

The Impact of Adopting Cloud Computing Technology on Reducing the Problem of Accounting Information Asymmetry and Its Reflection on Firm Value: An Empirical Study on a Sample of Companies Listed on the Iraq Stock Exchange

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Abstract

The project sought to examine how adoption of the cloud computing technology has contributed to alleviating the issue of information asymmetry on accounting and its ultimate implications on the value of the firm against a background of the increasing pace of digital transformation experienced in the business environment, and the implications it has on the quality and transparency of accounting information. The research is important because cloud computing is used to support the effectiveness of the accounting information system, speed up the data processing, and the accessibility of financial information at the appropriate time to the various stakeholders.

The study followed a descriptive-analytical design where the accounting and financial data were analyzed and questionnaires were administered to the sampled sample comprising of accountants and financial managers in the sampled companies to determine the degree of cloud computing adoption and its impact on lessening the accounting information asymmetry. The study hypotheses, as well as, were tested and the relationship between the variables of the study analyzed through appropriate statistical methods.

The findings demonstrated the positive effect of the adoption of cloud computing technology as statistically significant to lessen the information asymmetry of accounting by enhancing the quality of information and the degree of transparency and dependability in the financial reporting. This in turn was directly translated into the improvement of firm value whether through the improvement of market value or financial performance. The results also showed that companies with cloud computing have a higher capacity to furnish precise and prompt financial reports than those that do not embrace the technology.

The study recommends encouraging companies to adopt cloud computing technology within their accounting systems, develop technological infrastructure, and train accounting personnel to use it efficiently, given its effective role in reducing the information gap, enhancing investor confidence, and increasing firm value.

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1. Introduction

In recent decades, the business environment has witnessed fundamental transformations as a result of the rapid development of information and communication technologies, which has directly influenced accounting information systems and the mechanisms for preparing and presenting financial reports. The quality and transparency of accounting information have become central issues affecting the efficiency of financial markets and investment decision-making, particularly in light of the problem of accounting information asymmetry between company management and external parties, which represents one of the most significant challenges facing investors and financial markets.

Accounting information asymmetry is a case where the management holds greater or more accurate information than the one held by investors and other stakeholders. This is an imbalance that can cause irrational decisions in investment, increase the risk, and a decrease in the trust in financial reports, thus negatively impacting firm value. In this respect, there is a necessity to implement the latest technologies that can increase the productivity of the accounting information systems and decrease the information gap.

One of the most evident modern technologies that have led to a qualitative change in handling and processing accounting information is the cloud computing technology which has facilitated real time access to information, data integration, reduced operating costs, and the accuracy and speed of financial reporting. The use of cloud computing facilitates accounting disclosure and enhances transparency which could help reduce the issue of accounting information asymmetry.

Within the framework of the new financial markets, such as the Iraq Stock Exchange this problem gains additional significance as there are numerous issues connected with the development of the technological infrastructure and the enhancement of the investor confidence. Enhancement of market efficiency and improving market value of listed companies are achieved through improvement of quality of accounting information and lessening information asymmetry.

This paper, therefore, endeavors to examine how using cloud computing technology can help in mitigating the issue of accounting information asymmetry and its expression on firm value by an empirical study involving a sample of companies listed on the Iraq Stock Exchange with the view of offering a scientific and practical framework that will support managerial and investment decisions and improve the financial market transparency.

2. Chapter One: Research Methodology

2.1. First: Research Problem

Majority of financial markets have shortcomings regarding accounting information asymmetry where the management or internal parties hold information about the present and future economic performance of the companies than the information held by outside parties (e.g. investors, creditors, analysts) and other stakeholders in financial markets. This case is caused by the delay in financial disclosure, incomplete information, or differences in the quality of information, which causes inefficient investment decisions, higher risk, and lack of confidence in financial reports, which is adversely impacted on firm value in the financial market.

This has been a topic of concern to the financial markets which have tried to find relevant solutions to such problems. Cloud computing technology has become one of the new technologies that can be used to improve the effectiveness

of accounting information system through increased speed in data processing, ensuring that financial information is accessed in time, and data is integrated and more accurate. Although this technology is increasingly gaining significance, the level at which business entities listed on the Iraq Stock Exchange have embraced cloud computing and its effects in minimizing the issue of accounting information asymmetry is not clear enough.

Accordingly, the research problem centers on the following main question:

(How far does the accounting information asymmetry problem decrease because of the adoption of cloud computing technology, and how does it reflect on the firm value of Iraq Stock Exchange-listed firms?)

By solving this issue, the study aims at trying to bridge a knowledge and practical gap regarding the role of cloud computing in enhancing accounting information and value of firms in the Iraqi financial market environment.

2.2. Second: Significance of the Study

The importance of the research is based on the scientific, practical aspects of the ongoing rapid digitalization of the business environment and increasing the role of modern information technologies in creating accounting information systems and improving the efficiency of the financial market. The significance of the study may be described in the following way:

i. Scientific Significance

- The study is relevant in enhancing the accounting literature since it will help analyze how cloud computing technology can mitigate the issue of accounting information asymmetry which is a fairly recent topic in the accounting literature.
- It offers a theoretical model, that connects the acceptance of cloud computing, or accounting information quality, and firm value, thus explaining the correlations between the variables involved in the interactions of these variables in the emerging financial market.
- It addresses a research gap in terms of the lack of empirical experiments to determine the effects of cloud computing on accounting information asymmetry among firms listed in the Iraq Stock Exchange.
- It provides opportunities of future research which might develop on its findings in areas of accounting, accounting information systems and financial governance.

ii. Practical Significance

- Outcomes of the research can help the companies that operate in the Iraq Stock Exchange to determine the possibility of embracing cloud computing technology in their accounting processes.
- It directs financial and accounting management on how to enhance the quality and transparency of the accounting information thus narrowing the information difference between the management and investors.
- It gives useful signals to decision-makers and investors of the effect of accounting transparency on the value of firms, thereby increasing the efficiency of investment decisions.
- It assists regulatory and oversight bodies within the Iraqi financial market in developing policies and regulations that will promote the use of modern technologies and enhance the accounting disclosure.
- It helps to make investors more confident in the Iraqi financial market because of the quality of financial reporting and enhances the degree of disclosure and transparency.

