

**The impact of cloud computing on
activating the role of risk-based internal
audit and its reflection on the
organization's financial performance
- An Empirical Study-**

**تأثير الحوسبة السحابية على تفعيل دور المراجعة
الداخلية على أساس المخاطر وانعكاسه على الأداء المالي
للمنظمة - دراسة تجريبية-**

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المستخلص:

تمثل الهدف الرئيسي للبحث في "اختبار علاقة الارتباط بين تفعيل دور المراجعة الداخلية على أساس المخاطر والحوسبة السحابية وانعكاسها على الأداء المالي للمنظمة". ولتحقيق هذا الهدف قامت الباحثة بعرض وتصنيف وتحليل ما ورد في الأدبيات المهنية التي تناولت موضوع الحوسبة السحابية، المراجعة الداخلية على أساس المخاطر، والأداء المالي للمنظمة. وقامت الباحثة بتصميم استبيان وتوزيعه على عينة من مجتمع الدراسة لجمع بيانات الدراسة التجريبية. تكون مجتمع الدراسة من: المراجعين الداخليين والمديرين الماليين للشركات المقيدة بالبورصة المصرية والمدرجة ضمن مؤشر EGX 100 الذي يستخدم الخدمات السحابية من ٢٠١٨-٢٠٢٢. مكاتب المراجعة الخارجية بمحافظة القاهرة. تكونت عينة الدراسة من ١٨٢ فرداً من هذا المجتمع، وقد

تم تطبيق البرنامجين الإحصائيين SPSS، AMOS، وقد خلصت إلى ما يلي:- توجد علاقة ارتباط موجبة ذات دلالة إحصائية بين استخدام الحوسبة السحابية وتفعيل دور المراجعة الداخلية على أساس المخاطر، - توجد علاقة ارتباط موجبة ذات دلالة إحصائية بين استخدام الحوسبة السحابية والأداء المالي للمنظمة، - هناك انعكاسات إيجابية على الأداء المالي للمنظمة نتيجة تفعيل دور المراجعة الداخلية على أساس المخاطر في ضوء الحوسبة السحابية. الكلمات المفتاحية: الحوسبة السحابية، المراجعة الداخلية، على أساس المخاطر، الأداء المالي للمنظمة، المراجعين الداخليين، المديرين الماليين، البورصة المصرية، مؤشر EGX 100، محافظة القاهرة، البرامج الإحصائية SPSS، AMOS، دراسة تجريبية.

Abstract:

The main objective of the research was to “examine the correspondence between activating the role of risk-based internal audit and cloud computing, and its reflection on the financial performance of the organization.”. To achieve this objective, the researcher presented, classified, and analyzed what was stated in the professional literature that dealt with the topic of cloud computing, risk-based internal audit, and the financial performance of the organization. The researcher designed a survey and distributed it to a sample of the study populations to collect data for the empirical study. The study population consisted of: -Internal auditors and financial managers of companies registered on the Egyptian Stock Exchange and listed within the EGX 100 index that used cloud services from 2018-2022.- External auditors in external auditing offices in Cairo governorate. The study sample consisted of 182 individuals from this population. The two statistical programs SPSS and AMOS were applied, and the following was concluded: there is a statistically significant positive correlation between the use of cloud computing and activating the role of risk-based internal audit, there is a statistically significant positive correlation

between the use of cloud computing and the financial performance of the organization, there is a positive impact on the financial performance of the organization because of activating the role of risk-based internal audit considering cloud computing.

Keywords: Cloud computing, Risk-based internal audit, the financial performance of the organization, internal auditors, financial managers, Egyptian Stock Exchange, EGX 100, Cairo governorate, SPSS, and AMOS statistical programs, An Empirical Study.

Purpose: This research aims to examine the correspondence between activating the role of risk-based internal audit, cloud computing, and its reflection on the financial performance of the organization.

Design/methodology/approach: The researcher designed a survey and distributed it to a sample of the study population to collect empirical study data. SPSS and AMOS statistical programs were applied for analyzing the data and obtaining conclusions.

Findings and recommendations: Considering the results of the empirical study, there is a positive impact on the financial performance of the organization because of activating the role of risk-based internal audit considering cloud computing, through: The quality of risk-based internal audit considering cloud computing contributes to creating value for the company and improving profitability, which leads to improving the company's financial performance, the quality of risk-based internal audit activities under cloud computing results in reliable financial reporting, risk-based internal audit plays a key role in helping to manage and evaluate risks with the development of cloud services, which contributes to improving the financial performance of the organization. The study recommended that: The importance of designing and implementing programs to develop the accountants and internal and external auditors' professional awareness of the risks of using cloud computing, its role in activating risk-based internal audit, and its impact on the financial performance of the organization, the importance of designing and

developing a risk-based internal audit system to benefit from cloud computing and avoid the risks associated with it, the need for stakeholders to participate in discussions about the implications of cloud computing risks, an organization's data governance program should be reviewed and better understood, as this is a key component of data processing in the cloud.

1. Introduction:

Cloud computing presents a new frontier for many organizations, and for internal audit as well. When confronting the challenges of cloud computing, internal auditors may need to stretch beyond their traditional audit roles, adding greater value as they assist the organization in building the required control environment to mitigate risks associated with the cloud. Implementing a cloud strategy changes the risk landscape in profound ways. As some risks are minimized, others spring up in their place. Recognizing and responding to this morphing organizational risk profile is the purview of IA. Internal auditors understand the interplay between business processes and risk. So, they can not only help business leaders articulate their appetite for risk, but they can also help develop strategies for mitigating it. and as a function that understands risks, IA can help provide the context and risk framework an organization should consider when moving to the cloud (**Deloitte, 2014**). Audit in a cloud environment is a combination of information systems audit and audit of Information Technology (audit of infrastructure IT).Cloud computing is a technology that is predicted to continue to grow so will be crucial in the coming years. An auditor should be able to review the risk assessment products and observe the process of risk assessment. While the role of internal auditors is crucial in developing additional understanding of this new technology to add value and more to advise their companies on the relevant risks and controls, as internal auditors have a higher level of understanding of Business Processes and operational audit (**Nurhajati, 2016**).

2. Literature Review:

2.1 Related research on cloud computing:

In the study (Nurhajati, 2016), the aim was to assess the current impact of cloud computing technology on the audit process, and to discuss the future implications of technological trends for the auditing profession. The firms participating in this study represent two of the four largest accounting firms in the world (Deloitte & KPMG). The study concluded that auditing in a cloud environment is a combination of information systems audit and audit of Information Technology (audit of infrastructure IT). Understanding the process of auditing in cloud computing environments with knowing there were two audit sites consist of audit on-site service cloud provider (CSP) and audit at the company's site (costumer cloud service). And the study showed that cloud computing audits will become increasingly, the use of that technology has influenced of the audit process and be a new challenge for both external and the internal auditors to understand IT and learn how to use cloud computing and cloud services that hire in cloud service provider (CSP), and considering the risks of cloud computing, and how to audit cloud computing by risk based audit approach. The study found that the risk-based approach (RBA) process for cloud computing is complicated because the technologies and controls are housed outside the entity being audited. And an auditor should be able to review the risk assessment products and observe the process of risk assessment. While the role of internal auditors is crucial in developing additional understanding of this new technology to add value and more to advise their companies on the relevant risks and controls, as internal auditors have a higher level of understanding of Business Processes and operational audit. The study of (Moghadasi et al., 2018) showed that cloud computing is a new form of IT system and infrastructure outsourcing as an alternative to traditional IT Outsourcing (ITO). Hence, migration to cloud computing is rapidly growing among organizations. Adopting this technology brings numerous positive aspects, although

imposing different risks and concerns to organization. An organization which officially deposes its cloud computing services to outside (offshore or inshore) providers and implies that it outsources its functions and process of its IT to external BPO services providers. Therefore, customers of cloud must evaluate and manage the IT infrastructure construction and the organization's IT control environment of BPO vendors. Since cloud is an internet-based technology, cloud auditing would be very critical and challenging in such an environment. This study has focused on practices related to auditing processes, methods, techniques, standards, and frameworks in cloud computing environments.

