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Article

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Sustainability reporting and earnings manipulation in Saudi market: Does institutional ownership matter?

Abdulwahid Ahmed Hashed¹ and Belal Ali Abdurraheem Ghaleb^{2*}

Abstract: Consistent with the notion that sustainability reporting (also known as corporate social responsibility (CSR) reporting) signals an ethical corporate culture and high monitoring, this study seeks to determine whether sustainability reporting reduces real earnings management (REM) practices and enhances the financial reporting quality (FRQ) in the Saudi market. The study also aims to investigate whether institutional investors impact this anticipated relationship. The study used two-stage least square (2SLS) regression, focusing on a sample comprising 840 firm-year-observations of firms listed on the Saudi Stock Exchange (Tadawul) during the 2016–2021. The empirical result shows that CSR reporting mitigates REM practice in the Saudi market. It also shows a negative link between institutional ownership and REM. Further, we document that institutional ownership strengthens the CSR-REM relationship. The study's results remain robust even after conducting sensitivity and additional tests to address endogeneity concerns. These results are important for several users of financial reporting, such as investors, other stakeholders, auditors, financial analysts and researchers interested in understanding the level of FRQ in the Saudi market. Further, it provides a clear picture for regulatory bodies in Saudi Arabia about the current CSR reporting level, FRQ and transparency in the Saudi market that expect to help them improve regulations and rules related to these issues, which, consequently, assist in achieving the vision 2030 goals.

Subjects: Corporate Social Responsibility; Accounting; Corporate Governance

Keywords: sustainability reporting; corporate social responsibility; real earnings management; Saudi market; institutional investors

1. Introduction

In recent years, the financial reporting quality (FRQ) and its credibility have been essential issues in maintaining the efficiency of financial markets that received great academic attention (Cohen et al., 2008). This is due to the significance of the information contained within these reports for investors, analysts and other users (Ghaleb et al., 2021). In addition, recent global business scandals (for example, Toshiba, Enron, and Satyam) have thrown light on the accuracy of information in corporate financial reports (Ehsan et al., 2020). In reality, the cornerstone of these controversies was earnings management (EM) (Ghaleb et al., 2021). EM behaviour is seen as agency

and information asymmetry problems among shareholders and management (Elghuweel et al., 2017; Ghaleb et al., 2022). Typically, managers manipulate results to deceive investors by employing either accrual-based earnings management (AEM) or real-based earnings management (REM) or maybe both techniques (Ghaleb et al., 2022; Roychowdhury, 2006; Zalata et al., 2019, 2022). Researchers argued and provided evidence that EM misleads stakeholders and other financial reporting users (Roychowdhury, 2006), increases the capital cost (Kim & Sohn, 2013), results in higher information asymmetry (Abad et al., 2018), and leads to engagement in fraudulent activities (Perols & Lougee, 2011). Thus, EM is a serious issue that affects the firms' FRQ and, thus, requires more investigation, particularly in emerging markets such as the Saudi market.

Sustainability reporting (corporate social responsibility (CSR) also used hereafter interchangeably) is a key tool that influences the communication between firms and stakeholders in an operational context (Noor et al., 2020). This influence can affect the investment and financing firms' decisions and FRQ. Further, CSR reporting could reduce information asymmetry problems, boosting the quality of reported information (Mohmed et al., 2019). Thus, CSR disclosure has become a central part of corporate governance (CG) as an element of moral and economic values. Increased attention has been paid to the effect of socially responsible activities on the firms' FRQ but with no conclusive results. Substantial past research in the CSR field shows managers can be involved in sustainability behaviour to hide EM practices and maximise their interests at the expense of the shareholders' interests. Thus, sustainability activities are positively associated with EM practices (García-Sánchez et al., 2020; Habbash & Haddad, 2020).

However, other empirical evidence has found that the ethical perspective considers involvement in sustainability as a signal of the corporate ethical and moral culture in decision-making (Prior et al., 2008). As a result, managers at businesses that actively engage in sustainability efforts tend less to practise EM practices (Ghaleb et al., 2021; Kim et al., 2019; Mohmed et al., 2019), implying that CSR enhances stakeholder satisfaction and corporate reputation.

Institutional ownership, as the percentage of outstanding shares held by the institutions, is an important CG mechanism that can reduce information asymmetry and oversee the agent's performance (Eissa et al., 2023). Institutional ownership is increasingly focused on social and environmental issues. The influence of institutional ownership on the CSR-EM link is anticipated for several theoretical reasons. First, institutional investors have great responsibilities toward corporate outcomes. Since involvement in EM may lead to engaging in fraudulent activities and harm FRQ (Nasir et al., 2018; Perols & Lougee, 2011), institutional shareholders have strong incentives to mitigate such practices through their monitoring of management. Second, institutional investors, the most influential capital providers, have a stronger incentive to monitor firms (Rahman, 2021).

Empirically, little is known about how companies having higher institutional ownership impact EM behaviour and the prior studies that examined this relationship are limited (e.g., Ahmad et al., 2023; Ajay & Madhumathi, 2015; Al-Duais et al., 2022; Chung et al., 2002). These studies have proved that firms with higher institutional ownership positively correlate with higher earnings quality, suggesting that institutional investors restrict EM practices. However, no study has considered the moderating effect of institutional ownership on the CSR-REM relationship. Thus, this study attempts to extend the previous research by exploring the moderating effect of institutional ownership on the CSR-REM nexus in the Saudi market.

