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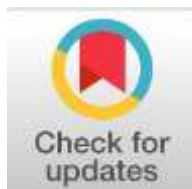

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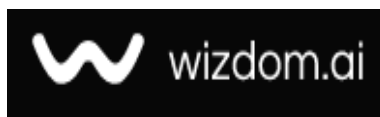
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Joint Auditing and Modern Technological Environment in Auditor Report Quality

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Abstract

General Background: Joint auditing has emerged as a critical response to environmental changes in the business landscape, aiming to enhance professional performance and increase stakeholder confidence in financial reporting through collaborative audit approaches. **Specific Background:** The practice involves two or more independent auditors sharing audit responsibilities and jointly issuing a single audit report, while modern technological environments have introduced new dimensions to audit quality through electronic reporting systems and digital assurance services. **Knowledge Gap:** Despite recognition of joint auditing's potential benefits, limited empirical evidence exists regarding how the integration of joint auditing practices with elements of modern technological environments specifically enhances the quality of auditors' reports in public sector institutions. **Aims:** This research examines the relationship between joint auditing mechanisms and modern technological environmental elements in improving auditor report quality at the Federal Board of Supreme Audit, analyzing data from 2015 to 2024 using econometric modeling. **Results:** The econometric analysis revealed that joint auditing techniques explain 84.6% of variations in electronic audit report quality ($R^2=0.846$), with audit committee expertise, meeting frequency, and technological integration demonstrating statistically significant positive impacts on report quality dimensions including relevance, reliability, comparability, and consistency. **Novelty:** This study uniquely applies autoregressive distributed lag modeling to demonstrate the long-term equilibrium relationship between joint auditing variables and electronic report quality in a supreme audit institution context, providing quantitative evidence of technological environment integration effects. **Implications:** Findings support regulatory frameworks promoting mandatory joint auditing adoption in financial institutions and emphasize the necessity of establishing professional institutes to govern joint audit practices while integrating continuous technological training for audit quality enhancement.

Keywords : Joint Auditing, Technological Environment, Audit Report Quality, Electronic Reporting, Financial Statement Audit

Highlight :

- Joint auditing enhances auditor independence and strengthens ability to detect fraud and errors effectively.
- Electronic reporting systems separate format design from execution across different software versions.
- Audit committee expertise increases electronic report quality by 1.13% per percentage point improvement.

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Introduction

There have been numerous quick modifications and advancements in the contemporary business world., such as technological advancements, the information and communication revolution, increasing competition among economic entities, and a growing focus on the customer. Joint auditing, which refers to the practice of analyzing and evaluating financial reports by two separate bodies that share the effort and responsibility and jointly generate a single audit report, has arisen in response. Joint auditing is a technique that increases the auditing process' efficacy and efficiency in identifying mistakes and fraud.. As for the quality of electronic reports prepared by the auditor, it refers to conformity with established standards and specifications, and to their suitability for users of financial statements to make appropriate decisions at the right time. One way to focus on discussing the impact of information technology on the auditing profession is to study the level of technical complexity in the IT environment that the auditor may encounter.

Research Methodology

1.1 Research Problem

The research problem emerges from the attempt to address and adapt to elements of the modern technological environment in enhancing the quality of the auditor's report. Financial reports and the accounting and auditing profession as a whole have lost credibility as a result of the abrupt financial crises and failures of several businesses, including some accounting and auditing organizations. The remaining methods focus on the new professional services in the auditing profession, which operates in a constantly evolving information technology landscape, requiring reporting on the credibility of information quality and database information technologies.

1.2 Research Importance

The importance of the research stems from the significance of joint auditing. Joint auditing can help improve the quality of the auditor's report by adjusting to aspects of the contemporary technology environment.. Confidence in the financial reports that businesses offer about their performance is strengthened by the auditing profession. If users did not believe these reports and financial data, they would not be utilized or trusted.. Therefore, joint auditing aims to improve audit quality and enhance the quality of the auditor's report.

1.3 Research Objectives

The research aims to study the knowledge the features of the Elements of the Modern Technological Environment and the knowledge underpinnings of joint auditing to elucidate their significance in improving the caliber of the auditor's report. Joint auditing is not new; it emerged from the need to respond to various environmental changes and developments in the business environment. It seeks to improve and develop professional performance and instill greater trust in financial statements and reports to enable users to make appropriate and well-informed decisions.

1.4 Research Hypotheses

The research is based on two hypotheses, as follows:

1.   Joint auditing can help improve the quality of the auditor's report.

2.   Elements of the modern technological environment can help improve the quality of the auditor's report.

1.5 Research Sample:

The research sample consists of auditors working at the Federal Board of Supreme Audit, based on data from the period 2015 to 2024.

