INTEGRATED REPORTING QUALITY, READABILITY, AND SUSTAINABLE FIRM PERFORMANCE: THE MODERATING ROLE OF BOARD SIZE IN ASEAN

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Abstract

This study examines the effect of integrated reporting quality (IRQ) and integrated reporting readability (IRR) on firm performance, with corporate governance as a moderating variable. The research sample is from companies listed in the Association of Southeast Asian Nations (ASEAN) countries during the COVID-19 pandemic. Panel data regression analysis involves 104 non-financial companies listed on the Indonesia, Malaysia, Thailand, and Singapore stock exchanges from 2020–2022. Firm performance is measured using return on assets (ROA). IRQ is measured using content element analysis, and IRR is measured using the Flesch reading ease (FRE) score. The analysis results show that IRQ and IRR do not affect firm performance. These results contradict the findings of Anna (2024), Chouaibi et al. (2022), Islam (2020), and Vitolla et al. (2019). However, when moderating variables are added, the effect becomes significant. The board size (BS) as a moderating variable weakens the effect of IRQ and strengthens the effect of IRR on firm performance. These findings contribute to the role of corporate governance in moderating the relationship between the quality and readability of integrated reporting with firm performance and provide insight into the importance of transparent and accountable reporting policies in dealing with global crises such as the COVID-19 pandemic.

Keywords: Firm Performance, Integrated Reporting, Quality, Readability, Corporate Governance

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1. INTRODUCTION

The World Health Organization (WHO) declared COVID-19 a global pandemic in March 2020, severely disrupting lives and economies worldwide (Association of Southeast Asian Nations [ASEAN], 2020). The COVID-19 crisis has impacted markets in developed and developing countries (Haladu & Bin-Nashwan, 2023), causing uncertainty and operational challenges. The global market instability, across the USA, Europe, and Asia, forced many companies to reduce or halt operations, raising concerns among stakeholders about the global economic crisis, potential corporate debt defaults, and financial stability (ASEAN, 2020). The uncertainty from COVID-19 increased stakeholder demands for not only traditional financial information but also non-financial disclosures that demonstrate corporate resilience, long-term value creation, and risk management. This reflects the understanding

that financial metrics alone cannot fully capture a company's ability to withstand complex shocks like a pandemic. Stakeholders require more comprehensive information covering environmental, social, and governance (ESG) factors alongside financial results (García-Sánchez et al., 2013). Integrated reporting is increasingly recognized as an innovative and comprehensive reporting model that combines financial and non-financial information into a single report, enabling companies to more effectively communicate their strategies for managing and developing capital to enhance corporate value (International Integrated Reporting Council [IIRC], 2024). During the COVID-19 pandemic, integrated reporting has been vital in addressing stakeholder needs by showcasing strategies for resilience, engagement, and sustainable growth amid crisis challenges. Integrated reporting helps reduce debt costs and improve operational efficiency, reflecting a broader trend toward transparency and accountability (Mohanty et al., 2024). Additionally, the use of integrated thinking fosters more aligned and thorough reporting, which strengthens accountability, transparency, and stakeholder trust in uncertain times (Tjahjadi et al., 2020). Thus, COVID-19 has not only disrupted economic performance but also affected the quality of integrated reporting, increasing stakeholders' reliance on comprehensive disclosures to assess a company's resilience and future prospects.