Saudi capital market is appropriate for conducting this research as sustainability activities and reporting research are still in the infancy stage in Saudi Arabia (Al-Duais et al., 2021; Boshnak, 2022), and EM is more pervasive in the market. These all make the Saudi market perfect for conducting the current study. Our sample covers Saudi-listed firms from 2016 to 2021. To evidence the effect of CSR reporting on REM, we estimate empirical models based on the two-stage least square (2SLS) regression. We find a negative relationship between CSR reporting and REM practices; thus, firms engaged in CSR strategies are less likely to engage in REM practices, in line with

the ethical perspective. Moreover, the empirical results show that institutional ownership decreases REM activities. Additionally, institutional ownership negatively moderates the CSR-REM relationship. These findings are robust after performing several additional analyses, including alternative measurements for REM, CSR reporting and tests for endogeneity.

Our study aims to make the following contributions to limited accounting research that examines the effects of non-financial information on earnings quality strategy. First, this study directly responds to recent calls by Habbash and Haddad (2020) for a deeper and additional examination of EM in the Saudi market. In this regard, the study contributes to the literature by reinforcing the understanding of how CSR reporting affects REM practices using agency theory. Second, while previous research has investigated the impact of CSR reporting on REM, it has not considered the moderating effect of institutional ownership in this relationship. In response to recent calls for a more in-depth examination of institutional ownership (e.g., Ahmad et al., 2023; Al-Duais et al., 2021), this study provides new evidence to the existing literature regarding the moderating role of the institutional ownership relationship. Finally, we believe this study is timely as the Saudi Vision 2030 aims to transition from an oil and gas economy to a more diverse business landscape and attract foreign investors to participate in this economic development. Accordingly, the study's findings offer managers and policymakers better insights into how institutional ownership can reduce REM practices.

The rest of the study is structured as follows: Section 2 provides the theoretical framework, Section 3 develops the research hypotheses, Section 4 explains the research design, Section 5 presents detailed empirical findings, and the results of the robustness tests are provided in Section 6. The discussion of the findings is presented in Section 7, and finally, Section 8 concludes the paper and outlines the implications of our findings

2. Theoretical framework

CSR reporting and REM behaviour have become crucial to the firm's operation (Chen & Hung, 2021). Several theories, such as signalling, legitimacy, agency, stakeholder, upper echelons, and institutional, have been employed to analyse the CSR-REM relationship. To understand this relationship, we use agency theory.

Agency theory is numerously considered in the literature using strategic decisions. Two competing views explain the CSR-REM relationship: managerial opportunism and ethical perspective. The first perspective considers CSR activities can exacerbate agency conflicts (Cao et al., 2023). Managers manipulating earnings to hide their firm's financial condition and advance their interests can negatively impact external shareholders or stakeholders (Ahmad et al., 2023; Jensen & Meckling, 1976). Thus, firms should adopt full disclosure of non-financial information to encourage shareholder support, reduce information asymmetry between shareholders and management and improve the firm's transparency (Chen & Hung, 2021). Several studies reported a positive CSR-REM relationship by supporting the managerial opportunism perspective (e.g., Habbash & Haddad, 2020; Jordaan et al., 2018).

However, the second perspective considers involvement in CSR activities as an indication of ethical obligation, reflecting the behaviour and decision-making of the corporation (Ghaleb et al., 2021; Prior et al., 2008). Further, Ansong and Wanasika (2017) and Ntim and Soobaroyen (2013) found that participating in social activities improves stakeholder satisfaction and corporate performance. Recent literature shows a negative CSR-REM relationship (e.g., García-Sánchez et al., 2020; Habbash & Haddad, 2020; Kim et al., 2019). Further, agency theory explains the role of institutional ownership in mitigating the negative effects of EM practices (Eissa et al., 2023). According to efficient monitoring assumptions, institutional owners play a significant role in managing management, reducing agency costs and opportunism managerial problems (Al-Duais et al., 2022; Sakaki et al., 2017).

3. Literature review and hypothesis development

3.1. CSR reporting and REM

CSR reporting is crucial for corporations; it allows them to provide their sustainability successes to stakeholders, helps market participants make more informed investment decisions and gains additional investment (Amel-Zadeh & Serafeim, 2018), reduces information asymmetries (Dhaliwal et al., 2014), improves long-term performance (Akben-Selcuk, 2019), and, in doing so, gains an excellent reputation and legitimacy (Valls Martinez et al., 2019). In addition, social-engagement activities are the driving factor for firms to practice EM. Drawing on agency theory, previous studies have indicated that CSR engagement can either show a firm's genuine consideration of the interests of a diverse range of stakeholders (ethical perspective) or might manifest the agency problem (managerial opportunism perspective) (Cao et al., 2023).

Results of recent studies on corporate sustainability/CSR reporting and EM activities are inconclusive. Kim et al. (2019) reveal that Chinese firms' CSR activities have an adverse association with REM but not AEM. Velte (2019) indicates that ESG performance negatively impacts AEM but not REM. Similarly, investigating an international sample from 2007–2016, García-Sánchez et al. (2020) conclude that firms with a lower level of corporate EM strategies exhibit higher CSR performance. Scholtens and Kang (2013) reveal that CSR is negatively related to EM practices in Asian firms. Palacios-Manzano et al. (2021) and Chen and Hung (2021) show that CSR activities constrain EM practices, suggesting that CSR activities encourage earnings quality. Consistent with this view, Ghaleb et al. (2021) indicate that CSR activities are negatively related to earnings manipulation in Jordanian firms, suggesting a possible effect of CSR reporting on FRQ. In a recent study, Cao et al. (2023) contend that USA firms practising CSR are less likely to engage in EM practices. This negative relationship is attributed to the ethical view, which states an ethical firm behaves ethically toward shareholders and stakeholders.