2.2 Related research on the risk-based internal audit:

The study (Terer & Ngahu,2017) sought to establish factors influencing the adoption of risk based internal audit in Kenya and Livestock Research Organization. More specifically the study sought to establish the influence of ICT on risk based internal audit adoption in KARLO. A descriptive research design was employed on a target population comprised of the senior managers in KARLO. A census approach was utilized on a population of 64 senior managers. Questionnaires were used as the main data collection instruments. The collected data was then organized and analyzed using statistical package for social sciences (SPSS) version 24. Data was analyzed in the form of descriptive statistics and inferential statistics. The study concluded that ICT infrastructure has significant influence on the adoption of risk based internal audit. The study recommended that the board of management should come up with policy measures that will aim at enhancing the adoption of risk based internal audit. The measures should address the enhancement of ICT infrastructure in the organization. The study (Heldifanny& Tobing, 2019) aims to analyze the implementation of a risk-based internal audit plan at University X. Research is conducted using a single case study design. The method used is field study. Field studies were conducted at the Internal Audit Unit or SPI at

University X by conducting interviews with the staff and collecting data, such as the University X Annual work Plan 2015–2017, University X Strategic Plan 2015–2018, AUN-QA Self - Assessment Report 2016, Internal Control Unit (SPI) report for the first half of 2017, and University X statistics for 2012–2016. The study found that When conducting their RBIA approach, SPI University X mainly focuses on operational risk, financial risk, and compliance risk, among other risks, because those risks must be addressed first to ensure that effective internal controls throughout the organization can be achieved. IIA suggested that, when carrying out the RBIA, the scope of the risk being managed must not only focus on operational risk, financial risk, and compliance risk but also primarily on strategic risk. One of the most important recommendations of the study is that SPI University X should begin to consider risks beyond financial, operational, and compliance risks and focus on strategic risks that may affect the University's reputation. And the study (Lois et al.,2021) aims to investigate the factors associated with the implementation of risk-based internal audit (RBIA). It constructs a questionnaire sent out to 185 internal auditors, executives, and accountants in Greece. This paper shows that there is a statistically significant positive relationship between the implementation of RBIA and: the provision of risk management training, an active audit committee role and the establishment of a formalized risk management system. The results have important implications for internal auditors, chief executive officers and accountants who wish to enhance internal audit effectiveness and the accuracy and quality of financial information, and the implementation of RBIA as a modern methodology in the field of auditing effectively achieves the interconnection of internal audit and risk management.

2.3 Related research on the financial performance of the organization:

The main purpose of the study (Chang et al., 2014) was to examine whether financial performance would be improved

after organizations implemented cloud computing technology. According to the results of the analysis, it was found that the cost structure and Return on Sales (ROS) of organizations adopted cloud computing are significantly improved. Considering the mixed arguments and uncertainty about the payoff of cloud computing. The study of **(Marete, 2014)** showed that risk-based internal audit influences a firm's use of its internal audit function to enhance risk management and control as well as governance which in turn influences accountability and enhances accuracy of financial statements thereby influencing the financial performance in financial institutions. To understand the relationship between risk based internal audit and the financial performance, the study examined whether use of risk based internal audit practices such as risk management, internal audit planning, internal audit capacity and internal audit standards affected the financial performance of commercial State Corporations in Kenya. The study adopted descriptive survey research with a view to obtaining information that describes existing phenomena. Primary data was collected using questionnaires. The study concluded that there existed a positive relationship between risk management, internal audit planning, internal audit capacity, and internal audit standards on the financial performance and therefore recommended that management in Commercial state corporations should embrace risk based internal audit practices. From the findings, the study recommended that managers in commercial state corporations in Kenya should adopt risk based internal audit practices such as risk management, internal audit planning, internal audit capacity and internal audit standards to enhance the financial performance of their organizations. The general objective of **(Muraguri, 2016)** study was to establish the effect of risk-based audit on performance of state-owned corporations in the Ministry of East African Community, Labor, and Social Protection in Kenya. The research design used was descriptive research design. The population of the study comprised 160 senior managers of State

corporations in the ministry. The study used primary data that was collected through self-administered questionnaires. The data was analyzed using descriptive statistics which included inferential statistics such as regression and bivariate relationship. The study established that risk assessment, internal audit standards, control environment and information system positively affected the financial performance of state-owned corporations in Kenya. The study recommended that the management of state corporations should implement effective risk-based audit practices to enhance performance. It also recommended that the management of the commercial state corporations in Kenya should bear the responsibility of equipping their firms' internal audit functions with adequate resources to enable them to develop effective annual risk-based audit plans. The study also recommended that to improve the financial reporting of state corporations in Kenya, the management of state corporations must embrace International Auditing Standards (ISAs), which guide ethical practices of internal audit personnel.

According to the above, the researcher concluded the following:

- 1- The concept of a risk-based audit is currently evolving in such a way to ensure that organizations experience the maximum benefits of each function in a mutually exclusive way.
- 2- The implementation of RBIA as a modern methodology in the field of auditing effectively achieves the interconnection of internal audit and risk management.
- 3- ICT infrastructure has significant influence on the adoption of risk based internal audit.
- 4- The role of internal auditors is crucial in developing additional understanding of this new technology to add value and more to advise their companies on the relevant risks and controls, as internal auditors have a higher level of understanding of Business Processes and operational audit.
- 5- Risk- based internal audit influences a firm's use of its internal audit function to enhance risk management and control as well as

governance which in turn influences accountability and enhances accuracy of financial statements thereby influencing the financial performance in financial institutions.

6- The research that the researcher is currently preparing is an extension of previous studies, in addition to that it combines the three variables represented in cloud computing, risk- based internal audit, and the financial performance of the organization, because there is a research gap in combining them.

3.Research Problem:

The research problem can be identified through the following questions:

- 1- Is there a correlation between the use of cloud computing and activating the role of risk-based internal audit?
- 2- Is there a correlation between the use of cloud computing and the organization's financial performance?
- 3- Is there a correlation between activating the role of risk-based internal audit and the financial performance of the organization considering cloud computing?

4.Research Objectives:

The research objectives are as follows:

- 1-Examine the correspondence between the use of cloud computing and activating the role of risk-based internal audit.
- 2-Examine the correspondence between the use of cloud computing and the financial performance of the organization.
- 3-Examine the correspondence between activating the role of risk-based internal audit and the organization's financial performance considering cloud computing.

5.Research hypotheses:

Hypothesis 1: "There is no statistically significant correlation between the use of cloud computing and activating the role of risk-based internal audit."

Hypothesis 2: "There is no statistically significant correlation between the use of cloud computing and the financial performance of the organization."

Hypothesis 3: “There is no statistically significant correlation between activating the role of risk-based internal audit and the financial performance of the organization considering cloud computing.”

Section 1: Theoretical Background of the Research

In this section, the researcher discusses what is meant by cloud computing, risk-based internal audit, the benefits of RBIA, the relationship between cloud computing and risk-based internal audit, the relationship between cloud computing and the financial performance of the organization, and the impact on the organization’s financial performance because of activating the role of risk-based internal audit considering cloud computing.

1.1 Cloud Computing:

Cloud computing is pictured as the next-generation technology. It is a web-based technology where quality services are provided to users including data and software, on remote servers. Cloud computing is just like as called Data outsourcing as an outsider gives storage services to the client. They produce good results for the customers without costing a lot of money for equipment and programming for information storage. Cloud computing eliminates the need to have a complete infrastructure of software and hardware to meet clients’ requirements and applications. It can be thought of or considered as an entire or an incomplete outsourcing of hardware and software resources. To access cloud applications, a fast Internet connection and a standard Internet browser are required. It offers an on-demand and scalable access to a shared pool of resources hosted in a data Centre at providers’ site (Malik et al.,2018).It is defined by NIST(The National Institute of Standards and Technology) is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction, the NIST’s classification, private cloud, community cloud, public cloud, and hybrid cloud

are the four major patterns of cloud deployment (Chou, 2015). The study (Bezdan et al., 2022) indicated that Cloud computing represents relatively new paradigm of utilizing remote computing resources and is becoming increasingly important and popular technology, that supports on-demand (as needed) resource provisioning and releasing in almost real-time. As defined by the study (Rashid & Chaturvedi, 2019) as storing and accessing data and programs over the internet instead of our computer's hard drive. The cloud is just a metaphor for the Internet. In a computer network we typically represent the internet as a cloud as shown in the figure (1).

