

The impact of information technology governance according to the COBIT on performance



Abdelwhab Musa Elgali Mohamed¹, Nasareldeen Hamed Ahmed Alnor², Omer Alsir Alhassan Mohammed³, Ebrahim Mohammed Al-Matari^{2,4,*}, Adeeb Alhebri⁵, Afaf Ahmed⁶

¹Finance and Investment Department, College of Business, Jouf University, Sakaka, Saudi Arabia

²Accounting Department, College of Business, Jouf University, Sakaka, Saudi Arabia

³Accounting Department, Faculty of Economics and Administrative Sciences, Islamic University of Minnesota, Virginia, USA

⁴Faculty of Commerce and Economics, Amran University, Amran, Yemen

⁵Accounting Program, Applied College, King Khalid University, Muhyle Assir, Saudi Arabia

⁶Business Administration Program, Applied College, King Khalid University, Sarat Obeida, Saudi Arabia

ARTICLE INFO

Article history:

Received 18 October 2023

Received in revised form

22 February 2024

Accepted 25 February 2024

Keywords:

Bank performance

Information technology governance

COBIT framework

Survey questionnaire method

SPSS analysis

ABSTRACT

This study aims to explore the relationship between the performance of banks and the governance of information technology as outlined by control objectives for information and related technologies (COBIT) standards. A survey questionnaire method was used to collect data, guided by a specific model to address the research objectives. Participants included employees from the Central Bank of Sudan and various commercial banks. Out of 280 distributed surveys, 240 were successfully returned and analyzed using the SPSS software to assess both measurement and structural models. The analysis revealed a positive and significant link between bank performance and several aspects: acquisition and implementation, support and delivery, monitoring and evaluation, and planning and organizing. This research contributes to the existing literature by specifically examining the performance of banks and information technology governance in the Middle Eastern context through COBIT, marking it as a distinctive empirical study in this field.

© 2024 The Authors. Published by IASE. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

The advent of a novel global paradigm and the process of globalization has engendered transformations across several domains, including the economy, legal systems, society, and technology. The rapid progress of information technology in recent years, coupled with the expansion of electronic commerce, has sparked heightened interest in the examination of information technology governance. This is due to the recognition that information technology plays a vital role in the success of organizations and is instrumental in delivering services and products in a highly efficient and effective manner. Information technology governance refers to a comprehensive set of practices, policies, roles, and organizational

structures that are essential and interconnected with information technology. Its purpose is to enable efficient decision-making. Information technology has greatly influenced disclosure and transparency procedures, as well as the financial and accounting systems of commercial enterprises. The requirement to undertake disclosure processes resulted in the creation of information technology along with the development of standards governing the use of financial and accounting systems.


Banks are considered to be one of the most important financial institutions in the economy because of their vital role in supporting national economies and providing financial services to consumers. This study aims to provide a clear definition of "IT governance" and determine its specific applicability in the banking sector by utilizing the control objectives for information and related technologies (COBIT) 5 model as a control framework.

Information technology governance plays a crucial role in establishing the control environment and concentrating attention on the audit and reporting functions, both of which are crucial for the success of a business. Information technology

* Corresponding Author.

Email Address: ibrahim_matri7@yahoo.com (E. M. Al-Matari)

<https://doi.org/10.21833/ijaas.2024.03.014>

 Corresponding author's ORCID profile:

<https://orcid.org/0000-0001-9247-2766>

2313-626X/© 2024 The Authors. Published by IASE.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

governance governs the contractual arrangement between a facility's administration and its customers. There is no denying that banks have implemented information technology governance. In light of the work of the COBIT framework and the significant advancements that the world is experiencing in the field of information technology, it is seen as a favorable indicator of the quality of its performance.

Information and technology in enterprises have become a significant and integral element of a firm, supporting its growth and sustainability. As a result, IT is a vital and necessary aspect of modern organizations. More critically, IT is vital in the strategic and operational activities of corporate enterprises (Fu et al., 2022). Therefore, managing IT necessitates special attention. Both corporate governance overall and IT governance specifically emphasize this aspect. The idea of IT governance, which emerged in the late 1990s, gained significance following numerous corporate scandals (such as Enron, WorldCom, Parmalat, etc.) and called for efficient governance structures and improved transparency mechanisms. IT has experienced rapid expansion in recent years, becoming pivotal in an expanding array of businesses (Awwad and El Khoury, 2021).

Harahap and Ikhwan (2023) defined the governance of Technology and Information as defined by Harahap and Ikhwan (2023) as a set of relationships and procedures that guide and control a company to fulfill its objectives by adding value through the use of information technology. IT Governance can be described as a systematically structured approach to the management of enterprise IT at all levels and areas of management, that is, both from the point of view of IT and its strategy and the perspective of corporate strategy, including their mutual integration, monitoring, and justification. The measures implemented at the IT management level of the enterprise are targeted and effective to achieve the set goal and achieve it (Maryska et al., 2015).

