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Effect of board attributes on the quality of integrated reports: evidence from India

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Abstract: Integrated reporting (IR) is a novel concept in corporate sustainability reporting, which prompts corporates for voluntary adoption of the reporting practice to generate value. The board features play a significant role in the adoption of IR. The IR has received significant attention but the impact of the board features on IR quality is still not extensively examined in developing countries like India. This study fills the gap by examining the association between board characteristics and IR quality in Indian context. The study employed fixed effect and random effect models for 46 corporates for a period of three years, i.e., 2019–2021. The empirical analysis found that board size, CEO duality, number of board meetings, and firm size had significant association with IR quality. In contrast, the number of independent members on board, percentage of women on board, liquidity and solvency has insignificant relationship with IR quality. This study extends the applicability of agency and stakeholders' theories to the IR framework. The study has implications for corporate executives and academicians on the effectiveness board features on IR quality.

Keywords: integrated reporting; sustainability; board size; CEO duality; women on the board; India.

JEL codes: M40, M41, M48, C32.

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1 Introduction

The traditional corporate reporting is unable to meet the demands of various stakeholders in terms of sustainability, governance, and socioeconomic information. The voluntary disclosure of non-financial information might help the companies to meet the expectations of stakeholders (Frias-Aceituno et al., 2013). The International Integrated Reporting Council (IIRC) is the organisation that introduced the concept of integrated reporting (IR) to strengthen the style and quality of reporting (IIRC, 2013; Velte and Stawinoga, 2017). The demand for the IR framework is increasing since its first announcement (De Villiers et al., 2020; Rinaldi et al., 2018). The IR is a new trend in corporate financial reporting which discloses both non-financial and financial information in a single document (IIRC, 2013). So, it represents a company's capacity to create value over time (Vitolla et al., 2020c). Thus, non-financial information is treated as additional information for value creation and this process leads to building interconnection among various capitals and underlines future orientation, strategic focus, and increased conciseness (IIRC, 2013). The goal of IR is to improve the efficiency of firms' disclosure and allow for a better resource allocation (IIRC, 2013). As a result, the companies started to present value creating information to various interested parties (Velte and Stawinoga, 2017).

The introduction of the IR framework had opened doors for researchers, interested parties and corporate investors (IIRC, 2013). The IR framework addressed the limitations of traditional financial reporting and outlines the standards for the integrated corporate

reporting practice (IIRC, 2013). Therefore, the problem of sustainable disclosure is reduced after the adoption of IR (Flower, 2015). The IR improves decisions related to risk management, strategies, and internal resource allocation (Frias-Aceituno et al., 2013). The empirical evidence concluded that the IR delivers better quality information than the traditional reports (Vitolla et al., 2020a). This high-quality reporting helps in the areas of minimising operational risks, reducing regulatory issues and improving the corporate financial performance (Pavlopoulos et al., 2019; Erin and Adegboye, 2022). The IR has received substantial attention from professional bodies (EY, 2014) academics (Vitolla et al., 2018), and policy makers (Barth et al., 2017). Hence, the IR framework is identified as an emerging research field for different users (Agustia et al., 2020). The researchers focused on the determinants of IR (Velte and Stawinoga, 2017), effects of IR on corporate characteristics and business value (Barth et al., 2017; Esch et al., 2019).

1.1 Motivations for IR adoption

The past literature has enumerated the importance of the implementation of IR framework, and the contribution of IR towards firms' performance. The IR quality has improved the corporate reputation and image of the firms (Vitolla et al., 2020a). According to Flores et al. (2019), the IR disclosure improves the accuracy of analysts' forecast about corporate performance. Garcia-Sanchez and Noguera-Gamez (2017) reported that IR disclosure helps to reduce cost of capital. The IR implementation helped top management to make better internal decisions (Esch et al., 2019) and led to increased corporate value (Dey, 2020). The organisations across the globe started to adopt IR framework to improve corporate value and stakeholder satisfaction. It was found that renowned standard setters, regulators, governing bodies, investors, and key professionals promote IR framework (IIRC, 2018; Hsiao et al., 2022). Therefore, this analysis aims to estimate the effect of board features on IR quality. The study examined how board characteristics help to remove the agency problem, information asymmetry and meet the expectations of stakeholders by promoting high-quality IR disclosure. The study has responded to the presence of limited empirical work and inadequate evidence on the impact of board characteristics on IR quality in India. This is one of the initial empirical studies to investigate the effect of board features on IR quality by considering agency and stakeholders theories in the Indian context.

The IR lab in India was formed in the year 2015 by the Confederation of Indian Industry (CII)-ITC Centre of Excellence for Sustainability Development (CIICESD) and promoted the IR framework in association with IIRC. Many financial and non-financial institutions had financial contributions to support IR lab in India (Basu, 2017). The Securities Exchange Board of India (SEBI) had released a circular requesting the top 500 publicly traded companies to adopt IR framework on voluntary basis from the financial year 2017–2018 (Basu, 2017). After this announcement, the interest towards IR adoption was improved by the listed firms over the last six years, but still these reports are not uniformly published. The IR is disclosed as a separate section in the annual reports and this section mainly focuses on presenting the value creation, interlinking strategies, trade-off between capitals and stakeholders' engagement. Hence, these reports disclose relevant and transparent information.

1.2 Theoretical support

This sub-section highlights the theories supporting the role of board features in the publication of non-accounting data in the integrated annual report.