However, some researchers indicate that managers may opportunistically employ CSR to hide their earnings manipulation. They suggest that managers who increase earnings might participate in socially responsible activities to avoid undesirable stakeholder monitoring and increase their self-interests at the expense of their firms' interests (García-Sánchez et al., 2020; Habbash & Haddad, 2020). Jordaan et al. (2018) report that firms with higher CSR performance are more inclined to engage in EM strategies through discretionary accruals, consistent with the view of Buertey et al. (2020), who indicate that South African firms with CSR may resort to a higher level of AEM. Likewise, Habbash and Haddad (2020) show that Saudi firms practising socially responsible activities use more EM strategies.

In contrast, Grougiou et al. (2014) find that CSR practices have an insignificantly reverse relationship with EM in US commercial banks. We assume that socially responsible firms will be more inclined to limit REM practices and make ethical operating decisions, resulting in increased transparency in financial reporting and reduced information asymmetries. Thus, our hypothesis is stated as follows:

H1: Firms with higher CSR are negatively associated with REM in the Saudi market.

3.2. Institutional ownership, CSR reporting and REM

Institutional ownership, as the percentage of outstanding shares held by the institutions, is an important CG mechanism that can reduce information asymmetry and oversee the agent's actions (Eissa et al., 2023). In addition, institutional investors' presence monitors firms' use of REM activities (Al-Duais et al., 2022). Institutional ownership is a key driver of sustainability reporting (Dyck et al., 2019). Several reasons explain institutional investors' interest in corporate sustainability and mitigating EM practices (García-Sánchez et al., 2020). Firstly, CSR-related initiatives can

generate value for firms, thereby enhancing financial performance for investors (Dyck et al., 2019). Secondly, institutional investors may be inclined towards CSR initiatives due to risk aversion since such actions have been shown to help mitigate certain risks (Amel-Zadeh & Serafeim, 2018; Dyck et al., 2019). Lastly, the interest of institutional investors in CSR has been attributed to their response to various pressures, such as social, media pressures, governmental, legislation, or ethical concerns for sustainable development (Amel-Zadeh & Serafeim, 2018; García-Sánchez et al., 2020).

According to efficient monitoring hypotheses under an agency theory, institutional ownership leads to less opportunistic behaviour (Al-Duais et al., 2022; Jensen & Meckling, 1976). However, empirical evidence relating to the effect of institutional ownership on EM practices is scarce in the Saudi market. Ramalingegowda et al. (2021) reveal that firms owned by institutional investors have a lower tendency to engage in EM practices because of the monitoring role of institutional owners. This aligned with the findings of Chung et al. (2002) and Ajay and Madhumathi (2015), who find that institutional ownership is correlated with higher earnings quality (lower EM), suggesting that institutional investors restrict EM. Al-Duais et al. (2022) report that institutional investors have great incentives to promote FRQ and alleviate REM since such a mechanism benefits the firm. Recently, Ahmad et al. (2023) found that institutional investors prevent managers from engaging in EM behaviour. However, other previous studies document that institutional ownership positively affects EM behaviour (Debnath et al., 2021).

Based on the above discussion and given the adverse impact associated with REM behaviour, institutional investors aiming for steady shareholdings may not be inclined to permit the use of REM behaviour since it could decrease the worth of their investment. Therefore, we expect that institutional ownership is negatively related to REM activities. Hence, the following hypothesis is stated:

H2: Firms with higher institutional ownership are negatively associated with REM in the Saudi market.

Empirical studies that examined the relationship between CSR and EM show inconsistent results, as discussed above. Some studies provide evidence of the negative relationship (Cao et al., 2023; Chen & Hung, 2021; García-Sánchez et al., 2020; Ghaleb et al., 2021; Kim et al., 2019; Palacios-Manzano et al., 2021; Scholtens & Kang, 2013; Velte, 2019). However, other studies provide evidence of the positive relationship (Buertey et al., 2020; García-Sánchez et al., 2020; Habbash & Haddad, 2020; Jordaan et al., 2018). However, these inconsistent findings could be further explained by examining the moderating role of institutional ownership on the CSR-REM nexus. To the best of the researchers' knowledge, only a few studies have analysed the moderating role of institutional ownership. For instance, Arianpoor and Farzaneh (2023) suggest that institutional ownership positively moderates the effect of auditor industry specialisation/cost of equity on AEM/REM. Potharla and Shette (2022) indicate that the insider ownership-REM nexus is positively moderated by institutional ownership. However, one empirical study examines institutional ownership's role in the CSR—EM link in the Indian market (Ahmad et al., 2023). The authors find that firms having large-size institutional ownership tend to weaken the relationship between CSR reporting and EM practices. Despite these attempts to investigate the moderating role of institutional ownership, to our knowledge, no empirical study has explored the moderating effect of institutional ownership on the CSR—EM nexus in the Saudi market. In light of this, we, therefore, hypothesise that:

H3: The institutional ownership positively moderates the relationship between CSR REM nexus.