2.3. Third: Research Objectives

In light of the research problem and its significance, the primary objective of this study is to determine the level of adoption of cloud computing technology in reducing the problem of accounting information asymmetry and its reflection on firm value, through an empirical study on a sample of companies listed on the Iraq Stock Exchange. From this main objective, the following sub-objectives are derived:

- i. To analyze the effect of adopting cloud computing technology on reducing the problem of accounting information asymmetry in the companies under study.
- ii. To measure the reflection of reducing accounting information asymmetry on firm value in the Iraq Stock Exchange.
- iii. To examine the relationship between the adoption of cloud computing and the quality and transparency of accounting information.
- iv. To address the challenges faced by the sample companies in implementing the requirements of cloud computing technology, as well as in providing symmetrical information that enhances firm value, based on both the theoretical and empirical aspects of the study.
- v. To reach a set of conclusions after measuring and analyzing the study variables in the fieldwork, in addition to presenting a number of recommendations that support companies and add value within the business environment through the application of cloud computing technology.

2.4. Fourth: Research Model and Hypotheses

i. Research Model

The research model addresses its variables represented by cloud computing technology, accounting information asymmetry, and firm value. Cloud computing technology constitutes the independent variable, accounting information asymmetry represents the mediating variable, and firm value serves as the dependent (responsive) variable.

To clarify the relationships among these variables, the following conceptual model is proposed:

Cloud Computing Technology → Accounting Information Asymmetry → Firm Value

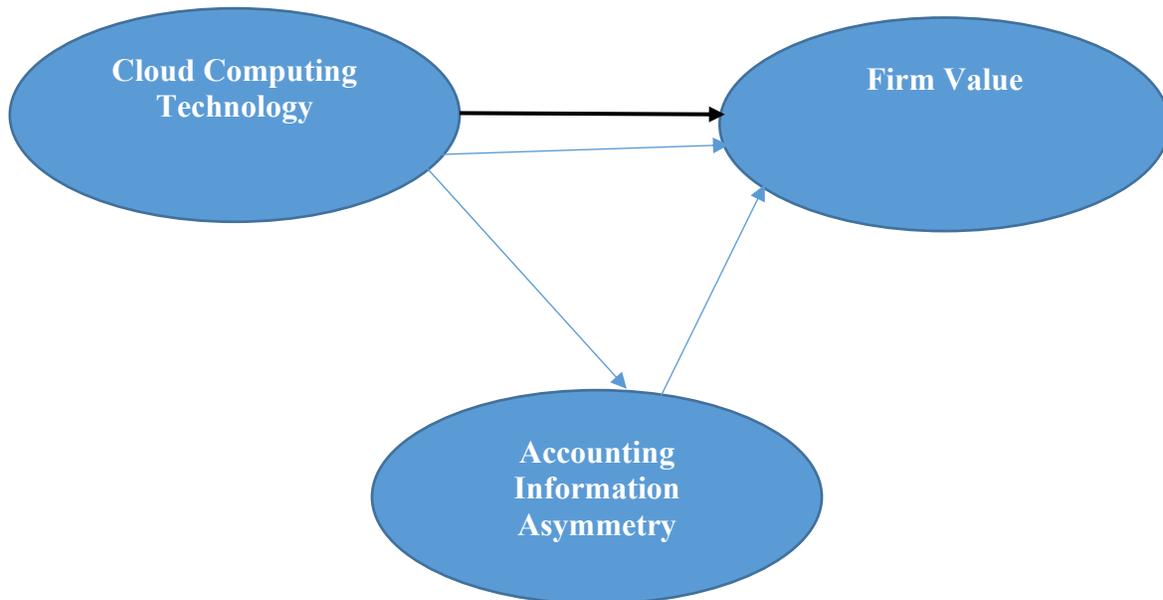


Figure (1): Proposed Research Model

Source: Figure prepared by the researcher.

ii. Research Hypotheses

In light of the research model, the following hypotheses are proposed:

H1: There is a statistically significant effect of cloud computing technology on reducing accounting information asymmetry in the sampled companies.

H2: There is a statistically significant effect of cloud computing technology on firm value in the sampled companies.

H3: There is a statistically significant effect of reducing accounting information asymmetry on firm value in the sampled companies.

H4: The adoption of cloud computing technology has an effect on reducing accounting information asymmetry and its reflection on firm value.

2.5. Fifth: Research Methodology and Data Collection Methods

2.5.1. Research Method: The study relies on two fundamental scientific research methods: the inductive method and the quantitative-analytical method, as they are more compatible with the nature of the current research than other methods.

2.5.2. Data and Information Collection Methods: The methods for collecting the necessary data and information for this study are based on two approaches:

(a) Theoretical Aspect: The researcher covers the theoretical aspect by relying on available books, journals, theses, dissertations, and conferences both Arab and international related to the research topic, in addition to using the international information network (Internet).

