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CGSC, audit quality, and Internet reporting: The mediation and moderation analysis

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Abstract

Research Questions: In what ways does the corporate governance scorecard (CGSC) and internet reporting intersect with audit quality? To what extent do technological advancement and auditor qualifications moderate the association between internet reporting, corporate governance (CGSC), and audit quality? In what capacity does audit quality mediate the association between internet reporting and the corporate governance scorecard (CGSC)?

Motivation: The rationale for conducting this study is to fill a known void in the academic literature concerning corporate governance in developing nations, with Egypt serving as an example.

Idea: The main idea of our study is to understand the impact of CGSC-measured corporate governance on internet reporting of financial and non-financial information. Our study also seeks to determine whether audit quality acts as a mediator and whether auditor qualifications and technological advancement moderate this relationship.

Data: Using a questionnaire, 258 auditors from various auditing firms, including the Big4 and national audit firms with international affiliation, data were collected.

Tools: Factor analysis, Pearson correlation, and Structure Equation Modelling.

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Findings: Corporate governance assessed by CGSC improves the Internet reporting through the mediation of audit quality, with auditor qualifications and technological advancement serving as moderators.

Contribution: This study contributes to the scholarly comprehension of the association that exist among CGSC, audit quality, and internet reporting. Implications for utilizing CGSC as a metric for evaluating corporate governance practices and its influence on online reporting are both theoretical and practical in nature. The investigation contributes valuable perspectives that can guide decision-making in practical and theoretical settings, thereby enhancing the academic discourse.

Keywords: Corporate governance scorecard (CGSC), Audit quality, Auditor qualifications, Technological advancement, Internet reporting.

JEL codes: M42, G34

1. Introduction

In response to the challenges and limitations of paper-based disclosure in the global business environment, which is characterized by rapid change and multinational corporations, electronic-based disclosure has emerged (Debreceny *et al.*, 2002). Paper-based disclosure does not meet the requirements of users of financial reports, who require readily accessible and expeditious information for decision-making. Internet reporting addresses this issue by enabling companies to publish dynamic and interactive financial and non-financial information on their websites, which is not possible with paper-based disclosure. Internet reporting offers additional presentation tools, such as multimedia audio and video communications, and information sources, such as historical financial reports and minutes from board of directors' meetings (Kamalluarifin, 2016).

According to Loukil and Yousfi (2012), the traditional approach to disclosure confronted a crisis of confidence following the exposure of a number of corporate controversies in Europe and the United States, including WorldCom and Enron. To restore this confidence, there was a worldwide demand for the mandatory implementation of corporate governance principles concerning the timely disclosure of information. According to Abid and Ahmed (2014), the majority of the world's countries have adopted regulations compelling businesses to adhere to these principles. According to Institute of Chartered Accountants in England and Wales (1998), corporate governance has emerged to ensuring efficient disclosure of firm information to its stakeholders. This suggests that disclosure is an important cornerstone of corporate governance. Many modern reporting methos have been suggested in response to critiques of the traditional reporting methos.

These modern methods were designed to overcome the constraints of the traditional approach to disclosure and give decision makers with timely and clear information. The qualities shared by these suggested models were limitless and quick access to information, an interactive manner of presentation, and the integration of financial and non-financial information. Internet reporting seemed to be the most appropriate technique for meeting these criteria while avoiding the drawbacks of the old paper-based disclosure system (Basuony & Mohamed, 2014; Bekiaris *et al.*, 2014; Mokhtar, 2017).

According to Sanad and Al-Sartawi (2016), the Internet has facilitated the development of cutting-edge technology and a novel method of communicating with stakeholders. Kartalis *et al.* (2017) argued that the internet is a versatile disclosure medium that provides visuals and enables broad, quick, and inexpensive communication with interested shareholders. Individuals have used the Internet for commercial purposes since the early 1990s, and businesses have recognized its importance in the dissemination of financial data. By the mid-1990s, it had become one of the most popular information sources. Thus, traditional financial reports have lost relevance in comparison to electronic financial reports available online (B. Singh, 2017). According to Alarussi and Shamkhi (2016), electronic reports surmount the limitations of paper reports. Due to the ineffectiveness of traditional paper-based business reports, decision makers rely on them less.

In 2012, the Egyptian Financial Regulatory Authority (FRA) issued a decree mandating that all companies listed on the Egyptian stock exchange publish their financial reports and associated documents on their websites (The Egyptian Exchange, 2022). This decision promoted internet reporting as a mode of communication for these companies' stakeholders. According to the 2016 statistics of the Egyptian stock exchange market, 70% of the listed companies had active websites and provided online financial reporting (The Egyptian Exchange, 2022).

The widespread availability of internet services and technological advancements such as DSL and inexpensive web design and maintenance facilitated the adoption of internet reporting. The increasing number of internet users, which reached 5.4 billion or nearly 67.9 percent of the world's population in 2021 (Internet World Stats, 2023), also encouraged businesses to utilize web-based reporting as a source of information for investors and creditors. Internet-based reporting provided various advantages, such as fast information, quick access, and improved price efficiency. Debreceny *et al.* (2002) and Alarussi and Shamkhi (2016) reported a significant association between internet reporting and the cost of capital, since it enabled foreign investors to access information from enterprises all over the world, lowering investment risk and growing investment opportunities.

Audit quality assures that financial reports are free of substantial inaccuracies that might lead to user confusion. Audit quality is not a single activity, but rather a system consisting of pre-audit, audit, and post-audit stages. Obtaining a knowledge of the client's business, organizing the audit, and choosing skilled staff are all examples of pre-audit quality measures. Compliance with standards, sufficient documentation, and testing of internal controls are all required for auditing. The post-audit phase comprises safeguarding the private information of the customer that the auditor has obtained. Furthermore, the auditor must be knowledgeable with the most modern technology used for recording and releasing annual reports, since this has an influence on the audit quality process. Prior research found a significant positive association between audit quality, corporate governance, and both mandatory and voluntary disclosure (Al-Nodel & Hussainey, 2010; EI-Deeb, 2015; Lihniash *et al.*, 2020).