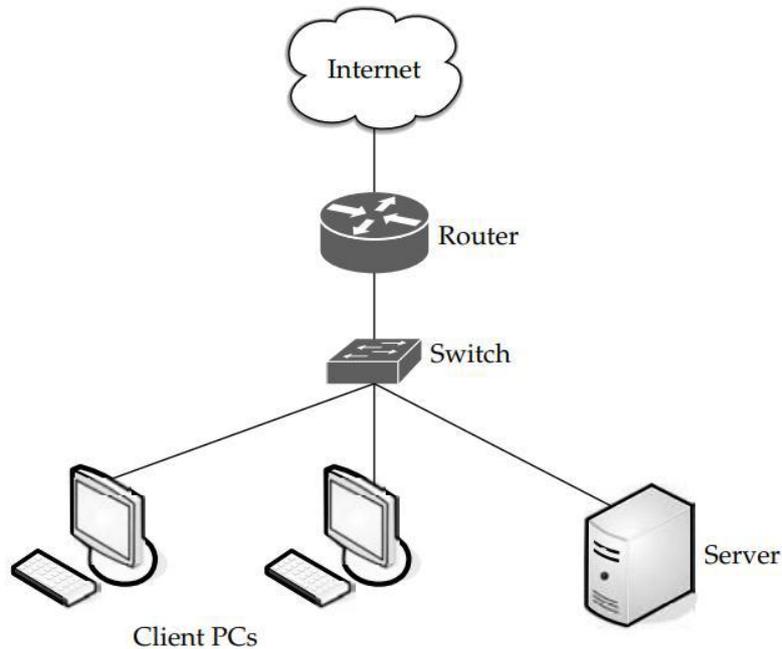


Figure (1): Internet is depicted by a cloud in a network. And a study (Rashid & Chaturvedi, 2019) was based on the help of organizations and individuals understand how cloud computing can provide them with reliable, customized, and cost-effective services in a wide variety of applications.

Characteristics of various cloud computing services, applications, and characteristics, and gives various examples for cloud services delivered by the most common cloud service Providers (CSPs) such as Google, Microsoft, and Amazon. It also discussed cloud computing service models and their benefits.

1.2 Risk-based internal audit:

Risk-based internal audit has emerged as an important contributor to effective risk management, it is a process, an approach, a methodology and an attitude of mind rolled into one. The simplest way to think about risk-based audit conceptually is to audit the things that really matter to your organizations, The Risk Based Audit is superior to traditional audit approaches for two reasons. First, it focuses on risks, the underlying causes of financial surprises, not just the accounting records. Second, the Risk Based Audit shifts the focus from inspecting the quality of the financial information that is recorded in the financial statements to building quality into the financial reporting process (Terer&Ngahu,2017). And the concept of a risk-based audit is evolving in such a way to ensure that organizations experience the maximum benefits (Young,2020). The Institute of Internal Auditors (IIA) defines Risk-based internal audit (RBIA) as a methodology that links internal audit to an organization's overall risk management framework. A risk-based internal audit (RBIA) enables internal auditors to provide an assessment to the board that the risk management process has effectively managed the organization's risk in accordance with its risk appetite (Heldifanny& Tobing, 2019). According to the Chartered Institute of Internal Auditors (CIIA) Risk-based internal audit is defined as a methodology that links auditing to an organization's risk management framework, which allows internal audit to provide assurance to the board that risks are managed effectively in relation to the risk appetite (Young,2020). And (Putri et al.,2018) defined it as: a complex process which lasts several years. The RBIA paradigm moves internal auditors' attention to be more focused on risk. And the study (Young, 2020) showed

that the functions of risk management and internal audit should be separated. The concept of a risk-based audit is currently evolving in such a way to ensure that organizations experience the maximum benefits of each function in a mutually exclusive way. This study aimed to identify determinants which could serve as a guideline for a risk-based audit of an operational risk management framework. The main components of an operational risk management framework were identified as risk governance, risk culture, risk strategy, and a risk management process. A literature review was used to identify twenty-two determinants that were rated for importance and current applicability by means of a survey. The study found the identified determinants are generic and applicable to all public and private organizations and can be used by internal audit as a guide towards a risk-based audit approach to provide independent assurance of an adequate operational risk management framework. The rated level of applicability of the determinants could also serve as a guideline for organizations to assess their own level of adherence to the determinants and to identify potential areas of development to ensure an adequate operational risk management framework. It is also envisaged that the determinants could be expanded to include the auditing of other risk types such as credit risk, market risk and strategic risk to establish a holistic risk-based audit approach. Among the most important recommendations of the study: involving all employees in risk management, integrating the strategic and risk management processes, and improving risk monitoring to identify and respond to potential business opportunities. A study (Putri et al.,2018) was performed to examine factors influencing the success of Risk Based internal audit implementation and develop a model of RBIA Griffin implementation. The study result showed 4 stages which must be performed in regencies/cities for successful RBIA implementation are: 1-Preparing Quality Human Resources, Reinforcing the Role of Internal Auditor, Commitment of Top Management, Good Communication Process.

2-Assessing the maturity of the organization risk management process.

3-Making audit plan.

4-Performing individual assurance audit.

1.3 The benefits of RBIA are as follows:

IIA (**Heldifanny& Tobing, 2019**) stated that the benefits of RBIA are as follows:

- 1- By implementing a RBIA, management identifies, assesses, and responds to risks that are higher or lower than the risk appetite of the organization.
- 2- Responding to the risks identified by the internal auditor is effective and not excessive.
- 3- A RBIA allows the auditor to provide recovery measures on residual risk that may not fall within the risk appetite.
- 4- The effectiveness of risk management processes can be monitored by management.
- 5- Risks, responses related to risks, and actions taken are to be classified and reported.

The (CIIA) (**Young,2020**) affirmed that the initial advantages of a risk-based internal audit can be summarized as follows:

- 1- Ensure that risks above and under the risk appetite threshold have been identified, assessed, and responded to.
- 2- Ensure that the responses to risks are effective.
- 3- Ensure that where residual risks are not in line with the risk appetite, remedial action is taken.
- 4- Ensure that risk management processes including the effectiveness of responses and completion of actions are being monitored by management.
- 5- Ensure that risks and actions are being properly classified and reported.

1.4 The relationship between Cloud Computing and risk-based internal audit:

When confronting the challenges of cloud computing, internal auditors may need to stretch beyond their traditional audit roles. Cloud computing has taken the business world by storm. And with it comes a potential deluge of risks. As confidentiality, security, service continuity, and regulatory compliance become even more critical to the business, what role should Internal Audit (IA) play in addressing these risks?(**Deloitte, 2014**) .A study (**Deloitte, 2014**) has been offering five proactive steps IA functions should consider as the organization adopts cloud computing initiatives:

- 1-Engage stakeholders in informed discussions about the risk implications of cloud computing.
- 2-Review the current organizational risk framework based on cloud risks that have been identified.
- 3-Develop risk-mitigation strategies to help minimize the risks that accompany cloud computing.
- 4-Review and better understand the organization's data governance program, as this is a key component in the treatment of data in the cloud.
- 5- Evaluate potential cloud vendors from a risk perspective.

According to a study (**Nurhajati, 2016**)The very best Internal Audit functions are regarded as a catalyst for change, helping the organization through the difficulties of changing environments, cultures, and so on. So, IT auditors need to understand these technologies, establish an approach for identifying the key risks and develop effectual audits of the technologies for those risks. However, the risk-based approach (RBA) process for cloud computing is complicated by the fact that all the technologies and controls are housed outside the entity being audited. Auditor must begin the audit planning by understanding the objectives of each business process and then determine whether these objectives have been incorporated into the client's processes, while adequately considering risks and internal controls. An auditor

should be able to review the risks assessment product and observe the risks assessment process. (Deloitte, 2014) study confirmed that IA can be part of the risk equation, assisting the organization with developing a risk-based approach to the use of cloud computing. This entails not only understanding the risks involved but suggesting ways to help minimize risk. And IA should make sure it understands the organization's current cloud footprint, conducts cloud audits by starting at the procurement process, and recognizes the conditions that prompt business users to bypass the IT shop and sign up for cloud services directly. It should also develop and leverage a customized framework tool to help identify the organization's top cloud risks and drill down to key statements.

Considering the results of the empirical study, the researcher suggests that when an organization adopts cloud computing initiatives, the current organizational risk framework should be reviewed based on the cloud risks identified, the internal auditor must conduct an audit in the cloud computing environment with the relationship between the risks taken from each stage in the cloud. And when facing the challenges of cloud computing, internal auditors may need to expand beyond traditional audit roles.