4. Research design

4.1. Sample and data collection

This study's sample selection comprises all non-financial firms listed in the Saudi Stock Exchange (Tadawul) from 2016 to 2021. We restrict our sample to non-financial firms as these firms cannot be analysed along with financial firms due to the differences in operation, internal control environment, and financial reporting requirements. In addition, non-financial firms are a crucial part of any stable economy (Ali et al., 2022). Samples are determined based on the purposive sampling method with the following criteria: (a) the firm published annual reports in 2016–2021, (b) the firm has complete data on CSR and EM. Secondary data on sustainability reporting/CSR, institutional ownership, and CG variables was hand-collected from the Saudi-listed firms' annual reports that were considered the main data source. In addition, data for EM, firms' characteristics and financial variables was collected from Thomson Reuters Datastream. The sample selection process is shown in Table 1.

4.2. Empirical models and variables

To assess the effects of CSR reporting on REM practices and the moderating role of institutional ownership on the CSR-REM nexus, we employ the following model:

$$\begin{aligned}
 REM_{i,t} = & \alpha_0 + \beta_1 CSRscore_{i,t} + \beta_2 IOC_{i,t} + \beta_3 CSRscore * IOC_{i,t} + \sum_{n=1}^8 \beta_n CONTROLS_{i,t} + \sum_{k=1}^{16} \beta_k INDDUMS_i \\
 & + \sum_{j=1}^6 \beta_j YEARDUMS_t + \varepsilon_{i,t}
 \end{aligned}
 \tag{1}$$

The dependent variable is REM. The following three equations are used to measure REM. This is consistent with the two key studies in REM (e.g., Cohen et al., 2008; Roychowdhury, 2006). To calculate overall REM, we aggregate these three different proxies, which comprise abnormal cash flow from operations (ACFO), abnormal discretionary expenses (ADIE), and abnormal production costs (APRC). ACFO, ADIE, and APRC are computed by subtracting the normal value from the actual value for each item, using equations (1), (2), and (3), respectively. The three REM measures are then aggregated by summing the standardised residuals of these proxies to create a single measure representing firms' overall REM (Alhebbri & Al-Duais, 2020; Cohen et al., 2008; Ghaleb et al., 2020). The definition of each variable is reported in Table 2.

$$\frac{CFO_t}{ASS_{t-1}} = \beta_1 \left(\frac{1}{ASS_{t-1}} \right) + \beta_2 \left(\frac{S_t}{ASS_{t-1}} \right) + \beta_3 \left(\frac{\Delta S_t}{ASS_{t-1}} \right) + \varepsilon_t
 \tag{1}$$

$$\frac{PRC_t}{ASS_{t-1}} = \beta_1 \left(\frac{1}{ASS_{t-1}} \right) + \beta_2 \left(\frac{S_{it}}{ASS_{t-1}} \right) + \beta_3 \left(\frac{\Delta S_t}{ASS_{t-1}} \right) + \beta_4 \left(\frac{\Delta S_{t-1}}{ASS_{t-1}} \right) + \varepsilon_t
 \tag{2}$$

$$\frac{DIE_t}{ASS_{t-1}} = \beta_1 \left(\frac{1}{ASS_{t-1}} \right) + \beta_2 \left(\frac{S_{t-1}}{ASS_{t-1}} \right) + \varepsilon_t
 \tag{3}$$

Table 1. Sample selection

Details	Observations
Initial sample	1,189
Less:	
Financial and insurance firms	323
Missing Data	26
Final Sample	840

Table 2. Variables definitions

Variables	Symbols	Definitions
Dependent variable		
Real Earnings management	REM	To measure overall REM, the aggregate value of the standardised ACFO (-1), standardised APRC, and standardised ADIE (-1).
Independent and moderator variables		
CSR reporting quality	CSRscore	CSR disclosure score
Institutional ownership	IOC	Percentage of shares held by institutional owners
Control variables		
Board independence	BIND	Percentage of board independent directors
Audit committee size	ACSIZE	Number of AC members
Concentration ownership	OWCO	Percentage of shares held by the largest five shareholders
Accrual-based Earnings management	ABS_DA	The discretionary accruals measured by the modified Jones model
Return on assets	ROA	Net income to total assets
Firm age	FAGE	Number of years since the firm establishment
Market-to-book ratio	MTB	Market capitalisation/book value of assets
Firm size	FSIZE	Total assets logarithm
Financial health	ZScore	Measured by Altman's Z-score

Where, CFO_t = Operations cash flow in period t , Ass_{t-1} = the lagged total assets, S_t = the annual sales, ΔS_t = the change in sales relative to the prior period, ΔS_{t-1} = the sales in year $t-1$ less sales in year $t-2$, PRC_t = the sum of the cost of goods sold ($COGS_t$) and changes in inventory (ΔINV) during the year, DIE_t = the total of discretionary expenses in the period t (sum of advertising expenses, R&D expenses, and SG&A), and S_{t-1} = the lagged total sales.

The independent variable is the CSR reporting (CSRscore), measured using a self-constructed CSR checklist developed as follows. Firstly, following previous researchers (Habbash & Haddad, 2020), a checklist covers six aspects (e.g., the environment, employees, community, customer, products and services and energy), with 37 disclosure items. Secondly, the CSR disclosure quality is manually assessed through content analysis extracted from the firms' annual reports. Thirdly, it designed a scoring scheme of "0-3". Fourthly, the final CSR quality score for each firm was calculated as the percentage of the actual CSR score to the maximum CSR score as follows:

$$CSRscore_j = \frac{\sum_1^n X_{ij}}{nj}$$

Where:

CSR_j is the firm's CSR disclosures quality;

X_{ij} is the score of 0 was assigned if the j th firm does not disclose, the value of 1 disclosed general qualitative data, the value of 2 was assigned if the j th firm disclosed qualitative data with precise

explanation and the score of 3 was assigned if the *j*th firm disclosed quantitative data; and *n_j* is the number of items expected for *j*th firm ($n \leq 37$).