Internet reporting, according to Debreceny *et al.* (2002), can enhance the content and usefulness of financial information for users by providing timely access. However, this also makes it difficult for auditors to verify the accuracy of information posted online. Mokhtar (2017) suggested that audit quality is a crucial element for enhancing the verifiability and reliability of internet reporting. Xiao *et al.* (2004) demonstrated that international companies tend to have higher audit quality because their auditors are more acquainted with the most recent E-Audit technology and are better trained to use the technological innovations adopted by their clients. Some studies have found a positive association between audit quality and disclosure quality (Abozaid *et al.*, 2020; Xiao *et al.*, 2004), whereas others have found no significant association (Abdelsalam & Street, 2007; Hossain *et al.*, 1995; Tuan *et al.*, 2020).

The auditor’s qualifications can influence the relationship between corporate governance and audit quality. This includes the auditor’s experience, education, industry knowledge, and proficiency with accounting and auditing software innovations. These factors allow the auditor to conduct high-quality audits and gain the trust of financial report users. In addition, the emergence of web-based reporting necessitates that auditors possess specific qualifications and skills to accommodate the new global concept. The technological advancement utilized by the company to implement internet reporting is a crucial factor in facilitating this process of auditing for all parties (Demek *et al.*, 2020).

According to Justina and Simamora (2017), the OECD scorecard evaluates five dimensions of corporate governance. Each dimension has a different weight depending on its relative importance. The dimension of "shareholder rights" consists of 26 questions and accounts for 10% of the total score, while the dimension of "equitable treatment of shareholders" comprises 17 questions and represents 15% of the total score. The dimension of "role of stakeholders" includes 21 questions and contributes 10% of the total score, whereas the dimension of "disclosure and transparency" covers 42 questions and constitutes 25% of the total score. The dimension of "board responsibilities" encompasses 79 questions and makes up 40%

of the total score. The score for each dimension is calculated by summing up the points in that dimension and adjusting for the items that are not applicable. The company's total score is then calculated by assigning weights to each dimension and aggregating the weighted score (Bulman *et al.*, 2017).

This paper offers a thorough review of the growing topic of internet reporting among Egyptian stock exchange-listed firms. This paper builds on previous studies that examined only a single aspect of internet reporting, such as corporate governance, audit quality, or voluntary disclosure, as dependent or independent variables. This paper proposes a novel framework by evaluating the direct and indirect impacts of using CGSC as a measure of corporate governance quality, a novel concept in Egypt, on internet reporting, while taking into consideration the mediating role of audit quality and the moderating roles of auditor qualifications and technological development. The following sections will address the literature review and empirical analysis, respectively.

2. Literature review and hypotheses development

2.1 Corporate governance and corporate Internet reporting (CIR)

According to agency theory, managers serve as agents who protect shareholder interests. This theory describes the relationship between the principal and the agent who acts on behalf of the proprietors and to whom decision-making authority has been delegated (Bonazzi & Islam, 2007). Agency theory entails some fundamental costs, including monitoring and control costs incurred by the principal to limit the divergent actions of the agent, bonding costs incurred to ensure that the agent does not adopt practices that are incompatible with the owners' benefits, and residual losses resulting from misalignment of agents. As a result of a conflict of interest among the company's creditors, shareholders, and management, as well as information asymmetry, agency costs might arise. The agent's goal is to raise the degree of voluntary disclosure of Internet reports in order to eliminate information asymmetry. Non-executives or the chief executive (the agent) who administers the firm and shareholders (principal) who supply capital to the company and expect managers to fulfill their duties to maximize shareholder wealth are also considered in the theory. The agent is given permission to manage company processes and is compensated with bonuses and incentive packages. This can motivate managers to offer greater information about the company's performance to investors in order to justify their reward schemes.

According to Golden and Kohlbeck (2017), in addition to the disclosure required by present regulation, companies can also provide voluntary information that is not governed by any legal framework. Some governance principles, such as the ASEAN Corporate Governance Scorecard (ACG Scorecard), can guide this form of disclosure. Through transparency and disclosure, a high-quality corporate governance scorecard is critical for decreasing agency conflict. Disclosure has also been emphasized as a means of demonstrating the quality of earnings and incorporating corporate governance planning. Furthermore, the practice of disclosing information and publishing online financial reports has grown.

Abdelsalam *et al.* (2007) examined the link between corporate governance mechanisms such board size, independence, CEO duality, ownership structures, audit fees and profitability, and corporate online reporting. According to their findings, board independence and CEO duality have a major impact on corporate internet reporting. Furthermore, they found that larger companies submitted their annual reports online more rapidly. On the basis of their findings, they concluded that firm corporate internet reporting practices were influenced by the ownership structure and board composition. They also reported a moderate association between ownership structure and firm size and corporate internet reporting.

The extent of disclosure can differentiate firms based on their performance and quality, according to the signaling theory. Companies with low performance and quality tend to be less transparent and restrict stakeholder access to information. Omran & Ramdhony (2016) found that companies, supported by cutting-edge technologies and high-quality internet infrastructure, increase their level of voluntary disclosure to their stakeholders. In addition, the signaling theory suggests that firms with high profits may have an incentive to disclose more information in order to convey to investors the firm's profitability, maintain the management position and reward level, and increase the share price of the firm (Keliwon *et al.*, 2018). This is confirmed by Abdelsalam *et al.* (2007), who found that managers of companies with a high profit tend to disclose more information in order to increase their own benefits. Previous research has demonstrated that the quality of corporate governance practices influences the extent of information disclosure, and that many businesses use the Internet to disseminate their financial information. Thus, researchers have examined the relationship between Corporate Governance and Electronic Financial Reporting (Schleifer *et al.*, 2019). Sabrina *et al.* (2019) investigated the relationship between disclosure transparency, as measured by the level of Internet financial reporting performance (IFR), and corporate governance scorecard structures. The corporate governance scorecard included dimensions such as "shareholders' rights", "fair treatment of shareholders", "shareholders' role", "disclosures and transparency", and "board responsibilities". They found that the corporate governance scorecard structures influence the performance of the company's online electronic financial reporting and respond to the information asymmetry between managers and investors. In addition, they demonstrated that the relationship between the Corporate Governance Scorecard and the IFR varies by firm size.
Kamalluarifin (2016) investigated CIR on seven firm variables and four corporate governance mechanisms: business type, profitability, company size, leverage, dual

roles, ownership structure, board composition, and board size. CIR was significantly linked to profitability, business form, equity issue, leverage, liquidity, firm size, ownership structure, board composition, board size, and service sector engagement. Barakat *et al.* (2020) evaluated board composition, educational background, board independence, ownership structure, profitability, and market capitalization as variables affecting Palestinian company Internet financial reporting. They observed an association between board education and Internet financial reporting, although board independence and audit committee impact were low. Internet-based financial reporting and ownership concentration were also positively correlated.

