

Firmansyah, Egi Arvian; Umar, Umar Habibu; Saminu Jibril, Rabi

Article

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*Corresponding author: Egi Arvian Firmansyah, Faculty of Economics and Business, Universitas Padjadjaran, Bandung 40132, Indonesia
E-mail: egi.firmansyah@unpad.ac.id

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David McMillan, University of Stirling,
United Kingdom

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FINANCIAL ECONOMICS | RESEARCH ARTICLE

Investigating the effect of ESG disclosure on firm performance: The case of Saudi Arabian listed firms

Egi Arvian Firmansyah^{1*}, Umar Habibu Umar² and Rabi'u Saminu Jibril³

Abstract: This study investigates how environmental, social, and governance (ESG) disclosures influence the performance of listed Saudi Arabian companies. The study used unbalanced panel data obtained from the Bloomberg database (2010–2020). The results show that ESG has significantly reduced TOBINSQ but has an insignificant association with return on equity (ROE). Concerning the ESG components, environmental disclosure has an insignificant negative association with TOBINSQ but is significantly and positively related to ROE. Social disclosure has a significantly reduced TOBINSQ but is insignificantly and negatively associated with ROE. Meanwhile, governance disclosure significantly improved and reduced TOBINSQ and ROE, respectively. Besides, the findings offer helpful implications for regulatory bodies and policymakers toward providing practical guidelines and policies that ensure the implementation of ESG activities maximizes shareholders' wealth.

Subjects: Environmental Economics; Finance; Business, Management and Accounting

Keywords: environmental, social, and governance; ESG disclosure; financial performance; Saudi Arabia

JEL Classification: L25; M41; Q56

1. Introduction

Corporate disclosure is one channel through which businesses may share their ESG performance (El Khoury et al., 2021). ESG is an acronym for environmental, social, and governance. The Environmental, Social, and Governance (ESG) score is a numerical indicator created and released by Bloomberg that accounts for roughly 120 Performance indicators (Shaikh, 2021). ESG initiatives may be seen as a technique to show stakeholders that firms have significant concerns about their requirements and sensibility (Kalia & Aggarwal, 2022). ESG disclosure has grown popular among businesses and communities that value social responsibility (Shaikh, 2021). The world is continually evolving, and ESG disclosure activities are becoming increasingly popular due to the developing global environmental catastrophe (Giannopoulos et al., 2022).

ESG is progressively elevating itself to the status of one of the most critical metrics for assessing firms (Gao et al., 2022). Firms with good ESG scores tend to have better access to trade credit (Luo et al., 2023) and show better property as a safe investment instrument during the global health crisis caused by COVID-19 (Rubbiani et al., 2021). Investors, company management, and other

stakeholders have been paying close attention to ESG performance in recent years since it is a well-known and crucial method of raising a firm's value (Ahmad et al., 2021). Hence, governments around the globe have progressively passed ESG-related laws, rules, and policies, and a lot of organizations (NGOs) have started to encourage ESG reporting and assessment (Liu et al., 2022). Specifically, in 2014, the European Union required that external non-financial information include ESG information by big companies (Liu et al., 2022).

Consequently, firms are under pressure to maximize their struggles and concentrate on non-financial facets of their duties as investors' interest in these issues and global awareness of risks related to environmental issues in particular, as well as other non-financial things like social responsibility and good governance, are on the rise (Aydoğmuş et al., 2022). Thus, business organizations have increased consciousness of ESG activities, making many of them have started programs to enhance performance on ESG issues, management roadshows with investors to highlight their ESG practices, and many have started publicly disclosing their ESG efforts in their annual reports (Khan, 2019).

ESG disclosure provides a considerable chance to comprehend companies' non-financial reporting (Albitar et al., 2020). ESG performance is determined by a variety of ESG-related factors in order to promote sustainable business practices (Lee & Isa, 2022). ESG practices protect the shareholders' interests as management and decision-making are separated in a firm (Chouaibi et al., 2022). Anxious stakeholders and investors want to know how the company manages its operations and where its money is invested, especially in light of its ESG reporting (Kalia & Aggarwal, 2022). Therefore, ESG information benefits investors and society as it is essential to the financial markets, which is the responsibility of both government and private sectors (Ahmad et al., 2021). Although allocating resources to ESG initiatives may appear to be at odds with profit maximization, doing so is compatible with business sustainability since it allows organizations to fulfill the expectations of various stakeholders, which should enhance financial performance (Lee & Isa, 2022).

Moreover, businesses and shareholders must address the critical question of whether ESG disclosure practices can result in improved corporate performance (Alareeni & Hamdan, 2020) because there remains a nagging doubt about the long-term financial feasibility of ESG-based investments despite the adoption of non-financial indicators in the investment decision criteria (Rastogi & Singh, 2022). Therefore, it is crucial to comprehend if and how ESG practice pays off, given the resources and focus that firms are investing in this area (Zheng et al., 2022).

For many years, academics and business research have paid special attention to exploring the influence of ESG reporting on a company's profitability (Aydoğmuş et al., 2022; Bodhanwala & Bodhanwala, 2022; Chouaibi et al., 2022). Literature work on the interplay between ESG disclosure and corporate performance grows exponentially (El Khoury et al., 2023). Therefore, many studies were conducted across the globe that evaluated how ESG reporting affects corporate performance (Giannopoulos et al., 2022). ESG indicators are non-financial performance measures that influence firm performance (Kweh et al., 2017). Some scholars believe that ESG reporting leads to a reduction in a firm's profitability. For instance, the work conducted by Jibril et al. (2022) considers the transition from non-renewable energy as a significant environmental challenge faced by companies operating in emerging and developing economies. This is due to the high cost of the transition, which involves enormous capital investment. Thus, with a high financial commitment to related environmental issues, companies do not willingly disclose their environmental issues to save costs and increase their financial performance.

An extensive literature review points out three weaknesses or limitations of prior studies. First, because the literature is rife with contrasting paradoxes and findings, the connection between ESG and business profitability remains unclear (Khan, 2022). Second, prior studies primarily concentrate on the overall ESG performance or one component sole dimension of ESG, and it might not be a good idea to focus on just one dimension (Alareeni & Hamdan, 2020). Therefore, a few ESG

studies focused on all three ESG elements and their effects on firm performance (Alareeni & Hamdan, 2020). Some of these studies explored how ESG components affect company performance (Abdi et al., 2022; Bahadori et al., 2021; Maji & Lohia, 2022; Saygili et al., 2022). Third, previous studies were mainly carried out in developed economies, though a few of them focused on some developing countries like China, India, and Malaysia (Ahmad et al., 2021; Alareeni & Hamdan, 2020; Albitar et al., 2020; Aydoğmuş et al., 2022; Chouaibi et al., 2022; Gao et al., 2022; Kalia & Aggarwal, 2022; Khan, 2019; Kweh et al., 2017; Lee & Isa, 2022; Liu et al., 2022; Rastogi & Singh, 2022; Shaikh, 2021; Zheng et al., 2022). Therefore, in most developing countries, researchers pay little or no attention to examining how ESG disclosure influences company performance due to the non-availability of the data on notable databases such as Bloomberg, S&P Capital IQ, and Refinitiv Eikon. Perhaps this happens because companies in most developing countries have no regulations and guidelines for reporting ESG activities. Consequently, most firms (including those listed) disclose minimal or no ESG information.