Recently, there has been growing interest among organizations in IT governance as a means of justifying IT investments. Numerous studies have indicated that companies possessing effective IT governance models tend to realize greater returns on their IT investments than their competitors (Lunardi et al., 2014). The use of IT has become a critical component in banks' day-to-day operations, serving as the backbone that upholds their processes. Its impact can be viewed from multiple perspectives, including its ability to (i) automate the banking data environment, (ii) spur innovation to maintain competitiveness in financial markets, (iii) augment distribution and delivery channels, (iv) enhance payment systems, and (v) establish itself as a valued strategic resource in the contemporary landscape (Panetta et al., 2017). The adoption of COBIT 5 within the organization aims to evaluate the effective use of information technology as well as to reduce risk and optimize resources for the benefit of

the organization and its stakeholders. Auditors and users can utilize COBIT 5 documents and recommendations to implement IT Governance and tackle technical challenges (Umam et al., 2023). COBIT 5 encompasses the comprehensive management of information and related technologies across the entire organization, encompassing both business and functional responsibilities while taking into account the IT-related interests of internal and external stakeholders. The principles and enabling elements of COBIT 5 are applicable to businesses of all sizes and types, including for-profit, nonprofit, and government entities (Christianto et al., 2022).

Several studies have highlighted the importance of IT governance in improving bank performance. Joshi et al. (2013) examined the correlation between IT governance and the manner in which firms convey their IT governance operations. A sample of 200 commercial banking organizations was investigated, revealing a clear correlation between variations in transparency and disparities in institutional contexts. Moreover, companies with strong corporate governance practices view IT performance as crucial when informing and communicating with shareholders. Similarly, Patón-Romero et al. (2017) stressed the importance of implementing Green IT practices and proposed a governance and management framework based on COBIT 5 to guide organizations in their efforts. These findings indicate that effective IT governance practices, such as the disclosure and implementation of Green IT, significantly improve bank performance. Furthermore, Awwad and El Khoury's (2021) study objective was to determine, while controlling for bank and governance-related variables, the effect of information technology governance on the financial performance of banks in the context of Palestine. from 2008 to 2019 for the six regional banks listed on the Palestine Exchange. Two accounting metrics, ROA and ROE, used to determine performance, were examined, and the findings revealed that IT governance has a favorable effect on both metrics.

A summary of the development of the literature and hypotheses is given in Part 2 with regard to various areas of inquiry. Section 3 describes the methodology used to examine and evaluate the sample articles. The study's findings and interpretations are covered in Sections 4 and 5, respectively. The conclusions, limitations, and suggestions for further research are presented in Section 6.

2. Literature review developed the hypothesis

As achieving pre-planned goals contributes to directing and controlling the organization, information technology governance is often used to promote desirable behaviors in the use of information technology (Putri et al., 2017). Accordingly, Okour (2019) focused on comparing a group of businesses that adopted IT governance mechanisms with the performance of their IT departments. According to Lunardi et al. (2014),

companies that implemented IT governance policies performed better than their competitors, especially in terms of making profits. The impact of adopting IT governance practices on financial performance was more noticeable in the year following adoption compared to the year of adoption itself. This aligns with the findings of [Alansari and Al-Sartawi \(2021\)](#), who investigated the effectiveness of information technology governance in guiding electronic banking services provided by banks in the Gulf Cooperation Council nations. Their research revealed that electronic banking services reached a satisfaction level of 77%, strongly linked to the IT governance practices employed by banks. They also recommended that regulatory bodies encourage the banking sector to utilize more electronic banking tools and applications. Additionally, they suggested regulatory support to ensure the effective implementation of cybersecurity laws in GCC nations. Hence, [Maizlish and Handler \(2005\)](#) discovered that some businesses spend around 50% of their total capital expenditure on information technology. An increasing interest in monitoring electronic information systems is the result of the best use of information technology in accounting and financial industries ([Al-Hibari and Al-Matari, 2019](#); [Ali et al., 2019](#); [Houcine et al., 2023](#)).

The study conducted by [Al-Fatlawi et al. \(2021\)](#) investigated the role of implementing information technology governance using the COBIT 5 framework in improving the security of accounting information systems at the Trade Bank of Iraq. This research focused on four dimensions: planning, organizing, acquisition implementation, support and delivery, and monitoring. The findings reveal that implementing COBIT 5 IT governance procedures reduces the risks associated with data processing and enhances the security of automated accounting information systems. The bank's accounting system also includes all the elements of information technology governance that ensure client information privacy and protect against system hacks. The findings of this study help stakeholders better understand the nature of IT governance within the COBIT 5 framework and its role in enhancing accounting data security. Previous research by [Bierstaker et al. \(2001\)](#) also found that IT governance has a significant impact on each step of the audit process and enables auditing of all client data, leading to increased efficiency and effectiveness in auditing. However, [Danutirta et al. \(2022\)](#) cautioned that the use of information technology also carries high investment costs, including hardware purchases, software development, and system maintenance, which may lead to losses if not properly managed. Despite these risks, businesses and institutions can potentially maximize the benefits of information technology and minimize the risks of losses by implementing effective governance.