The relationship between corporate governance attributes, internal audit quality, and financial reporting quality in Uganda’s financial institutions was investigated by Kaawaase *et al.* (2021). They administered a questionnaire to the institutions’ Chief Financial Officers, Senior Accountants, and Internal Audit Managers. The results indicated that board expertise and role performance are substantially associated with financial reporting quality, whereas board independence has no significant effect on financial reporting quality. In addition, the study discovered a significant link between internal audit quality and financial reporting quality.

Ardillah and Carolin (2022) assessed the impact of corporate governance structures on Internet Financial Reporting (IFR) in their research. The study utilized data from all Indonesian Stock Exchange-listed mining companies between 2014 and 2018. The findings revealed that the magnitude of the board of directors had a positive effect on IFR, whereas the reputation of the auditor and ownership of public shares had a negative effect.

Using data from Jordanian-listed companies, Al Qawasmeh (2022) assessed the significance of internet financial reporting in providing timely and cost-effective information, especially during the COVID-19 pandemic. The study assessed the effect of various corporate governance factors, including board size, board independence, gender diversity, CEO age, CEO education level, and audit committee, on internet financial reporting. The study found a significant correlation between internet financial reporting and board size, board independence, CEO age, return on assets, and leverage. However, the study found that gender diversity, CEO education level, audit committee membership, and firm size had no effect on internet financial reporting.

Kiswanto and Setiawan (2022) investigated the relationship between the characteristics of the board of directors and the timeliness of corporate Internet reporting (TCIR) in Indonesian companies. The study revealed that board size, independence, tenure, family ties, and gender had a significant impact on TCIR, whereas the age of the president director, foreign director, and founder did not. In addition, the study identified firm size, profitability, and liquidity as control variables for TCIR via the company’s website.

Calista and Febrianto (2023) analysed the influence of governance structure, blockholders, company age, and technology cost on internet financial reporting (IFR) adoption in the banking industry. Ultimately, the findings revealed that numerous factors influence the adoption of IFR by companies simultaneously. IFR adoption was correlated with a larger board of directors, a larger audit committee, a lesser percentage of blockholder ownership, and higher technology costs.

Online financial reporting offers numerous benefits like 24/7 global access, multilingual translation, interactive graphics, low dissemination costs, and collaboration abilities, as noted by Kartalis *et al.* (2017). Moreover, Kaur and Singh (2020) identified major advantages for investors such as facilitating investment decisions, improving timing and efficiency of collecting data. They found key drivers for companies are business competition, brand image enhancement, and advancing technology. However, ensuring security of online financial data is a major challenge, as stated by Li *et al.* (2017) and Amin and Mohamed (2016). Additionally, factors influencing online reporting include corporate governance aspects like board composition, educational background, ownership structure, profitability and market capitalization (Barakat *et al.*, 2020; Kamalluarifin, 2016). Overall, developing economies aim to build investor confidence and attract investment through strong corporate governance, which relies partly on effective online financial disclosure (Sanad & Al-Sartawi, 2016). Thus, online reporting provides advantages but also requires strategic governance to ensure rigorous data security and useful information for investors. Thus, we formulate the following hypothesis:
***H1**: there is a positive relationship between the level of corporate governance quality, as measured by a corporate governance scorecard (CGSC), and the extent of Internet reporting by firms.*

2.2 Corporate governance and audit quality

According to Hadi *et al.* (2016) and Komalasari and Suryanto (2018), corporate scandals have negative consequences for a variety of worldwide stakeholders, including regulators, accountants, practitioners, researchers, and organisations. Many countries' business laws must be revised as a result of this. Furthermore, in developed countries, audit and accounting practises are critical for assuring, authorising, and verifying the quality of information disclosure. Similarly, corporate governance is important for improving the audit function's efficacy.

Audit quality is a critical issue that attracts attention from stakeholders relying on audited financial data, as it enhances trustworthiness and decision-making utility (Komalasari & Suryanto, 2018). High quality audits align statements with standards and provide valuable information. Moreover, they are crucial for capital markets by improving risk management, control, and governance, thus boosting financial performance (Alduwaila *et al.*, 2018; El-Deeb & Abdel Megeid, 2017). Prior accounting and finance research indicates auditors are motivated to perform quality audits to maintain reputations and avoid liability. Legal norms demand high standards, and auditors have financial incentives to provide quality and reduce litigation risks. In summary, quality audits are key for stakeholder trust, corporate oversight, and auditor reputation, underscored by legal requirements and risk avoidance.

According to the Country Report and Evaluation of the ASEAN Corporate Governance Scorecard (Asian Development Bank, 2017), the average ratings of all member nations improved between 2012 and 2015. According to Akgun and Tektufekci (2017), audit committee members are independent of firm management and have the responsibility of supervising financial reporting and accounting processes. This idea is in line with the Corporate Governance Scorecard.

Using Korean audit hour data from 2015 to 2017, Hwang *et al.* (2022) examined the relationship between audit firms' quality control (QC) efforts and auditor independence, specifically in relation to the issuance of continuing concern opinions (GCOs). Even after controlling for client firm characteristics, the authors discovered that a higher ratio of QC hours to total audit hours is positively associated with the likelihood of issuing GCOs to client firms. In addition, the study revealed that the impact of QC efforts on auditor independence is greater for economically significant client firms and those with superior governance.