Aiming to overcome the shortcomings present in previous studies, this research assesses the effects of ESG and its constituents' reporting on the performance of Saudi Arabia's quoted firms. It concentrated on Saudi-listed firms because of the country's dedication to ESG practices to attain Saudi Vision 2030, which enforces specific issues of social and environmental concerns (Bamahros et al., 2022; Chebbi & Ammer, 2022). Besides, Saudi Arabia is ranked second in the region regarding the adoption and implementation of ESG (Ghardallou, 2022). It is also an emerging economy prosperous with petroleum and is the world's largest oil exporter (Workman, 2021). The country has been trying to diversify its economy by developing various sectors, such as tourism, sports, and other related sectors (Al-Monitor, 2023). Hence, local and international investors have increasingly become interested in knowing the risks and potential benefits of their investments in the country (Adileh, 2022). That could be known through reporting ESG information in the annual reports as it enables investors to make rational decisions.

Eventually, ESG reporting becomes a mandate for companies operating in Saudi Arabia as the country's economy shifts away from oil to build a more sustainable future (Adileh, 2022). Recent initiatives by the Saudi Exchange include the introduction of voluntary ESG reporting guidelines and supporting Saudi Arabian businesses to incorporate best practices and superior ESG reporting into their daily operations. They are crucial to guarantee that the Saudi stock market becomes a popular investment destination (Institutional-Investor, 2022). That is because stakeholders demand ESG information, especially investors (Tarmuji et al., 2016). Consequently, Saudi governance codes mandate that all publicly listed firms disclose non-financial information related to ESG in their annual reports (Bamahros et al., 2022; Chebbi & Ammer, 2022). Also, the ESG reporting guidelines released by the Saudi Exchange reveal to enhance the awareness and significance of ESG investing in Saudi Arabia (PRNewswire, 2021). In line with Vision 2030, the country aspires to develop into a genuinely global country with a financial network that links possibilities in the Middle East with companies and investors in other parts of the globe (Institutional-Investor, 2022). These struggles might assist Saudi Arabia in realizing its Vision 2030 by attracting foreign companies and transforming the economy from an oil-based one to a more diversified one (Chebbi & Ammer, 2022). For these reasons, it is considered appealing for academics to research Saudi Arabia, particularly on themes related to ESG and financial performance in this country.

As far as we know, this research pioneers an attempt to assess how ESG and its elements influence corporate profitability within the context of Saudi Arabia. The research reveals that the overall ESG and social disclosures have significantly reduced TOBINSQ. However, governance disclosure has significantly affected TOBINSQ (positive) and ROE (negative).

This research adds to the existing body of literature in various dimensions. The results could be helpful to the regulators and policymakers in Saudi Arabia in revising the regulations and policies that can enhance the firm ESG practices and reporting to attract foreign investments into the country. Specifically, the Saudi Exchange could find the findings helpful in revising the ESG reporting guidelines in such a way as to ensure ESG practices improve firm performance in the country.

Considering the implications of most findings showing that a higher level of disclosure reduces firm performance, revising the ESG implementation guidelines and other relevant policies and regulations becomes necessary. Similarly, regulators and policymakers in other developing countries, particularly the ones that have not yet mandated their companies to launch and implement ESG activities and reporting, can significantly learn from this study. This is because firms participate in ESG activities to increase their profitability and show their commitment to complying with the market requirements (Khan, 2022). ESG performance is recognized by investors, company management, and other stakeholders since it is vital to boost firm performance (Ahmad et al., 2021). Besides, this study will benefit the management of Saudi companies in making a decision regarding the implementation of ESG activities and reporting in such a way as to enhance firm performance.

The remainder of the paper is structured as outlined below. Section 2 is specifically allocated to the literature review, briefly overviewing Saudi Policy on ESG disclosure, theoretical perspectives, and empirical reviews. Section 3 accommodates the adopted methodology in the research. In section 4, the results are presented and discussed. Finally, section 5 shows the conclusion of the study.

2. Literature review

2.1. Overview of Saudi policy on ESG reporting

To promote ESG reporting in Saudi Arabia, the Saudi Exchange issued comprehensive standards for reporting ESG in 2021, which are believed to be helpful to at least 200 listed companies and other firms that may eventually seek to go public (Institutional-Investor, 2022). The promotion of ESG investment in Saudi Arabia has received significant improvement through government regulations that promote transparency and disclosure (Evreka, 2023). Al-Rumaih, the CEO of Saudi Exchange, disclosed that the Saudi ESG guidelines have continuously become crucial to local and international investment decisions, stimulating firms to report their ESG performance voluntarily (PRNewswire, 2021). Further, Al-Rumaih argues that advancing ESG practices is essential to achieving Saudi Arabia's Vision 2030 goals, diversifying the economic base, and creating a stable financial sector (Institutional-Investor, 2022). Aligned with the goals outlined in Saudi Vision 2030, firms listed in Saudi Arabia must disclose their activities about the environment and society. Hence, various relevant organizations in Saudi Arabia have jointly struggled to promote ESG reporting by Saudi firms. Specifically, notable Saudi institutions that actively support the achievement of the sustainability agenda in line with Vision 2030 include the King Khalid Foundation, Ministry of Economy and Planning, Ministry of Finance, Ministry of Commerce, Capital Market Authority, Ministry of Energy, Human Resource and Social Development, Ministry of Investment, Ministry of Environment, Water, and Agriculture, and Ministry of Finance and Planning (Saudi Exchange, 2021). These efforts have made many firms listed on the Saudi Exchange uphold the principles and practices that support ESG since they realize the inherent importance of a sustainable growth strategy.

2.2. Theoretical perspectives

Several theories can be adopted to assess how ESG reporting is related to corporate performance. For instance, the stakeholder theory pertains to managing organizations and ethical practices within the business realm, which considers the various entities influenced by businesses, such as customers, suppliers, local communities, and creditors (Lin, 2018). Stakeholder theory aligns with this research on ESG because ESG practices of a company will contribute to good management, satisfying various company's stakeholders and thereby resulting in a positive financial performance (Freeman, 1994). That aligns with slack resource theory, which says the company's financial performance will improve if resources are allocated to social and environmental projects (Abdi et al., 2022). However, the stakeholder theory contradicts the agency theory profounded by (Jensen & Meckling, 1976), stating that investing in ESG provides no financial benefit because the company spends money on non-productive activities. The debate between the two poles is

heated among researchers in various country contexts and settings, and this current study attempts to contribute to developing the theory by sampling Saudi Arabian companies.

ESG is often perceived as the same concept as CSR (corporate social responsibility). However, these two terms are dissimilar. The clear distinction between these two is that CSR is a business strategy driven by corporations. In contrast, ESG seems to involve the standards that investors use to evaluate a company or firms that use CSR (Rau & Yu, 2023). Addressing that difference, this study focuses on ESG instead of CSR.