Information technology must be well managed to serve as a catalyst in attaining the objectives of the organization, as it supports the tasks and activities of

members of parliament. To determine the level of the General Secretariat of the Indonesian House of Representatives' current capabilities and make recommendations to raise that level, [Susanti and Sucahyo \(2016\)](#) used the COBIT 5 framework to evaluate the governance of information technology within an organization. The outcomes demonstrated that the General Secretariat of the Indonesian House of Representatives information technology governance procedure was put into practice and served its intended purpose. APO13 (Security Management), BAI01 (Program and Project Management), and EDM01 are the three processes in COBIT 5 that need to be prioritized as a result of recommendations for process improvement that were developed based on three criteria (stakeholder support, IT HR, and target time for completion) (Ensure Governance Framework Setup and Maintenance).

It is evident from reading earlier research that addressed the topic of information technology governance that businesses have a very strong and rising desire to establish information technology governance and make the switch from antiquated to contemporary technological systems. This is because it has a significant impact on knowledge management in banks and because the human component of information technology has a greater impact on knowledge management than hardware and equipment. Every step of the audit process is also affected. Every client's data may be audited, which will greatly improve the efficiency and efficacy of audits. Yet according to a number of recent studies, businesses that employ information technology governance principles outperform a group of similar businesses in terms of profitability, as measured by metrics like return on assets, return on shareholders' equity, and profit margin ([Andry and Setiawan, 2019](#); [Joshi et al., 2022](#)).

What sets our study apart from other studies is that it examines the degree to which banks implement COBIT-compliant information technology governance. We notice that the information discussed its use in other contexts rather than how banks used information technology governance, which is in line with the COBIT methodology.

The governance of information technology has emerged as a crucial concern for many businesses across several industries ([Naim et al., 2022](#)). It consists of leadership, organizational structure, and processes that emphasize supporting the organization's technology and guaranteeing the accomplishment of the organization's strategy. It is a component of corporate wisdom and the responsibility of the board of directors and executive management. And its goals, as well as the administrative and organizational requirements necessary to guarantee an information technology asset is managed appropriately and consistently ([Amali et al., 2023](#))

Conclusion: Enterprises are interested in using modern technology to publish their financial reports and manage the risks they are exposed to.

Information technology governance is crucial to their success and to help them achieve their goals by assisting them in providing accurate and up-to-date information. Using software and the Internet, the facility's numerous units are brought in harmony.

This leads to the conclusion that effective information technology governance requires several components that must work together to achieve the organization's goals. These components include developing, implementing, supporting, and continually improving plans, as well as paying attention to and maintaining the available information technology in order to keep up with the rapid advancement of information technology.

The COBIT framework for IT governance is an important achievement in the field of technology governance. Published in 1996 by the Information Systems Audit and Control Association (ISACA), this study aimed to alleviate the difficulties auditors face when dealing with automated accounting systems. It also serves as a practical reference for auditors operating in an IT environment. Furthermore, it allows organizations to use valuable information sources, including customers, investors, employees, production, audits, service speeds, and consumer data, to optimize their information utilization and understand associated risks (Hardy, 2006). The COBIT framework includes seven goals: effectiveness, efficiency, confidentiality, integrity, availability, compliance, and dependability of information controls and related technology. Through (37) references to the suggested activities in accordance with COBIT 5, which comes under the heading of various dimensions: planning and organization, procurement and implementation, delivery support, and monitoring and evaluation, COBIT was developed as a control instrument for IT governance. For comprehensive in terms of theoretical frameworks and comparative studies in similar contexts such as Iraq (Talab and Flayyih, 2023) Jakarta (Andry, 2016; Andry and Hartono, 2017) Mataram (Erniwati and Hikmawati, 2015). These studies investigate how COBIT-based IT governance differs throughout industries and how such variations impact performance and other variables in different contexts.

2.1. Planning and organizing and bank performance

Effective corporate governance and the establishment of IT governance rely heavily on meticulous planning and organization (Okour, 2019). Effective organization and planning are necessary to ensure the successful implementation of IT management, where IT features are translated from the governance structure into tangible procedures and practices within the company (Patón-Romero et al., 2017). It comprises Planning and organization of the strategic and tactical aspects of information technology, with a focus on how IT may effectively assist in the achievement of business objectives. This entails strategic vision development,

communication, and management from many perspectives. In addition, a proper organizational structure and technology infrastructure must be established to support the successful fulfillment of strategic goals (Sallé 2004). Planning and organizing are crucial elements of bank performance in the banking sector, and substantial research has been conducted on how they affect bank success. The goal of this study is to investigate the beneficial connection between organization, planning, and bank performance. In organizational management, which also includes leadership and ensuring that information technology has a wide range of applications to meet needs, governance is a key component (Setiawan and Fianty, 2023).

An increasing body of research indicates a positive connection between planning, organizing, and bank performance. For example, a study on strategic planning showed a positive correlation with financial performance, with respondents agreeing that strategic planning is a key factor for financial success. In addition, research conducted by Onyimbo (2018) revealed that the implementation of strategic planning methods, including goal setting, strategic plan formulation, participatory decision-making, reward and recognition systems, and training and development initiatives, had a beneficial effect on Equity Bank performance. The study also found a significant correlation between the strategies employed by Dyer and Blair Investment Bank Ltd. and their performance in terms of objective performance indicators, such as total revenue growth, total asset growth, net income growth, market share growth, and overall performance or growth. A separate study conducted in Kenya observed a correlation between the execution of strategies and the performance of commercial banks. The study revealed that implementing strategies enhances corporate image, business excellence, and operations management. Nevertheless, research conducted by Al-Qatamin and Al-Omari (2020) discovered that planning and organizing did not have a statistically significant impact on the quality of information technology services. Based on the above discussion, this study proposes the following hypotheses:

H1: There is a positive relationship between planning and organizing and bank performance.