(b) Field Aspect: For the field aspect, the researcher relied on financial statements, board of directors' reports, auditors' reports, as well as the data and information disclosed and published on the website of the Securities Commission by the sampled companies listed on the Iraq Stock Exchange. These were analyzed using measurement indicators obtained based on the studies of Al-Jalabi (2023: 14) and Arakid et al. (2025: 207).

2.6. Sixth: Research Scope

2.6.1. Spatial Scope: The geographical area of the study consists of the sample of joint-stock companies listed on the Iraq Stock Exchange in different spheres.

2.6.2. Temporal Scope: The time frame of the study includes the financial statements and reports of the sampled corporations of the years 2020 to 2024. This was chosen so as to maintain continuity of data and information and to have representation of the activity in the financial market in the sector.

2.7. Seventh: Research Population and Sample

The sample of the population under research is a sample of companies listed in the Iraq Stock Exchange, which is illustrated in the table presented below:

Table (1): Research Population and Sample

S	Company Name	S	Company Name
1	Bank of Baghdad	8	Kurdistan International Islamic Bank
2	Iraqi Commercial Bank	9	Gulf Insurance Company
3	United Investment Bank	10	Dar Al-Salam Insurance Company
4	Sumer Commercial Bank	11	Baghdad Iraq Public Transport Company
5	Mosul Bank for Development and Investment	12	Al-Mamoura Real Estate Investments Company
6	Al-Mansour Bank for Investment	13	Al-Khiyata Al-Haditha Company
7	Ashur International Bank for Investment	14	Iraqi Company for Carpets and Upholstery

Source: Table prepared by the researcher.

3. Chapter Two: Theoretical Framework of the Study

3.1. Section One: Cloud Computing

3.1.1. Concept of Cloud Computing

Cloud computing is an IT model that offers computing services including servers, storage, databases, networks and software as cloud services offered by the cloud service providers through the Internet. This technology is based on the fact that it makes use of distributed virtual infrastructure through which users can access computing resources on demand without having to own or directly manage hardware and servers (Shihab & Sulaiman, 2025: 182).

VO Van et al. (2024: 61) specified cloud computing as a technology that involves the Internet to allow users to obtain computing resources, including storage, processing capability, and applications through the Internet, which offers a scalable computing environment and pay-as-you-go capabilities. Baker et al. (2023: 23) defined it as a groundbreaking technology that has change the manner in which businesses and individuals process computing and data management. Basically, cloud computing entails offering a range of computing services via the Internet, such as servers, databases, storage units, software, networks and providing on-demand access to a common resource of customizable resources.

Cloud computing relies on a network of servers connected via the Internet, managed by global cloud service providers such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform. These systems operate on a subscription or pay-as-you-go model, meaning that organizations and individuals pay only for the resources they use, without the need for significant infrastructure investments.

3.1.2. Characteristics of Cloud Computing

Just as the Internet revolutionized access to information, cloud computing does the same for information technology by providing a qualitative shift in resources and services. These outcomes are significant for both service providers and consumers, making cloud computing a modern direction in the world of computing and information technologies. The main characteristics of cloud computing include (Al-Fartusi, 2025: 54):

- i. **On-Demand Self-Service:** Users can utilize cloud computing capabilities at any time and place without the need for human intervention.
- ii. **Broad Network Access:** Cloud services are accessible via the Internet through standards and mechanisms that support heterogeneous user platforms, such as mobile phones, tablets, laptops, and workstations.

- iii. **Resource Pooling and Integration:** Service providers deliver services to users by pooling and integrating physical and virtual resources, some leased and some owned.
- iv. **Rapid Elasticity:** Cloud computing resources can be automatically provisioned and scaled based on acceptance of certain conditions and user requests.
- v. **Measured Service:** Cloud systems automatically control and optimize resource usage by leveraging the ability to measure service metrics such as storage, processing power, bandwidth, and active user accounts, and report on them.
- vi. **Flexible Access:** Users can access the cloud and benefit from its services from any location and at any time.

3.1.3. Types of Cloud Computing

There are several types of cloud computing, including (Shihab & Sulaiman, 2025: 185):

i. Based on Deployment Models:

- **Public Cloud:** These services are provided over the Internet by external service providers and are available to the general public. Users share resources with other clients, reducing costs. Examples include Amazon Web Services (AWS) and Microsoft Azure.
- **Private Cloud:** This infrastructure is dedicated to a single organization, providing greater control and security. It can be managed internally or by a third party and is often used by organizations that require a high level of privacy.
- **Hybrid Cloud:** This model combines public and private clouds, allowing organizations to leverage the advantages of both. Data and applications can be moved between the two environments as needed, providing greater operational flexibility.

ii. Based on Service Models:

- **Software as a Service (SaaS):** This is simply ready-to-use software that is delivered through the Internet to a customer without necessarily needing to be installed locally. These are web-based email systems and Customer Relationship Management (CRM) systems.
- **Platform as a Service (PaaS):** It offers an environment of development and execution to an application allowing developers to create and operate applications without complexity of infrastructure. This involves development software and databases.
- **Infrastructure as a Service IaaS:** Provides computational infrastructure that is available in the form of a service, which includes servers, storage, and networks, where the user can run operating systems and applications.

iii. Future Trends in Cloud Computing

Due to the active development of digital technology, cloud computing is now one of the keystones of digital transformation in economic players. It is no longer applied as a data storage and application operation tool but nowadays it is an intelligent and versatile infrastructure which can keep up with the current trends. The trends of cloud computing in the future entail the following (Ezzeldin & Abdullah, 2025: 724):

- **Cloud-Enabled Artificial Intelligence:** Combining cloud infrastructures and artificial intelligence technologies to offer automated analysis and prediction services, automatically manage the resources, and

ensure security by quickly identifying patterns and threats. Research is devoted to the ways in which cloud distribution systems can be combined with AI in order to enhance performance and efficiency.