Then, to improve the research model's goodness and to isolate the effect of CSR reporting on EM practice, we also add control variables that may affect the relationship between CSR reporting and EM practice. We control for the board independence (*BIND*), audit committee size (*ACSIZE*), and concentration ownership (*OWNC*) as controls for the CG mechanisms (Ghaleb et al., 2021). We also include discretionary accruals (*ABS_DA*), market-to-book ratio (*MTB*), firm age (*FAGE*), return on assets (*ROA*), firm size (*FSIZE*) and Altman's Z-score (*ZScore*) (Chandren et al., 2021; Eissa et al., 2023; Ghaleb et al., 2021, 2022), as controls variables.

5. Empirical results

5.1. Descriptive statistics

Table 3 displays the descriptive statistics for the research variables used in our regression. We find that the average (median) of *REM* is -0.000 (0.013). Regarding our independent variables, the average (median) of *CSRscore* is 0.368 (0.340). The average *IOC* is 0.089, suggesting that the participation of institutional investors is relatively low. As for the control variables, the average of *ABS_DA* is 0.051. The average *BIND* is 0.475, with an average of *ACSIZE* three members. The sample firms' average *OWCO* is 0.361, indicating that their share concentration is generally moderate. The mean value of *ROA* is 0.037, indicating that Saudi firms engaged in CSR are, on average, profitable firms. The average natural logarithm of *FAGE* is 3.143, and the mean value of *MTB* is 2.397. In addition, the mean logarithm value of *FSIZE* is 14.607. The mean value of *ZScore* is 4.957.

Table 4 presents the Pearson correlation matrix for all variables used in our regression analysis. It is evident that *CSRscore* is significantly negatively correlated with *REM*. We have also observed a negative association between *IOC* and *REM*, providing initial support for our hypothesis. Furthermore, the reported results indicate that the Pearson correlation coefficient for all variables is less than 0.80. Therefore, the multicollinearity problem does not significantly impact the accuracy and reliability of our regression analysis results.

5.2. Multivariate analysis

A two-stage least squares (2SLS) instrumental variable (IV) approach is employed to control for any endogeneity bias stemming from reverse causality. We follow previous research (Cao et al.,

Table 3. Descriptive statistics

Variables	Mean	SD	Min	Median	Max
REM	-0.000	0.150	-0.726	0.013	0.712
CSRscore	0.368	0.265	0.000	0.340	1.030
IOC	0.089	0.196	0.000	0.000	1.000
ABS_DA	0.051	0.055	0.000	0.035	0.604
BIND	0.475	0.159	0.000	0.444	1.000
ACSIZE	3.460	0.666	2.000	3.000	5.000
OWCO	0.361	0.246	0.000	0.350	1.000
ROA	0.037	0.087	-0.624	0.036	0.472
FAGE	3.143	0.585	0.693	3.258	4.477
MTB	2.397	1.892	0.290	1.765	14.320
FSIZE	14.607	1.683	9.857	14.485	21.488
ZScore	4.957	6.550	-1.154	2.639	48.437

Notes: Variable definitions are provided in Table 2.

2023; Chouaibi & Zouari, 2022) using the industry average of CSR reporting and one-year-lagged values of CSR reporting as instruments. These IVs are likely to be exogenous to the contemporaneous CSR reporting score. Table 5 displays the results of the 2SLS regression. Column (1) and (2) investigates the impact of CSR reporting on REM. The results from second-stage regression in Column (2) show that *CSRscore* has a statistically significant negative correlation with REM ($p < 0.01$), which is consistent with the ethical perspective. This result aligns with our predictions, and thus, H1 is accepted. This evidence supports the view that firms' higher disclosure of CSR information is adversely correlated with REM.

Further, the results from second-stage regression in Column (2) show that *IOC* has a significant negative relationship with REM ($p < 0.000$), which is in line with the efficient monitoring hypotheses under an agency theory. This indicates that institutional-controlled firms are less likely to engage in REM. These results support our expectations; thus, H2 is accepted. This evidence concludes that the firm's institutional investor ownership exhibits a reduced tendency towards engaging in REM practices.

Regarding control variables, the coefficient of *ACSIZE* is positive and significant, suggesting that firms with large AC have a high REM. However, the *ROA*, *MTB* and *ZScore* coefficients are negative and significant, indicating that firms with higher profitability, higher growth, and higher financial health are related to reduced REM. Counterintuitively, the coefficients on *ABS_AD* and *FSIZE* are positive and insignificant correlated with REM, while the coefficients on *BIND*, *OWCO* and *FAGE* are negative and insignificant related to REM.

Column (3) and (4) of Table 5 examines the interaction between *CSRscore* and institutional ownership on REM practices. The results from second-stage regression in Column (4) reveal that *IOC* is significantly moderated the *CSR-REM* relationship ($p < 0.01$), implying that the CSR reporting in constraint REM is more pronounced when firms have institutional ownership. This result is consistent with our predictions, and thus, H3 is accepted.