2.2. Acquisition and implementation and bank performance

Acquire and implementation is a phase of designing, building, and implementing IT governance. It provides guidance on the process of acquiring and implementing IT solutions, including the requirements definition, identification of available solutions, documentation preparation, and training and enabling users to operate the new system (Dewi et al., 2021). To accomplish an IT strategy, IT solutions must be found, created, or bought, as well as implemented and integrated into

the business process. This area also covers improvements to and maintenance of existing systems to ensure that their lifecycle is maintained (Sallé, 2004). Based on the above discussion, this study proposes the following hypotheses:

H2: There is a positive relationship between acquisition and implementation and bank performance.

2.3. Support and delivery and bank performance

Support and delivery are major factors in bank performance. Effective support services and efficient delivery channels are critical for providing customer service, improving operational efficiency, and ensuring customer delight.

Evaluating the maturity level is important, especially in the COBIT delivery and support area. Effective connectivity and support are essential components of standard operational tools in governance systems, as highlighted by Sukoco et al. (2021). Several studies have emphasized the importance of customer service and delivery in the banking business (Zeithaml, 2000), for example, underlining the importance of customer support services in fostering customer loyalty and improving overall customer experience. Customer satisfaction and loyalty can be considerably influenced by efficient and responsive customer support services such as helpdesk support, complaint settlement, and inquiry management.

Furthermore, bank delivery channels, such as online banking, mobile banking, ATM services, and branch services, are critical for providing customers with convenient and accessible banking services. According to studies by Alalwan et al. (2014) and Karjaluoto et al. (2002), distribution channels play an important role in affecting customer views, satisfaction, and loyalty. Banks must invest in modern, dependable, and secure delivery routes to meet customer expectations, improve convenience, and maintain their market competitiveness.

Additionally, the study by Wamba et al. (2015) emphasized the importance of operational efficiency in banking success. Support and delivery services that efficiently help streamline processes, save costs, and improve overall operational efficiency. Banks can improve their ability to deliver services on time, accurately, and efficiently by streamlining their support and delivery processes, resulting in increased customer satisfaction and operational efficiency. Based on the above discussion, this study proposes the following hypotheses:

H3: There is a positive relationship between support and delivery and bank performance.

2.4. Monitoring and evaluation of bank performance

Every IT process must undergo routine quality and control requirement assessments. Management

of an organization's control mechanisms is overseen by the monitoring domain (Symons, 2005). Monitoring and evaluation (M&E) are critical functions in assessing the progress, effectiveness, and impact of projects or programs (Callistus et al., 2018). Monitoring provides descriptive information on the progress of work, while evaluation focuses on proving the degree to which goals and outcomes are met and analyzing the effects and impact trends (Callistus et al., 2018). M&E practices play a significant role in assessing the effectiveness of various strategies and initiatives in the context of bank performance.

The terms monitoring and evaluation are sometimes used interchangeably, but they are distinct functions. Monitoring is the process of gathering information and ensuring that it is utilized by the management to assess the effects of a project, both intentional and unintentional, and their impact. The purpose is to determine whether the project's intended objectives have been achieved. The data and information collected through monitoring were used in the evaluation to analyze the project's effects and impact trends. In some instances, monitoring data may reveal significant discrepancies from project expectations, necessitating an evaluation to examine the underlying assumptions and premises of project design (Otieno, 2019). Several studies highlight the importance of M&E practices in improving bank performance. For example, Mohamud (2023) found a positive correlation between M&E planning, stakeholder engagement, staff training, and the adoption of information systems and health project performance in Kenya. Amin et al. (2023) demonstrated how M&E activities can strengthen stakeholder relationships and reduce agency issues, ultimately leading to a positive community impact in the context of community development projects.

Furthermore, Raimondo (2016) concluded that higher M&E quality is associated with better project performance as measured by the World Bank. This highlights the importance of effective M&E practices in improving outcomes. In the context of information technology governance in banks, Kurniadi and Adhariani (2022) evaluated the implementation of the COBIT 5 framework in Bank ABC and provided recommendations for improvement, aiming to align IT governance with management expectations and achieve the bank's vision.

In summary, monitoring and evaluation are critical factors that influence bank performance by providing essential information to assess the progress, effectiveness, and impact of initiatives. Effective M&E practices can enhance project performance, strengthen stakeholder relationships, reduce agency issues, and align IT governance with management expectations, thereby leading to improved bank performance.

From examining previous research on information technology governance, it's evident that many businesses aspire to implement it, shifting from traditional accounting systems to modern

technological ones. This shift significantly impacts knowledge management in banks, with human elements being most influential and hardware and equipment being least significant. This influence extends across all stages of the audit process, facilitating comprehensive auditing of customer data, thus enhancing auditing efficiency and effectiveness. Furthermore, companies adopting information technology governance practices tend to outperform comparable ones, particularly in terms of profitability indicators like return on assets, return on shareholders' equity, and profit margin, as indicated by recent studies (Andry and Setiawan, 2019).