Many researches indicate that corporate governance and audit quality influence the integrity of financial reporting. Mulyadi *et al.* (2022) found independent board members, audit committees, institutional ownership, and audit quality significantly impacted financial statement reliability in Indonesian manufacturers. Specifically, independent commissioners and higher audit quality positively affected statement credibility. This highlights the importance of governance and quality audits for reporting integrity. Moreover, Alduwaila *et al.* (2018) suggested poor auditing contributed to the Asian financial crisis, underscoring audit quality's role in efficient markets and performance. High-quality audits aligning with standards provide confidence in statement accuracy and transparency. In summary, studies show governance mechanisms and auditor competence are critical for credible reporting and properly functioning capital markets. Based on the previous discussion, we formulate the following hypothesis:
H2: *there is a positive relationship between the level of corporate governance quality, as measured by a corporate governance scorecard (CGSC), and quality of audit.*

2.3 Audit quality and Internet reporting

There has been a lot of research conducted regarding audit quality and how to quantify it. However, there is still no agreement on what audit quality is or how to measure it. DeAngelo's definition of audit quality as "the joint probability that an auditor will both discover and report a breach in the client's accounting system" has been adopted in many earlier studies. This definition emphasizes the auditor's capacity to notice mistakes and his/her willingness to report them. It pertains to financial statement external audits, but it may also be used for other types of auditors (such as internal auditors) and audits (such as compliance and operational audits) (DeAngelo, 1981).

According Khan and Ismail (2012), in the early 2000s, financial reporting shifted from the conventional printed annual report to modern online financial reporting, which attempts to fulfil the different demands of users. The fast advancement of Internet communications technology (ICT) has altered how businesses interact with their shareholders, customers, suppliers, and other stakeholders. The Internet provides firms with a form of voluntary disclosure, allowing them to share information with different stakeholders instantly (M. Khan & Ismail, 2012). The Internet creates a new communication channel that provides a low-cost and creative flow of information on a larger scale. Also, the Internet improves the disclosure of financial and non-financial information (Dyczkowska, 2014). Websites are becoming a more common source of information (Musleh, 2016). Also, Khan and Ismail (2012) confirmed this argument.

The Internet is a technology that has the ability to improve external reporting and has grown in importance in financial reporting (Khan & Ismail, 2012; Khan, 2007). The Internet revolution has transformed the conventional flow of accounting, auditing, and accountability information for diverse stakeholders into a new method of delivering timely information. Because of technological advancements, the Internet is now a valuable, timely, and cost-effective instrument for disseminating financial information to investors. The Internet has developed into an important research tool, particularly in the subject of financial reporting and disclosure (Khan, 2007). The Internet has been described as more successful than paper-based financial reporting because it is more relevant and engaging, allowing for a broader opportunity for deeper inquiries (Ojah & Mokoaleli-Mokoteli, 2012).

Financial statements are used by various stakeholders like shareholders, creditors, regulators, and the public to make informed decisions, underscoring the need for accurate and credible reporting (Abdullah *et al.*, 2017; Trabelsi *et al.*, 2004). Most companies now leverage websites to disseminate financial information given the advantages of cost-effectiveness, interactivity, and adaptability. Comprehensive online reporting encompassing annual statements, share prices, and other data allows assessment of company transparency and performance (Abdullah *et al.*, 2017; Trabelsi *et al.*, 2004). Moreover, information technology enables online digital disclosure, which as per Abdullah *et al.* (2017) improves quality, reduces asymmetry, and increases investment and value. Relatedly, Singh and Singh (2018)

found smaller boards and lower debt associate with greater website disclosure. They also indicated audit committees impact online report quality. In summary, online financial reporting provides multifaceted benefits, but relies on strong governance and auditing to ensure high quality information for investor decisions.
Musleh (2016) asserted that companies may convey their goals and other relevant information to interested parties directly through online financial disclosure, enhancing openness and lowering monitoring expenses. Websites that are well-structured and organized make it easier to assess managerial performance. According to several studies, enhancing disclosure openness can reduce agency problems and information asymmetry. Therefore, timely financial information disclosure reduces agency costs, safeguards investor rights, boosts investor trust, enhances data transparency, and reduces monitoring costs and inconsistent information. AlMatrooshi *et al.* (2016) provided a similar claim, claiming that companies that disclose more information, reduces information disparity and agency costs. Their research revealed that big companies prefer to publish information online since doing so saves costs and allows for quick sharing of information.

Bananuka and Nkundabanyanga (2022) assessed the influence of audit committee efficacy (ACE), internal audit function (IAF), and firm-specific attributes on internet financial reporting (IFR) among Uganda’s financial services firms. The relationship between these variables and IFR was determined using the diffusion of innovation (DOI) theory. A questionnaire survey was conducted with forty financial services firms in Uganda. The findings revealed that both ACE and IAF substantially contributed to positive variations in IFR, but only capital structure demonstrated a significant effect.

During the COVID-19 pandemic, Putra *et al.* (2022) conducted research on technology acceptability in the internal audit department of a retail company. They utilised qualitative methods, such as a case study approach, focus group discussions, and a review of the literature. The Technology Acceptability Model (TAM) served as the framework to comprehend technology user acceptability. The findings of the study indicated that technology had been successfully incorporated into five critical areas of internal audits: planning, documents, field audits, confirmation, and reporting. It highlighted the importance of implementing technology into internal audit processes, particularly when dealing with remote work situations resulting from the pandemic. This leads us to the following formulation:
H3: *there is a positive relationship between the extent of Internet reporting and audit quality.*

2.4 The mediating role of audit quality

Reducing the associated financial and legal risks is one of the auditing process’s major concerns. To do this, auditors must adhere to a stringent audit quality procedure, which makes sure they carry out their duties with competence and care. Audit quality refers to the auditor's ability to give a reasonable assurance that the standards were followed in conducting the audit. Auditors now have to make sure that the financial statements presented on the company website are accurate and free of substantial errors, which presents a new problem given the rise of Internet reporting (Omran & Ramdhony, 2016). In order to reduce the possibility of inaccurate information or significant errors in the assertions connected to balances, transactions, or disclosures, auditors must adopt e-audit methods (Fakhfakh & Jarboui, 2020).