Furthermore, our regression has no weak identification or an overidentification problem. For instance, the Cragg-Donald Wald F-statistic (weak identification test) is 1497.06 and 1520.599, respectively, which exceeds the rule-of-thumb threshold of 10; the Anderson LM statistic (under identification test) is 563.329 and 565.046; and the Sargan J-test (over-identification test) p-value is 0.157 and 0.115. These results suggest that the instrumental variable is valid.

6. Robustness tests

6.1. Alternative estimation techniques (OLS with robust standard errors, FGLS and SCC)

To confirm the robustness of the main findings, we conducted OLS with robust standard errors, FGLS and SCC regressions. Researchers claim that the OLS with robust standard errors, FGLS and SCC regressions approach corrects autocorrelation problems (Al-Duais et al., 2022; Wooldridge, 2011). The results in Table 6 consistently reveal that *CSRscore* and *IOC* exhibit a negative relationship with REM, corroborating the main results (see Table 5). This suggests that these factors can potentially curb REM in the Saudi market.

6.2. An alternative measure of REM

As previously stated, this study adopts the approach of previous researchers, measuring REM by aggregating the residuals estimated from the three measures of REM (Cohen et al., 2008; Eng et al., 2019). However, some researchers report that summing the *APRC* with the *ACFO* may lead to double-counting since they arise from the same activities (Cohen & Zarowin, 2010). As a result, scholars measure REM activities by combining the three residuals into two measures: *REM1*, which combines *ADIE* and *APRC*, and *REM2*, which combines *ADIE* and *ACFO* (Al-Duais et al., 2022; Cohen & Zarowin, 2010). Thus, this study re-run the OLS regression for *REM1* and *REM2*. The results in Table 7 remain consistent with those reported in the main results (see Table 5), implying that

Table 4. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) REM	1.00											
(2) CSRscore	-0.14***	1.00										
(3) IOC	-0.17***	0.35***	1.00									
(4) ABS_DA	0.06*	-0.16***	-0.12***	1.00								
(5) BIND	0.05	-0.13***	-0.16***	0.01	1.00							
(6) ACSIZE	0.05	0.33***	0.44***	-0.14***	-0.10***	1.00						
(7) OWCO	-0.18***	0.16***	0.43***	-0.09**	-0.39***	0.17***	1.00					
(8) ROA	-0.35***	0.18***	0.13***	-0.07**	-0.16***	0.05	0.23***	1.00				
(9) FAGE	0.07*	0.12***	-0.01	0.00	-0.04	0.11***	-0.11***	-0.10***	1.00			
(10) MTB	-0.21***	0.04	0.06*	0.15***	-0.05	-0.05	0.07*	0.10***	-0.06*	1.00		
(11) FSIZE	-0.06*	0.54***	0.53***	-0.20***	-0.22***	0.42***	0.37***	0.20***	0.03	-0.19***	1.00	
(12) Zscore	-0.19***	-0.05	0.03	-0.06*	0.09***	-0.10***	-0.07**	0.25***	0.05	0.20***	-0.28***	1.00

Notes: *, **, and *** represent statistical significance at 10%, 5% and 1%, respectively. Variable definitions are provided in Table 2.

Table 5. The results of 2SLS regression

Variables	Direct relationship		Moderating role	
	First-Stage	Second-Stage	First-Stage	Second-Stage
CSRscore		-0.051* (-1.755)		-0.049* (-1.675)
IOC	-0.044* (-1.912)	-0.116*** (-3.139)	-0.004 (-0.166)	-0.077* (-1.808)
CSR*IOC			-0.010*** (-3.046)	-0.009* (-1.865)
ABS_AD	-0.151** (-2.122)	0.125 (1.095)	-0.152** (-2.143)	0.125 (1.096)
BIND	0.019 (0.834)	-0.036 (-0.977)	0.024 (1.049)	-0.031 (-0.848)
ACSIZE	-0.002 (-0.390)	0.033*** (3.815)	-0.004 (-0.751)	0.031*** (3.580)
OWCO	0.004 (0.279)	-0.042 (-1.621)	0.005 (0.305)	-0.041 (-1.611)
ROA	0.126*** (2.657)	-0.556*** (-7.343)	0.118** (2.499)	-0.564*** (-7.456)
FAGE	-0.001 (-0.114)	-0.007 (-0.736)	-0.003 (-0.462)	-0.009 (-0.944)
MTB	0.003 (1.496)	-0.013*** (-3.926)	0.003 (1.615)	-0.013*** (-3.865)
FSIZE	0.013*** (3.887)	0.003 (0.644)	0.014*** (4.279)	0.005 (0.867)
ZScore	0.000 (0.394)	-0.003* (-1.941)	0.001 (0.743)	-0.002* (-1.724)
CSRscore _{t-1}	0.920*** (54.484)		0.923*** (54.909)	
IVCSRscore	0.123 (1.265)		0.133 (1.371)	
Intercept	-0.172*** (-3.010)	-0.001 (-0.015)	-0.181*** (-3.183)	-0.008 (-0.089)
Industry_FE	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes
R ²	0.917	0.267	0.918	0.271
Prob > chi2/Prob>F	0.000***	0.000***	0.000***	0.000***
Endogeneity test:				
Durbin (score) chi2(1)	-	0.107 (p=0.7435)	-	0.009 (p=0.9259)
Wu-Hausman F(1,652)	-	0.102 (p=0.7498)	-	0.008 (p=0.9278)
Under identification test	-	563.33***	-	565.046***
Weak identification test	-	1497.06	-	1520.599
Over-identification test	-	0.157	-	0.115
Observations	686	686	686	686

Notes: *, **, and *** represent statistical significance at 10%, 5% and 1%, respectively. The t-statistic is in parentheses. IVCSRscore is the percentage of CSRscore instrumented with industry average CSRscore, CSRscore_{t-1} is the one-year lagged values of CSRscore. Variable definitions are provided in Table 2.