Our study differs from previous ones in that it specifically examines the extent to which banks implement information technology governance using the COBIT framework. Although previous studies may have explored the application of IT governance in other contexts, our study is unique in its focus on banks and the COBIT framework. Our study specifically examines the elements of COBIT 05 and how they relate to bank performance, with a focus on planning and organization, acquisition and implementation, support and delivery, and monitoring and evaluation. Based on this, we formulate the following hypotheses:

H4: There is a positive relationship between monitoring and evaluation and bank performance.

3. Methodology of research

The goal of this study was to evaluate the research hypotheses by examining data that had

been gathered from a survey list. This information was used to obtain the necessary data. The statistical tool SPSS, which stands for the Statistical Package for Social Sciences, and the chi-square test for the significance of differences were employed to produce the best findings. The arithmetic mean, frequency, and relative distribution were also calculated. The study population and sample are the employees of the Central Bank of Sudan, and Sudanese commercial banks made up the initial research population (Benzerrouk et al., 2023). Participants were randomly selected from the study population. 94% is the rate. The model of the study is as follows:

$$COBIT5 = \beta_0 + \beta_1Ai + \beta_2Bi + \beta_3Ci + \beta_4Di + \epsilon_t$$

where, *COBIT5* is bank performance. *Ai* is planning and organizing *Bi* is acquisition and implementation. *Ci* is support and delivery. *Di* is monitoring and evaluation, and *E* is error.

4. Data analysis and findings

4.1. Profile of respondents

The questionnaire was divided into three sections: the first section with an introduction explaining its purpose, followed by personal information (age, educational background, professional background, area of specialization, job position, and years of experience), and Table 1 provides a description of each section (personal data).

Table 1: Participants' demographic information

No.	Characteristics	Class	Repetition	Percentage
1	Age	Less than 25 years old	6	2.5
		From 25-35 years	87	36.3
		From 36-45 years old	99	41.3
		From 46-60 years old	42	17.5
		Over 61 years old	6	2.5
2	Qualification	Bachelor's	105	43.8
		Postgraduate diploma	12	5.0
		Master's	81	33.8
		Ph.D.	39	16.3
3	Professional qualification	Other	3	51.3
		Sudanese fellowship	21	8.8
		Arab fellowship	15	6.3
		British fellowship	21	8.8
		American fellowship	24	10.0
4	Scientific specialization	Other	159	66.3
		Accounting	102	42.5
		Business management	21	8.8
		Banking sciences	39	16.3
5	Career center	Information technology	36	15.0
		Other	42	17.5
		Director of the department	48	20.0
		Accountant	60	25.0
		Auditor	27	11.3
6	Years of experience	Chief of accounts	18	7.5
		Other	87	36.3
		Less than 5 years	33	13.8
		From 5-10 years	66	27.5
		From 11-15 years	63	26.3
		From 16-20 years old	33	13.8
		21 Years and over	45	18.8

Table 1 displays various demographics of the study participants. It indicates that 41% of the sample were aged between 36 and 45, 44% held bachelor's degrees, and 34% had master's degrees, reflecting their educational qualifications. Furthermore, 34% possessed professional credentials. In terms of academic backgrounds, 43% specialized in accounting. Additionally, 25% held accountant positions, while 28% had between five and ten years of experience, with some respondents having up to 15 years of experience.

4.2. Reliability and validity test

The research's performance was given to four arbitrators for verification of apparent honesty (Alnor et al., 2023; Benzerrouk et al., 2023), and Cronbach's alpha coefficient was determined for each field of study, as shown in Table 2, to determine the stability of the study.

Table 2 shows that the reliability coefficient of the overall tool is (0.895), which is quite high in comparison to the acceptable percentage of (0.6) or

higher needed to generalize the study's findings to human and social sciences.

4.3. Descriptive analysis

A descriptive analysis of the concept is given in Table 3. Support and delivery had the highest mean (4.65) and the lowest standard deviation (0.50), according to statistics. Nonetheless, monitoring and evaluation had the lowest mean (4.28) and largest standard deviation (0.88) compared to all other groups.

4.4. Correlation analysis

According to Hair et al., a significant collinearity issue is shown by the correlation coefficients study, which reveals statistical correlation matrix coefficients of 0.90 or higher. There was no multicollinearity issue since all correlations in Table 4 were less than 0.900, and none of the model's variable correlations surpassed 0.90.

Table 2: Results of the reliability test of the study tool (internal consistency of the questionnaire statements)

Cronbach's alpha	Cronbach's alpha based on standardized items	No. of items
.930	0.933	5

Table 3: Result of descriptive analysis

Variable	Range	Minimum	Maximum	Mean	Std. deviation	Variance
Ai	3.00	2.00	5.00	4.54	0.71	0.50
Bi	4.00	1.00	5.00	4.52	0.78	0.61
Ci	3.00	2.00	5.00	4.65	0.70	0.50
Di	3.00	2.00	5.00	4.28	0.94	0.88
COBIT (5)	3.00	2.00	5.00	4.44	0.78	0.61
Valid N (listwise)						

Table 4: Result of correlations analysis

Variable	1	2	3	4	5
Ai (1)	1.000				
Bi (2)	0.695**	1.000			
Ci (3)	0.720**	0.740**	1.000		
Di (4)	0.729**	0.718**	0.691**	1.000	
COBIT5 (5)	0.748**	0.751**	0.789**	0.792**	1.000

** : Correlation is significant at the 0.01 level (2-tailed)

5. Discussion

This section concentrates on the regression analysis results that show that planning and organization have a positive and significant link with bank performance, as shown in Table 5. Furthermore, installations and acquisitions have a significant impact on bank performance. These

results were similar to those reported by Dewi et al. (2021). Help, delivery, and bank performance also have positive and substantial associations. Similar results were reported by Wamba et al. (2015). Monitoring, evaluation, and bank performance are strongly and favorably correlated. Similar results were reported by Amin et al. (2023).