2.3. Empirical review and hypothesis development

2.3.1. ESG disclosure and financial performance

Empirical studies that investigate the connection between ESG and business performance are generally ambiguous, yielding both favorable (positive) and unfavorable (negative) outcomes. Prior studies mostly show that ESG reporting improves firm performance (Ahmad et al., 2021; Alareeni & Hamdan, 2020; Albitar et al., 2020; Aydoğmuş et al., 2022; Bahadori et al., 2021; Lee & Isa, 2022) because ESG disclosure stimulates companies to act more environmentally and socially friendly. For instance, in a study using 351 sampled firms indexed in FTSE350 UK, Ahmad et al. (2021) documented that ESG disclosure is positively associated with company financial performance. Moreover, the study suggests that companies exhibiting stronger ESG performance tend to demonstrate more robust financial performance than those with weaker ESG performance. Furthermore, in a review study using a dataset until 2015, Friede et al. (2015) found that 90% of the research investigating the association between ESG reporting and company performance showed that ESG reporting is positively related to firm performance. That result aligns with a study by Huang (2021), documenting a positive but economically modest association between ESG disclosure and corporate performance. However, Atan et al. (2016) reveal an insignificant effect of ESG disclosure on a company's performance proxied by Economic Value Added (EVA). A significant negative impact of CSR on firm performance was also documented by Bătae et al. (2021), employing the European banking sector. In addition, a study using Norwegian companies reveals that ESG initiatives negatively affect financial performance proxied by Return on Asset (ROA) (Giannopoulos et al., 2022). Interestingly, that study reveals that ESG initiative is positively associated with Tobin's Q.

Furthermore, a study by El Khoury et al. (2021) reveals a non-linear effect of ESG scores on financial performance. Their study indicates a concave relationship between those two variables, implying that ESG is considered a value creator if the investment is relatively low. However, it becomes a value destroyer for a company if the investment is excessive. Research by Gao et al. (2022) reveals that firms' ESG performance minimizes the probability of their stock price experiencing a crash. Furthermore, stakeholder theory implies that ESG activities may result in positive outcomes for the company because they benefit its stakeholders.

Since the literature results on the ESG-financial performance relationship are inconsistent, this current study reexamines this relationship using Saudi Arabian firms with different characteristics from other countries, primarily European or democratic countries. The fact that Saudi Arabia Kingdom is a non-democratic country and the firm governance of the country might result in compelling evidence, thereby enhancing the body of knowledge on the ESG-financial performance relationship. Therefore, this study proposes the following first hypothesis.

H1: ESG significantly and positively influences the financial performance of the firms listed in Saudi Arabia.

2.3.2. Environmental disclosure and financial performance

This current study further extends the ESG-financial performance relationship by examining the ESG effect using its individual components. The first component of ESG is the environment (E). Previous studies on environmental disclosure's influence on financial performance are also

mixed. For example, a study employing the airline industry worldwide revealed that environmental and social activities are positively and significantly related to the financial performance represented by Tobin's Q (Abdi et al., 2022). That result is supported by Al Amosh et al. (2022), employing 124 non-financial firms from Jordan, Palestine, Lebanon, and Syria, indicating the essence of improving ESG disclosure to improve financial performance. That result aligns with previous studies conducted earlier (Bahadori et al., 2021; Bătae et al., 2021; Buallay, 2020; Maji & Lohia, 2022; Mardini, 2022).

Nonetheless, several previous studies documented that environmental factors are negatively associated with financial performance (Ahmad et al., 2021; Alareeni & Hamdan, 2020; Duque-Grisales & Aguilera-Caracuel, 2021; Jibril & Maikano, 2022; Koroleva et al., 2020; Menicucci & Paolucci, 2022; Saygili et al., 2022). A study by Saygili et al. (2022) revealed that environmental disclosure is negatively related to the performance of Turkish-listed firms. ESG investments are high, and organizations forfeit cash flow and divert other resources needed for operations, lowering their profitability (Duque-Grisales & Aguilera-Caracuel, 2021). In contrast, Buallay (2022) showed that sustainability reporting influences insignificantly corporate performance indicators of agricultural firms.

Theoretically, stakeholder theory suggests that businesses prioritizing environmental concerns are more likely to experience improved performance as they aim to enhance overall firm efficiency. However, considering the inconsistent results of the environment-financial performance relationship in the previous empirical studies, this study proposes the following second hypothesis.

H2: Environmental disclosure significantly and positively influences the financial performance of the listed firms in Saudi Arabia.

2.3.3. Social disclosure (CSR disclosure) and financial performance

The second ESG element is social (S) disclosure, more popularly known as CSR (corporate social responsibility). Many companies from different sectors have started to perform CSR initiatives and disclosed them in their annual accounts and reports. Empirical-wise, prior studies documented different results on the impact of social disclosure on corporate performance.

For instance, a study in the airline industry reveals that social disclosure positively influences financial performance because this initiative is directly linked to the company's operation and improvement or can reduce the operation costs, subsequently improving firm performance (Abdi et al., 2022). That result is supported by a study using UK firms (Ahmad et al., 2021) and studies in various countries, such as the US (Alareeni & Hamdan, 2020), India (Maji & Lohia, 2022) and Turkiye (Saygili et al., 2022). Furthermore, a study using 24 emerging countries showed a similar result (Bahadori et al., 2021).

Nonetheless, some scholarly work documented that social disclosure is negatively related to corporate profitability. For instance, a study by Bătae et al. (2021) reveals that investors in banking sectors do not see CSR as an essential factor that would eventually increase financial performance. This result aligns with Duque-Grisales and Aguilera-Caracuel (2021) employing multinational companies, Menicucci and Paolucci (2022) using the Italian banking sector, and Mardini (2022) using a large dataset using non-financial listed firms in 35 nations. Furthermore, according to stakeholder theory, CSR or social activities will enhance a firm financial performance because a company attempts to provide benefits to the parties where it is tied up in the network (Freeman, 1994). Based on the synthesis of prior empirical studies, this research proposes the following third hypothesis.

H3: Social disclosure significantly and positively influences the financial performance of the listed firms in Saudi Arabia.

2.3.4. Governance disclosure and financial performance

The final component of ESG is governance (G). Disclosing governance information allows stakeholders and potential investors to look for helpful information relevant to their decision-making needs, such as ownership structure and board composition (Rossi et al., 2021). The governance elements assess concerns related to the processes and systems to warrant that members of the board and managers operate for their stakeholders' best interests. Board governance includes board arrangement, leadership, independence, risk management, and business ethics (Lee & Isa, 2022).

Previous studies reveal both positive and negative results on the governance-financial performance relationship. A recent study using the India setting reveals that governance is statistically and positively related to firm financial performance, indicating that companies with a higher level of governance can achieve higher profitability (Maji & Lohia, 2022). That result is supported by previous studies (Ahmad et al., 2021; Brooks & Oikonomou, 2018; Mardini, 2022; Masud et al., 2018; Saygili et al., 2022).

Some prior research has unveiled an adverse correlation between governance disclosure and the financial performance of firms. For example, Abdi et al. (2022) unveiled the governance disclosure to significantly reduce the airline industry's financial performance. It suggests that increased financial performance may not always follow an organization's investment in creating board and corporate social responsibility policies for airlines. Similarly, other studies like Bahadori et al. (2021), Duque-Grisales and Aguilera-Caracuel (2021), Menicucci and Paolucci (2022), and Bătae et al. (2021) documented a negative effect of governance disclosure on corporate performance. Contrarily, according to stakeholder theory, good governance will improve financial performance because transparency and accountability will be better, satisfying the firm stakeholders, primarily the shareholders. As a result of documenting the inconsistent and few empirical results of the governance-financial performance association, this study proposes the fourth hypothesis.