1.2.1 Agency theory

The agency agreement explains the contractual agreement between one party, i.e., principal who appoints another party, i.e., agent to act on behalf of the principal (Jensen and Meckling, 1976). The conflict of interest arises due to the opportunistic management behaviour and the presence of information asymmetry (Jensen and Meckling, 1976). The agency issue can be solved by having greater participation of independent board members and disclosing high-quality IR information (Vitolla et al., 2020a). The IR disclosure removes information asymmetry and conveys useful information to various stakeholders. Frias-Aceituno et al. (2013) examined the role of board on reducing the agency problem and information asymmetry by disclosing high-quality IR information and improving the transparency in reports. Vitolla et al. (2020a) enumerated the role of board members on adoption IR and IR disclosure. The IR system presumes to increase the publishing of both financial and non-financial information to reduce the information asymmetry and agency problem.

1.2.2 Stakeholders' theory

This stakeholder's theory enumerates about the association of different stakeholders like customers, creditors, employees, traders, suppliers, credit providers and other segments of the society with the company (Ofoegbu et al., 2018). Therefore, the company needs to keep strong relationships with different stakeholder groups for long-term survival in the market (Frias-Aceituno et al., 2014). The IR is considered as a best way to maintain the relationship with the stakeholders by publishing both accounting and non-accounting data as per their requirements. Vitolla et al. (2020c) noted that disclosing high-quality of IR information enhanced the association between stakeholder groups and company.

The remainder of the study is structured as follows: Section 2 focuses on assessment of IR quality and board composition literature, followed by the methodology applied in Section 3. Discussions and interpretation of results are highlighted in Section 4 and final section includes concluding remarks and followed by references and Appendix.

2 Literature review

The linkages between board characteristics and IR framework have been subjected to several research studies. Particularly, the present literature concentrates on the effect of corporate governance variables on IR quality. Bachiller et al. (2015) found the board configuration (size, board independence) had mixed results with the social and financial performance of family and non-family businesses. Biswas (2015) examined the drivers of corporate governance guidelines and reported the crucial role of internal and external factors. Lai et al. (2016) found a positive association between corporate governance and IR disclosure. Simona et al. (2017) investigated 1,047 European listed firms and found that board size and board diversity significantly influenced the IR disclosure.

Hoang (2018) discussed the influence of the board on corporate disclosure and IR practice. The key points were the lack of connectivity of ESG information with the organisation information system and the IR disclosure had positive association with the board size. Ofoegbu et al. (2018) examined the relationship between corporate characteristics on environmental disclosure for 303 environmental-sensitive listed firms. The study observed a favourable and significant impact of board independence and board size on environmental disclosure. In contrast, the board meetings had a limited impact on the environmental disclosure.

Kilic and Kuzey (2018) investigated the forward-looking disclosure of early IR-adopting companies. The study employed content analysis and multivariate ordinary least squares methods and found that most of the firms preferred to disclose qualitative forward-looking statements compared to the quantitative disclosures. The study also found firm size and gender diversity was positively affecting the forward-looking disclosure. However, leverage, profitability, board size and board composition did not affect forward-looking disclosure. Ofoegbu and Odoemelam (2018) applied content analysis, multivariate analysis and found that board characteristics positively affected the environmental disclosure quality in South Africa and this relationship is non-existent for Nigerian firms.

Vitolla et al. (2020a) analysed the effect of board characteristics on IR quality and found the positive effect of board size, board independence, board diversity, and board activity on the quality of IR disclosure. Marrone (2021) found that board size and gender diversity were positively associated with the IR quality whereas the CEO duality was negatively affecting the IR quality. Vitolla et al. (2020b) enumerated the role of intellectual capital disclosure (ICD) as part of IR framework in achieving financial objectives of companies. The study investigated impact of board features on implementing ICD quality and reported that the board size, board independence, board diversity, and board activity were positively affecting the ICD quality. Chouaibi et al. (2022) examined the relationship between board features and IR quality of selected ESG indexed companies. The study employed content analysis and panel data analysis and found positive relationship among board features (size, independence, diversity) and IR quality. The study suggested that ESG indexed companies to opt for higher disclosure of IR information which might lead to better performance and increase in brand value.

Girella et al. (2022) investigated Eurostoxx600 companies with 2,103 firm-year observations over three years. The study reported that board size, and board independence had a positive association with the IR publication. Similarly, the board size, and board independence jointly influenced the IR disclosure and sustainability. Qaderi et al. (2022) investigated the effect of board characteristics on IR quality and examined how the existence of a sustainable committee affects board and IR relationship for Malaysian firms. The analysis found that board size, % of women on board, non-executive members' remuneration, and board independence had a favourable association with IR quality. Further, the analysis reported that the agency problem was reduced after the introduction of IR and the interest of stakeholders in the firm was also enhanced.

Lawal and Yahaya (2024) analysed 155 Nigerian listed companies from 2013 to 2022 by using Generalised Methods of Moments, and found that board diversity, firm size has favourable significant effect on IR. While ownership, board independence, profitability, financial leverage, role of auditors had adverse effect on IR disclosure. Similarly,

Devarapalli and Mohapatra (2024) analysed 46 Indian companies and reported that board size, CEO duality, leverage, COVID pandemic crisis, non-executive board members and firm size had significant influence on IR quality disclosure comprising both content elements and six capitals of IR system. In contrast, the percentage of women, board interaction, profitability had insignificant influence on total IR quality disclosure. Further, Dhifi and Zouari (2024) examined 449 UK listed companies from 2010 to 2020 by employing structural equation model. The outcomes indicated that IR had a mediation effect on the association between CEO's attributes (age, education, and experience) and corporate performance. Likewise, Kabwe (2023) reported that board size had significant influence on financial reporting quality. In contrast, audit committee independence, board independence, board accounting expertise, and gender diversity had little impact on financial reporting quality in the context of Zambian listed companies. Salehi et al. (2023) analysed 35 Iraqi Stock Exchange from 2012 to 2018 by employing a multivariate regression analysis and found board expertise, audit committee, ownership had positive association with financial reporting transparency. In contrast, board independence, and remunerations, and management team ability had insignificant association with financial reporting transparency. Makri et al. (2023) found that board size, women participation and presence of independent board members had positive association with IR quality by using two-stage least square method for 195 firms. Ahmed (2023) found risk management committee, presence of independent board members and board size had positive association with IR disclosure. While, frequent board interactions, size and independence of audit committee, frequent interactions of audit committee and risk management committee and size of risk management committee had negative association with IR disclosure.