The Theoretical Framework of the Research

2.1 The Concept and Importance of Joint Auditing

The practice of auditing using the joint audit technique has become a contentious issue in the professional sphere, and this discussion has since spread to the auditing academic community. Due to substantial financial statement distortions brought on by fraud and the issuance of unqualified audit opinions that misled users of accounting information, the accounting and auditing profession has been accused of being one of the primary causes of the recent global financial crisis. have rekindled interest in this topic, even though the concept of joint auditing and the implementation of audits in this manner—whether at the local or regional level—have been recognized for decades [1].

Joint auditing is viewed as a systematic process for obtaining and objectively presenting information related to management's assertions about economic events and actions. The goal is to assess the degree to which these assertions conform to recognized standards and communicate the findings to relevant parties.. Two or more auditors who agree on how to divide up the audit work carry out this approach. All participating auditors offer a final assessment, and each auditor is entitled to examine the work of the others. In case of disagreement, the audit report must outline the points of difference and present each auditor's perspective [2].

This means that joint auditing involves two auditors reviewing the accounts of the same entity and issuing a joint audit report, which both sign. They jointly plan the audit and divide the fieldwork between them [3].

Thus, joint auditing represents an advanced method of forming judgments on financial statements and expressing a neutral opinion. It is a distinct audit approach that enhances the separation of tasks, supports auditor independence, increases efficiency, and strengthens the ability to handle disputes with the audited company's management. Joint audits also foster unified thinking, professional collaboration, and harmony among assigned auditors, involving joint planning and division of work in a way that avoids duplication. Ultimately, a single joint audit report is issued that can meet the expectations of financial statement users [4].

Because it raises the level of reasonable assurance that financial statements are free from significant misstatements, whether due to fraud or error, joint auditing is essential. When compared to individual audits, this assurance is typically more successful in joint audits. It also increases the

efficiency of coordination, collaboration, and planning efforts between the participating audit firms—ideally including at least one smaller firm—which enhances the effectiveness of mutual quality control systems and supports the issuance of a strong, unified audit opinion [5].

One researcher highlighted a number of crucial ideas that make the significance of joint auditing clear, which may be summed up as follows[6]:

1. Joint auditing improves the audit process's efficacy and efficiency in identifying fraud and mistakes. By strengthening the capacity to lower audit risks that can occur during individual audits, it is a useful strategy for raising audit quality.
2. The joint audit is more successful when team members from other departments—such as experts in economic valuation or industry specialists—use their unique skills and areas of experience..
3. Improving the required services offered to the audited business in order to increase the external auditor's independence and raise the standard of audit quality.
4. releasing a joint audit report based on shared accountability and effort, This increases customer trust in financial disclosures and statements.
5. Use best audit practices by leveraging combined experience, relying on applicable and accepted auditing standards.

2.2 Audit Quality Control in Joint Auditing:

Historically, the concept of quality began in the field of manufacturing and industrial operations, especially after World War II, which devastated the Japanese economy and left it weak and unable to compete. Japanese products at the time lacked adequate specifications, making them uncompetitive and unappealing to consumers beyond Japan's scattered islands. However, this initial weakness soon transformed into a strength, as Japan's economy rose to global prominence. One of the most critical and vital areas that contributed to this transformation was a serious commitment to improving the quality of its industrial products. Quality became both a tool for improvement and a means of elevating the overall level of the Japanese economy [7].

As for the term quality control, it refers to *"The means by which an audit firm can reasonably ensure that the opinions it issues in audit engagements always reflect adherence to generally accepted auditing standards, any applicable legal or contractual conditions, or any professional standards established by the firm itself."* [8]

The concept of audit quality can be expressed similarly to the traditional elements of product quality cost concepts: evaluation costs, failure costs, and prevention costs. This is based on the traditional cost model in relation to the burdens and costs borne by the auditor. A model was proposed consisting of three activities:

1. **Prevention Activities:**

These are actions undertaken by the audit firm to develop the technical competencies of its staff. These costs include expenses for training programs, adherence to model audit programs, costs associated with partner rotation in audit engagements, overtime pay for employees, and the costs of conducting tests to verify that the audit firm assesses client reputation before engagement acceptance.

2. **Appraisal Activities:**

These include monitoring the work of assistants and trainees during their assigned audit tasks, including the cost of review by a second partner before issuing the audit report. Appraisal costs cover the expenses associated with reviews conducted by the engagement partner, manager, or office head, as well as the cost of second-partner reviews and expert reviews conducted by professional bodies or other firms.

