instrument using the Fornell-Larcker criterion before proceeding to the next stage. The results indicated strong discriminant validity, showing that the tool was able to distinguish the important variables. The results of the Fornell-Larcker criterion are shown in Table 4.

Table 3
Heterotrait-Monotrait Ratio (HTMT)

	Firm Performance	IT Auditing	ITAE	ITAEF	ITAM	ITAQ
Firm Performance	----					
IT Auditing	0.579	----				
ITAE	0.429	0.826	----			
ITAEF	0.624	0.876	0.830	----		
ITAM	0.595	0.865	0.877	0.812	----	
ITAQ	0.677	0.575	0.387	0.565	0.517	----

Table 4
Discriminate validity- Fornell-Larcker criterion

	Firm Performance	IT Auditing	ITAE	ITAEF	ITAM	ITAQ
Firm Performance	0.853					
IT Auditing	0.535	0.958				
ITAE	0.388	0.756	0.855			
ITAEF	0.569	0.799	0.753	0.841		
ITAM	0.539	0.796	0.799	0.739	0.887	
ITAQ	0.610	0.526	0.353	0.503	0.468	0.821

4.2. Structural model

4.2.1. Multicollinearity

The main criterion for evaluating collinearity in the formatively-measured constructs is that indicators exhibit serious problems when the Variance Inflation Factor (VIF) reaches a value equal or higher to 5 (see Table 6). But even with lower thresholds problems of collinearity can arise, of the order of 3. The measurement model is optimally resilient and there is no issue multicollinearity when VIF values are less than or equal to 3 (Hair et al., 2022). The Variance Inflation Factors for all the latent constructs obtained by dummy regression in this study ranged from 1.0 to 3.3. These numbers are much lower than the conservative threshold of 3.3 proposed by Kock (2015), providing statistical evidence that Common Method Bias (CMB) did not inflate the path coefficients artificially.

4.2.2. Evaluate the model’s suitability

The developed model included interactions among various structural components; the statistical significance of these interactions was assessed by means of bootstrapping, using 5,000 resamples. The model quality is evaluated by means of different important statistical criteria such as path significance, effect size (F^2), predictive relevance (Q^2) and coefficient of determination (R^2) to comprehensively assess the model according to the recommendations of Hair et al. (2022). Such metrics are important to understand the variability of the endogenous variables and to assess the robustness and predictive value of the model.

The R^2 values for endogenous latent variables are 0.26 (substantial), 0.13 (moderate) and 0.02 (weak) (Cohen, 1988). According to the results ($R^2 = 0.750$, Table 5), external variables explain about 75.0 percent of the variation in IT auditing. On contrary, an R^2 score of 0.286 indicates that external factors account for 28.6% of the variation in Firm Performance. The Q^2 values of 0.698 and 0.336, respectively, suggest that the independent components are significantly relevant and the model has strong predictive power.

Table 5
R-square and Q-square.

IT Auditing	R-square	Q ² predict
	0.750	0.698
Firm Performance	0.286	0.336

The assessment of (f^2) is the subject of the following principles: If the value is less than 0.02, then the exogenous latent variable does not have any discernible impact; if it is between 0.02–0.15, then it is

medium; and if it is between 0.15–0.35, then it is large (Hair et al., 2022). This study examined effect sizes are within the acceptable range, as shown in Table 6.

Table 6
F- square and VIF

ITAE -> IT Auditing	F-square	VIF
	0.039	3.3
ITAEF -> IT Auditing	0.173	2.8
ITAM -> IT Auditing	0.130	3.3
ITAQ -> IT Auditing	0.048	1.4
IT Auditing -> Firm Performance	0.401	1.0

4.3. Hypothesis Testing

Table 7 and Fig. 2 summarize the results of the hypothesis testing in this study. Figure 2 presents the direct and mediating effects of the variables studied. The results show that ITAE has no significant effect on IT Auditing with p-value 0.098 and coefficient 0.181 at 5% significance level ($\alpha = 5\%$). The relationship between IT auditing and firm performance is very significant with coefficient of 0.535 and p-value of 0.001, which indicates that IT auditing has significant effect on the firm performance. The p-values of the other variables, ITAQ, ITAEF and ITAM are less than 0.05 which support these assumptions. The relationship between ITAEF and IT Auditing was the most significant, exhibiting a coefficient of 0.354 and a p-value of 0.011. This suggests that ITAEF has a significant influence on IT Auditing. Nevertheless, the effect of ITAQ on IT Auditing was very low in comparison with the other variables. Since the ITAQ → IT Auditing path had the least significant effect (with a coefficient of 0.131 and p-value of 0.019). The results provided empirical support for the hypothesized direct effects among the constructs examined and confirm the statistical significance of the relationships specified in the research model.