Abdelmoneim and El-Deeb (2024) examined 34 Egyptian non-financial companies from 2015 to 2021 by employing regression analysis. The analysis reported favourable association between ESG disclosure and quality of IR disclosure. In addition, women participation in board, board size positively moderated the association between ESG disclosure and quality of IR disclosure. Dhochak et al. (2024) investigated companies from Asia-Pacific countries from 2016 to 2020 and found women participation in board, presence of independent board members had positive association with sustainability disclosure but CEO duality had insignificant influence on disclosure of sustainability information. Arhinful et al. (2024) found larger board size, presence of women on board, and CEO duality had negative influence on the disclosure of corporate social responsibility information. Naik et al. (2024) found positive association between board gender diversity, firm size, firm financial leverage, and sustainability disclosure. Yusuf et al. (2024) reported that board attributes significantly improve the disclosure levels of IR information. Suman and Mohapatra (2023) confirmed the positive association between corporate performance and IR quality.

2.1 Hypotheses development

2.1.1 Board size and IR quality

The board size denotes the total number of board members who can influence the boards' operations, working conditions and effectiveness of board (Hichri, 2022). The agency theory outlines that boards with greater monitoring and controlling authority might enable the reliable communication and effective decision-making choices (Frias-Aceituno

et al., 2013). The superior board size induces board's effectiveness by reducing the information asymmetry and agency problem and helps to disclose high quality IR information on voluntary basis (Girella et al., 2019). Usually, larger board members hold diverse knowledge, skills, capabilities, and power to control the operations of the business (Frias-Aceituno et al., 2013; Vitolla et al., 2020a). Also, larger boards improve managerial capabilities of boards and help to improve the firm's disclosure rules (Vitolla et al., 2020a). Vitolla et al. (2020c), Qaderi et al. (2022) and Girella et al. (2019, 2022) demonstrated that greater boards significantly improve the IR adoption and disclosure of IR information. Larger board helps to provide diverse viewpoints, experience, and allows for better monitoring, thereby improves disclosure levels and reduce the agency problem (Frias-Aceituno et al., 2013). Similarly, Vitolla et al. (2020a) and Cooray et al. (2020) enumerated that firms with greater boards are likely to disclose high-quality IR information. The linkage between board size and IR quality is not examined in Indian context. This study relies on agency theory and argues that larger boards significantly improve the disclosure the IR information. Therefore, this study postulates the following hypothesis.

H₁ Board size significantly improves the IR quality of Indian listed firms.

2.1.2 CEO duality and IR quality

CEO duality occurs when the CEO holds another important position in the organisation (Cooray et al., 2020). CEO duality is an unfavourable governance condition that makes it difficult to access the reliable information for the stakeholders (Cooray et al., 2020), stakeholders' interest might not be considered, and the quality of IR disclosure is not conceded (Haniffa and Cooke, 2002). Therefore, the role of chairman/managing director and CEO must be distinct (Cooray et al., 2020). Previous studies have reported negative association between IR quality and CEO duality (Majumder et al., 2017; Sundarasan et al., 2016). A few studies have also found positive association between IR quality and CEO duality (Pavlopoulos et al., 2017; Cooray et al., 2020). Jizi et al. (2014) found a favourable association between CEO duality and corporate disclosure. This study argues that CEO duality does not restrict the authorities of board members and is likely to promote higher IR information (Cooray et al., 2020; Devarapalli and Mohapatra, 2024). Therefore, this study proposes the following hypothesis.

H₂ CEO duality significantly improves the IR quality of Indian listed firms.

2.1.3 Frequent board activity and IR quality

Frequent board interactions/board activities help the boards to perform their managerial supervision function effectively (Aliyu, 2019). The higher frequency of board activities reflects in the comprehensive inspection system (Omran et al., 2021). The inspection system improves the board's capacity to oversee reports, decreases agency issues, improves quality of non-financial disclosure, and maintains strong stakeholders' relationship (Omran et al., 2021). The board supervision always improves the disclosure quality of non-financial information and decreases information asymmetry (Chou et al., 2013). Corporate boards must vigorously encourage transparent disclosure through

annual reports (Omran et al., 2021). Frequent board activities improve the communication between the board members (Qaderi et al., 2022). These interactions might encourage the corporates to make significant disclosures of the required information (Omran et al., 2021). Further, frequent board activities enable the directors to share high-quality information and demonstrate the deep involvement of the directors in the prosperity of the company (Kılıc et al., 2015). Vitolla et al. (2020a) claimed that frequent board activities give enough time to the directors to perform their monitoring function effectively and improves the corporate disclosure such as IR. Girella et al. (2022) argued that boards with greater activities can overcome the challenges with IR disclosure by strengthening the board capacity to oversee reports and lowering agency problems. A few empirical studies have found positive association between frequent board activities and IR adoption or IR quality (Vitolla et al., 2020a; Wang et al., 2020). In contrast, a few papers found an insignificant association between board activities and adoption of IR or quality of the IR (Frias-Aceituno et al., 2013; Girella et al., 2022; Orshi et al., 2019). Though, there are mixed outcomes on the frequent board activities and IR quality association, the present study postulates that the frequent board activities significantly influenced the IR disclosure quality. Thus, this study posits the following hypothesis.

H₃ Frequent board activities significantly improve the IR quality of Indian listed firms.