1.5 The relationship between Cloud Computing and the financial performance of the organization:

Financial performance is the achievement of the company's financial performance for a certain period covering the collection and allocation of finance measured by capital adequacy, liquidity, solvency, efficiency, leverage, and profitability. The financial performance, the company's ability to manage and control its own resources. Cash flow, balance sheet, profit-loss, capital change can be the basis of information for corporate managers to make decisions. It is important to understand fundamental analysis and technical analysis (Fatihudin,2018).The researchers (Li, Z., et al., 2021) conducted

an empirical study of the long-term impact of cloud computing on financial performance, specifically from the perspective of efficiency and innovation. A sample of companies listed in China was taken. The analysis results showed that cloud computing adoption leads to years of financial decline followed by an upturn. The downward trend is more pronounced when it is adopted with innovation. The researchers (**Chen et al., 2022**) also conducted an experimental study to investigate the economic impact of cloud service adoption on firm performance. And estimate the performance effect of cloud computing on worldwide listed firms that adopted cloud service during 2010–2016. The results indicate that cloud computing has a significant and positive impact on the profitability and market value of listed firms with varying degrees in both short and long time periods. In addition, the magnitude of the performance effect varies with firm size and industry type. The study (**Khayer et al., 2020**) aimed to investigate the determinants of successful implementation of cloud computing and, further, examines how cloud computing success influences firm performance. Data were collected from 300 Chinese firms which have adopted cloud computing. To analyze the data, partial least squares structural equation modeling (PLS-SEM) was used. An importance-performance map analysis (IPMA) was also conducted to identify the critical factors that exhibit high importance but low performance. The results of the study revealed that end-user satisfaction, information quality, system quality, managerial information technology (IT) capability and technical IT capability significantly affect cloud computing success. Additionally, cloud computing success has a strong and positive impact on firm performance. IPMA further confirms that managers need to concentrate more on system quality, information quality, user satisfaction and technical IT capability. To assess the impact of cloud computing usage on business performance, a study of (**Gangwar, 2017**) was presented an integrative research model that links environmental, organizational, and technological capability constructs. And to

fill a literature gap, the study focused on post adoption stages, i.e., actual usage and value creation, by surveying 403 manufacturing firms in India. The data were analyzed through exploratory and confirmatory factor analyses, yet structural equation modeling further tests the proposed model. The results show that business, human and technological capital, change management, organizational culture, and regulatory and supplier support are all vital antecedents of cloud computing usage, with firm size moderating actual usage and performance. The unique insights the results provide can help organizations enhance their cloud computing adoption and thereby improve their business performance.

Considering the results of the empirical study, it became clear to the researcher that: applying cloud computing technology improves the financial performance of companies, cloud computing has a significant and positive impact on the profitability and market value of listed companies to varying degrees in short and long time periods, the application of cloud computing technology leads to years of declining financial performance followed by improvement.

1.6 The impact on the organization's financial performance because of activating the role of risk-based internal audit considering cloud computing:

Considering the results of the empirical study, it became clear to the researcher that: the quality of risk-based internal audit considering cloud computing contributes to creating value for the company and improving profitability, which leads to improving the company's financial performance, the quality of risk-based internal audit activities under cloud computing results in reliable financial reporting, risk-based internal audit plays a key role in helping to manage and evaluate risks with the development of cloud services, which contributes to improving the financial performance of the organization.

Section 2: The Empirical Study

2.1 Introduction:

The researcher designed a survey and distributed it to a sample of the study population to collect empirical study data. The empirical study deals with a description of the study population and its sample, as well as the questionnaire used, its validity and stability, and the methodology used in data analysis. It aimed to test hypotheses and finally obtain scientific and logical results.

2.2 The Empirical Study objectives:

The empirical study aims to achieve the following:

- 1-Examine the correlation between the use of cloud computing and activating the role of risk-based internal audit.
- 2-Examine the correlation between the use of cloud computing and the financial performance of the organization.
- 3-Examine the correlation between activating the role of risk-based internal audit and the financial performance of the organization considering cloud computing.

2.3 Population and sample of the study:

The study population consisted of:

- Internal auditors and financial managers of companies registered on the Egyptian Stock Exchange and listed within the EGX 100 index that uses cloud services from 2018-2022.
- External auditors in external auditing offices in Cairo governorate.
- Because the study population is unlimited, the sample number was limited to 182 respondents. The electronic method was used through Google Drive, where the questionnaires were sent to the sample electronically, and then the responses were received, reviewed, and analyzed.

2.4 Preparing the questionnaire:

The researcher prepared a questionnaire to collect empirical study data, and it was designed in a way that leads to achieving the objectives of the study, and helps in testing its hypotheses. The survey included demographic data, and three research dimensions as follows:

Demographic data includes qualification, job, and experience.

Dimension 1: includes statements about the role of cloud computing in activating the role of risk-based internal audit.

Dimension 2: includes statements about the impact of cloud computing on the financial performance of the organization.

Dimension 3: includes statements related to the feedback on the organization's financial performance because of activating the role of risk-based internal audit considering cloud computing.

2.5 The hypotheses of the study:

Hypothesis 1: "There is no statistically significant correlation between the use of cloud computing and activating the role of risk-based internal audit."

Hypothesis 2: "There is no statistically significant correlation between the use of cloud computing and the financial performance of the organization."

Hypothesis 3: "There is no statistically significant correlation between activating the role of risk-based internal audit and the financial performance of the organization considering cloud computing."

2.6 Steps of statistical analysis:

1-The researcher designed a survey form that is consistent with the purposes of the research and helps to test the hypotheses of the study. It included demographic data and three research dimensions representing the previously mentioned study dimensions. The questionnaire listed to organization access.

2- It has also been given weights of the responses according to the Likert scale ordinal quintile as follows:

Disagree at all	Disagree	Neutral	Agree	Strongly agree
1	2	3	4	5

The range has been distributed $(5-1=4)$ into five levels, every level= $4/5=0.8$, then the mean degree of agreement ranges as follow:

Disagree at all	Disagree	Neutral	Agree	Strongly agree
1-1.79	1.80-2.59	2.60-3.39	3.40-4.19	4.20-5

3- The data was entered for computer and used SPSS, and AMOS statistical programs.

4- The data was analyzed and obtained conclusions.

2.7 Methodology:

Data validity was tested for statistical analysis to determine the possibility of generalization the results obtained from the sample on the study population, and describe the variables in terms of central tendency and dispersion, and finally testing hypotheses, leading to the search findings as follows:

-Internal Consistency: by calculating the correlation coefficient of each of the phrase in the axis with the total score of the axis that belongs to.

-Reliability Test: through the scale (alpha) Cronbach's Alpha to the axis of the questionnaire, to find out the possibility of generalization of the results obtained from the sample to the population study.

-Frequency Tables: to describe the demographic characteristics of the sample.

-Descriptive Statistics: to describe the variables of the study, it used the arithmetic mean and relative mean as a measure of

central tendency; It has also been used the standard deviation and coefficient of variation as a measure of dispersion.

-Simple Regression: used to examine the correlation between two variables, one independent and the other is the dependent, and examine the impact of the independent variable on the dependent variable. The null hypothesis can be rejected, and the alternative hypothesis accepted, if the level of significance is less than 0.05, and the value of T is positive.

-Path Analysis: in order to build the research model, the Path Analysis is used in the case of the presence of mediator variable, that is considered as an independent and dependent at the same time, i.e. it is affected by independent variable, and affect the dependent variable at the same time, where the effect of independent variable on the dependent variable is divided into direct effects and indirect effects, where the intermediate variable explains these relationships.

2.8 Statistical Analysis and Testing Hypotheses:

The statistical analysis includes the demographic characteristics of the sample, measures of validity and reliability, descriptive statistics, and testing hypotheses:

2.8.1 The demographic characteristics of the sample:

Identify the characteristics of the sample in terms of qualification, job, and experience, to ensure that the sample includes the target categories, their academic qualifications, and experience in a way that ensures the proper distribution of the sample and its ability to complete the questionnaire list accurately and objectively. The following table illustrates these characteristics:

Table (1)
Demographic characteristics of the sample

Demographic Characteristics	Value	Frequency	%
Qualification	Bachelor's	158	86.8
	Master's	15	8.2
	Ph.D.	9	4.9
Job	Internal Auditor	108	59.3
	Member of an external audit office	49	26.9
	Financial Manager	25	13.7
Experience	Less than 5 years	49	26.9
	From 5 - less than 10 years	75	41.2
	From 10 - less than 15 years	43	23.6
	More than 15 years	15	8.2
Total		182	100

The table (1) shows that:

Distribution of the sample according to Qualification:

The largest percentage are those holding a bachelor’s degree, represent 86.8% of the total sample, followed by those holding a master’s degree represent 8.2%, then those holding a doctorate represent 4.9%, which confirms that the sample is adequately qualified to complete the questionnaire and answer its questions accurately and objectively.