H4: Governance disclosure significantly and positively influences the financial performance of the listed firms in Saudi Arabia.

3. Methodology

3.1. Data and sample

This research explores how ESG and its components influence the financial performance of Saudi-listed companies. The data for this research were generated from the Bloomberg database for the sampled firms. The database has become a popular and reliable source of data for practitioners, academics, and practitioners (Chebbi & Ammer, 2022). We target to utilize all the listed firms that report their ESG scores as a study sample. The Saudi Exchange listed 206 companies at the end 2021 (Chebbi & Ammer, 2022). The ESG data for all the listed Saudi firms were searched from the Bloomberg database over eleven (11) years from 2010 to 2020.

Moreover, the study used panel data that consists of 237 observations from a sample of 26 listed companies with some missing values as inadequate data for the Saudi Market, which were not available on the database (Al-Faryan, 2021). The sample we consider is only the firms with a minimum of four year-data, which is the minimum number of years for applying panel regression analysis. Consequently, some firms with ESG data of less than four years were excluded. Table 1 displays the sectoral sample distribution.

It is worth noting that using only a sample of 26 listed Saudi firms was not intentional; rather, it stemmed from the scarcity of ESG data among most Saudi companies. Consequently, these were the only firms for which we found sufficient data spanning at least four years available on the Bloomberg database during the study. Two key reasons could be attributed to the shortage of ESG scores for Saudi-listed firms. First, ESG reporting is not compulsory, though firms are encouraged to

Table 1. Sample distribution

Sector	Number of companies	Percentage
Banking	9	35%
Building Materials/Products	1	4%
Chemicals	3	12%
Diversified Holding Companies	1	4%
Electric Utilities	1	4%
Food Products	2	8%
General Mining	1	4%
Life Insurance	1	4%
Real Estate Developers	2	8%
Restaurants	1	4%
Water Transport/Shipping	1	4%
Wireless Communications	3	12%
Total	26	100%

do so in Saudi Arabia. Second, the genuine commitment to stimulate Saudi firms to invest in and report ESG activities began in recent years. For example, it was in 2018 that Saudi Exchange (Tadawul) partnered with the United Nations' Sustainable Initiative for ESG awareness and campaigns toward improving sustainable investment in the country (Saudi Exchange, 2021). Besides, the first comprehensive guidelines for EG activities and reporting were released in 2021 (Institutional-Investor, 2022).

Consequently, only ESG data for a few Saudi-listed firms were accessed from the database. Despite the low representativeness of the results due to using a small sample, the findings can be helpful for regulators and listed firms in the country. In recent studies like Bamahros et al. (2022) (Bamahros et al., 2022) and Chebbi and Ammer (2022), the use of a small sample of firms is attributed to inadequate ESG data.

3.2. Variables and their measurements

The study used thirteen variables, including two dependent, four independent, and seven control variables. The dependent variables are market-based and account-based performance measurements, which are Tobin's Q and return on equity (ROE). The four independent variables are ESG disclosure and its three broken-down elements: environmental, social, and governance disclosure. The seven (7) control variables are board size, board independence, board meetings, audit committee size, audit committee meeting, firm size, and leverage. The variables in this study, including their measurement, expected signs, and sources, are presented in Table 2.

3.3. Econometric models

We investigate the effect of ESG disclosure on the financial performance of 26 listed firms in Saudi Arabia over eleven years. Hence, this study found the generalized method of moments (GMM) as the most suitable analysis method. Hence, this study found that the generalized method of moments (GMM) is the most appropriate analytical approach. Some critical conditions that suggest using the GMM estimator include the sample size must be larger than the period covered, and independent variables must be related to the previous and possibly current realizations of the error (Roodman, 2009, p. 86). Applying the GMM model has many benefits as it effectively addresses heteroskedasticity, autocorrelation, and endogeneity issues (Arellano & Bover, 1995; Blundell & Bond, 1998; Duong et al., 2023; Roodman, 2009; Yousaf et al., 2019, 2019). The proposed models showing how ESG disclosure impacts market-based and accounting-based performance measurements are as follows:

$$\begin{aligned} \text{TOBINSQ}_{it} = & \beta_0 + \beta_1 \text{TOBINSQ}_{it-1} + \beta_2 \text{ESG}_{it} + \beta_3 \text{BS}_{it} + \beta_4 \text{BI}_{it} + \beta_5 \text{BM}_{it} + \beta_6 \text{ACS}_{it} + \beta_7 \text{ACM}_{it} \\ & + \beta_8 \text{SIZE}_{it} + \beta_9 \text{LEV}_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

$$\begin{aligned} \text{ROE}_{it} = & \beta_0 + \beta_1 \text{ROE}_{it-1} + \beta_2 \text{ESG}_{it} + \beta_3 \text{BS}_{it} \\ & + \beta_4 \text{BI}_{it} + \beta_5 \text{BM}_{it} + \beta_6 \text{ACS}_{it} + \beta_7 \text{ACM}_{it} + \beta_8 \text{SIZE}_{it} + \beta_9 \text{LEV}_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

Moreover, we decompose ESG disclosure into its three (3) components, environmental, social, and governance disclosures, to assess how they influence firm performance. The models for estimating the effects of the corporate governance attributes on ESG disclosure and its components are as follows:

$$\begin{aligned} \text{TOBINSQ}_{it} = & \beta_0 + \beta_1 \text{TOBINSQ}_{it-1} + \beta_2 \text{ENV}_{it} + \beta_3 \text{SOC}_{it} + \beta_4 \text{GOV}_{it} + \beta_5 \text{BS}_{it} + \beta_6 \text{BI}_{it} \\ & + \beta_7 \text{BM}_{it} + \beta_8 \text{ACS}_{it} + \beta_9 \text{ACM}_{it} + \beta_{10} \text{SIZE}_{it} + \beta_{11} \text{LEV}_{it} + \varepsilon_{it} \end{aligned} \quad (3)$$

$$\begin{aligned} \text{ROE}_{it} = & \beta_0 + \beta_1 \text{ROE}_{it-1} + \beta_2 \text{ENV}_{it} + \beta_3 \text{SOC}_{it} + \beta_4 \text{GOV}_{it} + \beta_5 \text{BS}_{it} + \beta_6 \text{BI}_{it} + \beta_7 \text{BM}_{it} \\ & + \beta_8 \text{ACS}_{it} + \beta_9 \text{ACM}_{it} + \beta_{10} \text{SIZE}_{it} + \beta_{11} \text{LEV}_{it} + \varepsilon_{it} \end{aligned} \quad (4)$$

Notes: TOBINSQ, market-based performance; ROE, return on equity (accounting-based performance); ESG, environmental, social and governance disclosure; ENV, environmental disclosure; SOC, social disclosure; BS, board size; BI, board independence; BM, board meetings; ACS, audit committee size; ACM, audit committee meetings; SIZE, firm size; LEV, leverage; β_0 , constant term; β_1 - β_{11} , coefficients of the independent and control; Subscript i and t stand for firm and year, respectively; and ε is the error term.