2.1.4 Board independence and IR quality

Generally corporate boards consist of both executives and non-executive members (Frias-Aceituno et al., 2013). The non-executives are the outsiders and increase their independence. The board independence is another important feature in promoting and improving the disclosure levels of IR information (Frias-Aceituno et al., 2013; Qaderi et al. 2022). Boards with greater participation of independent members have superior monitoring behaviour (Fama and Jensen, 1983) and improve the effectiveness of the board (Liao et al., 2015). The board composition determines the effectiveness of board mechanisms in minimising agency problems (Akhtaruddin et al., 2009). Boards with a higher share of independent directors are more successful in steering management towards long-term value and monitoring the top management (Jizi et al., 2014). The membership of the board can influence the corporate governance practices and reduce agency issues (Vitolla et al., 2020a). In addition, the qualitative and quantitative data disclosure is improved after the adoption of the IR framework (Songini et al., 2021). Vitolla et al. (2020b) elaborated the association between IR and board independence. Thus, the study proposes the following hypothesis.

H₄ Board independence significantly improves the IR quality of Indian listed firms.

2.1.5 Board diversity and IR quality

The Board diversity is a prominent aspect of board characteristics (Mahmood et al., 2018) and role of the women on the board is crucial in disclosing high-quality integrated information (Frias-Aceituno et al., 2013). Women are crucial to promote the company's reputation by focusing more on social problems (Majumder et al., 2017). A high participation of women on the board tends to produce high-quality of non-financial information on voluntary basis (Ibrahim and Hanefah, 2016). The presence of women on

the board plays a crucial role in making effective decisions about the creation of integrated reports (Frias-Aceituno et al., 2013; Qaderi et al., 2022). Greater participation of women on the board may bring additional knowledge, abilities and experiences that support an efficient monitoring function of the board (Vitolla et al., 2020a). It is expected that a higher proportion of women on the board will promote high quality of IR disclosure, which will in turn lessen the information asymmetry and subsequent agency issues (Vitolla et al., 2020a; Qaderi et al., 2022). The corporate boards with effective gender diversity are better at managing the necessary resources for survival, which results in improvement of non-financial performance (Elmagrhi et al., 2019). Chanatup et al. (2020) enumerated that firms with greater presence of women on the board may promote and adopt IR guidelines effectively due to their wider viewpoints on resource allocation and decision-making choice. Hichri (2022) found that higher presence of female members leads to higher disclosure of IR information. Similarly, the involvement of women on the board enhanced the firms to disclose higher quality of IR information (Iredele, 2019; Dilling and Caykoylu, 2019). A few studies have reported the positive association between IR disclosure and gender diversity (Vitolla et al., 2020a; Kılıc and Kuzey 2018; Erin and Adegboye, 2022). In contrast, a few studies also concluded that gender diversity has no influence on firms to disclose the high-quality IR information (Girella et al., 2019; Cooray et al., 2020; Songini et al., 2021). This study posits the following hypothesis.

H₅ Board diversity significantly improves the IR quality of Indian listed firms.

3 Methodology

3.1 Sample size

The sample consists of forty-six corporates for three financial years, i.e., 2019–2021. This study had selected the purposive sampling technique by following the reports of Grant (2020), AICL (2020) and Vrushali (2019) and found that only limited companies published IR in India. The study did not include financial and banking companies due to data constraints (Kılıc and Kuzey, 2018). The board features data were obtained from the CMIE database and content analysis score was calculated based on the integrated annual reports of the companies.

3.2 Tools and specification tests

The study employed content analysis, and pooled ordinary least square (POLS) method, fixed effect (FE) and random effect (RE) models. The Hausman test was applied to check the suitability of FE or RE model for the estimated results. Similarly, Breusch-Pagan multiplier test was carried out to choose between RE or POLS model.

3.3 Model specification

The present study used a balanced panel data estimation to test the effect board features on IR quality by following the model of Kılıc and Kuzey (2018). The following mathematical equations explain the association between various variables.

$$IRQ_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 FS_{it} + \beta_3 Solv_{it} + \beta_4 Liq_{it} + E_{it} \quad (1)$$

$$IRQ_{it} = \beta_0 + \beta_1 CEOD_{it} + \beta_2 FS_{it} + \beta_3 Solv_{it} + \beta_4 Liq_{it} + E_{it} \quad (2)$$

$$IRQ_{it} = \beta_0 + \beta_1 NOBM_{it} + \beta_2 FS_{it} + \beta_3 Solv_{it} + \beta_4 Liq_{it} + E_{it} \quad (3)$$

$$IRQ_{it} = \beta_0 + \beta_1 NEBM_{it} + \beta_2 FS_{it} + \beta_3 Solv_{it} + \beta_4 Liq_{it} + E_{it} \quad (4)$$

$$IRQ_{it} = \beta_0 + \beta_1 \%WOB_{it} + \beta_2 FS_{it} + \beta_3 Solv_{it} + \beta_4 Liq_{it} + E_{it} \quad (5)$$

IRQ_{it} = IR quality; BS_{it} = Board size; FS_{it} = Firm size; $CEOD_{it}$ = CEO duality, $NOBM_{it}$ = Number of board meetings, $NEBM_{it}$ = Non-executive board members, $\%WOB_{it}$ = % of women on the board, $Solv_{it}$ = Solvency; Liq_{it} = Liquidity, and E_{it} = Error term.

3.4 Variable description

3.4.1 Dependent variable

Integrated reporting quality (IRQ) is used as a proxy to the eight content elements proposed by the IR system. The eight content elements are:

- 1 organisational overview and external environment
- 2 governance
- 3 business model
- 4 risk and opportunities
- 5 strategy and resource allocation
- 6 outlook
- 7 performance
- 8 basis for preparation and presentation.