Distribution of the sample according to Job:

The largest percentage were internal auditors, with a percentage of 59.3%, followed by member of an external audit office, with a percentage of 26.9%, and financial managers with a percentage of 13.7%, this indicates that the sample includes all the targeted categories appropriate to research topic.

Distribution of the sample according to experience:

Found that the largest percentage of the sample was in the category of years of experience "from 5 - less than 10 years" with percentage 41.2% of the total sample, followed by the category

"less than 5 years", with percentages 26.9% , followed by the category “from 10 - less than 15 years” with percentages 23.6% respectively, while the lowest category was the category "more than 15 years", with percentages 8.2% this indicates that the experience of the sample is sufficient to complete the questionnaire accurately and objectively.

2.8.2 Internal consistency and reliability:

Include measures of the validity and reliability of the content of the study variables, the validity of the questionnaire in terms of the validity of the scale (internal consistency), and the reliability scale, and the following are the results of those tests:

2.8.2.1 Internal consistency for “the role of cloud computing in activating the role of risk-based internal audit”:

The following table shows the correlation coefficient between the phrases of the availability of the elements of “the role of cloud computing in activating the role of risk-based internal audit” and the overall mean of the dimension that belongs to:

Table (2)

The correlation coefficient between the phrases of the role of cloud computing in activating the role of risk-based internal audit and the overall mean of the dimension that belongs to

No	Correlation Coefficient	Validity coefficient	No	Correlation Coefficient	Validity coefficient
1	.739**	0.850	7	.839**	0.912
2	.855**	0.922	8	.817**	0.899
3	.848**	0.918	9	.846**	0.917
4	.795**	0.886	10	.831**	0.908
5	.834**	0.909	11	.843**	0.915
6	.809**	0.894			

**** Correlation at 0.01 level, No “The number of the phrase in the questionnaire”, Validity coefficient = $2 \cdot R / (1 + R)$ where R correlation coefficient**

The table (2) shows that the correlation coefficients shown ranged between 0.739 and 0.855, and that they are all

positive and significant at the level of significance $\alpha = 0.01$, which was reflected in the validity coefficients, as they ranged between 0.850 and 0.922, and thus the dimension is considered true to what was set to measure it.

2.8.2.2 Internal consistency for "impact of cloud computing on the financial performance of the organization":

The following table shows the correlation coefficient between the phrases of impact of cloud computing on the financial performance of the organization and the overall mean of the axis that belongs to:

Table (3)

The correlation coefficient between the phrases of the availability of the impact of cloud computing on the financial performance of the organization and the overall mean of the dimension that belongs to

No	Correlation Coefficient	Validity coefficient	No	Correlation Coefficient	Validity coefficient
12	.811**	0.896	17	.835**	0.910
13	.810**	0.895	18	.860**	0.925
14	.828**	0.906	19	.838**	0.912
15	.824**	0.904	20	.846**	0.917
16	.817**	0.899	21	.858**	0.924

The table (3) shows that the correlation coefficients shown ranged between 0.810 and 0.860, and that they are all positive and significant at the level of significance $\alpha = 0.01$, which was reflected in the validity coefficients, as they ranged between 0.895 and 0.925, and thus the dimension is considered true to what was set to measure it.

2.8.2.3 Internal consistency for "The feedback on the organization's financial performance because of activating the role of risk-based internal audit considering cloud computing":

The following table shows the correlation coefficient between the phrases of the feedback on the organization's financial performance because of activating the role of risk-based

internal audit considering cloud computing and the overall mean of the dimension that belongs to:

Table (4)

The correlation coefficient between the phrases of the feedback on the organization’s financial performance because of activating the role of risk-based internal audit considering cloud computing and the overall mean of the dimension that belongs to

No	Correlation Coefficient	Validity coefficient	No	Correlation Coefficient	Validity coefficient
22	.892**	0.943	26	.859**	0.924
23	.885**	0.939	27	.892**	0.943
24	.798**	0.888	28	.885**	0.939
25	.821**	0.902			

The table (4) shows that the correlation coefficients shown ranged between 0.798 and 0.892, and that they are all positive and significant at the level of significance $\alpha = 0.01$, which was reflected in the validity coefficients, as they ranged between 0.888 and 0.943, and thus the dimension is considered true to what was set to measure it.

2.8.3 Reliability analysis:

Reliability measure illustrates the possibility of generalization the results obtained from the sample on the population, through the scale Cronbach’s Alpha, The value of Alfa ranges between zero and one, If there is no stability in the data, the value of this parameter equal to zero, and on the contrary, if there is complete stability in the data, the value of this parameter equal to the one, and if this measure has equaled or increased from 0.60, then it is possible to rely on the results of the study and generalize on the population.

Table (5)
Reliability scales for the study axis

Dimension	No of phrases	Alfa Reliability Coefficient	Honesty Coefficient ⁽¹⁾
Dimension 1	11	0.953	0.976
Dimension 2	10	0.951	0.975
Dimension 3	7	0.942	0.971

(1) Honesty coefficient is the square root of reliability coefficient. It is clear from the table that the (stability coefficient) alpha values amounted to 0.953, 0.951, and 0.942 on the dimensions of the questionnaire respectively, which was reflected in the honesty coefficients as they amounted to 0.976, 0.975, and 0.971 on those dimensions, which indicates that the responses have a high level of reliability.

2.8.4 Descriptive statistics:

Apply descriptive study to describe the variables of the questionnaire in terms of central tendency and dispersion, applying this to the dimensions of the study, the results are as follow:

2.8.4.1 Descriptive Analysis the role of cloud computing in activating the role of risk-based internal audit:

Apply descriptive analysis for the role of cloud computing in activating the role of risk-based internal audit, and the results as follow:

Table (6)
Descriptive statistics for the role of cloud computing in activating the role of risk-based internal audit

No	Variables	Mean	Relative mean ⁽¹⁾	Std. Deviation	C.V ⁽²⁾	Order
1	The role of internal auditors is crucial in developing additional understanding of cloud computing technology to add value and advising their companies on related risks and controls.	3.79	75.8	0.74	19.4	5
2	When facing the challenges of cloud computing, internal auditors may need to expand beyond traditional audit roles.	3.82	76.4	0.80	20.8	3
3	When an organization adopts cloud computing initiatives, stakeholders should be involved in discussions about the implications of cloud computing risks.	3.79	75.8	0.85	22.4	6
4	When an organization adopts cloud computing initiatives, the current organizational risk framework should be reviewed based on the cloud risks identified.	3.84	76.8	0.82	21.3	1
5	When an organization adopts cloud computing initiatives, risk mitigation strategies must be developed to help reduce the risks that accompany cloud computing.	3.78	75.6	0.84	22.2	7
6	When an organization adopts cloud computing initiatives, the organization's data governance program must be reviewed and better understood, as this is an essential element in processing data in the cloud.	3.81	76.2	0.83	21.9	4
7	When an organization adopts cloud computing initiatives, potential cloud vendors should be evaluated from a risk perspective.	3.71	74.2	0.84	22.6	10
8	Internal audit can be part of the risk equation, helping the organization develop a risk-based approach to using cloud computing.	3.69	73.8	0.79	21.4	11
9	The internal auditor plays a key role in helping to manage and evaluate risks as cloud services develop.	3.73	74.6	0.87	23.3	9
10	Understanding the different cloud models through the risk-based approach will help in managing risks by understanding the different threats to the cloud models used to deal with the risk-based approach.	3.73	74.6	0.84	22.5	8

No	Variables	Mean	Relative mean ⁽¹⁾	Std. Deviation	C.V ⁽²⁾	Order
11	The internal auditor must conduct an audit in the cloud computing environment with the relationship between the risks taken from each stage in the cloud.	3.83	76.6	0.81	21.0	2
	Overall mean	3.77	75.5	0.68	17.9	

(1) Relative mean = mean / 5 *100

(2) C.V. (Coefficient of variation) = Standard deviation / mean * 100.

(3) Agreement rate = 100 - C.V.