The growth of Internet reporting has increased the number of accounting research publications that cover this subject, according to Waweru *et al.* (2019). Specifically, Omran and Ramdhony (2016) examined how financial reporting is done online and how online reporting practices have evolved over time. Asogwa (2017) asserts that there is a connection between company features, corporate governance, and online reporting. These papers employed a variety of disclosure theories to explain the differences in online reporting practises, including agency theory, signal theory, the political cost hypothesis, and diffusion of innovation theory (Agyei-Mensah, 2018; Alarussi & Shamkhi, 2016).

According to Wai Kee *et al.* (2017), there is a clear link between corporate governance and audit quality. Their research assessed corporate governance by evaluating the effectiveness of the board of directors and the audit committee (AC). Audit fees paid to the external auditor, on the other hand, were used to assess audit quality. Wai Kee *et al.* (2017) used empirical data to not only confirm the importance of adhering to corporate governance principles and best practices for enhancing the audit process, but also to emphasize the need of providing direction to regulators, legislators, company leaders, and investors. Their findings highlighted the audit procedure's role in distributing knowledge concerning corporate governance practices. Furthermore, as Habbash and Alghamdi (2017) point out, the quality of auditing services is determined by the auditor's credentials, experience, industry expertise, and objectivity, which provides them with the essential capacities to manage complicated difficulties in specific firms.

Corporate governance, which has been a hot subject after several corporations failed to follow its principles, has an impact on the quality of audits and online reporting systems. Previous studies have investigated how certain aspects of corporate governance affect the quality and process of audit, especially the quality of procedures (Sailendra *et al.*, 2020; Salehi *et al.*, 2016). They also identified weaknesses in the corporate governance structure that often result in low-quality financial reporting and profit manipulation, and even fraud in public financial statements (Klai & Omri, 2011; Onuorah & Friday, 2016). Fakhfakh and Jarboui (2020) examined the relationship between corporate governance and financial reporting through the mediating role of audit quality on 28 Tunisian companies. This study contributed to the literature by providing a comprehensive framework for analyzing the link between corporate governance, online reporting and the role of audit quality as a mediator among other factors. Most previous studies focused on a single aspect of these issues. We propose that the quality of auditing is a positive intervening factor in the association between corporate governance structure and Internet reporting. This means that firms with better governance practices tend to have higher audit quality, which in turn leads to more extensive and timely disclosure of financial information on the Internet. Therefore, we propose the following hypothesis:

H4: *The relationship between CGSC and Internet reporting is positively mediated by audit quality.*

2.5 The moderating role of auditor qualifications

Nwanyanwu (2017) argued that providing effective auditing services requires the possession of appropriate skills and competence. This necessitates making sure the audit team is capable and qualified for the task. This may be accomplished by possessing the necessary degrees and certifications in accounting and finance, as well as by taking part in ongoing professional development programmes and discussions to keep the audit staff members up to date on the most recent advancements in auditing and accounting. For instance, by including them in the curricula of higher education institutions, international financial reporting standards (IFRSs) and international public sector accounting standards (IPSASs) have become fundamental components of auditing and accounting practices. These are a component of the requirements for achieving quality control in financial reports, which also include statements issued by accounting organizations about technical and competency training intended to support the retention of auditors.

The AICPA's quality control standards for personnel management aim to ensure that audit staff have the suitable characteristics to perform effectively. The audit engagement is entrusted to those who have the relevant and qualified technical training, and participate in appropriate continuous education and professional development activities. The auditor's practical ability and competence influence various issues involved in the audit process, such as the auditor's technical skill, measured by the level of education, work experience, and type of certification (Kang *et al.*, 2017). Highlighting the importance of qualification, Kuntari *et al.* (2017) identified the auditor's knowledge and experience in auditing and accounting as key factors affecting the audit quality.

Albawwat and Frijat (2021) conducted a study on auditors' perceptions of assisted, augmented, and autonomous artificial intelligence (AI) systems in the audit process. The study investigated auditors' perspectives on the usability, utility, and contribution to audit quality of these AI systems. Auditors viewed AI as valuable and advantageous to audit quality as a whole. However, there were significant disparities between the three AI types in terms of usability and perceived contribution to audit quality. The study emphasizes the need for auditors to comprehend the various AI categories, hazards, and benefits in order to improve the quality of the auditing process. The practical implications of this study are applicable to audit firms, AI suppliers, and auditees.

Oluoch (2022) explored the influence of Information Technology (IT) on the internal auditing processes within Kenyan commercial institutions. The investigation focused on key aspects such as integrity, time efficiency, and cost implications, as well as the challenges associated with IT adoption. The study found that IT has a positive impact by enhancing integrity and reducing both time and costs; however, challenges arise due to the expensive nature of acquisition and implementation. Additionally, Lois *et al.* (2020) conducted a survey on internal audit departments in prominent audit institutions in Greece, aiming to understand the factors influencing continuous auditing and the techniques employed. Their findings underscored the significance of technological advancements, data protection against cyberattacks, employee skills and training, and the formation of virtual auditing teams. The study emphasized the need for businesses to prioritize cybersecurity, highlighting that the successful adoption of technology and modern techniques depends on the redefinition of organizational objectives and the adequate instruction of personnel.