3. **Failure Activities:**

Failures manifest in one of the following two forms:

a. The auditor issues an unqualified (clean) report on financial statements that contain errors and irregularities, thereby misrepresenting the true financial position.

b. The auditor issues an unqualified report on financial statements that lack the necessary disclosures required by professional standards and ethical principles.

In both cases, failure costs borne by the auditor include legal liabilities, compensation to affected parties, loss of client relationships, damage to the firm's professional reputation, the cost of restoring that trust, and disciplinary penalties imposed by professional regulatory bodies.

Under agency theory, it is essential to consider the existence of conflicts between the parties involved in the agency relationship within an organization. Therefore, external auditing is necessary to help reduce the intensity of these conflicts of interest. Numerous studies have focused on the concept of high audit quality or the transition from lower-quality audit firms to higher-quality ones and how this shift relates to reducing agency conflicts, One researcher, Mark L. DeFond, found a relationship between audit quality and agency conflicts. In his study, DeFond explained how an organization transitions to higher-quality audit firms—that is, the drivers of demand for higher audit quality and their connection to agency conflicts. He concluded that changes in the financing structure are positively associated with audit quality. This implies that owners and creditors serve as effective monitoring mechanisms for the organizations they finance. The greater the number of owners and the higher the level of indebtedness, the stronger the incentive to monitor the organization's behavior and ensure a higher level of audit quality.

2.3 Dimensions of the Auditing Profession in the Context of Information Technology

The traditional functions of the auditing profession are no longer sufficient to fulfill its role in today's and tomorrow's world—a digital world operating under a continuously evolving information technology revolution. There is no doubt that this technology will create a market for a wide range of services offered by the auditing profession, in response to increasing public demand. This situation necessitates fundamental changes in professional practice to meet those demands and shift toward assurance and attestation services. Auditors, in particular, are increasingly required to report not only on the operations and performance of various entities but also on the credibility and quality of information and database information technologies [9].

Auditors working in the present and future are expected to be well-versed not only in the traditional topics familiar to the public but also in broader business knowledge related to the use of technology in commercial, industrial, and service operations. In general, generally accepted accounting principles (GAAP) and generally accepted auditing standards (GAAS) will become increasingly filled with references to technical terms and specialized technologies [10].

Currently, the (AICPA) is sponsoring the *Vision Project* to shape the future of auditing for 2011 and beyond. The goal is to ensure that the auditing profession remains relevant and valuable to entities operating in a global and constantly changing market and to help build a better future for the profession in the age of information technology. The project emphasizes that auditors must be knowledgeable in IT and e-commerce fundamentals, as these are essential elements for the future. Mastery of these areas will increase competitiveness and security in the profession. The project also asserts that auditors are the trusted professionals who help individuals and organizations shape their futures. By combining insight with integrity, they provide services by clearly and objectively conveying the bigger picture and transforming complex data into focused, simplified information.

As a result of the information technology environment, the services provided by auditors to their clients have been impacted in two key ways. First, there has been a development in audit approaches, shifting toward integrated IT auditing and continuous auditing. Second, new professional services have been introduced, most notably the WebTrust service for enhancing trust in the client's website. The following provides a detailed explanation of these services [11]:

1. **Integrated IT Auditing:**
The expansion of the IT environment places greater demands on the auditing profession by requiring the reduction of related risks and control costs, and by establishing control mechanisms in an unpredictable environment. IT audit services must be designed for all stakeholders connected to the entity, through reengineering the existing control environment as part of comprehensive audit procedures.
2. **Continuous Auditing:**
This is a modern approach to evolving the traditional audit model, and a professional response to the inevitable impact of IT on the audit profession. This approach has been driven by rapid and ongoing developments in information technology. Modern technologies such as the internet and electronic data exchange have changed business practices to the point that many organizations now publish their interim and annual financial statements online.
3. **Web Trust Services (Website Assurance):**
The American Institute of Chartered Accountants (AICPA) and the Canadian Institute of Chartered Accountants (CICA) responded to the increasing demand for assurance on online transactions.) launched a service in 1997 to certify clients' websites with a WebTrust seal, providing confidence in the site's reliability and assurance about its security and data integrity. This service was enhanced in 2003 through the introduction of assurance principles and related standards by both institutes.
4. **System Trust Services (System Reliability Assurance):**

According to Arens and others, as entities become increasingly reliant on IT, confidentiality, availability, and accuracy of computer systems become critical concerns. An unreliable system can trigger a series of adverse events affecting the entity, its clients, suppliers, and other stakeholders. As a result, the AICPA and CICA developed System Trust services to provide assurance on the reliability of information systems.