It is clear from the table that the degree of agreement concerning "the role of cloud computing in activating the role of risk-based internal audit" at the general level is "Agree", with a mean of responses 3.77, with a relative mean of 75.5%, and the standard deviation was 0.68, with a coefficient of difference of 17.9%, and an agreement rate of 82.1% among the sample, which indicates homogeneity. The degree of agreement of all phrases was "Agree" where the mean of responses ranges from 3.84, 3.96. The highest roles were phrases (4 "When an organization adopts cloud computing initiatives, the current organizational risk framework should be reviewed based on the cloud risks identified", 11 "The internal auditor must conduct an audit in the cloud computing environment with the relationship between the risks taken from each stage in the cloud", 2 "When facing the challenges of cloud computing, internal auditors may need to expand beyond traditional audit roles") which the mean of responses was 3.84, 3.83, 3.82 respectively. The lowest roles were phrases (9 "The internal auditor plays a key role in helping to manage and evaluate risks as cloud services develop", 7 "When an organization adopts cloud computing initiatives, potential cloud vendors should be evaluated from a risk perspective", 8 "Internal audit can be part of the risk equation, helping the organization develop a risk-based approach to using cloud computing") which the mean of responses was 3.71, 3.71, 3.69 respectively.

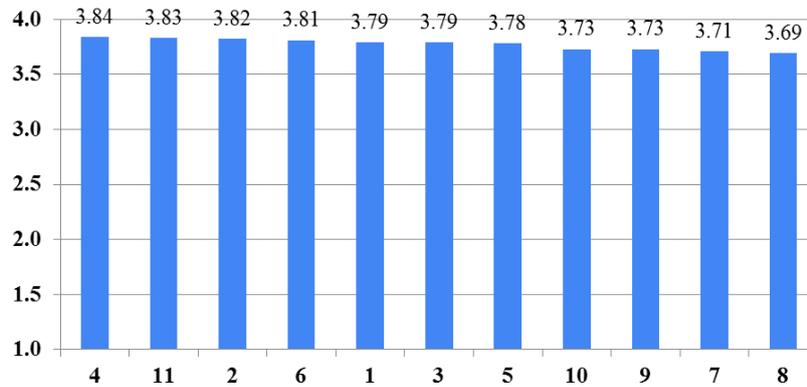


Figure (2): The mean responses of the sample concern the role of cloud computing in activating the role of risk-based internal audit.

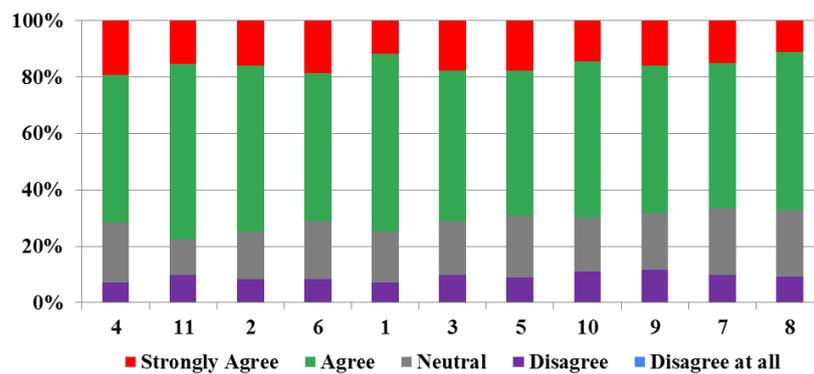


Figure (3): The relative frequencies of responses of the sample concerning the role of cloud computing in activating the role of risk-based internal audit.

2.8.4.2 Descriptive Analysis for “The impact of cloud computing on the financial performance of the organization”:

Apply descriptive analysis for the dependent variable (the role of cloud computing on the financial performance of the organization), and the results as follow:

Table (7)
Descriptive statistics for the impact of cloud computing on the financial performance of the organization

No	Variables	Mean	Relative mean ⁽¹⁾	Std. Deviation	C.V ⁽²⁾	Order
12	Applying cloud computing technology improves the financial performance of companies.	3.92	78.4	0.80	20.3	1
13	The application of cloud computing technology leads to years of declining financial performance followed by improvement.	3.86	77.2	0.73	19.0	3
14	Cloud computing has a significant and positive impact on the profitability and market value of listed companies to varying degrees in short and long time periods.	3.88	77.6	0.76	19.5	2
15	The degree of impact of cloud computing on the profitability and market value of listed companies varies depending on the size of the company and the type of industry.	3.79	75.8	0.81	21.4	5
16	Cloud computing has a significant and positive impact on the profitability and market value of listed companies that have adopted the cloud service.	3.71	74.2	0.84	22.6	9
17	Companies are moving to cloud computing to save money and improve performance.	3.75	75.0	0.84	22.4	6
18	The successful implementation of cloud computing provides companies with access to the latest information source technology, thus enabling companies to use vital resources effectively and focus on core business operations.	3.64	72.8	0.79	21.6	10
19	The stock market reacts positively to announcements of cloud computing initiatives because these announcements indicate to investors that companies can obtain better future cash flows.	3.73	74.6	0.84	22.5	8
20	Companies implementing cloud computing can generate market-based intangible assets, such as customer satisfaction, which in turn can reduce uncertainty about future corporate profits.	3.73	74.6	0.79	21.1	7
21	Companies applying cloud computing can generate market-based intangible assets, such as positive evaluations by investors of companies' standing and future growth potential, thus enabling companies to reach a higher market value.	3.85	77.0	0.80	20.7	4
	Overall mean	3.79	75.7	0.67	17.6	

It is clear from the table (7) that the degree of agreement concerning "The impact of cloud computing on the financial performance of the organization" at the general level is "**Agree**", with a mean of responses 3.79, with a relative mean of 75.7%, and the standard deviation was 0.67, with a coefficient of difference of 17.6%, and an agreement rate of 82.4% among the sample, which indicates homogeneity. The degree of agreement of all phrases was "**Agree**" where the mean of responses ranges from 3.84, 3.96. The highest impacts were phrases (12 "Applying cloud computing technology improves the financial performance of companies", 14, "Cloud computing has a significant and positive impact on the profitability and market value of listed companies to varying degrees in short and long time periods", 13 "The application of cloud computing technology leads to years of declining financial performance followed by improvement") where the mean of responses was 3.92, 3.88, 3.86 respectively. The lowest impacts were phrases (19 "The stock market reacts positively to announcements of cloud computing initiatives because these announcements indicate to investors that companies can obtain better future cash flows", 16 "Cloud computing has a significant and positive impact on the profitability and market value of listed companies that have adopted the cloud service", 18 "The successful implementation of cloud computing provides companies with access to the latest information source technology, thus enabling companies to use vital resources effectively and focus on core business operations") where the mean of responses was 3.73, 3.71, 3.64 respectively.

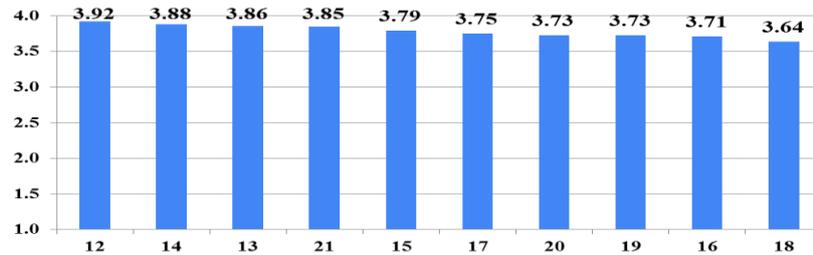


Figure (4): The mean responses of the sample concerning the impact of cloud computing on the financial performance of the organization.

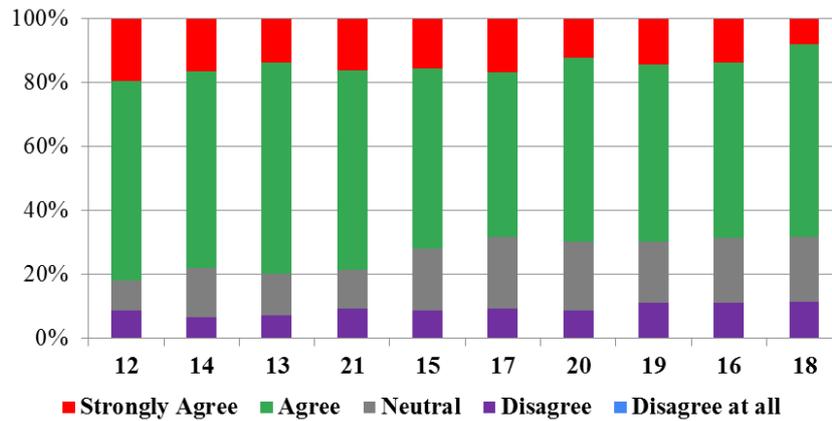


Figure (5): The relative frequencies responses of the sample concerning the impact of cloud computing on the financial performance of the organization.