Table 5: Result of multiple regression

Variable	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std. error	Beta		
Ai	0.174	0.058	0.158	2.990	0.003
Bi	0.159	0.053	0.159	2.982	0.003
Ci	0.358	0.059	0.323	6.066	0.000
Di	0.282	0.044	0.339	6.469	0.000
R square	0.761				
Adjusted R square	0.757				
F	187.005	0.000			

Implementing the findings of the impact of information technology governance based on the COBIT framework in the banking sector involves

aligning IT with business objectives, managing risks, measuring performance, optimizing resources, engaging stakeholders, fostering continuous

improvement, investing in training, and enhancing cybersecurity measures. These actions collectively strengthen IT governance, leading to improved performance in the banking sector.

Evaluating how IT governance, particularly within the COBIT framework, influences organizational performance requires considering a range of qualitative insights. These include alignment with corporate goals, risk management, resource optimization, decision-making, accountability, performance monitoring, IT culture and leadership, and cybersecurity resilience. Organizations can gain a comprehensive understanding of the impact of IT governance according to COBIT on their performance by examining these qualitative insights. To enhance overall organizational effectiveness, thorough assessments, input from key stakeholders, and continual refinement of IT governance policies are essential.

6. Conclusion

This study aims to investigate the relationship between the performance levels of financial institutions and their adherence to information technology governance based on COBIT standards. To achieve this objective, a survey questionnaire method was used, drawing responses from employees of commercial banks and the Central Bank of Sudan. Out of 280 distributed questionnaires, 240 were returned and analyzed using SPSS software. The statistical findings revealed significant positive correlations between various aspects of bank operations and COBIT-compliant IT governance, such as planning, organization, acquisition, implementation, support, delivery, monitoring, evaluation, and performance. This empirical study addresses a specific gap in Middle Eastern studies, focusing on the performance of Sudanese banks and their adherence to COBIT standards. It sheds light on financial institutions in emerging economies, particularly Sudan, and provides valuable insights for banks. Moreover, it contributes to decision-making processes within organizations.

Implementing IT governance according to the COBIT framework has the potential to significantly enhance organizational performance. COBIT provides guidelines for IT governance and management, including the establishment of governance frameworks, clarification of roles and responsibilities, alignment of IT with business goals, and management of information security.

Acknowledgment

The authors extend their appreciation to the Deanship of Scientific Research at King Khalid University for funding this work through a large group project under grant number (RGP.2/189/44).

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

- Alalwan A, Dwivedi Y, and Williams M (2014). Examining factors affecting customer intention and adoption of Internet banking in Jordan. In the UK Academy for Information Systems Conference Proceedings, 3. Available online at: <https://aisel.aisnet.org/ukais2014/3/>
- Alansari Y and Al-Sartawi AMA (2021). IT governance and e-banking in GCC listed banks. *Procedia Computer Science*, 183: 844-848. <https://doi.org/10.1016/j.procs.2021.03.008>
- Al-Fatlawi QA, Al Farttoosi DS, and Almagtome AH (2021). Accounting information security and IT governance under COBIT 5 framework: A case study. *Webology*, 18(Special Issue on Information Retrieval and Web Search): 294-310. <https://doi.org/10.14704/WEB/V18SI02/WEB18073>
- Al-Hibari AA and Al-Matari EM (2019). Role of time-driven resource-consumption accounting in strategic cost reduction and support of supply chain management. *International Journal of Supply Chain Management*, 8(2): 771-783.
- Ali M, Hameedi K, and Almagtome A (2019). Does sustainability reporting via accounting information system influence the investment decisions in Iraq. *International Journal of Innovation, Creativity and Change*, 9(9): 294-312.
- Alnor NHA, Al-Matari EM, Mohmed TEB, Berradia HM, Mohamed AME, and Benzerrouk ZS (2023). The effect of developing human capabilities on the company's performance through developing the company's capabilities. *WSEAS Transactions on Business and Economics*, 21: 95-108. <https://doi.org/10.37394/23207.2024.21.9>
- Al-Qatamin AA, and Al-Omari MH (2020). A study of the effect of information technology governance on quality of information technology services: The case of Jordan Customs Department. *Review of Integrative Business and Economics Research*, 9: 41-55.
- Amali LN, Katili MR, and Suhada S (2023). Core model of information technology governance system design in local government. *Telecommunication Computing Electronics and Control*, 21(4): 750-761. <https://doi.org/10.12928/telkomnika.v21i4.24287>
- Amin H, Scheepers H, and Malik M (2023). Project monitoring and evaluation to engage stakeholders of international development projects for community impact. *International Journal of Managing Projects in Business*, 16(2): 405-427. <https://doi.org/10.1108/IJMPB-02-2022-0043>
- Andry JF (2016). Performance measurement of information technology governance: A case study. *Jurnal Sistem Informasi*, 12(2): 56-62. <https://doi.org/10.21609/jsi.v12i2.477>
- Andry JF and Hartono H (2017). Performance measurement of IT based on COBIT assessment: A case study. *Jurnal Sistem Informasi Indonesia*, 2(1): 1-13.
- Andry JF and Setiawan AK (2019). IT governance evaluation using COBIT 5 framework on the national library. *Jurnal Sistem Informasi*, 15(1): 10-17. <https://doi.org/10.21609/jsi.v15i1.790>
- Awawad B and El Khoury R (2021). Information technology governance and bank performance: Evidence from Palestine. *Journal of Decision Systems*, 33(2): 311-334. <https://doi.org/10.1080/12460125.2021.2005860>