Abdullah *et al.* (2018) referred to the OECD's principles of corporate governance, which emphasize the distribution of rights and responsibilities among different participants in the corporation who are involved in corporate decision-making (OECD, 2004). They argued that audit quality can be enhanced by reviewing and evaluating how organizations manage their operations, such as compliance with procedures, auditor competence and ethical standards, including risk management. They also proposed that auditor performance and qualifications should be evaluated based on the achievement of audit objectives, such as the usefulness and reliability of audit reports. They note that the OECD principles have shifted their focus more towards the rights and duties of shareholders and the roles and incentives of board members. Based on this, they formulate the following hypothesis:
H5: *Auditor qualifications have a moderating effect on the association between the level of corporate governance quality, as measured by a corporate governance scorecard (CGSC) and audit quality.*

2.6 The moderating role of technological advancement

One way to provide information in a user-friendly format is to publish financial reports in Excel sheet or editable format, as well as to make the company's website and the information on it easily accessible. This can be achieved by using a suitable customized software that can facilitate these requirements (Mokhtar, 2017; Soltani, 2000).

The Internet has become a timely, useful and cost-effective medium for communicating information to investors, due to the new innovations of technological advancements. These advancements have enabled companies to publish not only their financial reports, but also their financial and non-financial highlights instantly, transforming the financial reporting process from paper-based to web-based. The globalized economy has increased the demand for information, especially for foreign investors in multinational companies. The business complexity has increased the importance of the quality of internal control and assurance services. Therefore, audit quality is a key driver for good reporting, where higher audit quality leads to higher quality of internet reporting (Ojah & Mokoaleli-Mokoteli, 2012; Oyelere & Al Shidi, 2006).

One of the factors that influence the adoption of Internet reporting systems by firms is the Internet infrastructure. The web reporting activities by companies, especially those listed in the Egyptian stock exchange market, have increased since 2014 due to the significant improvement in the telecommunication services in Egypt. The Internet can play a vital role in communicating information to the users of financial reports, especially in developing countries like Egypt (Abdullah *et al.*, 2017). The web-based reporting can help in disseminating the information easily and make it accessible for investors worldwide. Ramadan (2018) conducted a study within the Egyptian environment and found a positive association between online reporting and stock market price. This result indicates that accounting information is significant and relevant to investors, and that they require additional information sources than the usual reporting technique.

Various variables impact Internet reporting, including market demand and availability of information, as well as regulatory laws requiring corporations to disclose their information online. Companies must follow required disclosure requirements while also having the option to voluntarily reveal extra information in order to achieve a competitive advantage in the market (Bhuiyan *et al.*, 2007). The voluntary disclosure enables the management to use different mediums such as hyperlinks, editable financial statements, videos and interactive presentations. These mediums are enabled by the internet technology and the increased number of online users. The internet reporting should be protected by enhanced security systems to prevent unauthorized access and modification of the disclosed information. Mokhtar

(2017) predicts that the internet reporting will replace the traditional paper publication within this decade.

The Internet's unregulated information system affects the groups of users who are interested in this information (Amin & Mohamed, 2016; Verawaty, 2016). The lack of authenticity and credibility are major challenges of this system. The solution to these challenges is the assurance services provided by auditing firms. We propose that the effect of audit quality on Internet reporting is contingent on the level of technological advancement. Our proposition is that technological advancement affects both audit quality and Internet reporting. Technological advancement enables auditors to perform more efficient and effective audits, and also facilitates the disclosure of more timely and reliable information on the Internet. Based on this, we propose the following hypothesis:
H6: *The relationship between audit quality and Internet reporting is moderated by technological advancement.*
Figure 1 depicts the research model

3. The conceptual model:

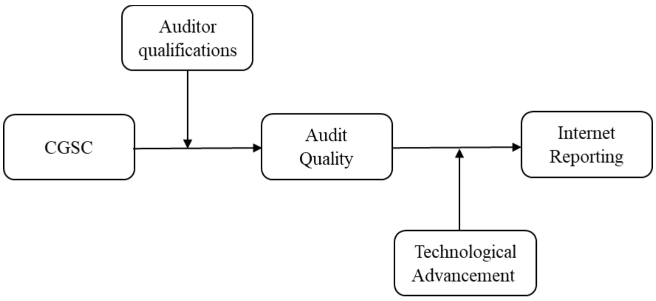

Figure (1) Hypothesized proposed model

4. Method

This study uses a questionnaire to collect data from auditors working in Big4 and internationally affiliated auditing firms in Egypt. The sample consisted of 258 valid responses, with a response rate of 73%. The rationale for selecting these firms was that they are subject to strict supervision from their international counterparts regarding the qualifications, audit quality procedures and continuous awareness of technological advancements in conducting audits. The changing economy and business environment require the auditing firms to respond quickly and ensure that they provide high-quality services with a high level of assurance. Therefore, the higher the audit quality, the level of compliance with corporate governance requirements, auditor qualification and awareness of technological advancements, the higher the level of internet reporting by the audited companies. This benefits the users of the financial statements by providing them with easy access to information. This was the main motivation for this research: to test the relationship between the independent variables of the study and the level of internet reporting by the auditees. We used a questionnaire with five sections to measure the five variables of the study: CGSC, audit quality, auditor qualifications, technological advancement and Internet reporting. We administered a preliminary version of the survey to two big4 firms and solicited their feedback on the variables and their operationalization. We incorporated all the suggested revisions in the final survey design. The next section will present the results of the statistical analysis of the data obtained from the survey.

5. Statistical analysis

This section presents the results of the statistical analysis and discusses the main findings in relation to the hypotheses. The data analysis methods and the tests of the hypotheses are also explained in this section.

5.1 Confirmatory factor analysis

To evaluate the reliability of the variable’s measurements, the structure equation modeling technique -Confirmatory factor analysis (CFA)- was applied, along with the path analysis to identify the most significant factors of the model that affect the internet reporting level (Hair *et al.*, 2010). The goodness of fit model was performed for the five alternate models to determine which one best fit the data collected.

As shown in table (1), the model with five factors (CGSC, audit quality, technological advancement, auditor qualifications, and Internet reporting) was the best fit for the data of the study, with no issues of discriminant validity. The fit indices of this model were: $\chi 2 = 981.27$, df = 669, $\chi 2/df = 1.48$, RMSEA =.046, CFI =.97, TLI =.95, indicating a superior fit compared to the other models. The factor loadings of this model were all significant and ranged from 0.60 to 0.92. Table (1) also shows that the other models had acceptable fit indices, but not as good as the five-factor model.