In Southeast Asia, particularly in the ASEAN countries of Indonesia, Malaysia, Thailand, and Singapore, the adoption of integrated reporting is gradually increasing, offering a unique setting to study its uptake and quality. In Indonesia and Malaysia, integrated reporting remains voluntary with relatively low adoption rates (Institute of Certified Public Accountants [ICPA], 2021). In Thailand, integrated reporting is still in the early stages with limited institutional support and awareness among public firms (Petcharat & Zaman, 2019). In Singapore, several companies' annual reports had an integrated reporting framework component in 2014, with DBS Group becoming the first company to adopt integrated reporting, indicating that this practice is relatively new (PricewaterhouseCoopers [PwC], 2014). All four countries demonstrate a strong commitment to corporate social responsibility (CSR) reporting. CSR reporting is often limited to stakeholders and promotes integrated reporting as an innovative solution for sustainability and objectivity challenges. Focusing on ASEAN, one of the largest and most attractive economic regions. According to the International Monetary Fund (IMF), ASEAN's global gross domestic product (GDP) reached US $3.9 trillion by 2022, about 3.6% of the world's total first is Indonesia (US $1.390 billion), Thailand (US $580.69 billion), Malaysia (US $469.62 billion), and Singapore (US $467.46 billion) having the largest GDPs (Nurrahim, n.d.). Based on ASEAN exchange, market capitalization rankings in 2023 place Indonesia first, followed by Singapore, Thailand, and Malaysia (Pitoko, 2023). Thus, selecting these four countries represents the region's rapid and diverse economic growth alongside evolving integrated reporting practices for sustainability and governance.

Empirical evidence indicates that numerous companies encounter difficulties in implementing integrated reporting due to the framework's complexity and lack of clear guidance (Chaidali & Jones, 2017). Furthermore, most studies focus on the effects of integrated reporting without adequately addressing critical aspects of reporting quality (Vitolla et al., 2019b). Many companies that have adopted integrated reporting do not fully follow the Integrated Reporting Framework, making it difficult to produce consistently high-quality and comparable reports (de Villiers et al., 2014). The framework emphasizes eight content elements aimed at improving information quality by clearly communicating value creation over the short, medium, and long term (IIRC, 2024). High-quality integrated reports should provide relevant, substantive information to fulfill their purpose (Songini et al., 2022). Besides quality, readability is important because it affects how well stakeholders understand, interpret, and trust the information, thereby reducing information asymmetry, complexity that may impact decision-making and long-term investment choices, and increasing trust (Bacha & Ajina, 2020; Hassan et al., 2019). Integrated reporting disclosures that are concise and accurate improve communication and support stakeholders' decision-making (Adegboyegun et al., 2020). While quality refers to the accuracy and completeness of disclosures, and readability concerns the structured presentation, clear and easy access for stakeholders. The quality and readability demonstrate a company's commitment to stakeholder concerns and trustworthiness. Consequently, the quality and readability of integrated reporting are important for companies to fulfill stakeholder information needs and enhance corporate performance.

The problem formulation in this study is as follows:

RQ1: Does the integrated reporting quality affect firm performance?

RQ2: Does the integrated reporting readability affect firm performance?

RQ3: Can the board size strengthen the effect of integrated reporting quality on firm performance?

RQ4: Can the board size strengthen the effect of integrated reporting readability on firm performance?

It aims to examine how the quality and readability of integrated reporting affect firm performance and whether board size (BS) moderates the quality and readability of integrated reporting on firm performance. Using panel data regression, the research analyzes a sample of 104 non-financial companies listed on stock exchanges in Indonesia, Malaysia, Thailand, and Singapore from 2020 to 2022. Previous studies have explored both quality and readability of integrated reporting on firm performance (Anna, 2024; Chouaibi et al., 2022; Islam, 2020; Qian et al., 2023; Raimo et al., 2021; Stone & Lodhia, 2019), often focusing on single countries or a global sample (Fayad et al., 2022; Qaderi et al., 2023). Existing research shows mixed results. Chouaibi et al. (2022), Islam (2020), and Vitolla et al. (2019a) find a positive impact of integrated reporting quality (IRQ) on firm performance, whereas Anna (2024) indicates that IRQ has a negative effect on firm performance. Then, Hassan et al. (2019) show that the readability of annual reports positively affects return on assets (ROA). Meanwhile, Dalwai et al. (2021) find that the readability of annual reports negatively impacts Tobin's Q and has no effect on ROA.