4. Results and discussion

4.1. Descriptive statistics

Table 3 provides descriptive statistics about the entire variables of this study. TOBINSQ has an average of 1.99 and minimum and maximum values of 0.76 and 5.03, with a standard deviation of 0.66, respectively. Return on equity (ROE) has an average value of 10 % with minimum and maximum values of -47% and 54%, respectively. ESG disclosure has an average value of 17%, with minimum and maximum values of 3% and 50%, respectively. That implies an overall low level of compliance with ESG by the selected firms, as the maximum level of compliance is 50%.

Similarly, the statistical analysis of environmental disclosure (EN) demonstrates an average disclosure level of 13% among the chosen firms, ranging from 0% to 49%. This suggests that within the selected firms, some have not provided reports on environmental disclosure. The average social disclosure (SOC) compliance rate stands at 20%, varying between 3% and 57%. As for governance disclosure (GOV), the average percentage is 42%, ranging from 14% to 64%. This indicates a better disclosure trend than EN and SOC, with the highest compliance levels recorded at 49%, 57%, and 64%, respectively.

The board size (BS) averages 9.69 members, ranging between 6.00 and 14.00 serving on the board. The percentage board independent directors (BI) stands at 42%, varying between a minimum of 13% and a maximum of 70%. Board meetings (BM) occur on average 6.12 times annually, with a minimum of 2 and a maximum of 16 meetings per year. The audit committee size (ACS) averages 4.02 members, which ranges from 2.00 to 6.00. Similarly, the frequency of audit committee meetings (ACM) averages 6.00 meetings, falling within the range of 2.00 and 14.00 meetings. Additionally, SIZE, represented as the natural logarithm of assets, averages 4.80, with a range between a minimum of 3.27 and a maximum of 6.28. Besides, leverage (LEV) accounts for 18% of total assets on average. While some companies did not secure any debt (0.00%), others debts-assets ratio reached 68%.

Table 2. Research variables and measurement

Variable	Description	Measurement	Expected Sign	Related hypothesis	Source of measurement
TOBINSQ	Tobin's Q or Q ratio	(Total assets - book value of equity + market value of equity)/total assets			Alareeni and Hamdan (2020), Abdi et al. (2022), Chouaibi et al. (2022)
ROE	Return on equity	Profit after tax and interest/Equity			Alareeni and Hamdan (2020), Al-Faryan (2021),
ESG	Environmental, social, and governance disclosure	An overall ESG disclosure score	+	H1	Alareeni and Hamdan (2020), Wasiuzzaman and Wan Mohammad (2020), Al Amosh et al. (2022), Abdi et al. (2022), Chouaibi et al. (2022)
ENV	Environmental disclosure	Score of environmental disclosure	+	H2	Alareeni and Hamdan (2020), Wasiuzzaman and Wan Mohammad (2020), Abdi et al. (2022), Al Amosh et al. (2022), Chouaibi et al. (2022)
SOC	Social disclosure	Score of social disclosure	+	H3	Alareeni and Hamdan (2020), Wasiuzzaman and Wan Mohammad (2020), Abdi et al. (2022), Al Amosh et al. (2022), Chouaibi et al. (2022)
GOV	Governance disclosure	Score of governance disclosure	+	H4	Alareeni and Hamdan (2020), Wasiuzzaman and Wan Mohammad (2020), Abdi et al. (2022), Al Amosh et al. (2022), Chouaibi et al. (2022)
BS	Board size	Count of directors serving appointed to the board	±		Wasiuzzaman and Wan Mohammad (2020), Bamahros et al. (2022)
BI	Board independence	The percentage of independent directors serving on the board	+		Wasiuzzaman and Wan Mohammad (2020), Al-Faryan (2021)
BM	Board meetings	The frequency of board meetings	+		Saygili et al. (2022), Bamahros et al. (2022)
ACS	Audit committee size	Number of directors appointed to the audit committee	+		Bamahros et al. (2022), Umar et al. (2022)
ACM	Audit committee meetings	Total number of meetings convened by audit committee members	+		Bamahros et al. (2022), Umar et al. (2022)
SIZE	Firm size	Natural logarithms of total assets.	+		Ahmad et al. (2021), Al-Faryan (2021), Abdi et al. (2022), Chouaibi et al. (2022)
LEV	Leverage	Total debt to total equity	±		Ahmad et al. (2021), Abdi et al. (2022), Chouaibi et al. (2022)

4.2. Pre-estimation tests

Table 4 shows the multicollinearity test results employing the variance inflation factor (VIF). These results for the models are acceptable, as they ranged between 1.13 and 6.18. Therefore, the VIF results are tolerable as none exceeds the threshold of 10, which is consistent with the works of Al-Faryan and Alokla (2023) and Gujarati and Porter (2009). Also, Table 4 displays the normality test results by applying skewness and kurtosis. As used in earlier research like Umar et al. (2023) and Umar and Al-Faryan (2023), variables with skewness values more than three and kurtosis values greater than ten should be considered to have outliers. Following these standards, none of the variables exceeds the threshold. Thus, all variables in this study are normally distributed.

4.3. Correlation matrix

Table 5 displays the Pearson correlation results of the variables in this research. The correlation coefficients are small except for rare ones, such as the correlation between GOV and TOBINSQ, BI and TOBINSQ, BM and TOBINSQ, ACS and TOBINSQ, and ACM and TOBINSQ with coefficients of 0.56, 0.13 and 0.95, 0.06 and 0.17 respectively. In this case, only the correlation coefficient between BM and TOBINSQ exceeds the threshold of 0.8 set by Kennedy (2008). Nonetheless, this can be overlooked as the VIF test result in Table 4 is negligible. Besides, the positive coefficients concerning correlation to ROE are BS and ROE, ACS and ROE, ACM and ROE, and SIZE and ROE, which have positive coefficients of 0.14, 0.030, 0.13, and 0.003, respectively. It is not a major problem, as this research does not primarily seek to determine their connections. Besides, none of the correlation coefficients is high to the extent that it can lead to an intolerable collinearity problem.

4.4. Multiple regression results using the two-step system GMM estimator

As earlier revealed, this study applied the two-step system GMM to estimate the relationship between ESG and the financial performance of the listed firms in Saudi Arabia. Table 6 displays the results of multiple regression produced using a two-step system GMM estimator.

The p-values associated with the first-order serial correlation, AR (1), are predominantly significant, while those related to the second-order serial correlation or AR (2) are not statistically significant. Meeting these criteria indicates the lack of serial correlation in our estimated results. The models 1, 2, 3, and 4 provide Hansen test values of 0.467, 0.228, 0.235, and 0.400, respectively, confirming the reliability of the instruments used in the models. Furthermore, the GMM regression results are reliable as each model has more groups than instruments.

