

-RESEARCH ARTICLE-

## INTEGRATION BETWEEN COBIT AND COSO FOR INTERNAL CONTROL AND ITS REFLECTION ON AUDITING RISK WITH CORPORATE GOVERNANCE AS THE MEDIATING VARIABLE

**Zeina Khdier Abass**

Department of Accounting, College of Administration and Economics, Mustansiriyah University, Iraq  
Email: [zeinaaali1971@uomustansiriyah.edu.iq](mailto:zeinaaali1971@uomustansiriyah.edu.iq)  
<https://orcid.org/0000-0002-5636-5047>

**Thamer Kadhim Al-Abedi**

Department of Accounting, College of Administration and Economics, Mustansiriyah University, Iraq  
Email: [thamer\\_kadhim@uomustansiriyah.edu.iq](mailto:thamer_kadhim@uomustansiriyah.edu.iq)  
<https://orcid.org/0000-0002-6903-7528>

**Hakeem Hammood Flayyih**

Department of Financial and Banking Sciences, College of Administration and Economics, University of Baghdad, Iraq  
Email: [hakeem.hmood@coadec.uobaghdad.edu.iq](mailto:hakeem.hmood@coadec.uobaghdad.edu.iq)  
<https://orcid.org/0000-0003-0615-0854>

### —Abstract—

The objective of the study was to assess the influence of the integration of information technology governance under the Control Objectives for Information and Related Technologies (COBIT) framework and internal control frameworks under the Committee of Sponsoring Organisations (COSO) framework on corporate governance (CG) and audit risk (AR). The study variables were measured with instruments created by previous authors. Thirty Iraqi banks listed on the Iraq Stock Exchange were chosen for 2019 through 2022. The study's findings support those of previous research. The

Citation (APA): Abass, Z. K., Al-Abedi, T. K., Flayyih, H. H. (2023). Integration Between Cobit and Coso for Internal Control and Its Reflection on Auditing Risk with Corporate Governance as The Mediating Variable. *International Journal of Economics and Finance Studies*, 15 (02), 40-58. doi:10.34111/ijefs. 202315203

study found that COBIT has actively contributed to supporting various banking activities and augmenting their efficacy through electronic devices and the prompt delivery of services. Integration of COBIT and COSO had a significant and positive effect on governance and audit readiness. The findings of this study demonstrate the significance of regulatory frameworks in enhancing banking performance.

**Keywords:** COSO, COBIT, corporate governance, audit risk

## 1. INTRODUCTION

It has been observed that irresponsible risk-taking and culture have emerged as significant concerns with the rise of corporate governance issues, and this has ensured that the organization's directors are not the final link in the chain of information (Yeoh, 2019). In addition, Abdulhussein et al. (2023) found that in recent years, as a result of an increase in business scandals and organizational complexities, the scope of internal auditing has been expanded, and it is essential for this as it contributes to corporate governance and enterprise risk management in an organization. In addition, the global financial crisis has exacerbated economic issues for enterprises worldwide (Al-Tae & Flayyih, 2023). It also demonstrates that improper and inadequate risk management can affect any jurisdiction or industry (Oakman et al., 2020). All businesses must create a policy with a comprehensive understanding of risk and develop an appropriate set of operating processes necessary to react and respond to shifting situations and circumstances promptly.

The audit literature (Nikolovski et al., 2016) has identified three risks that auditors confront. Errors and omissions in extremely complex transactions documented using judgment or guesswork are the primary source of inherent risk. Control deficiencies within the organization do not affect this audit risk (AR). Financial statement misrepresentation due to variables other than control defects poses an inherent risk (Taylor, 2000). Control AR refers to the probability of financial statement inaccuracies due to a lack of relevant controls or the failing of internal controls within an organization. The risk is high in situations with insufficient controls to detect or prevent fraudulent activity or errors (Bentley-Goode et al., 2017). According to Balfe et al. (2023), detection risk arises when auditors cannot detect or fail to identify misstatements in financial statements due to errors or illicit activities. This can occur when the auditing firm's procedures are insufficient to detect material misstatements resulting from fraud or error in the financial statements. Typically, either sampling or non-sampling errors are responsible for detection risk.

Since implementing the framework by the Committee of Sponsoring Organizations (COSO) in 1992, the internal auditing function has endured significant changes. In contrast to traditional theories that focused solely on financial controls, the COSO framework offered a comprehensive approach that included hard and soft controls, such as employee competence and professionalism (Abdulakareem & Mohammed, 2020). By

employing this alternative methodology, internal auditors can identify fundamental systemic causes, prevent the attribution of blame, and identify viable solutions. Auditors must comprehend COSO, evaluate the strengths and weaknesses of controls, define significant issues and reportable conditions, verify testimonial evidence, conclude with a final assessment, and identify corrective actions (Simmons, 1997).

According to Roussy et al. (2020), an effective internal control system necessitates a thorough comprehension and accurate identification of the various control dimensions and their significance in achieving the organization's objectives. According to Felo et al. (2023), the "tone at the top" is a COSO framework's control environment component. This is an integrated control framework that conceptualizes an effective internal control system. COSO serves as a foundational basis for the improvement of mutual understanding between the relevant stakeholders of the business because it provides them with a common language that facilitates effective communication and flow of information; consequently, it aids the business in efficiently achieving its goals (Bozoklar et al., 2020).

According to Cereola et al. (2011), internal control frameworks are the basis for comprehending and evaluating the effectiveness of organizational controls. Therefore, introducing the COSO of the Treadway Commission's internal control framework in 1992 was an important occasion for the internal auditing community. The COSO framework provided a comprehensive approach to internal control evaluation and administration, enabling auditors to make informed judgments about the effectiveness of internal controls. Implementing the COSO internal control framework 1992 provided management with a unified method for assessing internal control systems, incorporating five distinct control components. (Janvrin et al., 2012; Martin et al., 2014). These components include the control environment, risk assessment, control activities, information and communication, and monitoring. The introduction of the COSO internal control framework represented the first significant effort to formalize the definition of internal control and establish a measurement standard for it. The passage of the Sarbanes-Oxley Act (SOX), specifically section 404, a decade later further emphasized the importance of internal control. The law required organizations to establish and maintain internal controls for financial reporting, and managers and external auditors were required to evaluate and report on the effectiveness of internal control. According to D'Aquila (2013), this legislation is a significant step toward improving the quality and reliability of financial reporting in organizations. Since the implementation of the Sarbanes-Oxley Act (SOX) of 2002, public accounting firms and publicly traded corporations have placed a substantial emphasis on internal controls (Talab et al., 2023). Consequently, accounting graduates may be responsible for evaluating, documenting, and potentially verifying the adequacy of an organization's internal control framework. Internal Control-Integrated Framework by the Committee of Sponsoring Organizations COSO, 1992 is the most frequently used tool (Savage et al., 2008). The COSO concept

emphasizes that auditors must comprehend and implement the internal control framework to aid management in carrying out its responsibilities.