This study highlights the moderating role of BS in the relationship between IRQ, readability, and firm performance. As a key element of corporate governance, the board oversees management,

financial strategy, and ensures the accuracy of accounting decisions (Etuk & Dorathy, 2023). The findings suggest that a larger board may reduce the impact of IRQ on firm performance, as complex reports combining financial and non-financial metrics can divert attention from key strategic priorities. A smaller BS tends to monitor quality more effectively, resulting in better integrated reporting. In contrast, a larger BS can complicate coordination, hindering effective decision-making and negatively impacting firm performance (Dabor et al., 2015). Consistent with Haat et al. (2008), a smaller board enhances the firm's oversight capabilities and improves performance. However, the study also finds that larger boards enhance the positive effect of integrated reporting readability (IRR) on firm performance. Readability benefits from the diverse perspectives, broader experience, and stronger communication skills that larger boards bring, improving stakeholder engagement. Supporting this, Herenia et al. (2024) found that corporate governance factors positively moderate the relationship between the chairman's statement readability and firm performance. Larger boards contribute diverse experiences and enhance the readability of accounting narratives, suggesting that boards respond to opportunistic signals from management to pursue self-interest (Herenia et al., 2024). The opposing moderating roles of BS on quality and readability reflect different governance needs for optimizing each dimension. This study also included control variables, firm size, financial leverage, and board diversity.

The remainder of this paper is structured as follows. Section 2 outlines the theoretical framework and hypotheses development. Section 3 explains the research methods. Section 4 presents and analyzes the findings of the study. Section 5 discusses and summarizes the results in the context of existing literature. Section 6 presents the conclusions, limitations, and recommendations for future research.

2. LITERATURE REVIEW

2.1. Integrated report and related theories

Stakeholder theory highlights that a company's sustainability is contingent upon the resources and support provided by various stakeholder groups (Freeman & McVea, 2001). Stakeholder theory shows the importance of a company's interaction with stakeholders and the necessity of addressing the needs of each associated group or individual (Appiagyei et al., 2016). Integrated reporting serves as a strategic communication tool that fulfills the diverse informational requirements of stakeholders by transparently presenting the company's strategic objectives, risk management, governance, and value creation (Vitolla et al., 2019b). Companies that cater to stakeholder needs and expectations through integrated reporting demonstrate a commitment to high ethical standards in transparent communication and socially responsible behavior (Bacha & Ajina, 2020). Such reporting can foster trust and facilitate more informed decision-making among stakeholders, enhancing access to resources, increasing stakeholder support, and improving firm performance (García-Sánchez et al., 2013).

Legitimacy theory highlights that businesses function under a 'social contract' that motivates them to conform to societal values, norms, and limitations to gain approval or acceptance from society (Dowling & Pfeffer, 1975). Integrated reporting can be a strategic tool for corporations to establish, sustain, or enhance their legitimacy by aligning their disclosures with current societal norms and expectations (Lai et al., 2016). Integrated reporting aims to satisfy stakeholders interested in understanding how the business is managed, the potential future risks it faces, and the effects of the company's activities on the environment and society (Hoque, 2017). The ability to effectively communicate strategy and value creation has become important during the COVID-19 crisis, and to meet societal and stakeholder expectations that companies align with social values (Pistoni et al., 2018). Corporations can utilize integrated reporting disclosures to maintain legitimacy and demonstrate compliance with societal and stakeholder legitimacy demands, strengthening corporate reputation, influencing investor perceptions, and improving firm performance.

Agency theory examines the dynamics between principals (shareholders) and agents (managers), highlighting challenges arising from information asymmetries and conflicts of interest (Jensen & Meckling, 1976). Managers, who oversee operations, often have more detailed information than owners, potentially leading to adverse selection issues and moral hazard (Nada & Győri, 2023). Within the framework of agency theory, integrated reporting functions as a mechanism to mitigate agency problems by enhancing the accuracy, completeness, and accessibility of corporate disclosures (Yee Huei & Lian Kee, 2021). Integrated reporting serves as a tool for principals to monitor agents, ensuring the effective development of invested capital, thereby enabling shareholders and stakeholders to assess and align managerial incentives, ultimately enhancing firm value.