Table 3. Descriptive statistics

Variable	Mean	Minimum	Maximum	Standard Deviation
TOBINSQ	1.99	0.76	5.03	0.66
ROE	0.10	0.47	0.54	0.12
ESG	0.17	0.03	0.50	0.11
ENV	0.13	0.00	0.49	0.14
SOC	0.20	0.03	0.57	0.13
GOV	0.42	0.14	0.64	0.10
BS	9.69	6.00	14.00	1.06
BI	0.42	0.13	0.70	0.12
BM	6.12	2.00	16.00	2.20
ACS	4.02	2.00	6.00	0.90
ACM	6.00	2.00	14.00	1.92
SIZE	4.80	3.27	6.28	0.61
LEV	0.18	0.00	0.68	0.17

The regression results in Table 6 indicate that ESG has an adverse effect on TOBINSQ ($\beta = -0.5934$, $p = 0.000$), as shown by model 1. This is practically possible because, following the work of Rabiul et al. (2022), the ESG disclosure requirement could have led to an additional increase in general expenses, reducing the financial performance in the short run. These findings correspond with previous studies (Aureli et al., 2020; Bin Khidmat et al., 2020; El Khoury et al., 2021; Jibril et al., 2022; Manita et al., 2018), indicating that ESG had a detrimental effect on firm corporate performance. These findings indicate that company profitability would be improved when the ESG is reduced. Consequently, the less disclosure of ESG by the listed firms in Saudi Arabia, the higher the financial performance. Besides, model 2 demonstrates that ESG exhibits an insignificant negative correlation with ROE ($\beta = -0.1672$, $p = 0.283$). The outcomes from both model 1 and model 2 refute the first hypothesis (H1), suggesting a significant positive relationship between ESG and the financial performance of the listed firms in Saudi Arabia.

Regarding the effects of individual ESG dimensions, the environmental disclosure (ENV) regression coefficient in model 3 indicates an insignificant negative association with TOBINSQ ($\beta = -0.0373$, $p = 0.728$). This implies that ENV does not influence financial performance measured by TOBINSQ. This finding does not support (H2) that ENV has a significant relationship with the financial performance of the listed firms in Saudi Arabia. In contrast, the regression coefficient in model 4 suggests a significant improvement in ROE ($\beta = 0.424$, $p = 0.003$). This indicates the improvement in financial performance when the ENV is increased. This finding aligns with prior studies (Brooks & Oikonomou, 2018; Buallay, 2020, 2022; Shahbaz et al., 2020), documenting that ENV increased financial performance. This finding backed the second hypothesis (H2), affirming a significant positive correlation between ENV and financial performance.

Similarly, social disclosure (SOC) has adversely impacted TOBINSQ ($\beta = -0.4652$, $p = 0.001$). This supports the results obtained in previous studies (Ahmad et al., 2021; Alareeni & Hamdan, 2020; Duque-Grisales & Aguilera-Caracuel, 2021; Koroleva et al., 2020; Menicucci & Paolucci, 2022; Saygili et al., 2022), documenting that financial performance is reduced as the social disclosure is improved. Besides, SOC is insignificantly related to ROE ($\beta = -0.0746$, $p = 0.486$). Accordingly, the third hypothesis is not accepted.

Concerning governance disclosure (GOV), the result indicates that GOV is significantly and positively related to TOBINSQ ($\beta = 0.3006$, $p = 0.088$). This suggests that companies demonstrating

Table 4. Validity of research models

Variable	Multicollinearity test				Normality test	
	Model 1	Model 2	Model 3	Model 4	Skewness	Kurtosis
TOBINSQ	-	-	-	-	0.36	5.33
ROE	-	-	-	-	-0.52	6.62
ESG	1.16	1.13	-	-	1.35	4.24
EN	-	-	5.12	4.90	0.97	2.61
SOC	-	-	6.18	5.99	0.91	2.81
GOV	-	-	2.24	2.23	-1.47	5.35
BS	1.27	1.23	1.50	1.52	-0.18	4.52
BI	1.19	1.19	1.43	1.42	0.51	2.58
BM	1.28	1.23	1.37	1.22	1.98	9.00
ACS	1.39	1.43	1.61	1.57	-0.17	1.87
ACM	1.24	1.21	1.33	1.25	1.19	4.95
SIZE	1.47	1.44	1.68	1.79	-0.32	2.65
LEV	1.50	1.38	1.92	1.89	0.68	2.34

Table 5. Pearson correlation matrix

	TOBINSQ	ROE	ESG	EN	SOC	GOV	BS	BI	BM	ACS	ACM	SIZE	LEV
TOBINSQ	1.00												
ROE	-0.07	1.00											
ESG	-0.01	-0.01	1.00										
EN	-0.33***	-0.04	0.96***	1.00									
SOC	-0.28***	-0.05	0.91***	0.84***	1.00								
GOV	0.56***	-0.05	0.51***	0.15*	0.25***	1.00							
BS	-0.14**	0.14**	-0.06	-0.11	-0.130	0.02	1.00						
BI	0.13*	-0.01	-0.23***	-0.32***	-0.27**	-0.11	0.23***	1.00					
BM	0.95***	-0.070	-0.06	-0.05	-0.02	-0.01	-0.20***	0.04	1.000				
ACS	0.06	0.030	0.11	0.02	-0.05	0.13*	0.09	-0.17**	0.19***	1.00			
ACM	0.17**	0.13*	0.01	-0.05	-0.02	-0.06	0.03	0.01	0.30***	0.08	1.00		
SIZE	-0.07	0.003	0.21***	0.05	-0.080	-0.03	-0.09	-0.16**	0.13*	0.43***	0.20***	1.00	
LEV	-0.09	-0.46***	0.13**	0.54***	0.48***	-0.10	-0.24***	-0.26***	-0.03	0.11	-0.26***	-0.18***	1.00

Notes: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

elevated governance standards can accomplish better profitability levels. This result is supported by previous studies (Ahmad et al., 2021; Maji & Lohia, 2022; Mardini, 2022; Saygili et al., 2022). In contrast, the finding indicates an adverse association with ROE ($\beta = -0.3572$, $p = 0.001$). This suggests that the higher the GOV, the lower the financial performance of the selected firms. This result is supported by some earlier studies (Bahadori et al., 2021; Bătae et al., 2021; Duque-Grisales & Aguilera-Caracuel, 2021; Menicucci & Paolucci, 2022). Hence, this study accepts H4.

Regarding board size (BS), it is significantly positive and negative with TOBINSQ and ROE in model 1 and model 4, respectively. However, BS has insignificantly influenced ROE and TOBINSQ in model 2 and model 3, respectively. Board Independence (BI) does not significantly influence financial performance except in model 3, which significantly increased TOBINSQ. The occurrence of board meetings (BM) significantly increased financial performance in models 1, 2, and 3 but significantly reduced ROE in model 4. The audit committee size (ACS) has significantly reduced TOBINSQ in model 1 and significantly increased ROE in the model. In models 2 and 3, ACS has an insignificant relationship with ROE and TOBINSQ, respectively. ACS has an insignificant impact on TOBINSQ and ROE in models 2 and 3, respectively. Also, the frequency of audit committee meetings (ACM) has insignificantly associated with TOBINSQ and ROE in all models. In the case of SIZE, it has an insignificant association with financial performance in the models except in model 3, where it significantly decreased TOBINSQ. Besides, leverage (LEV) is insignificantly related to TOBINSQ and ROE in models 1 and 2 but significantly positive and negative with TOBINSQ and ROE in models 3 and 4, respectively.