Table 7
Two tail: $P < 0.001$; $P < 0.05$; $t\text{-value} > 1.96$

H1: ITAE -> IT Auditing	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Decision
	0.181	0.198	0.110	1.656	0.098	Not Accepted
H2: ITAQ -> IT Auditing	0.131	0.124	0.056	2.346	0.019	Accepted
H3: ITAEF -> IT Auditing	0.354	0.324	0.140	2.537	0.011	Accepted
H4: ITAM -> IT Auditing	0.328	0.348	0.151	2.168	0.030	Accepted
H5: IT Auditing -> Firm Performance	0.535	0.537	0.069	7.786	0.000	Accepted

5. Discussion

5.1. Discussion of research results

The main aim of this study is to identify and examine the critical factors of IT auditing practices that impact the performance of firms within Ethiopian commercial banks. To achieve this, the study addresses two central research questions, with the first (RQ1) focusing on the most critical determinant affecting IT auditing practices in these institutions. The analysis revealed that IT Audit Effectiveness (ITAEF), IT Audit Quality (ITAQ), and IT Audit Methodology (ITAM) significantly and positively influence IT auditing practices. The lack of a significant correlation between ITAE and IT Auditing practice (H1) ($\beta = 0.181$; $p = 0.098$), on the other hand, indicates that ITAE has absolutely no effect on the initial expectations. This finding creates fresh opportunities for investigating the causes of this perception. Interestingly, the study reveals a significant and strongly drawn to IT Audit Effectiveness (ITAEF) relative advantage than other factors. The coefficient ($\beta = 0.354$) is even higher than that of It Audit Methodology (ITAM) ($\beta = 0.328$) and IT Audit Quality (ITAQ) ($\beta = 0.131$). IT audits evaluate the effectiveness, efficiency, and security of IT controls to allow organizations to identify shortcomings and improve governance structures (Azizi et al., 2024); in practice, auditors must determine the necessary resources for these audits based on technological complexity, decisions that directly impact audit efficiency and effectiveness (Huh et al., 2021). Therefore, ITAEF, indicates that the effectiveness of IT audits is the strongest positive driver of IT auditing practices.

Meanwhile, IT Audit Methodology (ITAM) still has a significant effect and showed a significant positive effect ($\beta = 0.328$, $p = 0.030$). The finding is in line with previous research that has identified the improvement of efficiency, effectiveness, and overall audit quality as a major goal of the IT audit

methodology (Havelka & Merhout, 2013). Therefore, the effectiveness of the audit depends on the influence of the methodology, the availability of the related documents and proof and the selection of the methodologies (Rahimi & Amini, 2015). Hence, ITAM, the methodology used is a significant, positive predictor of the IT Auditing practices. While, IT Audit Quality (ITAQ) showed a smaller yet statistically significant positive influence ($\beta = 0.131$, $p = 0.019$). This view is supplemented by Kibrit et al. (2023) with the importance of compliance with auditing standards, anomaly detection, and satisfaction of financial statement users' needs. IT audit is a process of evaluating systems, IT infrastructure, security procedures and compliance with relevant standards (Anggraini et al., 2024). Among the identified factors that have a significant impact on IT Auditing practices, ITAQ had comparatively the least impact.

The coefficient of IT audit expertise (ITAE) ($\beta = 0.181$) and the p-value of 0.098, indicated that IT audit expertise did not significantly impact the IT auditing techniques. The hypothesis of ITAE was not supported at a 5% level of significance which means that ITAE has no significant effect to the initial expectation of IT auditing practice in this context. The result is surprising, because the existing literature supports the positive association of ITAE and IT auditing outcomes (Alagić et al., 2021). Wu et al. (2024) also found that internal auditors with better IT skills are more effective in improving the design and implementation of the audit systems. In fact, operational resilience requires qualified auditors (Azizi et al., 2024). However, in practice the IT audit processes are most of the time not done due to the lack of auditor competence and technological aptitude although the theoretical expectations are there (Esparza et al., 2022). Hence, the results indicate that ITQ, ITAEF and ITAM (H2, H3 and H4) affect IT Auditing practices.