- **Edge Computing with Artificial Intelligence:** It has been shown that moving part of the processing capabilities to the edges of the networks, with the assistance of AI algorithms, can assist in reducing the response time, improve the privacy, and ease the load on the central cloud infrastructures.
- **Multi-Cloud and Hybrid Computing:** Research is also shifting to cloud models which involve the integration of several providers, either in hybrid clouds which are combinations of both the public and the private clouds or in multi-cloud environments. These models make them more flexible, share risks, and establish dynamic operating environments.
- **AI-Enhanced Cloud Security:** With the rise in cyber-threats, AI is applied to enhance cloud security by identifying real-time threats and automatically reacting to them, which lowers security threats in contemporary security models, including the Zero Trust model and AI-driven activities (AIOps).
- **Sustainable Cloud Computing:** The process of connecting AI will enhance the energy efficiency of data centers by incorporating smart services like using smart cooling systems and managing energy resources to assist in achieving sustainability objectives by minimizing carbon emissions.
- **Integration of Quantum Computing in the Cloud:** The goal of the economic entities is to integrate quantum computing with cloud platforms to assist with the intricate data analysis and sophisticated encryption operations. In spite of the fact that this trend is at its infancy, the academic research is establishing the basis of future integration.

Hence, the future of cloud computing is one of the strategic opportunities of economic entities aiming at improving their competitiveness in the context of global digitalization. The increased focus is given to the relevance of AI-based security solutions to safeguard the data, along with the need to go with sustainable cloud computing to moderate the technological development and environmental sustainability. Regardless of the regulatory and technical issues, the comprehensive adoption of such trends is likely to provide a qualitative shift and provide new prospects of growth and innovation in the digital economy.

3.2. Section Two: Information Asymmetry, Its Risks, and Mitigation

3.2.1. Concept Of Information Asymmetry

Zavolokina et al. (2021: 886) argue that the concept of information asymmetry is directly related to the concept of information, particularly financial and accounting information that possesses utilitarian value, also referred to as “informational value.” Information asymmetry arises from disparities and priorities in access to information by economic decision-makers. Such disparities can lead to opportunistic behavior, resulting in a lack of trust between buyers and sellers, and potentially complete market failure. Opportunistic behavior is defined as “pursuing self-interest with cunning.” For example, a seller may deceive a buyer by providing misleading information about the condition of a used car in the market, which generates information asymmetry.

Mohsen and Abdullah (2020: 92) define information asymmetry as the withholding of certain accounting information by economic entities, which significantly affects the decisions of current and prospective investors for personal gain. It may also result from users’ inability to interpret or utilize issued financial reports effectively, or a combination of both.

Based on the above, the researcher notes that information asymmetry manifests in two main forms. The first involves inequality in access to information between management and internal parties on one side, and external parties on the

other. The second form arises from unequal access to information among external parties themselves for instance, the asymmetry between domestic investors and foreign investors.

3.2.2. Risks of Accounting Information Asymmetry

Hui Sung (2014: 57) identifies the following as the most significant risks:

- **Adverse Selection (focusing on the owner relationship):** Adverse selection occurs when a certain party possesses superior information compared to others. These circumstances arise between the seller and the buyer and may result in losses for one party. For example, the owner of an economic entity may have information regarding a future decline in the entity's stock price, while the buyer is unaware of this information. Under such conditions, the buyer is likely to incur losses from trading the shares.
- **Moral Hazard (focusing on the management-owner relationship):** Moral hazard arises when the management of an economic entity is delegated to an agent with the aim of maximizing wealth. Due to insufficient information and the inability to monitor managerial activities, combined with potential conflicts of interest between managers and owners, managers may seek to maximize their own benefits alongside or even at the expense of the owners' interests.

3.2.3. Effects of Information Asymmetry

The presence of information asymmetry in the capital market whether between company management and investors or among investors themselves leads to several undesirable effects at both the market and firm levels. These effects can be summarized as follows (Omar & Ahmed, 2023):

- **First Effect:** Information asymmetry in its various forms allows certain parties to earn abnormal returns at the expense of others due to their early access to information about the company's performance. This situation has a negative impact on all market participants, issuing companies, the stock market, and the national economy.
- **Second Effect:** If the market can fully access and absorb private information, it becomes difficult for informed traders to earn abnormal returns at the expense of uninformed participants. This implies that no negative effects are imposed on market participants.

The first effect is considered the more logical scenario due to the presence of many parties especially internal parties who have the incentive and expertise in their field, enabling them to acquire informational advantages over others. This can occur either by exploiting information before it is publicly disclosed or by withholding such information from other parties.

3.2.4. Reducing Accounting Information Asymmetry

Information plays a crucial role in the capital market, particularly accounting information, as it enables market participants to anticipate the return on their investments and assess the associated risks, thereby determining appropriate investment pricing.

Yet, there are instances where the company management can deliberately conceal some information to investors with the intention of gaining abnormal returns on the shares they hold or they can also resist disclosure of financial forecasts. Also, not all the information can be shared because some businesses will withhold data that they feel will be detrimental to their competitiveness since it may be exploited by their rivals to modify their production outlook, or

investment strategies. This gives rise to what is known as information asymmetry, which is one of the key factors contributing to financial instability and can lead to financial and banking crises. Information asymmetry occurs when one party in financial transactions possesses more information than the other, resulting in the latter being unable to properly assess risks and potentially making incorrect decisions (Hui Sung, 2014: 55).