The scoring system is developed based on Agustia et al. (2020) and Adegboyegun et al. (2020). The scoring system is carried out by two authors. In the initial stage, each author had evaluated 20 annual reports and cross examined the scoring patterns and the authors were satisfied with the scores allotted. In the next stage, both authors divided remaining annual reports equally and allotted scores cautiously. The final allotment is confirmed after the through cross examination of the scores. The score was allotted in binary coding. If the element is revealed in the annual report, the study allotted a score of 1 and allotted 0 otherwise. Each content element has a maximum score of six and the total score for eight content elements is 48. The scoring criteria for all content elements are disclosed in Appendix 1. The calculation of IRQ is presented in the following mathematical equation.

$$IRQ_i = \frac{\sum_1^8 CE_i}{\text{Maximum Possible Score}} * 100$$

IRQ is integrated reporting quality, CE is content element.

3.4.2 Independent variables

The independent variables represent board characteristics such as board size (BS), board independence, number board meetings, % of women on the board and duality of CEO. Board size is considered as the total number of directors present in the board (Vitolla et al. 2020a; Simona et al., 2017). The number of board meetings held during a financial year presents the board activities (Frias-Aceituno et al., 2013; Vitolla et al., 2020a). The board diversity is considered as % of women participation on board (Kılıc and Kuzey, 2018; Vitolla et al., 2020a; Qaderi et al., 2022). CEO duality is a dummy variable; if the CEO holds dual positions in a company, value is one and otherwise zero (Marrone, 2021; Cooray et al., 2020). Board independence is considered as the number of non-executive members on the board (Liao et al., 2015; Vitolla et al., 2020b).

3.4.3 Control variables

This study used the natural logarithm of total assets as firm size. It is assumed that firms having higher size disclose more non-financial information. Vitolla et al. (2020a), Adelowotan and Udofia (2021) found positive association between firm size and IR quality. Solvency is measured as the ratio of debt to total assets. Adegboyegun et al. (2020) and Vitolla et al. (2020a) found that companies with high debt did not disclose higher information to the outsiders. The liquidity is measured as the ratio of current assets to current liabilities.

4 Results and discussion

4.1 IR quality trend

Figure 1 discloses the mean score of IR quality for three successive years. The mean score of IR quality is 87% in 2019, 89% in 2020, and 93% in 2021. The disclosure level of the sampled firms is adequate, and the disclosure quality improved during this period. The IR quality did not decrease during the COVID-19 pandemic, which means IR-adopting companies disclosed sufficient information as per the requirements of stakeholders. The IR quality again improved in the post-pandemic period.

Figure 1 Trend of IR quality



Source: Author's compilation

4.2 *Descriptive statistics*

The IR quality index variable has a mean score of 89.62 with a maximum score of 100 and a minimum score of 54. The higher average denotes a high-quality disclosure among the IR practicing companies in India. The board size has a maximum score of 31 and a minimum score of 8. The average board size score is 14.78. The count of board meetings has an average score of 6.30. The non-executive board members have a maximum score of 16 and a minimum score of 3 with an average score of 9.27. The board diversity has a low average score. The results are shown in Appendix 2.

4.3 *Correlation matrix*

According to Myers (1990), the values of variance inflation factor (VIF) lower than 10 indicate that the effect of multicollinearity is insignificant in the regression model. The problem of multicollinearity is non-existent in this study as the maximum VIF is 3.85 for board size. The IR quality is positively correlated with BS, %WOM, CEOD, NOBM, NEBM and FS. The IR quality was adversely correlated with solvency and liquidity. The board size was positively correlated with IRQ, indicating that the board size and IR disclosure move together for the selected Indian companies. The correlation matrix is presented in Appendix 3.

4.4 *Panel data analysis*

The panel data estimations are presented in Tables 1 to 5. To examine panel data, the study employed POLS, FE, RE analyses. The study found the RE method is more appropriate as is confirmed by the Hausman specification test for all the five models. Further, the study has selected RE based on the Breusch-Pagan multiplier test.

Table 1 represents the estimations of model one. The BS is positive and statistically significant with the IRQ at p-value of 0.06. The coefficient of board size is 0.39, which indicates a 1-unit improvement in the board size of the Indian sampled companies' results in an average improvement of 0.39 units of the IR disclosure quality. The result suggests that corporates with higher board size publish better quality of IR disclosure. This finding specifies that Indian listed companies with greater board size contribute to enhance the disclosure quality of IR. Mostly, the larger boards possess diverse skills and expertise, which may result in disclosing high-quality of IR. The larger boards might significantly contribute to removing agency problems, information asymmetry, helps to satisfy the expectations of stakeholders and suggest the top management in disclosing high-quality IR. The findings are in line with previous studies which accepted that larger boards lead to disclose and improve the quality of IR (Vitolla et al., 2020a; Jizi et al., 2014; Osazuwa et al., 2016; Simona et al., 2017; Alfiero et al., 2018; Qaderi et al., 2022; Girella et al., 2022). The outcomes support the board size as one of the principal factors of board effectiveness. Thus, the proposed hypothesis (H1) is supported.

Table 2 presents result of equation two. The CEOD is positive and statistically significant with the IRQ at p-value of 0.0. The coefficient of CEO duality is 6.07, which indicates a one-unit improvement in the CEO duality of the Indian sampled companies' results in an average improvement of 6.07 units of the IR disclosure quality. The results proved that CEOD plays a key role in promoting and adopting the IR quality. The CEO holding dual positions in a company might lead to quick decisions and helps to prepare

high-quality IR information. This finding specifies that Indian listed companies with CEO duality support to disclosure high-quality IR information. Often companies with CEOOD finds less bureaucratic issues and enhance the disclosure of high-quality IR information. Our results are in line with the outcomes of Ofoegbu and Odoemelam (2018), Lopes and Braz (2020), and Marrone (2021). Thus, the second proposed hypothesis (H2) is supported.