The analysis regarding **RQ2: How do IT auditing practices influence overall firm performance?** The ITA practices strongly supported the hypothesis (H5) ($\beta = 0.535$, $p = 0.000$). In addition, this important contribution also affects the firm performance ($f^2 = 0.401$) positively in the previous studies (Salihu & Hoti, 2022). The model explains a significant predictive power with ITA auditing for 28.6 ($R^2 = 0.286$) of the variance in firm performance, highlighting the strategic importance of ITA as a governance instrument for risk mitigation. This finding supports the assumption that the IT audit function has developed into an important strategic advisory role that guarantees operational resiliency and data integrity, instantly boosting the company's total value (Alagić et al., 2021; Anggraini et al., 2024). The IT audit department must be independent in order to provide unbiased evaluations (Merhout & Havelka, 2008).

5.2. Theoretical Implications

The path from IT Auditing to Firm Performance is highly significant ($\beta = 0.535$, $p = 0.000$) which supports the central proposition of Agency Theory that independent monitoring mechanisms reduce the information asymmetry and conflicting interests created between the bank management (agents) and the shareholders and depositors to whom they serve (principals) (Jensen & Meckling, 1976). The IT audit function is an independent control mechanism that reduces agency cost by providing assurance that decisions and allocation of IT resources are in the interests of stakeholders instead of the self-interest of

management. The magnitude of this path ($f^2 = 0.401$) indicates that the monitoring role is not simply symbolic and does have a measurable effect on firm outcomes. This finding supports the core assumption of Agency Theory in IT governance literature that effective independent audit of IT investments and controls is a feasible mechanism for principals to protect their interests against the inefficiency of agents, confirming the applicability of the theory in the IT audit literature in the context of Ethiopian banking.

Another complementary explanation for the non-significant relationship between IT Audit Expertise and IT Auditing practices is given by the Resource-Based View (H1: $\beta = 0.181$, $p = 0.098$). The RBV holds that a sustainable advantage arises not from simply possessing a valuable resource, but from the firm's capacity to organize, deploy, and embed that resource into value-creating processes (Barney, 1999; Bharadwaj, 2000). Certified, technically skilled auditors are, in isolation, a valuable resource; however, the results suggest that expertise alone does not meet the RBV's further conditions of being organizationally embedded, rare, and difficult to imitate. By contrast, IT Audit Effectiveness, Methodology, and Quality, constructs that capture how expertise is structured, channeled, and operationalized within audit processes, emerged as the significant drivers of IT Auditing practices. This pattern is consistent with the RBV argument that resources generate competitive advantage only when they are converted into organizational capabilities; technical competence that is not routed through robust methodologies and quality-assurance mechanisms remains an underused, isolated resource rather than a source of advantage. The finding therefore nuances the RBV's application to professional audit settings: human capital is a necessary but not sufficient condition, and its performance impact is contingent on the surrounding organizational architecture that converts individual competence into a genuinely valuable and well-organized capability.

Taken together, the two theoretical lenses explain different halves of the same empirical story. Agency Theory clarifies why IT Auditing, functioning as an independent monitoring mechanism, ultimately strengthens Firm Performance, while the RBV clarifies why the mere possession of auditor expertise is theoretically insufficient without the organizational processes effectiveness, methodology, and quality needed to convert that expertise into a genuine resource advantage. This dual framing strengthens the study's theoretical contribution by showing that IT Auditing's influence on firm performance operates simultaneously through a governance-and-monitoring channel and a resource-configuration channel, rather than through either mechanism alone.

6. Conclusion

The study contributes to provide practical insights for different stakeholders in Ethiopian commercial banking sector. The findings highlight that IT Audit Effectiveness ($\beta = 0.354$) is the most important predictor of IT auditing practices for bank management and governance and reaffirm the importance of management directing resources and processes to improve the utility and relevance of the audit findings. Furthermore, the result of a significant association between IT auditing and firm performance ($\beta = 0.535$) emphasizes the importance of the attention of senior management to the supervision of IT

operations and the acknowledgment of the role of IT audits as advisory bodies that safeguard organizational value. These insights can lead to two potential benefits for management, the first of which is improved risk management and operational efficiency when IT audit practices are identified for their strengths and weaknesses. The findings also offer a clear direction for IT audit departments to improve by using a robust methodology to strengthen audit processes. The insignificant effect of IT Audit Expertise is surprising, as skilled staff is not enough. Hence their expertise needs to be leveraged effectively through structured processes and methodologies to achieve meaningful improvements. This provides departments with a way to explore the gap between the level of expertise and its practical application. Finally, the study provides regulators with crucial insights that can enhance compliance with regulatory standards and guide strategic initiatives in a rapidly evolving digital transformation sector.