2.4 The Relationship Between Joint Auditing and Elements of the Modern Technological Environment for Enhancing Audit Report Quality :

Electronic reporting is a technology that permits the creation of incoming and departing electronic document formats in accordance with regulatory requirements in different countries and regions.. The management of various formats is made possible by electronic reporting, which enables the creation of business papers in the necessary forms for the electronic exchange of information with banks, government agencies, and other organizations as well as the implementation of new regulatory standards [12].

The Electronic Reporting Engine is designed primarily for business users rather than developers. Since users configure formats instead of writing code, Electronic document creation and editing becomes quicker and simpler. TEXT, XML, Microsoft Word documents, and OPENXML spreadsheets are currently supported by electronic reports. To support other formats, there is an extension interface. The following features are provided by the engine: [13]:

1. It serves as a single unified tool for electronic reporting across various areas, replacing more than 20 different engines used for report generation in Finance and Operations applications.

2. It separates report format design from execution, meaning the same format can be applied across different software versions.

3. It supports creating a custom format based on an existing one, with capabilities to automatically upgrade the custom format if the base format is updated due to translation or customization requirements.

4. For both Microsoft and its partners, it is now the standard solution for managing translation needs in electronic reporting.

5. It enables the use of Microsoft Dynamics Lifecycle Services (LCS) to distribute formats to partners and clients.

Data models and model mapping components are supported by electronic reporting. An abstract depiction of a data structureA data model component provides sufficient information about a business domain area to meet reporting requirements. The following components make up a data model component[14]:

1. A **data model** comprising things particular to a certain area and an organized description of the connections between them.

2. A **model mapping**, which links a specific application's data sources to individual elements of the data model, defining at runtime the data flow and dataset rules used in reporting over a specific period.

The mapping model that supports outbound electronic documents offers the following features [15]:

1. Various data kinds, including tables, data entities, methods, and enumerations, can serve as the data model's sources.

2. It enables user input parameters that might be specified as data sources when certain values need to be determined at runtime.

3. It allows data transformation, filtering, sorting, aggregation, and logical calculated fields similar to Microsoft Excel formulas, using a formula designer in the electronic reports.

Each business domain has a data model component that must be utilized as a single data source for reporting, separating the creation of reports from the actual usage of data sources. It helps the original design and upkeep of report formats more effective by representing domain-specific business concepts and functions. The ISO country/region code configuration determines access to electronic reporting format components. When this parameter is left empty for a specific version of a format configuration, any business can access the format component at runtime. When this setting includes ISO country/region codes, the format component can only be accessed by companies whose primary address is assigned one of the defined ISO country/region codes.

Electronic report configuration is considered an embedding program for a specific electronic reporting component. This component may be a format component or a data model component. Various versions of an electronic reporting component may be included in a configuration. Every configuration is identified as belonging to a certain configuration provider. When the configuration owner is chosen as the active provider in the application's electronic reporting settings, you can modify a draft version of a configuration component. A new format configuration can be created from a given data model configuration. In the configuration tree, the constructed format configuration is a child of the original data model configuration.

There is a format component in the generated format configuration. The format component of the child format configuration will automatically incorporate the data model component from the original model configuration as the default data source. Each electronic report configuration's author (owner) is identified by the electronic reporting provider. You may control the list of configuration providers using electronic reporting. The Microsoft configuration supplier is identified as the owner of format settings made available for electronic documents as part of the Finance and Operations solution. configuration supplier. You may use the task guide "Electronic Reporting – Create a Configuration Provider and Mark It as Active" to find out how to register a new electronic reporting provider. The shared LCS asset library provides access to a list of configurations stored in the shared asset library in Lifecycle Services (LCS). The shared asset library in LCS is the sole way to register this kind of electronic reporting repository for the Microsoft provider. The most recent electronic reporting configurations can be imported into the active instance [16] [17][18][19][20][21].

"The Practical Aspect of the Research"

3-1- An Introductory Overview of the Federal Board of Supreme Audit:

Founded in 1927, the Federal Board of Supreme Audit is a separate financial and administrative body. Represented by the President of the Board or a designated representative, it is regarded as the top financial control body connected to the Iraqi Council of Representatives. The Board is responsible for auditing public funds wherever they are found, and it is regarded as one of the leading institutions in safeguarding public funds, detecting fraud and manipulation, and combating financial corruption. The Board's strategic objectives include preserving public funds, supporting public accountability, and enhancing the economy. Article Two of Law No. (6) outlines the Board's responsibilities, which include auditing and reviewing the accounts of entities under its jurisdiction, ensuring compliance with financial laws, regulations, and instructions, performance evaluation and auditing, providing technical assistance in accounting and auditing fields, promoting accounting and auditing systems based on internationally accepted standards, and finding proof of corruption, fraud, waste, abuse, and inefficiency in issues pertaining to the receipt, usage, and expenditure of public monies through audit and performance review. As mandated by the national legislative authority, the Board is also in charge of looking into and reporting on matters pertaining to the effectiveness of public expenditure and the utilization of public resources.