According to (Aksoy et al., 2020), the internal control of COSO is a comprehensive process that has been effected by an entity of the company's management, board of directors, and other authorized personnel, in the achievement of a specific objective such as bringing efficiency and effectiveness to the organization's operations, enhancing the reliability of the firm's financial operations, and improving financial reporting. COSO is compliant with all applicable laws and regulations. In addition, Rae et al. (2017) outlined five interdependent COSO components. The Control environment, which is the environment in which COSO operates, is the first component. It comprises "the philosophy and operating style of management," "the structure of the organization," "authorities and responsibilities," and "human resource policies and practices" (Rae et al., 2017). The second component is risk assessment, which addresses several compliance, operational, and financial organizational objectives, identifies the primary success factors, analyzes and identifies risk, and effectively manages change (Rae et al., 2017). The third element consists of control activities. The control activities emphasize all the activities that aid in identifying the directives of the company's management as crucial to addressing potential hazards. COSO has paid attention to the various categories of control measures and the integration and indicators of risk assessments (Rae et al., 2017). Information and communication is the fourth component; it is one of the most important components because it entails communicating external and internal information and capturing and identifying information for attaining the organization's objectives (Rae et al., 2017). Monitoring represents the fifth and final element. The process evaluates the internal control system and performance quality over a specified period using distinct evaluations and ongoing activities. (Rae et al., 2017) Monitoring aspects include the objective of leading corrective measures and actions, the reporting of deficiencies, the plan of action, the documentation of the involved controls and systems, the applied methodologies, the evaluation process, and, lastly, the designation of the evaluator.

In this context, Rae et al. (2017) analyzed a correlation between the five components of the COSO framework to determine their effect on corporate governance. The research reveals a direct correlation between communication and information and the control environment. Contact and information also directly and significantly relate to control activity procedures, policy, and risk assessment. Rae et al. (2017) propose that an organization's control activity procedures and policies must be monitored and evaluated to ensure their continued relevance and conformance. In addition, the principal alternative to structural equation modeling facilitates the connection between information and communication, risk assessment, and the control environment. In addition, structural equation modeling supports the notion of an inverse relationship

between communicational and informational components and monitoring. (Rae et al., 2017).

According to COSO, internal control is a systematic process designed to provide reasonable assurance of achieving organizational objectives, especially those relating to the reliability of financial reporting, compliance with legal and regulatory requirements, and the efficacy and efficiency of operations. In addition, the execution of COSO's five internal control framework components is the responsibility of management. COSO presents these components as a pyramid, with the control environment at the base, risk assessment, and control activities on the next level, information and communication near the top, and monitoring at the apex (Hubbard, 2003).

Using the COSO framework, Thabit et al. (2017) assessed the efficacy of the internal control system in Kurdistan, northern Iraq, and businesses. The study demonstrated a disparity between the internal control systems of companies in Kurdistan and the requirements of the COSO framework. The research suggested that Kurdish enterprises improve their internal control systems per international standards to implement the COSO framework effectively. According to Hopkin (2018), risk assessment, as defined by COSO, is the analysis and identification of risks associated with attaining the objectives and goals of the organization by establishing a basis for how they could manage the risk.

Adopting information technology (IT) is crucial to achieving a competitive advantage in strategic management. Numerous businesses have allocated substantial resources to IT investments, believing that these investments will improve company performance and productivity. The banking industry prioritizes incorporating IT to enhance its performance, especially in facilitating financial services as an intermediary. (Muawanah, 2020) Researchers have shown considerable interest in examining the critical role of IT in enhancing organizational performance. IT governance (ITG) is the organizational process of ensuring that the investment in IT enables the achievement of strategic and tactical objectives.

ITG is also a component of corporate governance (CG) that focuses on the function that IT plays within an organization. There are numerous significant aspects of ITG, with the design of decision-making authority and organizational structure being the most important. Debrecey (2013) discussed various aspects of ITG, including the function of governing bodies such as the board of directors in supervising and directing IT. The author emphasized the significance of designing ITG's decision rights and organizational structures and posed questions about the roles and responsibilities undertaken by the governing body versus senior and operational management. In addition, the article discusses how IT should be structured within an organization and whether it should be distributed predominantly to operational or administrative units.

## 2. LITERATURE REVIEW

The auditing literature review centered on internal control and the failings observed over years of practical experience with corporate failures, accounting, and auditing. These disasters have emphasized the need for a more comprehensive view of control systems. In the past, evaluating the efficacy of an economic unit's control systems in detecting and preventing errors and fraud in financial statements lacked frameworks and standards. This circumstance necessitated a broader understanding of control systems. However, the COSO framework has filled this void by providing a set of standards for evaluating the efficacy of internal control. This framework permits an estimated evaluation of the control system efficacy of an economic unit. The COSO integrated framework for internal control is the only standard currently used in the United States to evaluate the effectiveness of internal control systems in financial reporting (Mohammed et al., 2021). Several authors have discussed the COSO conceptual framework in previous literature and found it provides guidance and clarity (Rashid et al., 2021). Separately and collectively, the components of the COSO framework have been the subject of extensive research.

In addition, some researchers have discovered a correlation between control activities and monitoring. However, very little research has been found that employs rigorous statistical analysis to examine all five components of the COSO framework. According to Braim et al. (2023), the COSO framework illustrates the organization-wide application of an internal control system.