The study identified and analyzed the key determinants of IT auditing practices that affect the performance of the firm in Ethiopian commercial banks. The study found that IT Audit Effectiveness, IT Audit Quality and IT Audit Methodology are significant and influential factors and IT Audit Effectiveness is the most critical determinant ($\beta = 0.354$, $p = 0.011$). The findings strongly support the view that improved IT auditing practices are associated with improved firm performance. On the other hand, emphasizing the strategic importance of effective audit processes to ensure data integrity and optimize the use of IT assets. The absence of a significant relationship between IT Audit Expertise and IT auditing practices ($\beta = 0.181$, $p = 0.098$) provides a plain contrast. By implying that expertise in itself, in terms of education or certification, does not necessarily translate to better day-to-day auditing results. This unexpected result opens the way to further research on the mechanisms for better leveraging expertise through structured methodologies and organizational processes. The study concluded that enhancing IT auditing practices based on IT audit effectiveness, strong methodology and quality assurance can improve firm performance in Ethiopia's banking industry.

7. Limitations and Future Research Directions

It is important to understand the many limitations of this study. First, causal inferences cannot be formed in a cross-sectional study since the correlations between variables are seen at a single point in time. Second, the sample was not random and comprised five Ethiopian banks and so, the findings can only be generalized to this specific institutional framework. Third, focusing on one industry makes it harder to generalize to other industries contexts with distinct legislative and technological environments.

Future research could break through the time constraints of the present study to achieve a better understanding of the practices, perspectives and contextual difficulties of IT auditing through qualitative methodologies and more longitudinal designs. Lastly, further research on the issues facing Ethiopian commercial banks would make IT auditing models more adaptable and useful in similar emerging market situations. This would add a richer layer of context to our understanding of how these banks operate.

Declarations

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Conflict of Interest

The authors declare no conflict of interest.

Ethics Declaration

ETHICAL APPROVAL:

This study was reviewed and granted an exemption by the School of Information Science at Addis Ababa University **Institutional Review Board (IRB)** (Approval Date: October 3, 2025; Protocol Number: ST/SIS/02/0218/25).

ACCORDANCE:

All research procedures were performed in accordance with relevant guidelines and regulations, including the **Declaration of Helsinki**. Informed consent was obtained from all participants prior to completing the anonymous survey.

Declaration of Generative AI (GAI) Use:

Generative AI tools were utilized in the preparation of this manuscript employed to assist with language refinement and editorial mechanics, including improving clarity, grammar, and overall readability.

Data Availability

All raw and processed data, survey instruments, protocols, variable definitions, and statistical analysis scripts required to replicate the findings of this study have been deposited in the Zenodo repository and can be accessed at **10.5281/zenodo.22060307**. These materials are fully accessible for public evaluation.

Author Contribution

Biniam G. Lakew wrote original manuscript and Analysis the data , Tibebe Beshah and Mengistu Bogale wrote the first draft of the review manuscript and supervised.