Table 1. Results of confirmatory factor analysis

Model	χ^2	*df*	CFI	TLI	RMSEA
5 factors model	981.27	669	0.97	0.95	0.046
4 factors model (audit quality and internet reporting were blended into a single factor)	2637.15	688	0.89	0.82	0.087
4 factor model (Technological advancement and internet reporting blended into a single factor)	3089.32	701	0.77	0.74	0.096

Model	χ^2	*df*	CFI	TLI	RMSEA
3 factor model (audit quality and Technological advancement blended into a single factor)	2055.10	697	0.86	0.83	0.084
3 factor model (auditor qualifications and audit quality blended into a single factor)	2231.69	703	0.88	0.81	0.093
2 actor model (audit quality, auditor qualifications, Technological advancement, and internet reporting blended into a single factor)	2975.17	685	0.75	0.68	0.107
One factor (CGSC on Internet reporting)	4152.66	693	0.71	0.63	0.122

Note: df = degree of freedom; **TLI** = Tucker–Lewis's index**; CFI** = confirmatory fit index; **RMSEA** = root mean square error of approximation.

5.2 Average variance extracted (AVE) and Composite reliability

The authors applied confirmatory factor analysis, a specific type of factor analysis, to test the validity and consistency of the measures of the constructs. They presented the results of confirmatory factor analysis in Table (2), which includes composite reliability (CR) and the average variance extracted (AVE) to assess the reliability of the overall scale of the latent variables. Confirmatory factor analysis (CFA) evaluates the factor structure for a set of observed variables and examines the relationship between the latent and observed variables, as well as the discriminant validity and convergent validity (Asparouhov *et al.*, 2018). The results indicate that the values of composite reliability (CR) are above 0.70, ranging from 0.85 to 0.93, and that the values of Average variance extracted are above 0.50, ranging from 0.54 to 0.65, which suggest acceptable convergent validity (Bagozzi & Yi, 1988).

Table 2. Overall constructs reliability, composite reliability, average variance extracted, and factor loadings of indicators

Construct and items	AVE	CR	@	loading	t-value
CGSC	**0.60**	**0.93**	**0.92**		
Rights of Shareholders				0.756	6.143***
Equitable treatment of shareholders,				0.797	11.035***
Role of stakeholders				0.770	10.219***
Responsibilities of the board				0.907	14.193***
Disclosure and transparency				0.891	13.612***
Audit quality	**0.54**	**0.85**	**0.79**		
Pre-audit requirement				0.730	9.211***
Engagement performance				0.835	13.931***
Security over the client's records				0.786	12.123***

Construct and items	AVE	CR	@	loading	t-value
Planning of the engagement				0.810	11.802***
Latest technology is used				0.709	7.493***
Auditor qualifications	**0.61**	**0.90**	**0.82**		
Highly skilled staff				0.763	8.771***
Years of experience				0.699	6.452***
Professional certificates acquired				0.735	9.186***
Auditor specialization in specific industry				0.881	11.953***
Ability of the auditor to use advanced software of auditing				0.798	12.436***
Technological advancements	**0.59**	**0.92**	**0.90**		
Financial data in processable format (Excel Format)				0.625	3.379**
Accessibility (Convenience and Usability) Attributes				0.743	6.809***
Presence of a website for the company				0.819	6.550***
Using automated system to keep records of the company				0.835	9.266***
Internet reporting	**0.65**	**0.85**	**0.77**		
Financial attributes				0.852	7.282***
Corporate governance attributes				0.785	6.170***
Investor relations attributes				0.670	4.571***
Forward looking attributes				0.803	6.371***

Note: ** $p < 0.01$, *** $p < 0.001$

5.3 Descriptive statistics and correlation matrix

The study variables are analyzed descriptively to provide a general overview of their characteristics. The mean, standard deviation and correlations of CGSC, auditor qualifications, audit quality, Technological advancement, and Internet reporting are presented in Table (3). Table (3) also shows the correlation matrix for the main constructs of the model. The results indicate that CGSC is positively correlated with audit quality, auditor qualifications, technological advancement, and Internet reporting at a significance level of less than 0.01, except for Internet reporting which has a significance level of less than 0.05. Moreover, audit quality has a significant positive correlation with auditor qualifications, technological advancement, and Internet reporting at a significance level of less than 0.01. The correlation matrix findings support the subsequent hypotheses testing of the research.

Table 3. Descriptive statistics, correlation coefficients among variables

Variable	M	SD	CGSC	Audit quality	Auditor qualifications	Technological advancement	Internet reporting
CGSC	3.78	0.97	1				
Audit quality	3.20	0.77	0.50**	1			
Auditor qualifications	3.14	1.08	0.49**	0.63**	1		
Technological advancement	3.33	0.68	0.50**	0.54**	0.61**	1	
Internet reporting	3.66	0.60	0.28*	0.43**	0.29*	0.38**	1

Note: * and ** indicate significance at the 5% and 1% levels, respectively.

5.4 Hypothesis testing

The regression estimates of the model components are shown in Table (4), where all the direct effects have significant coefficients at a level of 0.001 or lower, except for auditor qualification, which is significant at a level of 0.05. The indirect effects of the model (mediating role) indicate that CGSC has a significant influence on Internet reporting through audit quality as a mediator, with a significance level of 0.01 or lower. Based on the results of the regression analysis, it can be inferred that CGSC positively affects both Internet reporting and audit quality, and that audit quality and auditor qualification positively impact Internet reporting. Therefore, the researchers can accept H1, H2 and H3, which state that CGSC has a positive effect on Internet reporting and audit quality, and that audit quality positively affects Internet reporting. Regarding H4, bootstrapping with 95% confidence interval was used (Preacher & Hayes, 2008). The results confirmed that audit quality positively mediates the relationship between CGSC and Internet reporting.