Rubino et al. (2014a)'s research objective was to demonstrate how ITG facilitates the enterprise risk management process. The study describes how the incorporation and support of the COSO for Enterprise Risk Management (COSO ERM) framework by the COBIT framework enables a company to accomplish its goals. The study's findings disclosed inconsistencies in the COSO ERM and demonstrated how the COBIT framework could aid in developing an effective internal control system. In addition, Rubino et al. (2017) sought to determine the impact of the ITG framework COBIT on the control environment and internal control system. They analyzed how the COBIT framework affected the control environment and internal control system. In particular, the study demonstrated how the structure and processes of COBIT affect the seven categories of control environmental factors. The findings indicated that implementing the COBIT framework provides managers and auditors with valuable guidance for implementing or evaluating internal control systems.

Seven factors of the control environment component of the COSO have been identified by Lamboglia et al. (2021) through a research study. This component provides the foundation for the remaining four framework components. The main components provide communication and information flow with moral guidance. For example, human resource practices and policies follow an organization's behavioral guidelines and code

of conduct (Al-Swidi et al., 2021). Consequently, the environment of control may also be viewed as an ethical conduct and environment. Rae et al. (2017) investigated the connections between the COSO framework's components and their influence on the monitoring function of organizations. The study concentrates on the five components of an effective internal control system, as defined by the COSO framework 1992, which have been recognized as crucial to ensuring the quality of CG. The findings suggest that organizations can improve their CG practices by better comprehending the interrelationships between COSO components, thereby achieving their operational, financial reporting, and compliance objectives. Ettish et al. (2017) analyzed and proposed methods for integrating multiple internal control frameworks to accomplish effective corporate ITG. According to the current IT security and governance literature, singular or multiple non-integrated frameworks are ineffective. In light of this, the study employs a deductive methodology, draws on existing literature, and concentrates on three well-known internal control frameworks (ERM, COSO, and COBIT5) to propose an integrated framework that could aid organizations in achieving ITG more effectively and efficiently.

An integrated framework is a system that links significant control objectives to strategic business goals, taking ITG principles into account at both the strategic and operational levels. This framework ensures that IT and business management share a common understanding of the essential risk areas representing the organization's objectives. The research indicates that implementing an integrated framework can eliminate redundant controls and processes, enhancing ITG. The congruence of the framework with the organization's objectives is crucial to achieving this result. The authors suggested that businesses interested in improving their ITG adopt the proposed integrated framework (Rubino et al., 2014b).

According to (Ha, 2019), after the most recent global financial crisis, Europe and the United States were confronted with numerous bankruptcies, corporate controversies, and significant evidence of inadequate audit, accounting, and risk management systems. In addition, the study suggests that corporate governance is a requirement for stock markets. In this regard, Manita et al. (2020) conducted a study that concluded that using advanced technology and digitalization has enhanced the quality of auditing, the overall audit system, and its role in the corporate governance mechanism. With the aid of big data, auditing can now transition from a sampling method to a global analysis. Manita et al. (2020) have also recommended that auditors concentrate on data analysis rather than data collection. This study's findings indicate that advanced technologies have aided auditors in conducting efficient and timely audits, and the researcher suggests revising the traditional auditing methods and standards.

Muawanah (2020) analyzed the effect of CG on the efficacy of IT adoption in business performance. The study measured IT adoption using two indicators: organizational expenditures on IT and the level of IT administration within the organization. According

to the findings, a company's performance can be enhanced by implementing better CG practices, which include IT guidance and supervision. [Almaqtari et al. \(2023\)](#) assessed the role of ITG as an intermediary between CG mechanisms and business continuity, as well as transparency and disclosure, during the COVID-19 pandemic in Jordan. Without the mediating effect of ITG during the pandemic, the impact of CG mechanisms on business continuity, transparency, and disclosure is diminished.

[Dat et al. \(2020\)](#) analyzed the impact of corporate governance in the information and technology industry within the context of China in a related study. According to this study, all relevant stakeholders, including shareholders, employees, supervisors, and directors, should fulfill their roles and responsibilities to improve corporate governance. Moreover, [Al-Gamrh et al. \(2018\)](#) discovered a positive relationship between corporate governance and accounting performance. This study's findings also indicate that corporate governance negatively affects an organization's economic performance. In normal times, corporate governance can mitigate the negative effects of risk and leverage on an organization's financial and accounting performance, according to the authors. In this regard, [Dina et al. \(2020\)](#) have identified an active need for proactive corporate governance in a business, especially for enhancing financial performance. In this study, the researcher has utilized a meta-analysis to reconcile the research findings and implement alternative theoretical approaches that go beyond the agency theory when considering the development of a convergence agenda for corporate governance.

The most comprehensive component of the CG structure, CG is a beneficial starting point. It involves the board of directors delegating, directing, and supervising management to attain the organization's objectives. In contrast, AR, closely related to CG, is the process by which management identifies and addresses uncertainties (including risks and opportunities) that could impact the organization's ability to achieve its goals. Control is an essential aspect of AR and entails the administration's actions to reduce risks to an acceptable level. All three processes are geared toward achieving the organization's goals. The board of directors is responsible for conducting the CG process, whereas the administration is responsible for conducting the AR and control processes. Board and administration support is required to implement CG, AR, and control processes effectively. Organizations cannot achieve sustained success in attaining their goals without effective AR, control, and CG processes. Therefore, the board of directors and administration rely on one another to successfully implement CG, AR, and control processes.

According to [Amali et al. \(2020\)](#), the information and technology sector has advanced significantly in the current competitive era, and advanced technology has significantly shaped and reshaped enterprises. Organizations are presently advancing in developing and exploiting technology to advance good corporate governance, also known as IT governance. The lack of resources and exhaustive requirements for using and analyzing it can hinder the development of corporate governance and the achievement of

organizational objectives. In this regard, [Amali et al. \(2020\)](#) have utilized a combat model for assessing and identifying the majority level after IT firms and the industry have provided their services. The study has focused on the IT industry's support service and delivery sector. In this study, the researcher acquired research data through documentation observation and a survey questionnaire, and the study results indicate that Level 3 is the predominant service level in the IT service industry. The COBIT Framework is extensively used to evaluate the service level of Information and technology organizations and industries. According to research conducted by [Amali et al. \(2020\)](#) and [Wagire et al. \(2021\)](#), determining the maturity level of an IT organization serves as a benchmark and aids in expanding and enhancing its services. Recent updates were made to the COBIT framework in 2019. This updated model yields effective results promptly. It also modifies the model's content and structure by introducing numerous new features and updating the existing ones, such as the design factors that enable dealing with the governance system and promoting better corporate governance; numerous other features have also been introduced and updated ([Steuperaert, 2019](#)).