3-2- The Relationship Between Joint Auditing and Elements of the Modern Technological Environment for Enhancing the Quality of the Auditor's Report at the Federal Board of Supreme Audit:

The time series of the banks in the study sample for the years 2015 to 2024 must be examined in order to create the study model and assess the effects of its variables. When it comes to revealing the essential components that define a certain phenomena throughout time, time series analysis is a prominent and significant tool. It is feasible to predict how time series could change in the future by monitoring their overall evolution. In order to analyze time series and forecast the variables and events that might impact different areas, econometric models have been developed.

The research variables must be determined in order to accomplish the study's goals and test its hypotheses. These variables were described in the preceding paragraph of this chapter, where the dependent variable is the caliber of the electronic audit report that the external auditor created, and the independent variable is the auditing techniques used in the banks under investigation. The following econometric model may be used to carry out the econometric analysis in a way that complies with the demands of the present study after the independent and dependent variables have been determined:

$$y = a_0 + a_1x_1 + a_2x_2 + a_3x_3 + a_4x_4 + a_5x_5$$

$$+ a_6x_6 + a_7x_7 + a_8x_8 +$$

Where:

y: The dependent variable representing the quality of the electronic audit report.

x_1: The independent variable related to the financial or accounting expertise level of the audit committees.

x_2: The independent variable related to the size of the audit committees.

x_3: The independent variable related to the frequency of audit committee meetings.

x_4: The independent variable related to the size of the bank.

x_5: The independent variable related to capital intensity.

x_6: The independent variable related to the debt ratio.

x_7: The independent variable related to the profit margin.

x_8: The independent variable related to the size of the audit firm.

a_0: The constant term.

$a_1, a_2, ..., a_n$: The parameters estimated.

e: The random error term.

Accordingly, joint auditing has been represented as an independent variable in the study through a set of sub-variables, namelyThe audit committees' size, frequency of meetings, level of financial or accounting knowledge, bank size, capital intensity, debt ratio, profit margin, and audit firm size.

Additionally, the audit expectation gap, which measures the quality of the electronic audit report, has been chosen as the research's dependent variable.the quality gap, and the communication gap for the first research hypothesis, and measured by relevance, reliability, comparability, and consistency for the second research hypothesis.

The study variables (independent and dependent) can be expressed using a logarithmic form, ensuring that there are no negative values within the research variables. Accordingly, the model used will be semi-logarithmic (Semi-Log), as follows:

$$logy = a_0 + a_1logx_1 + a_2logx_2 + a_3logx_3 + a_4logx_4 + a_5logx_5$$
$$+ a_6logx_6 + a_7logx_7 + a_8logx_8 + e$$

 In order to carry out the econometric analysis, a few initial diagnostic tests that can help choose the best econometric model must be carried out. Among these exams, the most crucial ones are: the cointegration test, lag length selection test, and unit root stationarity test. The unit root test will be used in this investigation to assess the time series' integration order and stationarity..

Several studies have shown that the existence of a unit root causes non-stationarity in the majority of the time series for the variables to be examined. This implies that each given time series has a unit root, which means that the series' variance and mean are dependent on time differences rather than being constant. A misleading association between the studied variables can arise from assuming stationarity in time series that really contain a unit root. This can result in exaggerated values for the (T) test, the (F) test, and the coefficient of determination (R^2).

Joint auditing represents an advanced form of judgment on financial statements and the expression of a neutral opinion. It is an auditing method that distinguishes the auditing process, supports auditor independence, and enhances their efficiency. Consequently, it is imperative to assess the stationarity of the time series to confirm that the correlations among the research variables are authentic..

The Phillips-Perron test, which determines the stationarity of the time series by testing the null hypothesis (H_0) that a unit root is present, is one of the most crucial tests to handle this problem. The econometric analysis results for the variables in the current study may be presented using the unit root test (Phillips-Perron Test). The following tables show the outcomes of the unit root test (Phillips–Perron Test) for the first and second hypothesis:

The Variables	Value of T Calculated	Table Value at the Level of Significance			The Results
		1%	5%	10%	
$Logy$	1.8770	2.1340	3.4160	3.8820	The Level
	4.0960	3.1220	3.3250	3.6140	The First Difference
$Logx_1$	1.6170	2.1220	3.3440	3.8980	The Level
	4.9850	3.1450	3.2230	3.7560	The First Difference
$Logx_2$	2.1450	2.1130	3.4180	3.5510	The Level
	6.5640	3.1290	3.3270	3.6170	The First Difference
$Logx_3$	2.0080	2.2330	3.4670	3.1080	The Level
	4.7150	3.1860	3.3890	3.7220	The First Difference
$Logx_4$	2.3270	2.1450	3.4450	3.7080	The Level
	5.3950	3.1530	3.3490	3.6220	The First Difference
$Logx_5$	2.4550	2.2440	3.3450	3.7070	The Level
	4.3890	3.1530	3.4490	3.6220	The First Difference
$Logx_6$	2.4450	2.1550	3.3120	3.7280	The Level
	5.6870	3.0080	3.2140	3.5330	The First Difference
$Logx_7$	2.4680	2.1180	3.2160	3.5250	The Level
	4.5840	3.3320	3.5650	3.8240	The First Difference
$Logx_8$	2.3680	2.0060	3.2260	3.5540	The Level
	3.4830	3.1440	3.2150	3.4240	The First Difference

Table (1). Results of testing the variables of the first hypothesis using Unit Root Test (Phillips−Perron Test)

Source : Based on the findings of the (EViews-9) methodology, prepared by the researcher.

Table (2). Results of testing the variables of the second hypothesis using Unit Root Test (Phillips−Perron Test)

The Variables	Value of T Calculated	Table Value at the Level of Significance			The Results
		1%	5%	10%	
$Logy$	1.6670	2.1440	3.4530	3.8160	The Level
	4.3250	3.1120	3.3270	3.6550	The First Difference
$Logx_1$	1.5220	2.1350	3.3270	3.6170	The Level
	3.1260	2.2450	3.4490	3.6220	The First Difference
$Logx_2$	2.2170	2.2160	3.4430	3.7180	The Level
	5.7630	3.1530	3.3290	3.8770	The First Difference
$Logx_3$	2.0090	2.4530	3.5620	3.8860	The Level
	4.8840	3.4430	3.6160	3.9230	The First Difference
$Logx_4$	2.3310	2.3450	3.5660	3.7750	The Level
	6.4290	3.2990	3.4390	3.9820	The First Difference
$Logx_5$	2.5130	2.1140	3.5610	3.7620	The Level
	4.2280	3.0090	3.4190	3.7880	The First Difference
$Logx_6$	2.3870	2.2280	3.4840	3.8110	The Level
	3.6560	3.6780	3.7260	3.8940	The First Difference
$Logx_7$	2.1870	2.1170	3.2730	3.5630	The Level
	5.0670	3.1440	3.2560	3.7510	The First Difference
$Logx_8$	2.3180	2.0950	3.2680	3.7430	The Level
	4.5440	3.0040	3.4290	3.6380	The First Difference

Source : Based on the findings of the (EViews-9) methodology, prepared by the researcher.

It is observed from the two previous tables that all the time series of the study variables are non-stationary at the level (Level), whereas they become stationary after taking the first difference (The First Difference) at a 1% significance level. Accordingly, the results of the econometric model can be estimated after conducting the cointegration test among the study variables to confirm the existence of a potential long-term equilibrium relationship between them. Therefore, it is essential to perform a cointegration test for these variables, as cointegration refers to a method of establishing a long-term equilibrium or relationship among non-stationary variables.

There are several tests available to measure the cointegration among the study variables, with one of the most prominent being the Johansen-

Juselius Test. In order to perform this test, two key sub-tests must be conducted: the Trace Test and the Maximum Eigenvalue Test. These two tests can be explained as follows:

First: Trace Test:

This test is used to determine the trace (or presence) of cointegration among the study variables. It tests the null hypothesis that the number of unique cointegration vectors (r) is less than or equal to a specified number (q), against the alternative hypothesis (r = q). It is calculated according to the following formula:

$$\square_{Trace}(r) = T\Sigma_{i=r+1}In(1-\square\square)$$

Where:

T: Represents the sample size.
r: The number of cointegration vectors.

Here, **(r)** denotes the smallest eigenvalues among the total number of (p – r) possible vectors. The null hypothesis states that there are at most **r** cointegration vectors, meaning that the number of vectors is less than or equal to **r**, which will be considered as variables in the current study.

Second: Maximum Eigenvalue Test (Maximum Eigen):

This test is calculated according to the following formula:

$$\square_{Max}(r,r+1) = T\Sigma_{i=r+1}ln(1-\square_{r-1})$$

The null hypothesis is tested, which states that there are **r** cointegration vectors, against the alternative hypothesis that there are **r+1** cointegration vectors. If the calculated likelihood ratio (LR) exceeds the critical value at a given significance level, the null hypothesis indicating the absence of cointegration vectors is rejected. If the LR value is lower, we fail to reject the null hypothesis, which assumes the existence of at least one cointegration vector.