Table 6. Robustness analysis for multiple regressions

Variables	Alternative regression (OLS with robust standard errors)		Alternative regression (FGLS)		Alternative regression (SCC)	
	Direct relationship	Moderating role	Direct relationship	Moderating role	Direct relationship	Moderating role
CSRscore	-0.000** (-2.341)	-0.000** (-2.265)	-0.035** (-2.362)	-0.035** (-2.376)	-0.049** (-3.248)	-0.048** (-3.481)
IOC	-0.096*** (-3.158)	-0.061* (-1.925)	-0.048** (-2.030)	-0.049* (-1.925)	-0.096*** (-5.123)	-0.061 (-1.950)
CSR*IOC		-0.009* (-1.840)		-0.001 (-0.384)		-0.009** (-3.443)
Intercept	0.019 (0.222)	0.008 (0.099)	0.123** (2.253)	0.114** (2.098)	0.019 (0.347)	0.008 (0.162)
Controls variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.263	0.266	-	-	0.263	0.266
Wald chi2(33)	-	-	537.73	505.66	-	-
Prob>F	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
Observations	840	840	832	832	840	840

Notes: *, **, and *** represent statistical significance at 10%, 5% and 1%, respectively. Robust t-statistics in parentheses. Variable definitions are provided in Table 2.

CSRscore and IOC are negatively related to REM measured by different measures. This suggests that the main findings are robust.

6.3. Subsample analysis

We employed a subsampling approach to confirm our conclusion about the interaction effect, as shown in Table 8. The study sample is classified into firms “with” and “without” institutional ownership using the median of the sampled firms as the cut-off. As per our discussion, we expect that CSRscore is negatively related to REM in firms with higher institutional ownership. Results in Table 8 Panel A confirm the negative and significant relationship between CSRscore and REM in firms with lower institutional ownership. On the other hand, there is an insignificant correlation between CSRscore and REM in firms without institutional ownership. These results support the main findings.

6.4. An alternative measure of CSR

The dichotomous measure is also used as an alternative to CSR reporting to avoid subjectivity in evaluating the quality of CSR reporting. Following prior research (e.g., Ghaleb et al., 2021; Wan-Hussin et al., 2021), we used the unweighted scoring method (binary scale) where a score of “1” is assigned if an item of CSR is disclosed and “0” if it is not. Then, we re-run our regression models. The results presented in Table 8 Panel B are qualitatively similar to those shown in Table 5, leading us to conclude that our main findings are robust using different CSR measures.

6.5. Controlling for self-selection bias

Chouaibi and Zouari (2022) and Wan-Hussin et al. (2021) highlight the problem of self-selection bias in research on CSR reporting. To remove the sample self-selection bias, we use a two-stage self-selection model. Firstly, a dummy variable (CSR_Dummy) is created, coded as “1” if the firm-level CSR reporting is more than the study median and “0” otherwise (Chouaibi & Zouari, 2022; Wan-Hussin et al., 2021). To estimate a probit regression model, the CSR_Dummy variable is used as the first stage’s dependent variable and all the main regression’s independent and control variables. Then, we compute the inverse Mills’ ratio (IMR) from the first stage. In the second stage,

Table 7. Regression results for alternative REM measures

Variables	Dependent variable = REM1		Dependent variable = REM2	
	Direct relationship	Moderating role	Direct relationship	Moderating role
CSRscore	-0.044*** (-2.938)	-0.044*** (-2.851)	-0.020* (-1.664)	-0.020 (-1.629)
IOC	-0.055** (-2.563)	-0.030 (-1.473)	-0.055*** (-3.078)	-0.043** (-1.996)
CSR*IOC		-0.006* (-1.731)		-0.003 (-1.220)
Intercept	-0.055 (-0.828)	-0.063 (-0.957)	0.012 (0.255)	0.008 (0.174)
Controls variables	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes
Year_FE	Yes	Yes	Yes	Yes
R ²	0.177	0.181	0.217	0.218
Prob>F	0.000***	0.000***	0.000***	0.000***
Observations	840	840	840	840

Notes: *, **, and *** represent statistical significance at 10%, 5% and 1%, respectively. Robust t-statistics in parentheses. Variable definitions are provided in Table 2.