Table 1 Panel data results

	POLS		FE		RE	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
BS	0.42	2.21 (0.03)**	0.34	1.11 (0.27)	0.39	1.86 (0.06)*
FS	3.21	6.60 (0.0)***	6.90	2.32 (0.02)**	3.29	4.91 (0.0)***
Solv	-9.11	-2.01 (0.05)**	-5.71	-0.59 (0.56)	-9.85	-1.87 (0.06)*
Liq	0.04	0.15 (0.88)	-0.33	-1.23 (0.22)	-0.19	-0.79 (0.43)
Constant	48.54	8.37 (0.0)***	4.71	0.13 (0.89)	48.84	6.22 (0.0)***
R ²	0.35		0.08		Overall R ² : 0.35	
F-test	18.02		2.11		Wald Chi ²	37.91
p-value	0.00***		0.00***		Prob. > Chi ²	0***
Housman test: Chi ² : 3.38; p-value: 0.49						
Breusch and Pagan Lagrangian multiplier test for RE: Chibar ² = 36.69; Prob. > Chibar ² = 0.0***						

Notes: BS – Board size, FS – Firm size; FE – Fixed effect, RE – Random effect; Coef. – Coefficient; Solv – Solvency; Liq – Liquidity. ***, **, * denotes significance at 1%, 5% and 10%.

Table 2 Panel data results

IRQ	POLS		FE		RE	
	Coef.	t-value	Coef.	t-value	Coef.	t-value
BS	5.53	3.83 (0.0)***	7.61	2.46 (0.02)**	6.07	3.44 (0.0)***
FS	3.4	7.77 (0.0)***	7.24	2.50 (0.01)**	3.45	5.56 (0.0)***
Solv	-4.02	-0.86 (0.39)	-4.19	-0.46 (0.65)	-4.7	-0.88 (0.38)
Liq	0.19	0.68 (0.50)	-0.09	-0.34 (0.73)	-0.01	-0.05 (0.96)
Constant	46.82	8.34 (0.0)***	-0.01	-0.00 (1)	46.59	6.12 (0.0) ***
R ²	0.4		0.13		Overall R ² : 0.39	
F-test	21.68		3.41		Wald Chi ²	48.83
p-value	0***		0***		Prob. > Chi ²	0***
Housman test: Chi ² : 3.52; p-value: 0.48						
Breusch and Pagan Lagrangian multiplier test for RE: Chibar ² = 35.46; Prob. > Chibar ² = 0.0***						

Notes: CEOOD duality of CEO; FS – Firm size; FE – Fixed effect, RE – Random effect; Coef. – Coefficient; Solv – Solvency; Liq – Liquidity. ***, **, * denotes significance at 1%, 5% and 10%.

Table 3 presents the results of equation three. The NOBM positively affected the IRQ at a p-value of 0.09. The coefficient NOBM is 0.65, which indicates a one-unit improvement in the number of board meetings of the Indian sampled companies' results in an average

improvement of 0.65 units of the IR disclosure quality. This finding specifies that Indian listed companies with higher NOBM have better disclosure quality of IR. Frequent board meetings might remove the agency problem and result in disclosure of high IR information. Further, frequent board meetings prompt the corporate boards to carry effective monitoring and observe the activities of management related to IR quality information. Presenting high-quality IR consumes ample time for the corporates and this process might be significantly monitored through effective board interactions among the members. The findings are in line with previous studies which supports that frequent board meetings lead to better disclosure and improve the quality of IR (Ntim and Osei, 2011; Vitolla et al., 2020a). In contrast, conducting frequent board meetings leads to consumption of resources, lack of decision making and does not support the disclosure of high-quality information (Kantudu and Samaila, 2015; Frias-Aceituno et al., 2013). The findings support that frequent board meetings significantly enhance the firms to publish high-quality IR information. So, the proposed hypothesis three (H3) is supported.

Table 3 Panel data results

<i>IRQ</i>	<i>POLS</i>		<i>FE</i>		<i>RE</i>	
	<i>Coef.</i>	<i>t-value</i>	<i>Coef.</i>	<i>t-value</i>	<i>Coef.</i>	<i>t-value</i>
NOBM	0.89	2.38 (0.02)**	0.43	0.93 (0.35)	0.65	1.72 (0.09)*
Log TA	3.34	7.20 (0.0)***	6.82	2.28 (0.03)**	3.44	5.27 (0.0)***
Solv	-12.62	-2.81 (0.01)***	-3.49	-0.37 (0.73)	-11.37	-2.15 (0.03)**
Liq	-0.08	-0.28 (0.78)	-0.36	-1.33 (0.19)	-0.25	-1.02 (0.31)
Constant	49.49	8.65 (0.0)***	7.07	0.20 (0.84)	49.62	6.37 (0.0)***
R ²		0.36		0.08	Overall R ² : 0.35	
F-test		18.32		2.02	Wald Chi ²	37.59
p-value		0***		0***	Prob. > Chi ²	0***
Housman test: Chi ² : 4.17; p-value: 0.38						
Breusch and Pagan Lagrangian multiplier test for RE: Chibar ² = 35.28; Prob. > Chibar ² = 0.0***						

Notes: NOBM – Number of board meetings; FS – Firm size; FE – Fixed effect, RE – Random effect; Coef. – Coefficient; Solv – Solvency; Liq – Liquidity. ***, **, * denotes significance at 1%, 5% and 10%.