The auditing literature review has focused on internal control and the failures over several decades in various areas, including company and accounting and auditing failures. These failures have demonstrated the need for a deeper comprehension of control systems. After decades of practical experience with failures in these areas, the auditing literature has identified the absence of frameworks or standards for evaluating the effectiveness of economic units in monitoring risks associated with financial statement errors and preventing fraud as a crucial issue. The COSO framework addresses the failures related to internal control systems by providing a set of standards for evaluating the efficacy of internal control. In the United States, the integrated framework of the Committee of Sponsoring Organizations (COSO) is the sole standard for assessing Internal Control over Financial Reporting (ICFR). The researcher has therefore formulated ten research hypotheses based on a comprehensive review of the literature concerning the observed variables of the study.

H1: COBIT has a positive effect on CG.

H2: COBIT has a positive effect on AR.

H3: CG has a positive effect on AR.

H4: The integration of COBIT has a positive effect on AR under CG.

H5: COSO has a positive effect on CG.

H6: COSO has a positive effect on AR.

H7: The integration of COSO has a positive effect on AR under CG.

H8: The integration of COBIT and COSO positively affects CG.

H9: The integration of COBIT and COSO positively affects AR.

H10: The integration of COBIT and COSO positively affects AR under CG.

### 3. METHODOLOGY

These sections discuss the methods utilized in the current study, the sample size, and the observed variables. Finally, the theoretical framework or model of the research is presented.

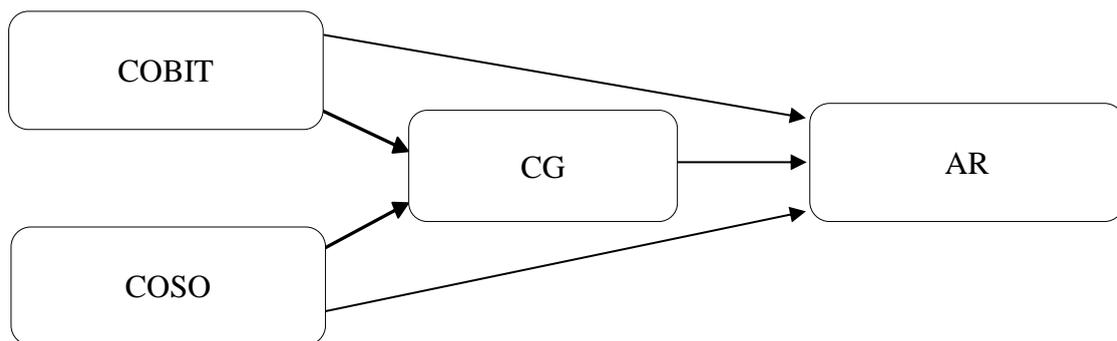
The COBIT provides several advantages, such as e-banking, which enables banking transactions using electronic devices to improve efficiency, quick service delivery promptly, simple transactions, uninterrupted information flow, detection of fraudulent practices, prompt responses, a lower error rate, and the provision of higher-quality services. The Iraqi banking system operates with all indicators set following Basel 3 and Central Bank requirements. These institutions serve as intermediaries between service providers and financial service providers. Integrating COBIT and internal control frameworks is crucial for institutions in the era of information technology. Banks must be adaptable regarding integrating COBIT and internal control frameworks in accordance with their aims and objectives for providing financial services.

### 4. SAMPLE

Per the Central Bank of Iraq's directives, Iraqi institutions have utilized COBIT methodologies since 2019. After excluding banks under guardianship and banks not applying the COBIT framework from 2019 to 2022, 30 Iraqi banks listed on the Iraq Stock Exchange were selected from a community of 44 banks. The investigation involved four variables. The first variable is the COBIT framework, which consists of five domains: planning and organizing, acquiring and implementing, delivering and supporting, and monitoring and evaluating processes.

The second variable, the COSO framework, consisted of the following five activities: environment control, risk assessment, control activities, information and communication, and monitoring. CG, the third variable, consists of five mechanisms: the extent of the board of directors, its independence from the Chief Executive Officer (CEO), the independence of its members, the audit committee, and the compensation and nominations committee. The fourth variable, AR, is defined by ISA 400 as the product of inherent, control, and detection risks. The measurement technique for each variable was chosen based on the typical dimensions.

Figure 1 illustrates the relationship between the study variables, as COBIT and COSO are independent variables, and CG and AR are approved variables.



**Figure 1.** The Model of Study

## 5. RESULTS AND DISCUSSIONS

### 5.1 Correlations Relationship

The study's results illustrate the relationship between the variables or the discriminant validity. According to the results, the heterotrait-monotrait (HTMT) ratios are high. The results demonstrated high discriminant validity and a strong correlation between variables. The results are presented in [Table 1](#).

**Table 1.** Correlations Relationship between the Variables

Correlations		COBIT	COSO	AR	CG
COBIT	Correlation	1			
	Sig.				
COSO	Correlation	0.542**	1		
	Sig.	0.000			
AR	Correlation	0.514**	0.385**	1	
	Sig.	0.000	0.000		
CG	Correlation	0.383**	0.542**	0.396**	1
	Sig.	0.000	0.000	0.000	

## 6. MEASUREMENT MODEL ASSESSMENT

### 6.1 The Measurement for the First Model Assessment

This section investigates the relationship between variables, both individually and within the proposed model, to demonstrate the model's validity in quantifying the integration of the COSO and COBIT frameworks in AR via the mediating effect of CG. [Figure 2](#) depicts the preliminary evaluation of the measurement model. The results indicate a positive correlation between adopting COSO in H1, H2, and H3 and AR in the Iraqi banking sector. In addition, the study discovered that the influence of COBIT on AR was substantially influenced by an effective GC, which also supports H4.