By implication, the findings signify that the sampled firms incurred additional costs concerning environmental and social disclosures, which involve high expenses attached to them. Consequently, these expenses reduced the firm's projected profit. Consequently, the financial performance decreased. On the contrary, GOV has demonstrated a positive significant effect on the financial performance of the selected companies. This could practically prove that good governance increases firms' general performance.

4.5. Alternative regression results

Table 7 displays alternative regression findings to verify the reliability of the results outlined in Table 6. Models 5 and 6 exhibit the regression results of heteroskedastic panel corrected standard errors (HPCSE). HPCSE regression results were employed after following specific tests. The Hausman test for models 5 and 6 favors the selection of fixed effects (FE) regression as they are statistically significant. Further, the panel heteroskedasticity test results are also significant, which suggests the selection of HPCSE regression.

Regarding models 7 and 8, the Hausman test results recommend using random effects (RE) regressions as they are statistically insignificant. Then, the Breusch and Pagan LM tests for these models provide significant and insignificant results, respectively. This implies the appropriateness of RE and OLS regression results for models 7 and 8, respectively. Finally, the heteroskedasticity test results reveal heteroskedasticity problems in these models, which suggest the use of feasible generalized least square (FGLS) regression and OLS robust regression for models 7 and 8, respectively.

The outcomes presented in Table 7 are substantially much like the ones presented in Table 6. Specifically, Table 7 shows that ESG has a significant adverse association with TOBINSQ ($\beta = -0.0005$, $p = 0.000$). In contrast, ESG demonstrated an insignificantly positive association with ROE ($\beta = 0.0551$, $p = 0.511$). ENV is insignificantly associated with TOBINSQ ($\beta = -0.0098$, $p = 0.924$) and ROE ($\beta = -0.1402$, $p = 0.407$), respectively. SOC has a significant negative relationship with TOBINSQ ($\beta = -0.4515$, $p = 0.000$) but insignificantly positive with ROE ($\beta = 0.202$, $p = 0.222$). The results for GOV reveal a non-significant positive relationship with TOBINSQ ($\beta = 0.1453$, $p = 0.361$), whereas the outcome for the effect of GOV on ROE is significantly negative ($\beta = -0.4782$, $p = 0.021$).

Table 6. Two-step system GMM regression results

Explanatory variables	Label	Dependent variables			
		TOBINSQ	ROE	TOBINSQ	ROE
		Model 1	Model 2	Model 3	Model 4
Lagged TOBINSQ/ROE	<i>L</i>	−0.0271 (0.183)	0.7284* (0.050)	0.0095 (0.428)	0.6360*** (0.000)
ESG disclosure	<i>ESG</i>	−0.5934*** (0.000)	−0.1672 (2.283)		
Environmental disclosure	<i>EN</i>			−0.0373 (0.728)	0.424*** (0.003)
Social disclosure	<i>SOC</i>			−0.4652*** (0.001)	−0.0746 (0.486)
Governance disclosure	<i>GOV</i>			0.3006* (0.088)	−0.3572*** (0.001)
Board size	<i>BS</i>	0.0573** (0.032)	0.0040 (0.758)	−0.0069 (0.357)	−0.0148** (0.049)
Board independence	<i>BI</i>	−0.0529 (0.778)	−0.2310 (0.374)	0.1199*** (0.009)	−0.0138 (0.847)
Board meetings	<i>BM</i>	0.2725*** (0.000)	0.0219* (0.099)	0.2227*** (0.000)	−0.0108* (0.091)
Audit committee size	<i>ACS</i>	−0.0864*** (0.000)	0.0221 (0.639)	−0.0123 (0.160)	0.0163** (0.012)
Audit committee meetings	<i>ACM</i>	0.0019 (0.914)	−0.0034 (0.812)	−0.0005 (0.855)	−0.0007 (0.869)
Size	<i>SIZE</i>	0.0090 (0.866)	−0.0362 (0.577)	−0.1220*** (0.002)	−0.0117 (0.508)
Leverage	<i>LEV</i>	0.2321 (0.294)	−0.2739 (0.230)	0.1439*** (0.000)	−0.4202*** (0.008)
Constant	<i>CONS</i>	0.4047 (0.440)	0.1386 (0.657)	1.3727 (0.000)	0.4335 (0.020)
<i>Model specifications:</i>					
Prob>chi2		0.000	0.000	0.000	0.000
Wald chi2		133929.83	206.49	1920000	13483.08
AR (1) (<i>p</i> -value)		0.084	0.077	0.071	0.088
AR (2) (<i>p</i> -value)		0.276	0.274	0.234	0.131
No. of instruments					
Hansen test		0.467	0.228	0.235	0.400
No. of groups		28	29	22	23
No. of instruments		20	17	20	20

*, ** and *** denote significance at 10, 5, and 1 percent, respectively. In all cases, *p*-values are shown in parentheses.

Table 7. Alternative results using GLS regression

Explanatory variables	Label	Dependent variables			
		TOBINSQ	ROE	TOBINSQ	ROE
		Model 5	Model 6	Model 7	Model 8
ESG disclosure	ESG	−0.2936*** (0.00)	−0.0551 (0.511)		
Environmental disclosure	EN			−0.0098 (0.924)	0.1402 (0.407)
Social disclosure	SOC			−0.4515**** (0.000)	0.2020 (0.222)
Governance disclosure	GOV			0.1453 (0.361)	−0.4782** (0.021)
Board size	BS	−0.0146* (0.076)	0.0081 (0.301)	−0.0137* (0.077)	0.0062 (0.441)
Board independence	BI	0.3174*** (0.000)	−0.1967*** (0.006)	0.0823 (0.273)	−0.1662** (0.035)
Board meetings	BM	0.2284*** (0.000)	−0.0044 (0.283)	0.2258*** (0.000)	−0.0141** (0.041)
Audit committee size	ACS	−0.0420* (0.000)	0.0268*** (0.005)	−0.0341*** (0.000)	0.0169* (0.071)
Audit committee meetings	ACM	−0.0087 (0.123)	0.0050 (0.205)	−0.0016 (0.687)	0.0030 (0.503)
Size	SIZE	−0.1051*** (0.000)	−0.0569*** (0.004)	−0.1330*** (0.000)	0.0090 (0.650)
Leverage	LEV	0.1738*** (0.000)	−0.3917*** (0.000)	0.1567*** (0.001)	−0.4123*** (0.001)
Constant	CONS	1.5379 (0.000)	0.3264 (0.021)	1.6733 (0.000)	0.2942 (0.030)
Hausman test (p-value)		0.0065	0.0010	0.4845	0.3336
Breusch and Pagan LM test (p-value)				0.0000	0.2510
Panel heteroskedasticity test (p-value)		0.0000	0.0000	0.0000	
Wald chi2		1650.97	71.04	3652.03	
F-value					4.17
Prob>chi2		0.0000	0.0000	0.0000	0.0001
R-squared		0.9536	0.3257		0.4362

*, ** and *** denote significance at 10, 5, and 1 percent, respectively. In all cases, p-values are shown in parentheses.