3.3. Section Three: Firm Value and Its Measurement Indicators

3.3.1. Concept of Firm Value:

Every company has specific goals and purposes, but the primary objective of a company is to maximize its value, which can be measured by its share price. An increase in firm value benefits shareholders. To achieve this goal, capital owners place trust in managers, also referred to as agents. These managers or agents are responsible for deciding on the allocation of necessary financing for the company, whether internal or external, for investment purposes. The capital structure policy primarily depends on the relationship between the financing decision and the type of investment the company's management should select to align with the company's goal, which is the prosperity of shareholders, reflected in the firm's value or market value derived from its share price (Al-Rawi & Yassin, 2025: 285).

Belo et al. (2022: 620) define firm value as the present value of the company's expected future cash flows. Firm value reflects the quality of management performance and the perception of stakeholders and investors regarding the company's success, which is strongly associated with high stock prices, as companies with higher stock prices tend to have greater overall value.

3.3.2. Objectives of Firm Value

Firm value represents the primary objective of companies and is an important factor for both companies and investors. A strategic focus on enhancing firm value is economically beneficial. Accordingly, there are objectives in determining firm value that stakeholders seek to achieve, which can be summarized as follows (Mohammed & Ahmed, 2020: 31):

- i. **Maximizing Wealth:** Companies aim to increase shareholder wealth by operating efficiently, with performance assessed through the company's market value. Firm value provides maximum wealth for shareholders through higher stock prices; the higher the share price, the greater the shareholders' wealth. The company seeks to increase its value by increasing the wealth of its owners or shareholders. Firm value is primarily measured in several ways, one of which is the market price of the company's shares. A key objective of the company is to maximize stakeholder welfare, which can be measured through firm value, as an increase in firm value aligns with owners' expectations and enhances their wealth and well-being.
- ii. **Maximizing Financial Value of the Company:** Maximizing the company's financial value reflects the outcome of financial decisions in both investment and financing. Financial decisions affect firm value by influencing the expected return and the level of risk the company may face.
- iii. **Maximizing Share Market Value:** One of the most important strategic goals of company management is to maximize the market value of the company's shares. This goal is often prioritized over others due to concerns about potential declines in stock value on the financial market. Many theories have emphasized this objective, gaining support from business firms and managers. The rationale for this focus includes:
 - Maximizing the market value of shares requires companies to operate more efficiently, reduce costs, and produce high-quality products and services at lower prices.
 - Maximizing market value encourages the development of goods and services desired by consumers, which drives the adoption of advanced technologies.

- iv. **Maximizing the Company's Market Value:** Increasing firm value in financial markets results from the rise in the market value of its shares. Firm value is reflected in the market value of its shares, with the share price representing the sale price in the market. This value is determined based on future returns, which are expected and considering any risk involved. A balance between these factors would help the company to attain the best value possible.

3.3.3. Tools for Creating Firm Value

Companies employ various methods and approaches to create value. Some of these methods are as follows (Al-Masoudi & Al-Tamimi, 2025: 174):

- a. **Profit Maximization:** This is the maximization of profit rate of the company in future and maximization of returns on current assets.
- b. **Profitable Growth:** This entails reaping the benefits of profitable growth in future that is, investing in projects that yield returns which is higher than the cost of capital used.
- c. **Cash Generation:** This will be the creation of free cash flow to invest and grow profitably and, thus, the use of external sources of finance becomes unnecessary.
- d. **Achievement of Excess Return:** This is when the performance of the market is exceeded by an extra amount of returns that add value to shareholders.

3.3.4. Indicators for Measuring Firm Value

Firm value is represented by the expected cash profit to be received by shareholders, calculated as the market price per share multiplied by the number of shares. This value is influenced by the following factors (Qadouj & Malikawi, 2019: 109):

- i. **Expected Return per Share:** An increase in expected return leads to an automatic increase in both the market value of the share and the firm's overall value.
- ii. **Dividends Distributed to Shareholders:** A higher dividend payout ratio results in an automatic increase in the share price, thereby increasing the market value of the firm, and vice versa.
- iii. **Timing of Investor Returns:** The closer the receipt of returns, the higher the share price, which in turn increases firm value, and vice versa.
- iv. **Market Discount Rate:** A decrease in the discount rate leads to an automatic increase in both the share price and the firm's value.
- v. **Investor Expectations:** Higher investor expectations result in an automatic increase in both the share price and the firm's overall value.

3.4. Section Four: Interrelationship Between Research Variables

3.4.1. The Effect of Cloud Computing on Reducing Accounting Information Asymmetry

Cloud computing has brought significant changes to the accounting and auditing professions by enabling users to access information stored on the cloud anytime and anywhere via an Internet connection. Zhygalova (2013: 31) notes that cloud-based accounting information systems provide superior capabilities and greater efficiency in data processing due to the flexible nature of cloud infrastructure. This contributes to reducing the time required to prepare financial reports, providing timely financial information, and enhancing decision-making processes.

Singerova (2018: 670) adds that the use of cloud computing in accounting improves the quality of financial reports by ensuring that accounting treatments are consistent with accounting standards, accurate, and free of errors.

Based on the above, the researcher observes that the use of cloud computing in accounting offers several advantages, including direct access to information at any time and from any location. It accelerates the dissemination of financial reports in a timely manner, making information simultaneously available to both internal and external parties. This enhances the efficiency of accounting work and increases the general availability of information. Through the optimal use of cloud computing by top management and the ability to share information anytime and anywhere, it significantly contributes to reducing information asymmetry, particularly in financial markets and generally in other companies.