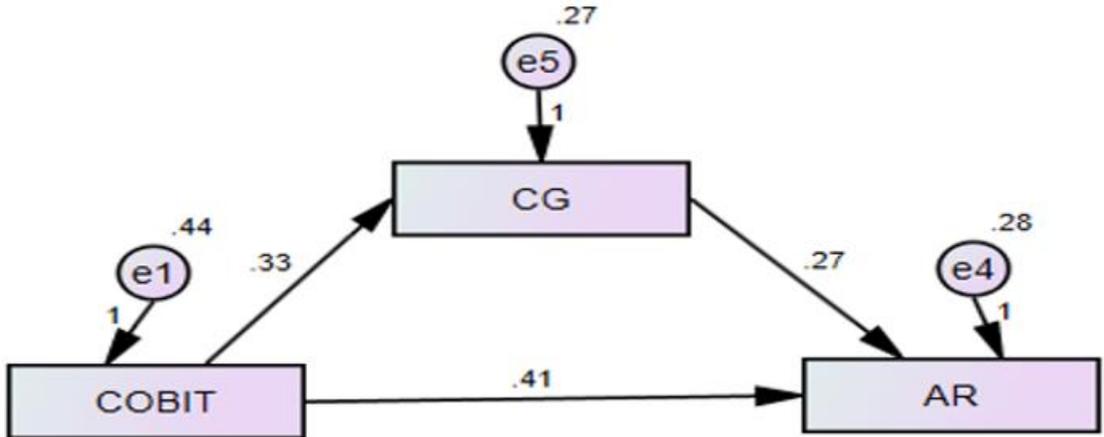


Figure 2. The Measurement of the First Model Assessment

### 6.2 The Measurement for the Second Model Assessment

The results indicated a positive correlation between COSO's compliance with H5 and H6, and AR in the Iraqi banking sector. Additionally, the study revealed that effective CG substantially mediated the effect of COSO on AR in both H7 and H7. Although COBIT had a greater impact on AR ( $: 0.41$ ) than COSO ( $: 0.23$ ), the mediation effect of CG was stronger in the second model ( $: 0.3$ ) for the relationship between the COSO framework and AR than in the first model ( $: 0.27$ ) for the relationship between the COSO framework and AR. The relationship between COBIT and CG was examined following Premuroso et al. (2007), Ho et al. (2011), and Muawanah (2020). However, the results contradict other investigations, including Muawanah (2020)'s. Al-Tae & Flayyih (2023)'s findings regarding the relationship between COBIT and CG are consistent with our own.

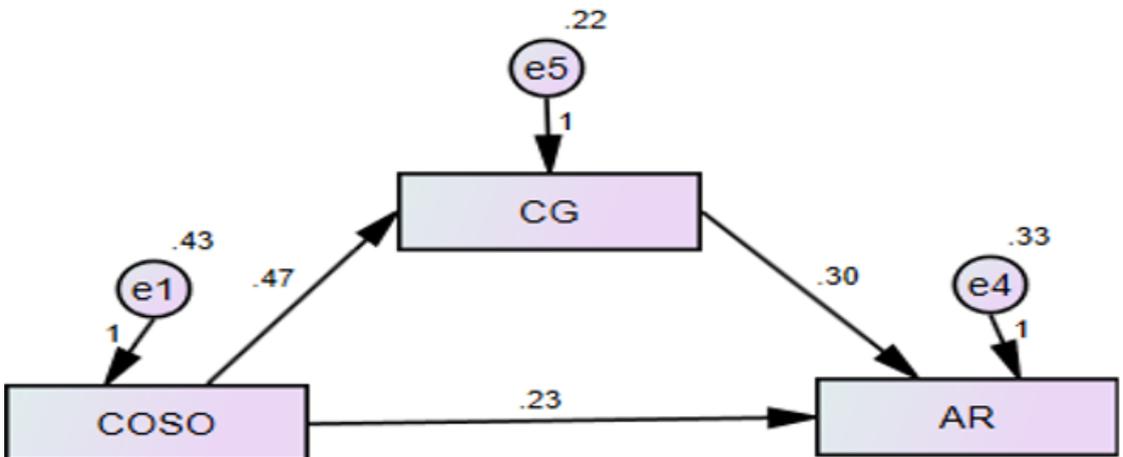


Figure 3. The Measurement for the Second Model Assessment

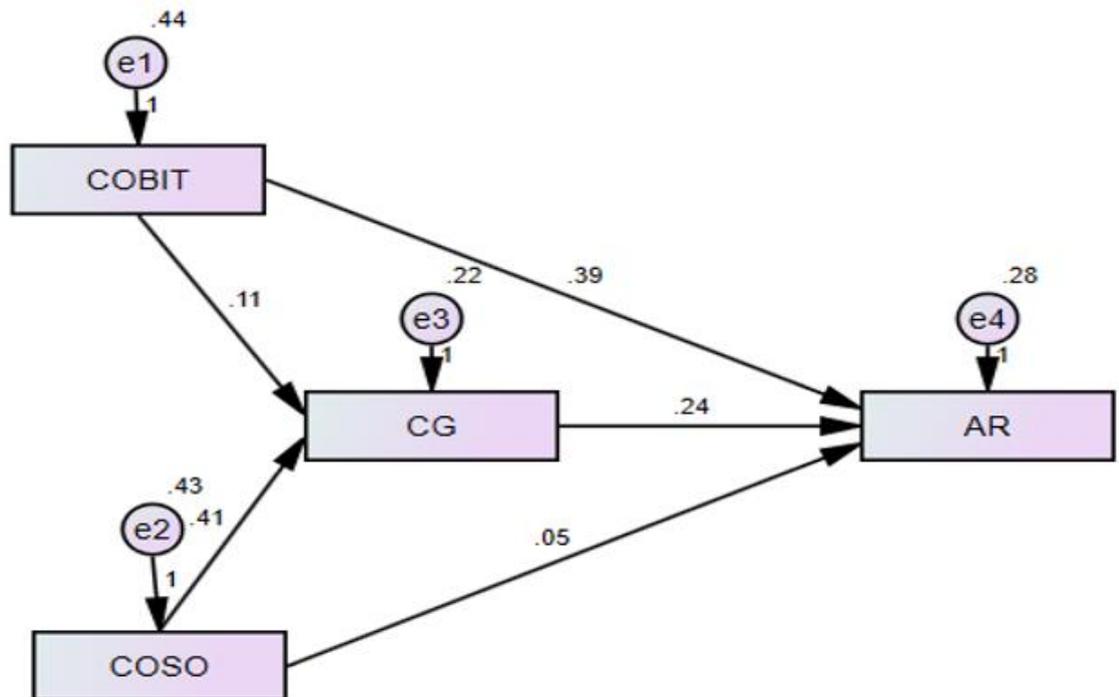
According to [Holm et al. \(2007\)](#), the observed relationship between CG and AR is consistent. Their study examined the incorporation of risk and control concepts into contemporary CG. As for the study of the relationship between the COSO framework and CG, the current study contradicts [Abdurrahman \(2021\)](#), who provided contradictory results for the relationship between internal control and CG and the company's performance.