If the time series are non-stationary at level, this may indicate that they are integrated of order one, i.e., I(1), or higher. In general, if cointegration exists, this means that the two series move together over time and may share a cointegrated relationship, resulting in a long-term equilibrium between the study variables.

To test for cointegration among the variables, it is essential that they are integrated of the same order. The test cannot be applied if the variables are integrated at different orders. Moreover, the accuracy of the results may be compromised in the case of small sample sizes. Therefore, an alternative method will be employed to determine the presence of cointegration among the variables—whether at level, first difference, or a mixture of both—through the Autoregressive Distributed Lag Bounds Testing (ADLB) approach.

This method offers several advantages over other cointegration tests, most notably its applicability regardless of whether the variables are integrated at I(0), I(1), or a mix of both. It also provides efficient estimates and reliable results for medium and large sample sizes. Additionally, it performs well when the stationarity of the variables is not clearly identifiable at a certain number of observations.

The results of the cointegration test (Johansen–Juselius Test) between the two main study variables—the quality of the electronic audit report produced by the external auditor (dependent variable) and joint auditing techniques (independent variable) with regard to both the Trace and Maximum Eigenvalue tests—are shown in the following table:

Table (3). Results of the Johansen–Juselius Cointegration Test Among the Study Variables

Hypothesized	Trace Test		Max Test	
No. of CE(s)	0.05	Trace	0.05	
Eigenvalue		Critical Value	Eigenvalue	Critical Vale
$r = 0 *$ None 0.574	78.7280	72.3180	22.7550	38.4140
At most 1r = 1		37.7220		16.4390
0.446		32.6170		19.1330
At most 2r = 2		19.9870		12.2250
0.133		15.5540		10.8950
At most 3r = 3		12.3230		10.2180
0.054		9.1290		9.2170
At most 4r = 4		7.6720		8.9450
0.042		7.0850		8.2180
At most 5r = 5		6.9490		8.0890
0.031		6.0820		6.3150
At most 6r = 6		5.6440		5.8420
0.025		5.0690		5.1260
At most 6r = 7		4.6480		4.6780
0.022		4.1350		3.4370
At most 6r = 8		4.0080		2.4490
0.021		3.3340		1.1580

Source   : Based on the findings of the (EViews-9) methodology, prepared by the researcher.

*Indicates rejection of the null hypothesis at the 5% significance level.

The Johansen cointegration test results using the maximum likelihood function are shown in the above table. Both a constant and a constrained linear trend were used in the calculations. It is clear from the preceding data that, at the 5% significance level, the computed values for the maximum eigenvalue and the trace statistic both surpass their respective critical values. This suggests that there is just one cointegration equation.

The null hypothesis, which makes the assumption that r = 0, was disproved. Consequently, the quality of the electronic audit report (dependent variable) and joint auditing techniques (independent variable) have a unique long-term equilibrium connection. The parameters of the single cointegration equation can be understood as long-term cointegration estimates between the variables under study. To put it another way, the values of these variables do not drastically change over time.

Accordingly, the null hypothesis stating the absence of a cointegration vector among the study variables is rejected. This suggests that these factors have a favorable association. Therefore, it can be concluded that the auditing methods employed in the research sample may have a good or negative effect on the quality of the electronic audit report..

Following the cointegration test between the independent and dependent study variables, long-term elasticities may be estimated using the Autoregressive Distributed Lag (ARDL) model for the study years, as shown in the accompanying table:

Table (4)

Long-Term Elasticity Results for the Study Variables

The Variables	Co. Efficient	Std. Error	T. Statistic	Prob.
$Logx_1$	1.1330	0.1280	6.1170	0.0160
$Logx_2$	0.9890	0.0340	4.3480	0.0240
$Logx_3$	1.2250	0.2180	6.5350	0.0120
$Logx_4$	0.6460	0.2440	4.3260	0.0580
$Logx_5$	0.5450	0.0770	3.2150	0.0380
$Logx_6$	0.3880	0.9920	2.1240	0.0320
$Logx_7$	0.2160	0.5410	3.8760	0.0180
$Logx_8$	0.1220	0.3320	3.4390	0.0150
C	0.6580	0.3210	4.2480	0.0270
$R_{Squared}$	0.8460	Mean Dependent Var.		0.3880
Adjusted $R_{Squared}$	0.8420	S.D. Dependent Var.		0.3450
S.E. of Regression	0.0080	Information Criterion		6.5510
Log Likelihood	1.8020	Henner Criterion		3.4340
$F_{Statistics}$	-	-		3482.0160
Prob. ($F_{Statistics}$)	-	-		0.0000

Source: Prepared by the researcher based on the results of the (EViews-9) methodology.