Furthermore, the U.S. Securities and Exchange Commission (SEC, 2013: 8) indicated that modern technologies reduce information barriers among investors and enhance firm value in financial markets.

3.4.2. The Effect of Information Asymmetry on Firm Value

Samuel Fosu et al. (2016) investigated the extent to which information asymmetry can be considered a key determinant of firm value and its relationship with firms' financial leverage. The study also aimed to assess the impact of information asymmetry on firm value before and after the global financial crisis (2007–2009), using a sample of companies in the United Kingdom. The results indicated that accounting information asymmetry negatively affects firm value. Additionally, the study found that the relationship between information asymmetry and firm value is more pronounced in the post-crisis period compared to the pre-crisis period.

Aldea Mita Cheryta et al. (2018) analyzed the impact of financial leverage and information asymmetry on firm value using cash holdings as a mediating variable. The study concluded that cash holdings can lead to asymmetric information, causing uncertainty that negatively affects firm performance. Consequently, the study identified a negative effect of information asymmetry on firm value.

Toan et al. (2020) studied the connection between the information asymmetry and the value of the firms in the Vietnamese stock exchange. The results of their findings were mainly validated on the fact that information asymmetry in Vietnamese companies negatively affects the value of firms. Besides, the findings revealed that financial leverage of such firms is of small significance in alleviating the adverse effect of information asymmetry on firm value.

This finding is consistent with Martinez-Ferrero et al. (2018), who observed that information asymmetry that exists in the stock market forces the uninformed parties to take defensive steps to ensure they escape the uninformed in the market by exercising partial or wholesale retreats. The behavior has the effect of diminishing market size, high transaction costs and therefore work against trading volume leading to lower stock liquidity that investors are worried about. Also, information asymmetry enhances the amount of information risk to the investors because they are unable to determine properly the expected returns to investments, which leads to unfavorable effects on the value of firms.

3.4.3. The Effect of Cloud Computing on Firm Value

Kim et al. (2022) examined the impact of implementing artificial intelligence technologies, including cloud computing, on firm performance, value, profits, and cost structures. An empirical study was conducted on a sample of 105 companies listed in the United States that adopted AI technologies during the period 2008–2014. The study concluded that there is a strong positive relationship between the adoption of AI technologies and firm value, as well as significant positive effects on the company's cost structure, which in turn enhances market value.

On a broader scale, Salvis et al. (2021) investigated the relationship between accounting information on digitalization and firm value by analyzing the impact of digitalization information provided directly or indirectly by companies through their websites. The study was conducted on a randomly selected sample of 114 companies from the list of firms applying integrated reporting in 2018, as listed on the International Integrated Reporting Council (IIRC) website. Regression analysis indicated a positive relationship between digitalization and firm value, suggesting that digitalization-related information serves as a mechanism for companies to increase their value in financial markets.

4. Chapter Three: Practical Aspect

4.1. Measuring Variables and Testing the Hypotheses

4.1.1. Measuring the Variables

The research variables are as follows:

- i. **Cloud Computing:** This is the independent variable and is measured using a dummy variable. If a company in the research sample adopts cloud computing, it takes the value **1**; otherwise, it takes the value **0**.
- ii. **Information Asymmetry:** This is treated as a mediating variable and is measured using the **bid-ask spread** the difference between the highest price a buyer is willing to pay and the lowest price a seller is willing to accept for a specific security. The bid-ask spread is the most commonly used indicator in accounting literature to measure accounting information asymmetry. In this study, it will be calculated as follows using the stock's bid and ask prices:

$$\text{Bid-Ask Spread} = \frac{\text{Ask Price} - \text{Bid Price}}{(\text{Ask Price} + \text{Bid Price})/2}$$

A larger difference between the ask and bid prices indicates a higher level of information asymmetry. This occurs because investors with prior information exploit it to maximize their personal gains by widening the price difference during trading, often at the expense of uninformed investors.

- iii. **Firm Value:** This is the dependent (response) variable and is measured using **Tobin's Q**, introduced by Tobin (1969). Tobin's Q is considered one of the most effective measures for evaluating firm value. It is calculated using the following formula:

$$\text{Tobin's Q} = \frac{\text{Market Value of Equity} + \text{Book Value of Debt}}{\text{Total Assets}}$$

This measure captures the market's valuation of the firm relative to the replacement cost of its assets.

$$\text{Tobin's Q} = \frac{\text{Market Value of Equity} + \text{Book Value of Total Liabilities}}{\text{Book Value of Total Assets}}$$

Noting that: Market Value of Equity = Number of Outstanding Shares × Year-End Closing Share Price

4.1.2. Results Analysis and Hypotheses Testing

i. Descriptive Analysis:

The statistical software SPSS was used to conduct the analysis of data in a descriptive manner. This was to find the mean, standard deviations, highest values, and the lowest values of the study variables. The results were as follows:

Table (2): Means, Standard Deviations, Maximum, and Minimum Values

Variables		Standard Deviation	Mean	Maximum Value	Minimum Value
Dependent Variable	Firm Value	3.728	6.392	15.000	2.700
Mediating Variable	Accounting Information Asymmetry	0.327	4.062	0.275	0.503
Independent Variable	Cloud Computing	3.352	6.364	0.719	0.362
	N	43			

Source: Table prepared by the researcher based on outputs from the statistical software SPSS.

The results of Table (2) above indicate that the mean value for the firm value variable reached **6.392**, with a standard deviation of **3.728**, while the maximum share price was **15.000** and the minimum was **2.700**.