2.8.4.3 Descriptive Analysis for “The feedback on the organization’s financial performance because of activating the role of risk-based internal audit considering cloud computing”:

The results as follow:

Table (8)
 Descriptive statistics for the feedback on the organization’s financial performance because of activating the role of risk-based internal audit considering cloud computing

No	Variables	Mean	Relative mean ⁽¹⁾	Std. Deviation	C. V ⁽²⁾	Order
22	The effectiveness of cloud computing application effects on risk-based internal audit activities, which affects the efficiency and effectiveness of operations, and this leads to improving the financial performance of the organization.	3.79	75.8	0.72	19.1	4
23	The quality of risk-based internal audit activities under cloud computing results in reliable financial reporting.	3.84	76.8	0.73	19.1	2
24	The risk-based internal audit function in the cloud computing environment plays an important role in helping finance departments carry out their responsibilities related to financial performance.	3.77	75.4	0.67	17.9	6
25	Focusing the risk-based internal audit function under the use of cloud computing on verifying compliance with governing rules and policies leads to improving the financial performance of the organization.	3.73	74.6	0.79	21.1	7
26	The quality of risk-based internal audit considering cloud computing contributes to creating value for the company and improving profitability, which leads to improving the company’s financial performance.	3.85	77.0	0.80	20.7	1
27	Understanding the different cloud models through a risk-based approach will help improve the financial performance of the organization.	3.79	75.8	0.72	19.1	5
28	Risk-based internal audit plays a key role in helping to manage and evaluate risks with the development of cloud services, which contributes to improving the financial performance of the organization.	3.84	76.8	0.73	19.1	3
	Overall mean	3.80	76.0	0.64	16.8	

It is clear from the table that the degree of agreement concerning "The feedback on the organization’s financial performance because of activating the role of risk-based internal audit

considering cloud computing" at the general level is "**Agree**", with a mean of responses 3.80, with a relative mean of 76.0%, and the standard deviation was 0.64, with a coefficient of difference of 16.8%, and an agreement rate of 83.2% among the sample, which indicates homogeneity. The degree of agreement of all phrases was "**Agree**" where the mean of responses ranges from 3.84, 3.96. The highest feedback were the phrases (26 "The quality of risk-based internal audit considering cloud computing contributes to creating value for the company and improving profitability, which leads to improving the company's financial performance", 23 "The quality of risk-based internal audit activities under cloud computing results in reliable financial reporting", 28 "Risk-based internal audit plays a key role in helping to manage and evaluate risks with the development of cloud services, which contributes to improving the financial performance of the organization") where the mean of responses were 3.85, 3.84, 3.84 respectively. The lowest feedback were the phrases (24 "The risk-based internal audit function in the cloud computing environment plays an important role in helping finance departments carry out their responsibilities related to financial performance", 25 "Focusing the risk-based internal audit function under the use of cloud computing on verifying compliance with governing rules and policies leads to improving the financial performance of the organization") where the mean of responses were 3.77, 3.73 respectively.

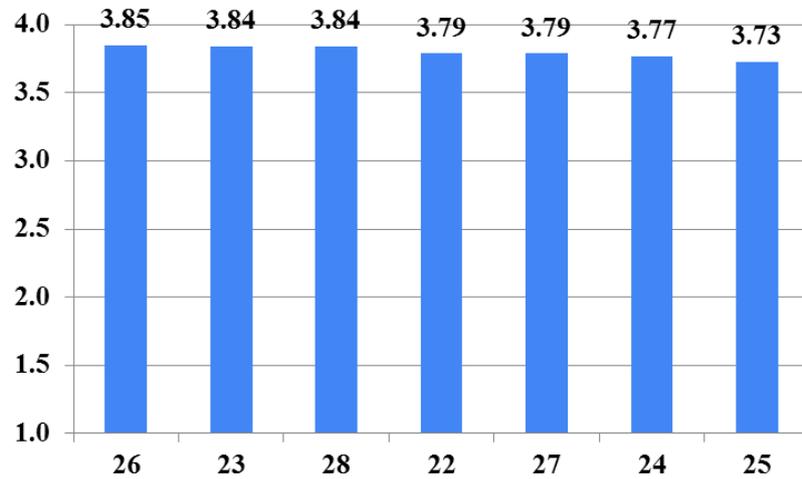


Figure (6): The sample responses of the concerning the feedback on the organization’s financial performance because of activating the role of risk-based internal audit considering cloud computing.

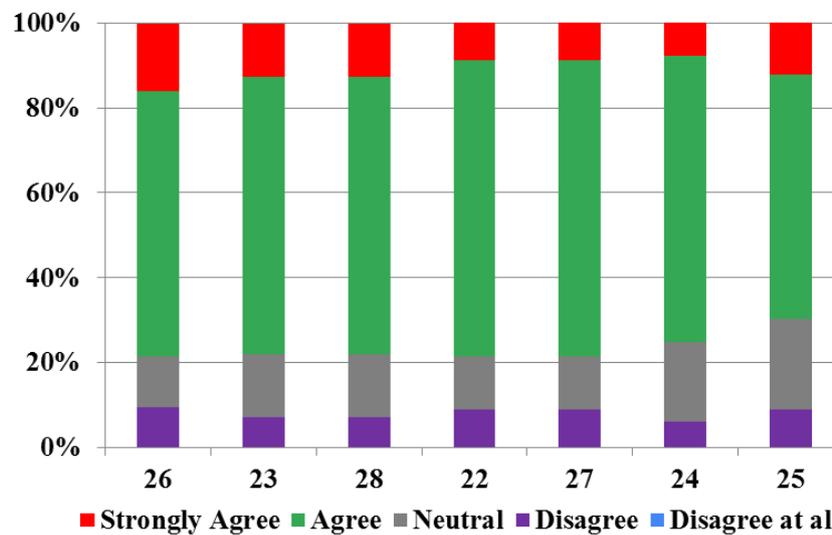


Figure (7): The relative frequencies of responses of the sample concerning the feedback on the organization’s financial

performance because of activating the role of risk-based internal audit considering cloud computing.

2.8.5 Testing hypotheses:

Testing hypothesis 1: “There is no statistically significant correlation between the use of cloud computing and activating the role of risk-based internal audit.”. To test this hypothesis, correlation and simple regression analyses were performed, and the results were as follows:

Table (9)

Simple regression analysis to examine the correlation between the use of cloud computing and activating the role of risk-based internal audit

Independent Variable: X “Cloud computing” Dependent Variable: M “The role of risk-based internal audit”						
R	R ²	F	P-Value	Coefficients	T test	P-Value
0.848	0.718	458.9	0.000	α (Constant)=0.785	5.495	0.000
				β =-0.799	21.423	0.000

From the table (9) it can be concluded that:

There is a significant positive correlation between “the use of cloud computing” and “activating the role of risk-based internal audit” where the value of the correlation coefficient ($r = 0.848$, $P\text{-value} < 0.01$), which means that "Cloud computing" positively affect "The role of risk-based internal audit". After estimating the parameters of the regression model, the regression equation can be formulated as follows:

$$M = 0.785 + 0.799 * X + \epsilon$$

Where: M: The role of risk-based internal audit, and X: Cloud computing; ϵ : Random error.

Testing the significant of the model (F test):

The model is significant since ($F = 458.9$, $P\text{-value} < 0.01$) which means that there is a significant positive effect of "Cloud computing" on "The role of risk-based internal audit".

Testing the significant of the independent variable (T test):
 It is clear from the T test for independent variable that ($T=21.423$, $P\text{-Value}<0.01$), which confirms that the independent variable is significant at 0.01 level.

The explanatory power of the model (R square):

The value of ($R^2 = 0.718$) which means that (71.8%) from the changes at "The role of risk-based internal audit" explained by "Cloud computing", which indicates that it is a high explanatory power.

From the previous results, it is concluded that hypothesis 1, which was formulated in the form of the null hypothesis, was rejected while the alternative hypothesis is accepted.

Testing hypothesis 2: "There is no statistically significant correlation between the use of cloud computing and the financial performance of the organization.". To test this hypothesis, correlation and simple regression analysis were performed, and the results were as follows:

Table (10)

Simple regression analysis to examine the correlation between the use of cloud computing and the financial performance of the organization

Independent Variable: X "cloud computing"						
Dependent Variable: Y "Financial performance of the organization"						
R	R ²	F	P-Value	Coefficients	T test	P-Value
0.881	0.775	621.6	0.000	α (Constant)=0.515	3.861	0.000
				β =-0.867	24.931	0.000

From the table (10) it can be concluded that:

There is a significant positive correlation between "cloud computing" and "the financial performance of the organization" where the value of the correlation coefficient ($r = 0.881$, $P\text{-value} < 0.01$), which means that "Cloud computing" positively affect "the financial performance of the organization".