- Benzerrouk ZS, Alnor NHA, Al-Matari EM, Alhebri A, and Al-Bukhrani MA (2023). The effect of the banking supervision on anti-money laundering. *Humanities and Social Sciences Letters*, 11(4): 399-415. <https://doi.org/10.18488/73.v11i4.3518>
- Bierstaker JL, Burnaby P, and Thibodeau J (2001). The impact of information technology on the audit process: An assessment of the state of the art and implications for the future. *Managerial Auditing Journal*, 16(3): 159-164. <https://doi.org/10.1108/02686900110385489>
- Callistus T and Clinton A (2018). The role of monitoring and evaluation in construction project management. In the *Intelligent Human Systems Integration: Proceedings of the 1st International Conference on Intelligent Human Systems Integration: Integrating People and Intelligent Systems*, Springer International Publishing, Dubai, UAE: 571-582. https://doi.org/10.1007/978-3-319-73888-8_89
- Christianto K, Honni JG, Ferdinal R, and Hendrawan TF (2022). Audit of finance application using COBIT 5 framework (case study in banking). *International Journal of Engineering and Information Systems*, 6(6): 77-88.
- Danutirta AS, Hariadhy RP, and Lubis M (2022). Evaluating IT governance implementation in the plantation company using COBIT 5 framework DSS01 domain. In the *Proceedings of the 6th International Conference on E-Commerce, E-Business and E-Government*, Association for Computing Machinery, Plymouth, UK: 91-95. <https://doi.org/10.1145/3537693.3537752>
- Dewi PM, Fauzi R, and Mulyana R (2021). Perancangan tata kelola teknologi informasi untuk transformasi digital di industri perbankan menggunakan framework COBIT 2019 dengan domain build, acquire and implement: Studi kasus bank xyz. *eProceedings of Engineering*, 8(5): 9672-9683.
- Erniwati S and Hikmawati NK (2015). An analysis of information technology on data processing by using COBIT framework. *International Journal of Advanced Computer Science and Applications*, 6(9): 151-157. <https://doi.org/10.14569/IJACSA.2015.060920>
- Fu Q, Abdul Rahman AA, Jiang H, Abbas J, and Comite U (2022). Sustainable supply chain and business performance: The impact of strategy, network design, information systems, and organizational structure. *Sustainability*, 14(3): 1080. <https://doi.org/10.3390/su14031080>
- Harahap AM and Ikhwan A (2023). Implementation of information technology governance in man 1 medan using the COBIT 5 framework. *Sinkron: Jurnal Dan Penelitian Teknik Informatika*, 8(1): 241-246. <https://doi.org/10.33395/sinkron.v8i1.11936>
- Hardy G (2006). Using IT governance and COBIT to deliver value with IT and respond to legal, regulatory and compliance challenges. *Information Security Technical Report*, 11(1): 55-61. <https://doi.org/10.1016/j.istr.2005.12.004>
- Houcine B, Kerroumia M, Abdelkader A, Ibrahim TKT, Alnor NHA, and Berradia H (2023). Analysis of the relationship between domestic savings and domestic investment in Saudi Arabia. *WSEAS Transactions on Business and Economics*, 20: 2077-2088. <https://doi.org/10.37394/23207.2023.20.181>
- Joshi A, Benitez J, Huygh T, Ruiz L, and De Haes S (2022). Impact of IT governance process capability on business performance: Theory and empirical evidence. *Decision Support Systems*, 153: 113668. <https://doi.org/10.1016/j.dss.2021.113668>
- Joshi A, Bollen L, and Hassink H (2013). An empirical assessment of IT governance transparency: Evidence from commercial banking. *Information Systems Management*, 30(2): 116-136. <https://doi.org/10.1080/10580530.2013.773805>
- Karjaluoto H, Mattila M, and Pentto T (2002). Factors underlying attitude formation towards online banking in Finland. *International Journal of Bank Marketing*, 20(6): 261-272. <https://doi.org/10.1108/02652320210446724>
- Kurniadi Y and Adhariani D (2022). Evaluation of information technology governance through the COBIT 5 framework approach: Case study at PT bank ABC post-merger. *Budapest International Research and Critics Institute-Journal*, 5(2): 14331-14340. <https://doi.org/10.33258/birci.v5i2.5299>
- Lunardi GL, Becker JL, Maçada ACG, and Dolci PC (2014). The impact of adopting IT governance on financial performance: An empirical analysis among Brazilian firms. *International Journal of Accounting Information Systems*, 15(1): 66-81. <https://doi.org/10.1016/j.accinf.2013.02.001>
- Maizlish B and Handler R (2005). *IT (information technology) portfolio management step-by-step: Unlocking the business value of technology*. John Wiley and Sons, Hoboken, USA.
- Maryska M, Doucek P, and Nedomova L (2015). Corporate informatics and strategic management. *Procedia Economics and Finance*, 26: 651-656. [https://doi.org/10.1016/S2212-5671\(15\)00806-0](https://doi.org/10.1016/S2212-5671(15)00806-0)
- Mohamud FI (2023). Monitoring and evaluation practice and performance of health projects in Isiolo County, Kenya. *International Journal of Social Sciences Management and Entrepreneurship*, 6(2): 278-287.
- Naim AB, Wibawa AS, Yude AK, Akbar BK, Rahmadani VS, Shihab MR, and Ranti B (2022). Changes in IT governance and its impact on organizational business process: Case study at Indonesia supreme audit institution (BPK). *Procedia Computer Science*, 197: 734-742. <https://doi.org/10.1016/j.procs.2021.12.195>
- Okour S (2019). The impact of the application of it governance according to (COBIT 5) framework in reduce cloud computing risks. *Modern Applied Science*, 13(7): 25-37. <https://doi.org/10.5539/mas.v13n7p25>
- Onyimbo BG (2018). *Strategic planning, competitive advantage and performance at equity bank*. Ph.D. Dissertation, University of Nairobi, Nairobi, Kenya.
- Otieno FAO (2019). The roles of monitoring and evaluation in projects. *Project Management Scientific Journal*, 1(5): 41-44.
- Panetta IC, Leo S, Santoboni F, and Vento G (2017). IT governance in the banking sector: Evidence from Italy, Germany, France and Spain. *Economic Review: Journal of Economics and Business*, 15(2): 63-76.
- Patón-Romero JD, Baldassarre MT, Piattini M, and Garcia Rodriguez de Guzman I (2017). A governance and management framework for green IT. *Sustainability*, 9(10): 1761. <https://doi.org/10.3390/su9101761>
- Putri MA, Aknuranda I, and Mahmudy WF (2017). Maturity evaluation of information technology governance in PT DEF using COBIT 5 Framework. *Journal of Information Technology and Computer Science*, 2(1): 19-27. <https://doi.org/10.25126/jitecs.201712123>
- Raimondo E (2016). What difference does good monitoring and evaluation make to World Bank project performance? *Policy Research Working Paper 7726*, World Bank Group, Washington D.C., USA. <https://doi.org/10.1596/1813-9450-7726>
- Sallé M (2004). *IT service management and IT governance: Review, comparative analysis and their impact on utility computing*. Hewlett-Packard Company, Palo Alto, USA: 8-17.
- Setiawan J and Fianty MI (2023). Risk assessment and recommendation strategy based on COBIT 5 for risk-A case study of an internet service provider company. *Journal of Information Systems and Informatics*, 5(1): 243-258. <https://doi.org/10.51519/journalisi.v5i1.453>
- Sukoco IW, Hermadi I, and Sasongko H (2021). Sipadu maturity level evaluation using COBIT 4.1: Case study of geospatial information agency. *Jurnal Aplikasi Bisnis Dan Manajemen*, 7(1): 179-179. <https://doi.org/10.17358/jabm.7.1.179>
- Susanti RY and Suchahyo YG (2016). Information technology governance evaluation and processes improvement