### 6.3 The Measurement for the Third Model Assessment

Before reporting the main model analysis findings, assessing the model's goodness of fit was essential. The results of the default model's root mean square error of approximation (RMSEA) value (0.583) indicate that it was acceptable as its value falls between 0 and 1. These results are shown in [Table 2](#).

**Table 2. The Quality Measurement for the Tested Model**

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	0.583	0.452	0.727	0.000
Independence model	0.417	0.362	0.475	0.000



**Figure 4. Structural Primary Model Assessment**

[Figure 4](#) demonstrates a positive correlation between COBIT and COSO in the Iraqi banking industry in H8 and H9, and AR. In addition, the results showed that the COBIT,

COSO, and AR of the banking sector in Iraq are substantially mediated by the efficient GC, which also supports COBIT in H10. [Table 3](#) enumerates the associations.

**Table 3. The Relationship between Variables**

Relationships	F	R <sup>2</sup>	P-Value
COBIT > CG	24.3	0.38	0.000
COBIT > AR	51.06	0.51	0.000
CG > AR	26.47	0.39	0.000
COBIT > CG > AR	18.72	0.32	0.000
COSO > CG	59.12	0.29	0.000
COSO > AR	24.72	0.39	0.000
COSO > CG > AR	21.72	0.33	0.000
COBIT & COSO > CG	30.96	0.55	0.000
COBIT & COSO > AR	28.72	0.41	0.000
COBIT & COSO > CG > AR	21.22	0.56	0.000

According to the table, there were ten hypotheses in the investigation. There were seven direct hypotheses and six indirect ones. All direct hypotheses were accepted with a p-value of 0.000; therefore, they are all significant at one hundred percent. Similarly, there were three indirect mediation hypotheses, as the researcher examined the impact of mediation on corporate governance as a mediator. The statistical analysis revealed that these three hypotheses were also accepted with a p-value of 0.000; therefore, they are also statistically significant at the 100% level. Therefore, there is a mediation of CG in all models. As shown in [Table 3](#), the value of F is greater than its tabular value for all models. The results demonstrate that the independent variables affect the dependent variables. The value of R<sup>2</sup> can corroborate the magnitude of each model's effect. The values vary according to the intensity of the interactions between the independent and dependent variables. The P-value indicates that it was statistically significant across all models.

## 7. CONCLUSION

This study aimed to evaluate the effects of integrating the COSO and COBIT frameworks on CG and AR. The results pertain to the primary model test, and relationships between the variables have been demonstrated. When the independent variables were measured separately in the segmented model, the results indicated a stronger relationship between the independent and dependent variables in the primary model. These findings are especially intriguing because they suggest that Iraqi banks have not effectively utilized CG mechanisms to support the implementation of control frameworks, resulting in a lack of integration between them. Therefore, bank management and board directors must aspire for ITG and internal control department collaboration.

## REFERENCES

- Abdulhussein, A. S., Al-Refiay, H. A. N., & Wahhab, A. M. A. (2023). The Impact of Internal Auditing on Corruption: Evidence from The Emerging Market. *Journal of Governance and Regulation/Volume, 12*(1), 367-375. doi: <https://doi.org/10.22495/jgrv12i1siart15>
- Abdurrahman, A. (2021). Implementation of Internal Control Based on Coso Framework and Good Corporate Governance on Company Performance: Case Study at PT. Indonesian Sharia Reinsurance. *Jurnal Ilmiah Mahasiswa Akuntansi, 10*(1), 1-10. doi: <https://doi.org/10.33508/jima.v10i1.2779>
- Abdulakareem, N. A., & Mohammed, S. A. (2020). Extent of Iraqis oil companies commitment to implement internal control procedures in accordance to updated COSO framework (an applied study in Midland Oil Company). *journal of Economics And Administrative Sciences, 26*(124). <https://www.iasj.net/iasj/article/195867>
- Aksoy, T., & Aksoy, L. (2020). Increasing importance of internal control in the light of global developments, national and international standards and regulations. *Sayıştay Dergisi, 33*(118), 9-40. Retrieved from <https://dergipark.org.tr/en/pub/sayistay/issue/61574/919303>
- Al-Gamrh, B., Ku Ismail, K. N. I., & Al-Dhamari, R. (2018). The role of corporate governance strength in crisis and non-crisis times. *Applied Economics, 50*(58), 6263-6284. doi: <https://doi.org/10.1080/00036846.2018.1489513>
- Al-Swidi, A. K., Gelaidan, H. M., & Saleh, R. M. (2021). The joint impact of green human resource management, leadership and organizational culture on employees' green behaviour and organisational environmental performance. *Journal of Cleaner Production, 316*, 128112. doi: <https://doi.org/10.1016/j.jclepro.2021.128112>
- Al-taee, S. H. H., & Flayyih, H. H. (2022). THE IMPACT OF THE AUDIT COMMITTEE AND AUDIT TEAM CHARACTERISTICS ON THE AUDIT QUALITY: MEDIATING IMPACT OF EFFECTIVE AUDIT PROCESS. *INTERNATIONAL JOURNAL OF ECONOMICS AND FINANCE STUDIES, 13*(3), 249–263. <https://doi.org/10.34109/ijefs>
- Al-Taee, S. H. H., & Flayyih, H. H. (2023). Impact of the electronic internal auditing based on IT governance to reduce auditing risk. *Corporate Governance and Organizational Behavior Review, 7*(1), 94-100. doi: <https://doi.org/10.22495/cgobrv7i1p9>
- Almaqari, F. A., Farhan, N. H., Yahya, A. T., Al-Dalaien, B. O. A., & Shamim, M. (2023). The mediating effect of IT governance between corporate governance mechanisms, business continuity, and transparency & disclosure: An empirical study of Covid-19 Pandemic in Jordan. *Information Security Journal: A Global Perspective, 32*(1), 39-57. doi: <https://doi.org/10.1080/19393555.2022.2053001>