Table 4 presents the results of equation four. The NEBM has an insignificant relationship with IRQ at p-value of 0.21. Our results concluded that boards with active participation of independent members do not have any impact on IR disclosure. The director's attention is focused only on high-quality information, not the type of report adopted by the firm. In this view, most of the board members are concerned about only in the disclosure quality rather than the instrument through which the information is reported. Consequently, the independent board members might not be interested in inducing the adoption of novel reporting techniques. Frias-Aceituno et al. (2013) and Songini et al. (2021) confirmed that absence of association of NEBM with IR disclosure. However, a few previous studies have supported the presence of non-executive board members enhances the monitoring of executives and the management and encourages the management to disclose high-quality IR information. Omran et al. (2021), Liao et al. (2015), Vitolla et al. (2020a), and Jamil et al. (2021) confirmed the association between NEBM and IR disclosure. The proposed hypothesis four (H4) is not supported.

Table 4 Panel data results

<i>IRQ</i>	<i>POLS</i>		<i>FE model</i>		<i>RE model</i>	
	<i>Coef.</i>	<i>t-value</i>	<i>Coef.</i>	<i>t-value</i>	<i>Coef.</i>	<i>t-value</i>
NEBM	0.54	2.05 (0.04)**	0.06	0.13 (0.89)	0.38	1.26 (0.21)
FS	3.3	6.93 (0.0)***	7.05	2.35 (0.02)**	3.44	5.18 (0.0)***
Solv	-9.96	-2.22 (0.03)**	-3.19	-0.32 (0.75)	-10.35	-1.96 (0.05)**
Liq	0.01	0.04 (0.97)	-0.33	-1.20 (0.23)	-0.21	-0.86 (0.39)
Constant	49.16	8.50 (0.0)***	6.31	0.18 (0.86)	49.64	6.33 (0.0)***
R ²		0.35		0.08	Overall R ² : 0.34	
F-test		17.78		1.79	Wald Chi ²	35.93
p-value		0***		0.01***	Prob. > Chi ²	0***

Housman test: Chi²: 4.31; p-value: 0.37

Breusch and Pagan Lagrangian multiplier test for RE: Chibar² = 35.32; Prob. > Chibar² = 0.00

Notes: NEBM – Non-executive board members; FS – Firm size; FE – Fixed effect, RE – Random effect; Coef. – Coefficient; Solv – Solvency; Liq – Liquidity. ***, **, * denotes significance at 1%, 5% and 10%.

Table 5 presents the results of equation five. The %WOB having insignificant relationship with the IRQ at p-value of 0.18. This indicates that presence of female members on boards had little impact on the level of IR disclosure for Indian listed companies. Firms in India must concentrate on providing equal opportunity to the women participation on board. Songini et al. (2021) reported that the presence of women on board does not lead to disclosure of the high-quality of IR information. The women participation on board plays a significant role in boards functioning in terms of enhanced decision making and provides significant support to sustainable issues. Qaderi et al. (2022), and Vitolla et al. (2020b) found presence of association between %WOB and IR disclosure. The proposed hypothesis five (H5) is not supported.

The Wald-Chi² for all five RE models was found to be statistically significant. Therefore, the Wald-Chi² indicated that the dependent variable is jointly influenced by all the proposed independent variables. The firm size is statistically significant with IRQ for all proposed models. The larger firms disclose better quality of IR information. The larger firms can afford more visibility, economic feasibility and social impact, and high-quality IR information. Mansor et al. (2021) and Vitolla et al. (2020b) found larger firms have more potential to disclose higher levels of IR information than the firms with lower firm size. Larger firms can maintain strong stakeholders' relationships and meet the expectations of the stakeholders. Solvency has mixed results in all five models. The companies with higher solvency level are not likely to disclose better quality IR than the companies with lower solvency. The increase in leverage of firms might increase the financial risk for investors. Moreover, the firms with high financial leverage might result in lower disclosure of IR information as the fund providers might not like the publication of confidential accounting and non-accounting information to the competitors and outsiders which is supported by previous literature (Adegboyegun et al., 2020; Vitolla et al., 2020a). The liquidity had not much effect on the disclosure of IR information. The IR reporting quality is intended to generate corporate value in a forward-looking

approach, but the liquidity is a short-range measure. Therefore, liquidity might not have affected the improvement of IR quality.

Table 5 Panel data results

<i>IRQ</i>	<i>POLS</i>		<i>FE</i>		<i>RE</i>	
	<i>Coef.</i>	<i>t-value</i>	<i>Coef.</i>	<i>t-value</i>	<i>Coef.</i>	<i>t-value</i>
% WOB	6.14	1.62 (0.11)	4.17	0.81 (0.42)	5.34	1.33 (0.18)
FS	3.49	7.60 (0.0)***	6.99	2.34 (0.02)**	3.55	5.42 (0.0)***
Solv	-11.61	-2.58 (0.01)**	-4	-0.42 (0.68)	-10.89	-2.04 (0.04)**
Liq	-0.03	-0.09 (0.93)	-0.33	-1.22 (0.23)	-0.21	-0.85 (0.39)
Constant	50.76	8.81 (0.0)***	6.56	0.18 (0.85)	50.42	6.38 (0.0) ***
R2		0.34		0.08	Overall R ² : 0.34	
F-test		17.19		1.96	Wald Chi ²	35.43
p-value		0***		0***	Prob. > Chi ²	0***
Housman test: Chi ² : 3.34; p-value: 0.50						
Breusch and Pagan Lagrangian multiplier test for RE: Chibar ² = 37.45; Prob. > Chibar ² = 0.00						

Notes: %WOB – % of women on board, FS – firm size; FE – Fixed effect, RE – Random effect; Coef. – Coefficient; Solv – Solvency; Liq – Liquidity. ***, **, * denotes significance at 1%, 5% and 10%.