Table 4. Standardized regression estimates from the structural model

Path	Standardized Coefficient	t value
Direct Effect		
CGSC → Internet reporting	0.294	3.96***
CGSC → Audit quality	0.579	7.24***
Audit quality → Internet reporting	0.512	3.74***
Auditor Qualification → Internet reporting	0.148	1.99*
Indirect Effect		
CGSC → Audit quality → Internet reporting	0.237	2.94**

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The moderating effects of auditor qualification and technological advancement on the relationships among CGSC, audit quality, and Internet reporting were tested using regression analysis. The results are presented in Table (5). Hypothesis 5 predicted that auditor qualification would positively moderate the relationship between CGSC and audit quality. The results supported this hypothesis, as the Adjusted R Square value increased from 37% to 55% when the moderator variable was added to the model. This indicates that auditor qualification enhances the association between CGSC and audit quality. This implies that the audit quality is enhanced by the CGSC when the auditor qualifications are high rather than low. Therefore, H5 is supported, which states that the moderator variable (auditor qualifications) positively influences the relationship between the CGSC and audit quality.

The moderation role of the technological advancements on the relation between the audit quality and the internet reporting is also examined in table (5). The results indicate that the technological advancements variable positively moderates the relationship of the audit quality and the Internet reporting at a significance level less than 0.05. This implies that the impact of the audit quality on the Internet reporting is enhanced by the presence of the technological advancements as a moderator, as the adjusted R Square value increased by 5%, from 29% to 34% with significant level less than 0.01. Therefore, H6 is accepted.

Table 5. Regression analysis of Moderation for audit quality and Internet reporting

Variables	Model 1	Model 2
(A) Moderating effect of Auditor qualifications		
CGSC	0.523^{***}	0.509^{***}
Auditor qualifications	0.189^{*}	0.165^{*}
CGSC × Auditor qualifications		0.282^{**}
R^2	0.37	0.55
$\triangle R^2$ change		0.18^{***}
F	34.27^{***}	43.15^{***}
(B) Moderating effect of Technological advancement		
Audit quality	0.261^{***}	0.297^{***}
Technological advancement	0.192^{**}	0.218^{**}
Audit quality × Technological advancement		0.145^{*}
R^2	0.29	0.34
$\triangle R^2$ change		0.05^{**}
F	19.44^{***}	20.51^{***}

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

6. Discussion

One of the current issues of interest is the implementation and compliance of corporate governance. The CGSC is a tool that many countries use to achieve good governance practices and high compliance levels. Meanwhile, disclosure is an ongoing issue in financial accounting to meet the demands of the users of financial reports. Therefore, Internet reporting has emerged in the last decade as a way to use the technological advancement in information dissemination tools. The CGSC and the Internet reporting are related topics that have not been sufficiently researched in developing countries, especially in Egypt. This gap in the literature is the main motivation for this research. The research aims to fill this gap and also to examine the mediating effect of audit quality and the moderating effects of auditor qualifications and technological advancements on the relationship between the CGSC and the internet reporting.

This paper examines the influence of corporate governance standards compliance (CGSC) on internet reporting, taking into account the moderating role of audit quality. Unlike most previous studies that treated audit quality as a control, independent or dependent variable only, this study considers it as a mediator between CGSC and internet reporting. The main argument is that higher compliance with corporate governance principles through CGSC leads to higher internet disclosure, especially when the audit quality is high. The paper also explores how auditor qualifications and technological advancement moderate the relationship between CGSC and internet reporting.

The research findings showed that Internet reporting is significantly influenced by CGSC and that the relationship between CGSC and Internet reporting is positively mediated by Audit quality. Furthermore, the effect of technological advancement on the relationship between audit quality and Internet reporting is higher than that of lower technological advancement. Therefore, technological advancement moderates the effect of CGSC on Internet reporting through audit quality.

According to the signaling theory, information disclosure influences the users' decisions. This is in line with previous studies that showed that adopting good corporate governance practices can enhance the Internet reporting of financial and non-financial information of the company. Internet reporting is vital in the globalized era, as it helps to reduce the problem of information asymmetry and achieve timeliness for delivering information to the decision makers at the right time. This can help to lower the risks of earnings management and fraud.

According to the research findings, there is a positive relationship between audit quality and Internet reporting. The findings also suggest that improving the technological advancement can have a significant impact on the quality of Internet reporting. This study supports that CGSC can enhance the internet reporting by improving the audit quality taking into account the auditor qualifications and the technological advancement.

This study is conducted in a developing country like Egypt, where the researchers did not find any previous studies that explored how audit quality, auditor qualifications and technology advancement mediate and moderate the relationship between CGSC and the Internet reporting. This research context is unique because Egypt is undergoing rapid economic, social, and political changes, which create a distinctive setting for this study.

By examining the technological advancement of the firms, this research contributes to the theoretical understanding of CGSC. This study also reveals how technological advancement enhances the ability of firms to report on the Internet. The empirical findings of previous studies corroborate the results of this research, which show a significant relationship between technological advancement and Internet reporting in Egypt. Moreover, this study finds a positive moderating effect of technological advancement on the relationship between audit quality and Internet reporting. Thus, this research suggests that technological advancement and auditor qualifications can improve the audit quality and consequently the quality of Internet reporting.

The results of this study indicate that CGSC can improve Internet reporting when it is implemented well and when Audit quality is high. Moreover, the findings suggest that positive group dynamics and perceptions of technological advancement can increase the pressure on groups to coordinate and motivate firms to disclose more information voluntarily.

The decision to focus our study on auditors rather than the more traditional firm-level approach for the CGSC warrants thought. Although CGSC is normally implemented at the corporate level, our purposeful focus on auditors arises from an understanding of their critical role as mediators impacting the actual application of corporate governance practices, particularly in the arena of online reporting. This auditor-level investigation decodes the complex link between auditors, corporate governance, and online reporting. While we recognize that our departure from traditional company-level research may be regarded as unconventional, we see it as a strength, giving a more nuanced perspective on the dynamics at play. This method adds a fresh perspective to the current literature by shining focus on the often-overlooked role of auditors in corporate governance and online reporting. While we recognize this option as a possible constraint, we believe it enriches the conversation and creates the framework for future research to investigate larger ramifications at the firm level.

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