Table 8. Results of robustness tests for sub-sample analysis, alternative CSR measures, and the Heckman test

Variables	Panel A		Panel B		Panel C	
	Sub-sample analysis (Dependent variable = REM)		Alternative CSR measure		Two-stage Heckman model	
	With institutional ownership	With institutional ownership	Direct relationship	Moderating role	First-Stage Probit	Second-Stage
CSRquantity			-0.001** (-1.971)	-0.001** (-1.966)		
CSRscore	0.000 (0.68)	-0.001** (-1.982)				
CSR_Dummy						-0.023 (-2.060)**
IOC			-0.097*** (-3.220)	-0.062* (-1.959)	-0.214 (-0.496)	-0.084 (-2.924)***
CSR*IOC				-0.009* (-1.896)		
IMR						-0.049 (-2.261)**
CSRscore						
CSRscore _{t-1}						
IVCSRscore						
Intercept	0.538*** (3.24)	-0.074 (-0.709)	0.031 (0.376)	0.019 (0.232)	-12.805 (-11.100)***	0.424 (2.443)**
Controls variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry_FE	Yes	Yes	Yes	Yes	Yes	Yes

(Continued)

Table 8. (Continued)

Variables	Panel A		Panel B		Panel C	
	Sub-sample analysis (Dependent variable = REM)		Alternative CSR measure		Two-stage Heckman model	
	With institutional ownership	With institutional ownership	Direct relationship	Moderating role	First-Stage Probit	Second-Stage
Year_FE	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	-	-	-	-	0.3754	-
R ²	0.639	0.182	0.262	0.266	-	0.269
Prob>F	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
Observations	235	605	840	840	840	840

Notes: *, **, and *** represent statistical significance at 10%, 5% and 1%, respectively. Robust t-statistics in parentheses. IMR. Inverse Mills' ratio. Variable definitions are provided in Table 2.

we include the IMR as an additional explanatory variable in our main model regression. The results of two-stage Heckman model, presented in Table 8 Panel C, support the results of our main regression (see Table 5). Thus, these findings suggest that self-selection bias does not affect our results.

7. Discussion

This study uses a sample of Saudi firms to support the idea that highly CSR firms are less inclined to participate in REM behaviour. Our main evidence confirms that CSR reporting constrains REM behaviour. This result supports the ethical perspective that the firms' higher disclosure of CSR information, the lower REM practices. This finding is consistent with Cao et al. (2023), Kim et al. (2019) and Ghaleb et al. (2021), who found similar results. Firms involved in CSR disclosure are less likely to be involved in REM. This may be because CSR activities encourage earnings quality (Chen & Hung, 2021; Palacios-Manzano et al., 2021) and enhance stakeholder satisfaction and corporate reputation; thus, Saudi firms' CSR tends to improve their financial transparency.

In addition, the evidence confirms that greater institutional investors are more likely to reduce REM. This is in line with the efficient monitoring hypotheses under an agency theory (Al-Duais et al., 2022), suggesting that institutional investors help to reduce information asymmetry by mitigating opportunism managerial problems and reducing agency costs (Sakaki et al., 2017). This result aligns with other authors (e.g., Ahmad et al., 2023; Al-Duais et al., 2022), who find that institutional investors alleviate REM because the institutional owners are a governance mechanism. Thus, firms have higher institutional ownership, and they can play a crucial role in mitigating agency conflict by curbing the divergent behaviour of management.

Moreover, the findings show how institutional ownership acts as a moderator in the relationship between CSR reporting and REM. This result aligns with other authors (Ahmad et al., 2023), who show that firms with high institutional ownership tend to weaken the CSR reporting-EM practices relationship. This is because institutional investors play a significant role in determining a firm's monitoring (Ramalingowda et al., 2021).

8. Conclusions

This article responds to recent calls to examine the role that CSR reporting plays in mitigating REM practices. Thus, it investigates the effect of CSR reporting and institutional ownership on REM. It also examines the impact of institutional ownership on the CSR-REM relationship. Based on a sample of the Saudi Stock Exchange (Tadawul) over the 2016–2021 period, we developed an index to capture the extent quality of Saudi firms' CSR. Our findings confirm a negative correlation between CSR reporting and REM, suggesting that CSR reporting reduces REM practices. Moreover, the regression result shows that institutional ownership is significantly associated with lower REM practices. Companies with higher institutional ownership tend to be less engaged in REM behaviour. Furthermore, the negative CSR-REM relationship is moderated (enhanced) by institutional ownership.

Our results have a few theoretical and practical implications. From a theoretical standpoint, our findings support the ethical views under agency theory. Specifically, the results suggest that CSR reporting constrains REM activities. In addition, the study's results support the efficient monitoring hypotheses under an agency theory. Firms with higher institutional ownership constrain REM. When institutional investors own more Saudi companies' shares, their REM activities reduce.

This research's findings may benefit regulators, policymakers, Saudi companies' management, and stakeholders. Firstly, our results suggest that regulators and policymakers should promote CSR initiatives by revising the current guidance in CG codes. Further, our study urges regulators to enhance market oversight, particularly focusing on firms with high institutional ownership. Secondly, our results encourage Saudi businesses and other stakeholders to promote CSR activities. Saudi firms should prefer institutional investors since this type of investor promotes management

to improve transparency in non-financial disclosures and reduce opportunistic managerial behaviour in financial reporting. Thirdly, our results help stakeholders consider the accuracy of financial reporting as a reliable indicator of information asymmetry.

Despite its importance and usefulness, our research has some limitations that could be addressed in future research. Firstly, this paper focuses only on firms in the Saudi capital market, and thus, our findings might not be generalisable to non-Saudi markets. Future researchers could analyse small and medium firms as well as non-listed firms. Secondly, it relied on annual reports to create the CSR reporting index. Future studies could explore using independently developed indices that utilise different data sources, such as sustainability reports, firm websites, or publicly available databases like Bloomberg or Thomson Reuters-Asset4. Thirdly, as the moderating effect of institutional ownership has produced significant results, future studies that could be focused on more refined ownership structure measures are warranted.

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