5 Conclusions

The present study has assessed the role of board features in effective enhancement of IR disclosure quality. The study used 138 firm-year observations of IR-adopting companies in India over three years, i.e., 2019–2021 and employed panel data analysis. The results indicated that larger boards help to disclose high-quality disclosure of IR information. Attributes like frequent board meetings, board size, firm size, and CEO duality are statistically significant with IR disclosure quality. While the board diversity or % of women on board and board independence are not significant with IR quality publication. The board characteristics are vital in promoting the disclosure quality of IR in India. The corporate board enhances the supervision of internal governance, protects the stakeholder's interest, and reduces the information asymmetry. So, the board members improve the firm's reporting transparency and improve the disclosure quality of IR. The agency issues are minimised after the implementation IR framework and disclosure of IR information by Indian companies. Similarly, stakeholders' associations are enhanced due to high quality disclosure of IR information. This study provides few significant contributions to the IR quality research. Firstly, the study examines an under-explored issue of IR quality in Indian context. Secondly, it examines the link between board features and IR quality with the support of agency and stakeholders' theories. Thirdly, the study observed that board features like board size, board activities and CEO duality can enhance the IR quality. While the role of independent board members and board diversity can be further explored. As the findings recommend an efficient board for improving IR quality and generating corporate value, the management should appoint qualified board members based on their competence and expertise. Their experience and specialised knowledge help the firms to publish high-quality reports and to maintain good

relationships with stakeholders' groups. The study has limitations related to the methodology it has adopted. Future studies could adopt methodologies to get robust estimations against the endogeneity issues. The subjectivity problem in the content analysis technique (Songini et al., 2021) persists; upcoming studies can employ a standardised checklist for the same. The sample period and size could be improved and the assessment of the impact of other variables on the level of IR disclosure of Indian companies can be explored with advanced empirical models.

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Appendix 1**Table A1** Content elements criteria

<i>Content elements</i>	<i>Sub-criteria</i>	<i>Score</i>	<i>Total score</i>
Organisational overview and external environment	Mission and vision	1	6
	Type of organisational structure	1	
	External factors like political, legal and economical	1	
	Organisation's ethics and values	1	
	ESG factors and sustainable goals	1	
	Presenting in business model	1	
Governance	Message from CEO/director/chairman/MD	1	6
	Leadership style/delegation of authority	1	
	Report on board of directors and remuneration policy	1	
	Formation of various committees	1	
	Awards and recognitions	1	
	Presenting in business model/capital trade-off	1	
Business model	Presenting this element in report	1	6
	Only diagrammatic presentation	1	
	Diagram includes all capitals with inputs, out-puts, and outcomes	1	
	Diagram includes all key business elements	1	
	Diagram with stakeholders' engagement/trade-offs	1	
	Diagram is presented with SDGs	1	
Risk and opportunities	Degree of uncertainty/identification of risk	1	6
	Types of business risks	1	
	Steps to minimise risk factors	1	
	Availability of business opportunities internal/external	1	
	Presenting this element in business model	1	
	Interlinking this element with capitals, and SDGs	1	
Strategy and resource allocation	Objective with and without time frame	1	6
	Strategies followed at various levels of management	1	
	Identifying and utilisation resources	1	
	Measurement of achievement and anticipating early warning signals with planned strategies	1	
	Presenting this element in business model/report	1	
	Interlinking strategies with capitals and other key elements	1	

Table A1 Content elements criteria (continued)

<i>Content elements</i>	<i>Sub-criteria</i>	<i>Score</i>	<i>Total score</i>
Performance	KPI with financial information	1	6
	KPI with past and present trends	1	
	National and International benchmarks	1	
	Sustainability and CSR performance	1	
	Presenting this element in business model	1	
	Linking performance elements with capitals, materiality SDGs and strategies	1	
Outlook	Future expectations and uncertainties	1	6
	Forecasts about key KPIs and business outlook	1	
	Defining report boundary/reporting period	1	
	Linkage between current performance and organisations' outlook	1	
	Presenting this element in business model	1	
	Implication of business model with capitals and SDGs for future assumptions	1	
Basis of preparation and presentation	Methods used for presenting and preparations	1	6
	Report on BRR/CSR and financial reports	1	
	Report on internal and external assurance	1	
	Concept of materiality and role of stakeholders	1	
	Information related to IIRC guidelines and IR framework	1	
	Report on UN sustainable goals and GRI guidelines	1	
Total content elements score			48

Appendix 2

Table A2 Descriptive statistics

<i>Variable</i>	<i>Mean</i>	<i>Std. dev.</i>	<i>Min</i>	<i>Max</i>
IRQ	89.62	9.74	54.00	100.00
BS	14.74	3.89	8.00	31.00
%WOB	0.31	0.19	0.00	0.80
CEOD	0.57	0.50	0.00	1.00
NOBM	6.30	1.92	2.00	12.00
NEBM	9.27	2.76	3.00	16.00
FS	12.05	1.58	8.99	16.09
Solv	0.43	0.18	0.01	0.75
Liq	2.30	2.88	0.36	30.20

Appendix 3**Table A3** Correlation matrix

<i>Variable</i>	<i>VIF</i>	<i>IRQ</i>	<i>BS</i>	<i>%WOB</i>	<i>CEOD</i>	<i>NOBM</i>	<i>NEBM</i>	<i>FS</i>	<i>Sol</i>	<i>Liv</i>
IRQ	-	1.00								
BS	3.85	0.37	1.00							
%WOB	1.30	0.21	0.40	1.00						
CEOD	1.25	0.34	0.07	0.11	1.00					
NOBM	1.19	0.29	0.21	0.03	0.08	1.00				
NEBM	3.53	0.33	0.84	0.40	0.05	0.16	1.00			
FS	1.35	0.54	0.38	0.21	0.07	0.29	0.33	1.00		
Solv	1.98	-0.05	-0.04	0.15	-0.31	0.19	-0.01	0.26	1.00	
Liq	1.56	-0.03	-0.10	-0.09	-0.01	-0.07	-0.08	-0.24	-0.54	1.00