Because the estimated coefficients of the study variables show a link between them, as the following table shows, joint auditing procedures are shown to improve the quality of the electronic audit report. The following formula can be used to depict the long-term equilibrium connection between the variables under investigation..:

$$logy = 0.6580 + 1.1330log + 0.9890log + 1.2250log + 0.6460log$$

$$+ 0.5450log + 0.3880log + 0.2160log + 0.1220log + 0$$

According to the data shown in the preceding table, the coefficient of determination (R^2) achieved 0.846, indicating that 84.6% of the fluctuations in the dependent variable (quality of the electronic audit report) can be explained by the independent variables (joint auditing techniques). Additionally, every independent research variable is shown to be statistically significant at the 5% level.

Several conclusions about these elasticities may be drawn from the above table on the long-term elasticity results of the research variables. These conclusions can be summed up as follows:

The quality of the electronic audit report increases by 1.1330% for every 1% increase in the audit committees' financial or accounting knowledge. Similarly, a 1% increase in the size of audit committees results in an improvement of 0.989% in the report's quality. Additionally, a 1% increase in audit committee meeting frequency results in a 1.2250% improvement in the electronic audit report's quality.

In contrast, a 1% increase in bank size improves the report quality by 0.646%, while a 1% rise in capital intensity leads to a 0.5450% improvement. Additionally, a 1% increase in the debt ratio results in a 0.388% improvement in report quality, and a 1% increase in the profit margin enhances the report quality by 0.216%. Finally, the quality of the electronic audit report improves by 0.1220% for every 1% increase in the audit firm's size.

The quality of the electronic audit report can therefore be positively impacted by audit programs, whether they are required or elective, joint audits, dual audits, or single audits.

Conclusions and Recommendations

Conclusions

1. Joint auditing represents an advanced form of expressing opinions on financial statements and delivering an impartial judgment. It is an audit approach that enhances the audit process, supports auditor independence, and It improves their proficiency and capacity to resolve conflicts with the audited entities' management. It also fosters unified thinking, professional collaboration, and mutual discussion among the assigned auditors, including the joint planning of the audit process.

2. Joint auditing strengthens the ability to have a reasonable certainty that there are no significant misstatements in the financial statements overall, whether as a result of fraud or error. .This assurance is more effectively achieved in joint audits compared to standard audits. Additionally, it improves the efficiency of planning, collaboration, and coordination across audit firms—particularly when one is a smaller firm—resulting in more robust quality control mechanisms and a unified, well-founded audit opinion.

3. The traditional roles of the auditing profession are no longer sufficient to fulfill its purpose in today's and tomorrow's digital world, which is characterized by a continuously evolving information technology revolution. There is no doubt that this technology will create a market for wide-ranging services provided by the auditing profession in response to the growing public demand for such services.

4. The expansion of the information technology environment imposes greater demands on the auditing profession, particularly in reducing associated risks and control costs, and in establishing reliable control mechanisms within this unpredictable environment. IT audit services must be designed for all parties associated with the entity by reengineering the existing control environment within the framework of comprehensive audit procedures.

5. Electronic report generation is considered a configuration program that includes a specific electronic reporting component . Different versions of the electronic reporting component may be included in the configuration, and each configuration is identified as belonging to a certain configuration provider.

Recommendations:

1. Laws and rules governing the professional practices of joint auditing programs must be issued by governmental entities and professional associations., while also raising awareness among economic units about the importance of such programs.

2. Efforts should be made to develop alternative methods and tools that can help overcome the challenges faced by auditors when conducting joint audit programs, in order to maximize the benefits and added value these programs provide.

3. All financial institutions should be encouraged to adopt and promote joint auditing due to its positive impact on narrowing the performance gap and improving the quality of electronic audit reports. Joint audits also enhance the ability to meet the requirements of a high-quality electronic report in line with the advancements and modifications of the contemporary commercial environment.

4. The performance of joint audit committees should be monitored throughout the year by both the board of directors and professional organizations to ensure their effectiveness and their ability to achieve the intended goals efficiently. Additionally, training should be provided in the use of information technology for the proper preparation of electronic audit reports.

A professional institute should be established to regulate and develop joint auditing practices, oversee continuing professional education for its members, and lay the scientific and practical foundations for audit committees. This includes organizing training programs for committee candidates and giving due attention to the electronic audit report, which must

be prepared with the highest possible speed and accuracy.

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