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Figures

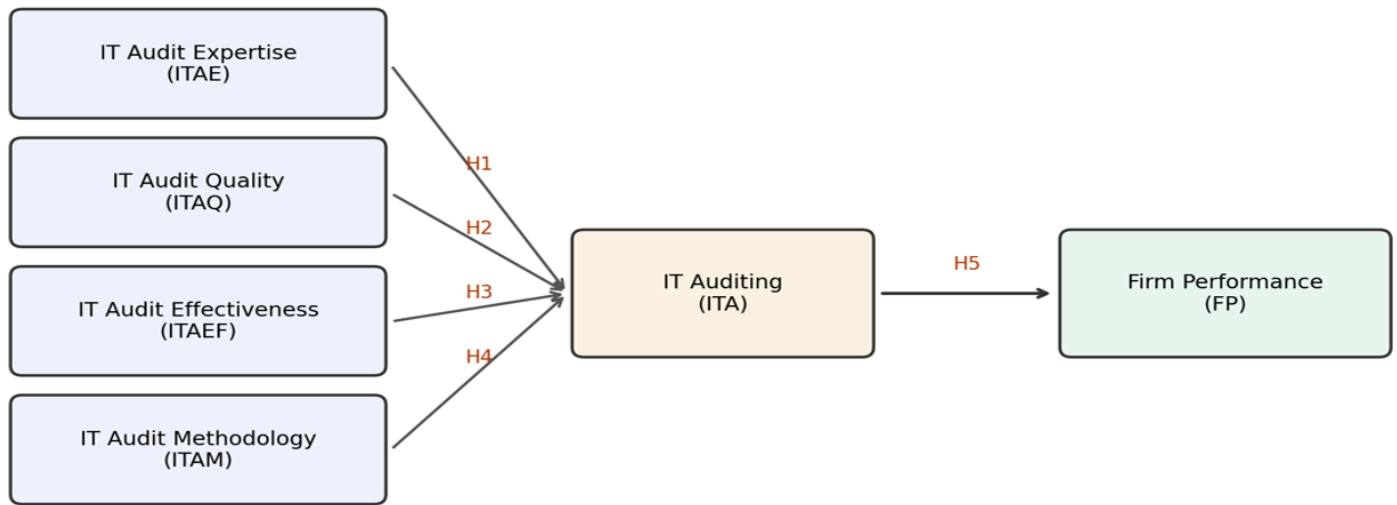


Figure 1

The Empirical Research Model- Relationships Between Variables

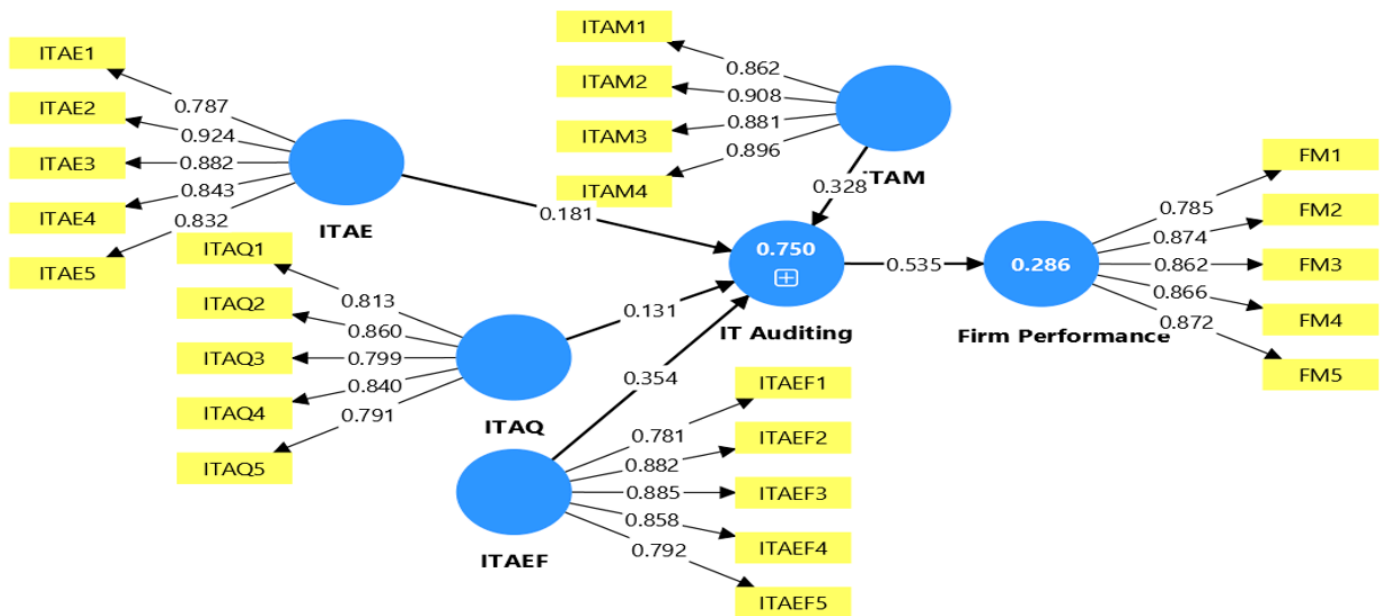


Figure 2

Path model