- Amali, L. N., Katili, M. R., Suhada, S., & Hadjaratie, L. (2020). The measurement of maturity level of information technology service based on COBIT 5 framework. *Telkomnika (Telecommunication Computing Electronics and Control)*, 18(1), 133-139. doi: <http://doi.org/10.12928/telkomnika.v18i1.10582>
- Balfe, C., Button, P., Penn, M., & Schwegman, D. J. (2023). Infrequent Identity Signals, Multiple Correspondence, and Detection Risks in Audit Correspondence Studies. *Field Methods*, 35(1), 3-17. doi: <https://doi.org/10.1177/1525822X211057623>
- Bentley-Goode, K. A., Newton, N. J., & Thompson, A. M. (2017). Business strategy, internal control over financial reporting, and audit reporting quality. *Auditing: A Journal of Practice & Theory*, 36(4), 49-69. doi: <https://doi.org/10.2308/ajpt-51693>
- Bozoklar, E., & Yilmaz, E. (2020). *Research Areas and Suggestions for Sustainable Manufacturing Systems*. Paper presented at the Industrial Engineering in the Digital Disruption Era: Selected papers from the Global Joint Conference on Industrial Engineering and Its Application Areas, GJCIE 2019, September 2-3, 2019, Gazimagusa, North Cyprus, Turkey: Springer, 63-72. doi: [https://doi.org/10.1007/978-3-030-42416-9\\_7](https://doi.org/10.1007/978-3-030-42416-9_7)
- Braim, S. J., & Mohammed, R. B. (2023). The (COSO) Framework: Implications of Internal Control Components on the Performance Manufacturing Companies. *Qalaai Zanist Journal*, 8(1), 1203-1227. doi: <https://doi.org/10.25212/lfu.qzj.8.1.48>
- Cereola, S. J., & Cereola, R. J. (2011). Breach of data at TJX: An instructional case used to study COSO and COBIT, with a focus on computer controls, data security, and privacy legislation. *Issues in Accounting Education*, 26(3), 521-545. doi: <https://doi.org/10.2308/iace-50031>
- D'Aquila, J. (2013). COSO's internal control integrated framework updating the original concepts for today's environment. *The CPA Journal*, 83(10), 22. Retrieved from <https://www.proquest.com/openview/324c319a40ddaac143d50bcb7780e24d/1?pq-origsite=gscholar&cbl=41798>
- Dat, P. M., Mau, N. D., Loan, B. T. T., & Huy, D. T. N. (2020). Comparative China Corporate Governance Standards after Financial Crisis, Corporate Scandals and Manipulation. *Journal of Security & Sustainability Issues*, 9(3), 932-942. doi: [https://doi.org/10.9770/jssi.2020.9.3\(18\)](https://doi.org/10.9770/jssi.2020.9.3(18))
- Debreceny, R. S. (2013). Research on IT governance, risk, and value: Challenges and opportunities. *Journal of Information Systems*, 27(1), 129-135. doi: <https://doi.org/10.2308/isys-10339>
- Dina, Q. A., Aristi, M. D., & Rodiah, S. (2020). The Role of Good Corporate Governance in Moderating the Influence of Profitability, Leverage, and Corporate Social Responsibility (CSR) on Company Value. *Jurnal Akuntansi Dan Ekonomika*, 10(1), 139-148. doi: <https://doi.org/10.37859/jae.v10i1.1992>

- Ettish, A. A., El-Gazzar, S. M., & Jacob, R. A. (2017). Integrating internal control frameworks for effective corporate information technology governance. *JISTEM-Journal of Information Systems and Technology Management*, 14, 361-370. doi: <https://doi.org/10.4301/S1807-17752017000300004>
- Felo, A. J., & Solieri, S. A. (2023). The Influence of Tone at the Top, Tune in the Middle, and Self-concept Maintenance on Financial Reporting Decisions. In *Research on Professional Responsibility and Ethics in Accounting* (Vol. 25, pp. 25-50): Emerald Publishing Limited, 25-50. doi: <https://doi.org/10.1108/S1574-076520230000025002>.
- Ha, T. T. H. (2019). Modern corporate governance standards and role of auditing-cases in some Western european countries after financial crisis, corporate scandals and manipulation. *International Journal of Entrepreneurship*, 23(1S). Retrieved from <http://digital.lib.ueh.edu.vn/handle/UEH/61754>
- Ho, J. L., Wu, A., & Xu, S. X. (2011). Corporate governance and returns on information technology investment: Evidence from an emerging market. *Strategic Management Journal*, 32(6), 595-623. doi: <https://doi.org/10.1002/smj.886>
- Holm, C., & Laursen, P. B. (2007). Risk and control developments in corporate governance: changing the role of the external auditor? *Corporate Governance: An International Review*, 15(2), 322-333. doi: <https://doi.org/10.1111/j.1467-8683.2007.00563.x>
- Hopkin, P. (2018). *Fundamentals of risk management: understanding, evaluating and implementing effective risk management*: Kogan Page Publishers. Retrieved from <https://books.google.ae/books?hl=en&lr=&id=bzFiDwAAQBAJ&oi=fnd&pg=PP1&dq=Hopkin>
- Hubbard, L. D. (2003). Understanding internal controls: auditors who can accurately interpret COSO's internal control framework offer great value to management. *Internal Auditor*, 60(5), 23-25. Retrieved from <https://go.gale.com/ps/i.do?id=GALE%7CA110222002&sid>
- Janvrin, D. J., Payne, E. A., Byrnes, P., Schneider, G. P., & Curtis, M. B. (2012). The updated COSO Internal Control—Integrated Framework: Recommendations and opportunities for future research. *Journal of Information Systems*, 26(2), 189-213. doi: <https://doi.org/10.2308/isys-50255>
- Lamboglia, R., & Mancini, D. (2021). The relationship between auditors' human capital attributes and the assessment of the control environment. *Journal of Management and Governance*, 25, 1211-1239. doi: <https://doi.org/10.1007/s10997-020-09536-8>
- Manita, R., Elommal, N., Baudier, P., & Hikkerova, L. (2020). The digital transformation of external audit and its impact on corporate governance. *Technological Forecasting and Social Change*, 150, 119751. doi: <https://doi.org/10.1016/j.techfore.2019.119751>