Regarding cloud computing, the table shows that the mean value is **6.364**, indicating that the majority of companies in the research sample adopt cloud computing technology. Its standard deviation is **3.352**, which is relatively small compared to the mean, meaning that the variation among companies regarding the adoption of the technology is very limited, which is a positive indicator.

For accounting information asymmetry, the mean value reached **4.062**, with a standard deviation of **0.327**. The maximum value of information asymmetry was **0.275**, while the minimum was **0.503**.

ii. Linear Collinearity Test:

To verify the linear collinearity among the research variables, the researcher calculated the **Collinearity Statistics** using the **Tolerance** coefficient for each variable and then computed the **Variance Inflation Factor (VIF)** for each variable to determine whether the data suffer from multicollinearity. A VIF value greater than 10 indicates a high level of multicollinearity among the research variables.

The results presented in Table (3) show that the VIF values are well below the acceptable threshold of 10. This indicates that multicollinearity is not an issue in this study.

Table (3): Multicollinearity Test Among the Research Variables

Variables	Collinearity Statistics	
	Tolerance	VIF
Firm Value	0.277	3.611
Cloud Computing	0.231	7.537
Accounting Information Asymmetry	0.101	6.753
Dependent Variable: Firm Value		

Source: Table prepared by the researcher based on outputs from the statistical software SPSS.

iii. Hypotheses Testing:

In this section, the researcher tests the main and sub-hypotheses defined in the research methodology, presenting the statistical tables related to the results, illustrating the effects of the variables on each other, and providing interpretations for these effects.

H1: There is a statistically significant effect between the adoption of cloud computing technology and the reduction of accounting information asymmetry in the companies included in the research sample.

Table (4) presents the statistical results obtained from the SPSS software after applying the regression equation to estimate the effect of cloud computing on reducing accounting information asymmetry.

Table (4): The Effect of Cloud Computing on Reducing Accounting Information Asymmetry

Variables	Coefficient		T-Statistic	Significance (Sig.)
Accounting Information Asymmetry	β_1	0.407	6.035	0.016
Constant	α	0.334	7.527	0.000
General Characteristics of the Regression Model				
P-Value	F	R^2	Correl.	
0.003	5.649	0.734	0.627	

Source: Table prepared by the researcher based on outputs from the statistical software SPSS.

It can be observed from Table (4) above that the regression model is statistically significant, as the F-statistic reached **5.649**, which is significant at the level of **0.003**, below the default significance level of **0.05**. This indicates that the model has explanatory power regarding the relationship between cloud computing and accounting information asymmetry. This is further supported by the coefficient of determination (R^2), which reached **0.734**, indicating that cloud computing explains approximately 73% of the variations in accounting information asymmetry.

The table also shows the statistical significance of the regression model for the effect of cloud computing on reducing accounting information asymmetry. The T-value for the accounting information asymmetry variable is **6.035**, significant at the **0.016** level, indicating that cloud computing has an effect on accounting information asymmetry. This effect is positive, as evidenced by the positive regression coefficient of **0.407**.

Based on these results, the first hypothesis is accepted, providing the conclusion that: *“There is a statistically significant effect of adopting cloud computing on reducing accounting information asymmetry.”*

H2: There is a statistically significant effect of cloud computing on firm value for the companies included in the research sample.

Table (5) presents the statistical results obtained from the SPSS software after applying the regression equation to estimate the effect of cloud computing on firm value for the companies in the research sample.

Table (5): The Effect of Cloud Computing on Firm Value

Variables	Coefficient		T-Statistic	Significance (Sig.)
Cloud Computing Firm Value	β_1	0.693	2.517	0.114
	β_2	9.223	7.878	0.000
Constant	α	0.005	0.012	0.991
General Characteristics of the Regression Model				
P-Value	F		R^2	Correl
0.000	6.742		0.719	0.764

Source: The table was prepared by the researcher based on the outputs of the statistical program (SPSS).

It can be seen from Table (5) above that the regression model is statistically significant, as its F-statistic reached a value of (6.742), which is significant at the level of (0.000), less than the default significance level (0.05). This indicates that the model has explanatory power regarding the relationship between cloud computing and firm value. This is further supported by the coefficient of determination (R^2), which reached a value of (0.719), indicating that cloud computing explains approximately 71% of the variations occurring in firm value. This demonstrates the existence of an effect of cloud computing on firm value, and that this effect is positive, as indicated by the positive regression coefficient of (0.693). Accordingly, the second hypothesis is accepted, providing the conclusion that “there is a statistically significant effect of adopting cloud computing on firm value.”

H3: There is a statistically significant effect of accounting information asymmetry on firm value for the companies in the research sample.

Table (6) presents the statistical results obtained from the SPSS statistical program after applying the regression equation to estimate the effect of mitigating accounting information asymmetry on firm value for the companies in the research sample.

Table (6): The Effect of Mitigating Accounting Information Asymmetry on Firm Value.

Variables	Coefficient		T-Statistic Value	Significance Value (Sig.)
Accounting Information Asymmetry Firm Value	β_1	0.693	6.517	0.114
	β_2	7.514	8.562	0.232
Constant	α	0.005	0.012	0.991
General Characteristics of the Regression Model				
P-Value	F	R ²	Correl	
0.001	6.842	0.757	0.835	

Source: The table was prepared by the researcher based on the outputs of the statistical program (SPSS).