- prioritization based on COBIT 5 framework at Secretariat General of the Indonesian House of Representatives. In the 2016 4th International Conference on Information and Communication Technology, IEEE, Bandung, Indonesia: 1-6. <https://doi.org/10.1109/ICoICT.2016.7571906>
- Symons C (2005). IT governance framework. Forrester Research. Cambridge, USA.
- Talab HR and Flayyih HH (2023). An empirical study to measure the impact of information technology governance under the control objectives for information and related technologies on financial performance. International Journal of Professional Business Review, 8(4): e01852. <https://doi.org/10.26668/businessreview/2023.v8i4.1382>
- Umam C, Mahmud W, Hidajat MS, and Setiarso I (2023). Information technology management governance analysis using COBIT 5 (case study at Universitas Dian Nuswantoro-PSDKU Kediri). Jurnal Sains, Teknologi dan Informatika, 10(2): 193-202. <https://doi.org/10.37373/tekno.v10i2.469>
- Wamba SF, Akter S, Edwards A, Chopin G, and Gnanzou D (2015). How 'big data' can make big impact: Findings from a systematic review and a longitudinal case study. International Journal of Production Economics, 165: 234-246. <https://doi.org/10.1016/j.ijpe.2014.12.031>
- Zeithaml VA (2000). Service quality, profitability, and the economic worth of customers: What we know and what we need to learn. Journal of the Academy of Marketing Science, 28: 67-85. <https://doi.org/10.1177/0092070300281007>