- Martin, K., Sanders, E., & Scalan, G. (2014). The potential impact of COSO internal control integrated framework revision on internal audit structured SOX work programs. *Research in Accounting Regulation*, 26(1), 110-117. doi: <https://doi.org/10.1016/j.racreg.2014.02.012>
- Mohammed, M. A., Al-Abedi, T. K., Flayyih, H. H., & Mohaisen, H. A. (2021). Internal Control Frameworks and Its Relation with Governance and Risk Management: An Analytical Study. *Estudios de Economía Aplicada*, 39(11), 18. Retrieved from <https://www.researchgate.net/profile/Hakeem-Flayyih/publication/356223856>
- Muawanah, U. (2020). Information technology adoption, corporate governance, and bank performance. *Journal of Information Systems Engineering and Business Intelligence*, 4(1), 11-17. doi: <http://dx.doi.org/10.20473/jisebi.4.1.11-17>
- Nikolovski, P., Zdravkoski, I., Menkinoski, G., Dicevska, S., & Karadjova, V. (2016). The concept of audit risk. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, 27(1), 22-31. Retrieved from <https://eprints.uklo.edu.mk/id/eprint/3074>
- Oakman, J., Kinsman, N., Stuckey, R., Graham, M., & Weale, V. (2020). A rapid review of mental and physical health effects of working at home: how do we optimise health? *BMC Public Health*, 20, 1-13. doi: <https://doi.org/10.1186/s12889-020-09875-z>
- Premuroso, R. F., & Bhattacharya, S. (2007). Is there a relationship between firm performance, corporate governance, and a firm's decision to form a technology committee? *Corporate Governance: An International Review*, 15(6), 1260-1276. doi: <https://doi.org/10.1111/j.1467-8683.2007.00645.x>
- Rae, K., Sands, J., & Subramaniam, N. (2017). Associations among the five components within COSO internal control-integrated framework as the underpinning of quality corporate governance. *Australasian Accounting, Business and Finance Journal*, 11(1), 28-54. doi: <http://dx.doi.org/10.14453/aabfj.v11i1.4>
- Rashid, A., & Ghazi, M. S. (2021). Factors affecting Sharī'ah audit quality in Islamic banking institutions of Pakistan: a theoretical framework. *Islamic Economic Studies*, 28(2), 124-140. doi: <https://doi.org/10.1108/IES-07-2020-0025>
- Roussy, M., Barbe, O., & Raimbault, S. (2020). Internal audit: from effectiveness to organizational significance. *Managerial Auditing Journal*, 35(2), 322-342. doi: <https://doi.org/10.1108/MAJ-01-2019-2162>
- Rubino, M., & Vitolla, F. (2014a). Corporate governance and the information system: how a framework for IT governance supports ERM. *Corporate Governance*, 14(3), 320-338. doi: <https://doi.org/10.1108/CG-06-2013-0067>
- Rubino, M., & Vitolla, F. (2014b). *IT governance, Risk Management and Internal Control System: the role of the COBIT framework*. Paper presented at the International OFEL Conference on Governance, Management and Entrepreneurship: Centar za istrazivanje i razvoj upravljanja doo, 174. Retrieved from

<https://www.proquest.com/openview/e02480660f9e119e57bfe0eb1e96c9b0/1?pq-origsite=gscholar&cbl=2035019>

- Rubino, M., Vitolla, F., & Garzoni, A. (2017). The impact of an IT governance framework on the internal control environment. *Records Management Journal*, 27(1), 19-41. doi: <https://doi.org/10.1108/RMJ-03-2016-0007>
- Savage, A., Norman, C. S., & Lancaster, K. A. (2008). Using a movie to study the COSO internal control framework: An instructional case. *Journal of Information Systems*, 22(1), 63-76. doi: <https://doi.org/10.2308/jis.2008.22.1.63>
- Simmons, M. R. (1997). COSO based auditing. *Internal Auditor*, 54(6), 68-73. Retrieved from <https://go.gale.com/ps/i.do?id=GALE%7CA20332303&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn>
- Steuperaert, D. (2019). COBIT 2019: A Significant Update. *EDPACS*, 59(1), 14-18. doi: <https://doi.org/10.1080/07366981.2019.1578474>
- Talab, H. R., & Flayyih, H. H. (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: Int. J. Prof. Bus. Rev.*, 8(4), 25. Retrieved from <https://dialnet.unirioja.es/servlet/articulo?codigo=8956086>
- Taylor, M. H. (2000). The effects of industry specialization on auditors' inherent risk assessments and confidence judgements. *Contemporary Accounting Research*, 17(4), 693-712. doi: <https://doi.org/10.1506/3LDH-AV52-0F4W-H4BB>
- Thabit, T., Solaimanzadah, A., & Al-abood, M. T. (2017). The effectiveness of COSO framework to evaluate internal control system: the case of kurdistan companies. *Cihan International Journal of Social Science*, 1(1), 44. Retrieved from <https://ssrn.com/abstract=3168888>
- Wagire, A. A., Joshi, R., Rathore, A. P. S., & Jain, R. (2021). Development of maturity model for assessing the implementation of Industry 4.0: learning from theory and practice. *Production Planning & Control*, 32(8), 603-622. doi: <https://doi.org/10.1080/09537287.2020.1744763>
- Yeoh, P. (2019). Corporate governance codes in the UK: The risk of over-reliance. *Business Law Review*, 40(1), 19-27. Retrieved from <https://heinonline.org/HOL/LandingPage?handle=hein.kluwer/blr0040&div=7&id=&page=>