In a nutshell, the results of the impact of ESG on corporate performance are consistent across the tables as they display that ESG reduced TOBINSQ significantly but does not have a substantial effect on ROE. In the case of ESG components, ENV has an insignificant negative relationship with TOBINSQ and a positive relationship with ROE in Tables 6 and 7. The regression results in both tables show that SOC has an insignificant negative relationship with TOBINSQ and is insignificantly

related to ROE. In the case of GOV, the findings in the two tables reveal that it is positively associated with TOBINSQ and significantly negative to ROE.

4.6. Discussion of findings

Saudi Arabia is an emerging economy with flourishing petroleum products and is considered the world's largest oil exporter. The nation ranked second in the region regarding the adoption and implementation of ESG (Ghardallou, 2022). However, the findings of the effects of the ESG and its components disclosure mostly suggest insignificant or negative associations with firm profitability. The total ESG disclosure significantly reduced the market-based performance (TOBINSQ). Similarly, environmental and governance disclosures decreased significantly in accounting-based performance (ROE). Only governance significantly improved TOBINSQ. The rest of the relationships are statistically insignificant.

Consequently, this study suggests that a higher level of compliance with ESG and its components disclosures does not enhance the financial performance of Saudi firms; instead, it either reduces or insignificantly influences it. These results tend to discourage firms from investing and reporting ESG activities. These corroborate the suggestion of Shalhoob and Hussainey (2023) that the ESG performance of Saudi Arabia needs significant improvements as it is moderately negative. Also, these results correspond with the argument of Rabiou et al. (2022) that ESG practices and disclosure requirements would lead to additional general expenses, which can reduce the financial performance in the short period due to the commitments cost and compliance cost with regulatory requirements. Besides, the comprehensive ESG reporting guidelines for companies were released in 2021 by Saudi Exchange (Institutional-Investor, 2022; PRNewswire, 2021). Therefore, the adoption and implementation of ESG activities and reporting in Saudi Arabia are at the introductory or beginning stage, where firms may spend huge capital expenditures as ESG investments that could lead the firms to suffer losses in the short run. Another reason ESG reporting either reduced or insignificantly affects Saudi firms is non-familiarity with ESG activities, which could make the firms apply weak or ineffective implementation strategies. Therefore, as Saudi firms continuously and consistently implement ESG activities and report them in the annual reports, they would become familiar with them, which may sustainably improve their financial performance.

From the theoretical perspective, the finding contradicts the stakeholder theory that companies with reasonable environmental concerns tend to have improved corporate performance because they will ultimately improve firm efficiency. They also contravene the argument of the slack resource theory, which says that the company's financial performance will improve if resources are allocated to projects related to society and the environment (Abdi et al., 2022). However, the study reaffirms the postulation of agency theory argued by Jensen and Meckling (1976), upholding that ESG provides no financial benefit because the company spends money on non-productive activities. Consequently, in the long run, firms with good environmental and social disclosure will tend to have better access to trade credit and enjoy a high level of recognition from their host community. This would create more opportunities for complied firms, leading to more investment and performance. This will undoubtedly improve firms' financial performance and benefit firms that have not fully complied.

5. Conclusion

This research examined the effects of environmental, social, and governance disclosures on the corporate performance of publicly listed companies in Saudi Arabia from 2010 to 2020. The findings revealed that ESG has a significant negative association with TOBINSQ but is insignificantly and negatively associated with ROE. Concerning the ESG components, environmental disclosure has insignificantly and negatively influenced TOBINSQ but has a significant positive influence on ROE. Social disclosure has a significant negative relationship with TOBINSQ but is negatively insignificant with ROE. In the case of governance disclosure, the results reveal a significant positive and negative relationship with TOBINSQ and ROE.

Briefly, environmental compliance is one of the major measures in ensuring zero-net emissions operation by firms globally. This could only be achieved when firms incorporated environmental accounting into their business strategies. Environmental accounting is a reporting requirement that compels firms to take full responsibility for the externalities resulting from their operational system. Thus, firms must comply with the environmental operations requirements by disclosing all measures taken to tackle societal and environmental issues. In the short run, the cost of ensuring compliance most decreases the firm's financial performance. However, firms that fully comply with environmental disclosure would be considered environmentally responsible in the long run. Hence, firms considered environmentally responsible in the market will improve due to more stakeholder patronage. Firms that heavily participated in social responsibility would have attracted many stakeholders, which in turn gives more benefit to the firms. Firms must comply with environmental requirements by reporting all environmental issues and measures taken to reduce societal consequences to achieve a tremendous market advantage that leads to better performance. Global Reporting Initiative (GRI) standards are designed to give a valuable guide to reporting standards in ensuring compliance with Sustainable Development Goals (SDGs) globally.

Furthermore, adherence to governance reporting enables companies to uphold essential corporate governance principles such as transparency, accountability, responsibility, and fairness. The significance of governance reporting is particularly pronounced for businesses prioritizing long-term sustainability, growth, and maintaining a positive corporate image. Corporate governance encompasses many responsibilities with its overarching objective of fostering economic growth, long-term sustainability, and maximizing shareholder wealth. As a result, companies that prioritize the interests of investors, employees, management, customers, and the government comprehensively are likely to achieve superior outcomes, contributing to holistic improvement in corporate performance.

Briefly, the findings offer practical and theoretical contributions. First, the regulators and policy-makers can use the findings to provide effective regulations and policies to boost ESG practices and reporting among firms in Saudi Arabia. In particular, the Saudi Exchange could find the results relevant in amending the ESG reporting guidelines to ensure that ESG practices enhance corporate performance in the kingdom. Revisions to the ESG implementation guidelines and other pertinent laws and regulations are required, considering the implications of most results demonstrating that more ESG reporting negatively affects company performance. Similarly, regulators and policy-makers in other developing countries, particularly the ones that have not yet mandated their firms to discharge and report ESG activities, can find this study helpful in developing the guidelines to be adopted by their companies. The management and board of directors of firms can find this study as a valuable guide to ensure the successful implementation and practice of ESG in such a way as to improve their firms' performance. Besides, local and international investors can utilize the findings of this study to make the right and rational investment decisions to maximize their wealth.

Even though this study documents significant contributions, it has some limitations that need to be addressed by future studies. First, this study is based on panel data analysis, which suggests the need to consider only firms with ESG data for a minimum of four (4) years. Accordingly, only ESG data for 26 companies were obtained from the Bloomberg database used to generate data for the study. Hence, future research is expected to consider a large sample size as the data becomes available on Bloomberg and other databases. Second, the research utilized only a sample of Saudi-listed companies. Hence, the study needs to be extended to cover more countries, particularly developing ones.

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Author details

Egi Arvian Firmansyah¹

E-mail: egi.firmansyah@unpad.ac.id

ORCID ID: <http://orcid.org/0000-0001-5296-706X>

Umar Habibu Umar²

ORCID ID: <http://orcid.org/0000-0003-0663-1439>

Rabiu Saminu Jibril³

ORCID ID: <http://orcid.org/0000-0003-1622-5426>

¹ Faculty of Economics and Business, Universitas Padjadjaran, Bandung, Indonesia.

² Department of Accounting and Finance, Universiti Brunei Darussalam, Gadong, Brunei Darussalam.

³ Department of Accountancy, Kano State Polytechnic, Kano, Nigeria.

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Data availability statement

The dataset is available for sharing upon a reasonable request.

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