It can be seen from Table (6) above that the regression model is statistically significant, as its F-statistic reached a value of (6.842), which is significant at the level of (0.001), less than the default significance level (0.05). This indicates that the model has explanatory power regarding the relationship between mitigating accounting information asymmetry and firm value. This is further supported by the coefficient of determination (R^2), which reached a value of (0.757), indicating that mitigating accounting information asymmetry explains approximately 75% of the variations occurring in firm value.

The table also shows the statistical significance of the regression model for the effect of mitigating accounting information asymmetry on firm value, as the T-value for the variable of mitigating accounting information asymmetry reached (6.517), which is significant at the level of (0.114). This indicates the presence of an effect of accounting information asymmetry on firm value, and that this effect is positive, as indicated by the positive regression coefficient of (0.693). Accordingly, the third hypothesis is accepted, providing the conclusion that “there is a statistically significant effect of mitigating accounting information asymmetry on firm value.”

H4: There is an effect of adopting cloud computing technology on mitigating accounting information asymmetry and its reflection on firm value.

Table (7) presents the statistical results obtained from the SPSS statistical program after applying the regression equation to estimate the effect of adopting cloud computing technology on mitigating accounting information asymmetry and its impact on firm value for the companies in the research sample.

Table (7): The Impact of Cloud Computing Technology on Mitigating Accounting Information Asymmetry and Its Reflection on Firm Value.

Variables	Coefficient		T-Statistic Value	Significance Value (Sig.)
Firm Value Cloud Computing Accounting Information Asymmetry	β_1	0.703	6.627	0.054
	β_2	7.362	8.295	0.001
	β_3	7.514	6.062	0.232

Constant	α	0.005	0.013	0.872
General Characteristics of the Regression Model				
P-Value	F	R ²	Correl	
0.002	6.584	0.672	0.739	

Source: The table was prepared by the researcher based on the outputs of the statistical program (SPSS).

It can be seen from Table (7) above that the regression model is statistically significant, as its F-statistic reached a value of (6.584), which is significant at the level of (0.002), less than the default significance level (0.05). This indicates that the model has explanatory power regarding the relationship between cloud computing, accounting information asymmetry, and their reflection on firm value. This is further supported by the coefficient of determination (R²), which reached a value of (0.672), indicating that cloud computing and mitigating accounting information asymmetry explain approximately 67% of the variations occurring in firm value.

The table also shows the statistical significance of the regression model for the effect of cloud computing on mitigating accounting information asymmetry, as the T-value for the variable of accounting information asymmetry reached (6.062), which is significant at the level of (0.232). This indicates the presence of an effect of cloud computing on mitigating accounting information asymmetry and its reflection on firm value, and that this effect is positive, as indicated by the positive regression coefficient of (7.514).

5. Conclusions and Recommendations

5.1. First: Conclusions

The findings introduced in the theoretical and practical portions of the research led to a set of conclusions that the researcher made as follows:

- a. The serious impact of the implementation of cloud computing technology in the mitigation of accounting information asymmetry is that the implementation of cloud systems led to the enhancement of the speed, accuracy and promptness of accounting information, which minimized the information asymmetry between the management, investors, and other stakeholders involved.
- b. The cloud computing technology contributed to the increase of the degree of transparency and financial disclosure, the integration of databases, and the combination of accounting systems, which has a positive influence on the quality of financial reports and their comparability and verifiability.
- c. The findings indicated a positive connection on firm value, and the level of cloud computing adoption and greater value indicators, as indicated by the market value per share which represents the confidence of investors in the quality of information held in the financial reports, was statistically significant.
- d. The companies in the research sample vary with regard to enjoying the benefits of cloud computing depending on the size of companies, technological infrastructure, and efficiency of human resources, which reveal that the beneficial effect is associated with the level of actual implementation of the technology in the accounting and administrative processes.
- e. The findings also revealed a strong occurrence of an accounting information asymmetry in the financial markets considering the securities are traded on a daily basis. Financial markets are thus the main place where this kind of asymmetry is manifest and decreasing the same helps to increase efficiency and value of companies in the financial markets.

On the basis of the above, the researcher arrives at the conclusion that the adoption of cloud computing technology is an effective strategic instrument to alleviate the accounting information asymmetry and the results are not only the improvement of the quality of financial reports, but also the improvement of firm value and sustainability in the financial markets.

5.2. Second: Recommendations

In light of the conclusions reached, the following recommendations and proposals can be formulated:

- a. Taking a concise strategy of the shift towards cloud computing as well as the need of the companies within the research sample to create an integrated strategic plan of adopting cloud computing technologies in accounting and financial systems in a way that makes the system integrate and provides a better accounting information.
- b. Increasing disclosure and transparency of financial information by stimulating the companies to enjoy cloud-based systems to enhance the speed and accuracy of financial reporting, which contributes to the decrease in information gap between the management and investors and curbs accounting information asymmetry.
- c. There is the necessity to create internal control systems and cybersecurity to facilitate the cloud computing environment with rigorous control procedures and sophisticated protection systems to guarantee data confidentiality and integrity, which increases the stakeholders confidence in the accounting information published.
- d. Improving the human competencies with the training of accounting and administrative personnel on how to operate cloud computing applications and data analysis to make sure that the provided technological opportunities are used.
- e. The findings also revealed that regardless of the attained benefits, the structural problems exist; the implementation of cloud computing technology into the Iraqi setting still has major issues associated with the network stability and legal provisions of cybersecurity and accounting information protection.

As such, the researcher insists on enhancing the role of regulatory bodies and enforcing regulations on the use of cloud computing in financial reporting preparation to enhance adherence to international accounting standards to bring about transparency, since it is of high importance in increasing value of companies in financial markets.

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