After estimating the parameters of the regression model, the regression equation can be formulated as follows:

$$Y = 0.515 + 0.867 * X + \varepsilon$$

Where: Y: The financial performance of the organization, X: Cloud computing, ε : Random error.

Testing the significant of the model (F test):

The model is significant since ($F = 621.6$, $P\text{-value} < 0.01$) which means that there is a significant positive effect of "Cloud computing" on "The financial performance of the organization".

Testing the significant of the independent variable (T test):

It is clear from the T test for independent variable that ($T = 24.9$, $P\text{-Value} < 0.01$), which confirms that the independent variable is significant at 0.01 level.

The explanatory power of the model (R square):

The value of ($R^2 = 0.775$) which means that (77.5%) from the changes at "The financial performance of the organization" explained by "Cloud computing", which indicates that it is a high explanatory power.

From the previous results, it is concluded that hypothesis 2, which was formulated in the form of the null hypothesis, was rejected while the alternative hypothesis is accepted.

Testing hypothesis 3: "There is no statistically significant correlation between activating the role of risk-based internal audit and the financial performance of the organization considering cloud computing." . To test this hypothesis, path analysis was performed which is the appropriate method for studying the correlations between variables in the case of intermediate variables. The following are the results of that analysis:

Path Analysis

Path Analysis was used, where there is an intermediate variable M "activating the role of risk-based internal audit" which is affected by the independent variable" X "Cloud computing", and at the same time affects the dependent variable Y "Financial performance of the organization". This path can be described or represented in the following figure:

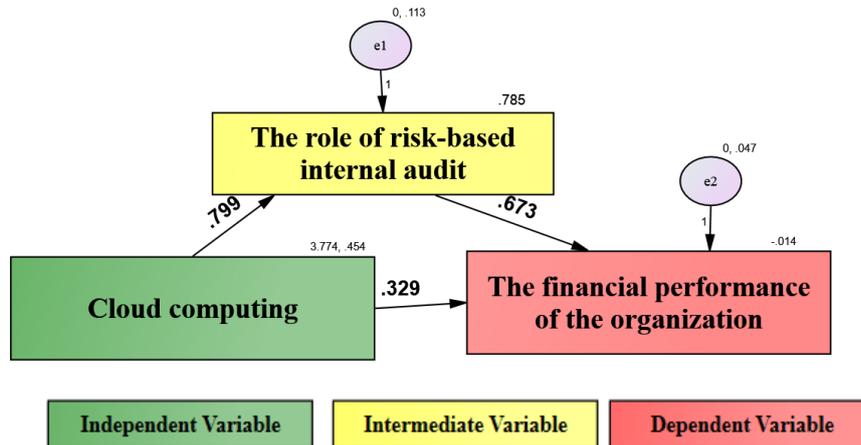


Figure (8): Effects for cloud computing on the role of risk-based internal audit and its reflection on the organization's financial performance.

From the path analysis figure, it is noted that:

- Cloud computing has a direct effect on the role of risk-based internal audit.
- The role of risk-based internal audit has a direct effect on the financial performance of the organization.
- Cloud computing has a direct effect on the financial performance of the organization, and an indirect effect through its effect on the role of risk-based internal audit, which in turn affects financial performance of the organization.

The following table shows the direct and indirect effects: the effects of cloud computing on the role of risk-based internal audit and its reflection on the organization's financial performance:

Table (11)

Direct and indirect effects: the effects of cloud computing on the role of risk-based internal audit and its reflection on the organization’s financial performance

Independent Variables \ Dependent Variables	M “The role of risk-based internal audit”			Y “The financial performance of the organization”		
	Direct Effect	Indirect Effect	Total Effect	Direct Effect	Indirect Effect	Total Effect
X “Cloud Computing”	0.799	0	0.799	0.329	0.538	0.867
M “The role of risk-based internal audit”				0.673	0	0.673

After testing the direct and indirect effect, it was found that:

- The direct positive effect of cloud computing on the role of risk-based internal audit was 0.799.
- The direct positive effect of the role of risk-based internal audit on the financial performance of the organization was 0.673.
- The direct positive effect of cloud computing on the financial performance of the organization was 0.329, indirect effect was 0.538, and the total effect was 0.867.

- The indirect effect of cloud computing on the financial performance of the organization computed through the path:
 Cloud computing ---> **Role of risk-based internal audit** = 0.799
Role of risk-based internal audit ---> financial performance =0.673

The indirect effect of cloud computing on financial performance is $0.799 \times 0.673 = 0.538$

From the previous results, it is concluded that hypothesis 3, which was formulated in the form of the null hypothesis, was rejected while the alternative hypothesis is accepted.

By estimating the coefficients of the model, the results were as follows:

Table (12)

Parameter estimation of the effect of cloud computing on the role of risk-based internal audit and its reflection on the organization’s financial performance

Variables	Estimate	S.E.	C.R.	P	R square
Intercept	.785	.143	5.510	***	0.718
M <--- X	.799	.037	21.482	***	
Intercept	-.014	.099	-.141	.888	0.892
Y <--- X	.329	.045	7.282	***	
Y <--- M	.673	.048	14.028	***	

Significant level < 0.01

After estimating the coefficients, the equations can be formulated as follows:

$$M = 0.785 + 0.799 * X + \varepsilon$$

$$R \text{ square} = 0.718$$

$$Y = -0.014 + 0.329 * X + 0.673 * M + \varepsilon$$

$$R \text{ square} = 0.892$$

Where X is "Cloud computing", M is "Role of risk-based internal audit", and Y is "Financial performance of the organization". From the previous results, there is a positive impact on the financial performance of the organization because of activating the role of risk-based internal audit considering cloud computing.

Section 3: Conclusions, Findings, and Recommendations

3.1 Conclusions:

The study concluded that:

H1: “There is no statistically significant correlation between the use of cloud computing and activating the role of risk-based internal audit” was rejected, and accept the alternative hypothesis since that: There is a significant positive correlation between “The use of cloud computing” and “activating the role of risk-based internal audit” where the value of the correlation coefficient

($r = 0.848$, $P\text{-value} < 0.01$), which means that "Cloud computing" positively affect "The role of risk-based internal audit".

H2: "There is no statistically significant correlation between the use of cloud computing and the financial performance of the organization" was rejected, and accept the alternative hypothesis since that: There is a significant positive correlation between "cloud computing" and "financial performance of the organization" where the value of the correlation coefficient ($r = 0.881$, $P\text{-value} < 0.01$), which means that "Cloud computing" positively affect" financial performance of the organization".

H3: "There is no statistically significant correlation between activating the role of risk-based internal audit and the financial performance of the organization considering cloud computing." was rejected.

3.2 Findings:

1-There is a role of cloud computing in activating the role of risk-based internal audit especially through:

A-The current organizational risk framework should be reviewed based on the cloud risks.

B-The internal auditor must conduct an audit in the cloud computing environment with the relationship between the risks taken from each stage in the cloud.

C-When facing the challenges of cloud computing, internal auditors may need to expand beyond traditional audit roles.

2-There is an impact of cloud computing on the financial performance of the organization especially through:

A- Applying cloud computing technology improves the financial performance of companies.

B- Cloud computing has a significant and positive impact on the profitability and market value of listed companies to varying degrees in short and long time periods.

C- The application of cloud computing technology leads to years of declining financial performance followed by improvement.

3-There is a positive impact on the financial performance of the organization because of activating the role of risk-based internal audit considering cloud computing, through:

A- The quality of risk-based internal audit considering cloud computing contributes to creating value for the company and improving profitability, which leads to improving the company's financial performance.

B- The quality of risk-based internal audit activities under cloud computing results in reliable financial reporting.

C- Risk-based internal audit plays a key role in helping to manage and evaluate risks with the development of cloud services, which contributes to improving the financial performance of the organization.

3.3 Recommendations:

According to the above, the following recommendations can be made:

1-The importance of designing and implementing programs to develop the accountants and internal and external auditors' professional awareness of the risks of using cloud computing, its role in activating risk-based internal audit, and its impact on the financial performance of the organization.

2-The importance of designing and developing a risk-based internal audit system to benefit from cloud computing and avoid the risks associated with it.

3-The need for stakeholders to participate in discussions about the implications of cloud computing risks.

4-An organization's data governance program should be reviewed and better understood, as this is a key component of data processing in the cloud.

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