2.2. Integrated reporting quality affects firm performance

Integrated reporting offers a comprehensive overview of how an organization generates value in relation to its strategic objectives, risks, governance, performance, and future prospects (IIRC, 2024). The quality of integrated reporting is pivotal in evaluating the effectiveness of information disclosure, as companies that fail to effectively communicate their value creation processes risk disseminating information that lacks credibility and clarity (Cooray et al., 2020). From the perspective of stakeholder theory, high-quality integrated reporting can address the diverse informational needs of various stakeholder groups, thereby fostering trust and confidence in corporate disclosures (Chouaibi & Hichri, 2021). Legitimacy theory also explains that companies with high-quality integrated reporting demonstrate alignment with societal expectations, particularly in the context of increasing demands for corporate responsibility and sustainability. IRQ helps companies make more sustainable and strategic decisions by providing insights that make it easier for stakeholders to understand firm performance (Chouaibi et al., 2022). In addition, agency theory emphasizes that transparent and comprehensive integrated reporting reduces

information asymmetry between management and shareholders, thereby mitigating agency conflicts and promoting good corporate governance (Jensen & Meckling, 1976).

Empirical studies from several studies align with theory; the study by Vitolla et al. (2019a) shows that companies with higher integrated reporting disclosure quality tend to exhibit enhanced financial performance. Similarly, Asmar et al. (2018) highlight the role of IRQ in reducing information asymmetry, thereby enhancing stakeholder trust and firm performance. Furthermore, the research by Qian et al. (2023) shows that increasing transparency through high-quality integrated reporting can mitigate risk, fulfill stakeholder requirements, and enhance corporate reputation and performance. Conversely, a recent study by Anna (2024) suggests that the quality of integrated reporting negatively affects firm performance; investors tend to ignore disclosures if the cost of processing complex integrated reporting impacts stock liquidity rather than benefits, indicating a failure to balance the quality and relevance of disclosures. This shows the importance of balancing quality with clarity, a topic that will be further explored in the subsequent section on report readability. Therefore, this study focuses on the quality of integrated reporting to comprehend firm performance, positing that quality not only determines what is communicated but also refers to the substantive accuracy and completeness of disclosures that affect stakeholders' trust and decision-making.

Numerous studies indicate that enhancing the quality of integrated reporting can lead to better firm performance (Chouaibi et al., 2022; Islam, 2020; Qian et al., 2023). Prior research has demonstrated that the quality of integrated reporting exerts a positive and significant influence on ROA and return on equity (ROE) (Chouaibi et al., 2022; Islam, 2020; Vitolla et al., 2019a). Based on previous studies, this study uses ROA as an accounting-based measure of firm performance with the following hypothesis:

H1: Integrated reporting quality positively affects firm performance based on return on assets.

2.3. Integrated reporting readability affects firm performance

Readability is an important dimension of effective corporate communication, referring to the clarity, accessibility, and ease of understanding of disclosed information (Courtis, 1995; Hrasky & Smith, 2008). The impact of information depends not only on the quantity of disclosure, but also on how accessible and understandable to stakeholders (du Toit, 2017). According to Barnett and Leoffler (1979, as cited in du Toit, 2017), readability provides feedback on how well stakeholders understand and use information for decision-making. Stakeholder theory emphasizes the importance of communication in clearer, structured, and easy-to-understand disclosures in meeting the needs, increasing stakeholder engagement and trust, thereby supporting better and more sustainable investment decisions (Bacha & Ajina, 2020). Readability influences how companies convey information comprehensibly to all stakeholder groups, shaping opinions and affecting firm performance. Legitimacy theory also highlights the importance of legibility in minimizing ambiguity and demonstrating transparency, strengthening a company's reputation and legitimacy (Haat et al., 2008). Additionally, readability can enhance the effectiveness of managerial oversight, aligning with agency theory's objective of reducing conflict and information asymmetry by ensuring principals have access to easily understandable information (Scott, 2014).

Reports that are easy to read enable companies to effectively communicate strategies, risks, and value creation, strengthening the company's image and investor confidence, which in turn has a positive effect on firm performance (Raimo et al., 2021). IRR can be realized if the information conveyed can be clearly understood, with a shared understanding between those who gather and information users (Luo et al., 2018). However, oversimplified or overly concise reports may raise concerns about transparency or insufficient disclosure, potentially decrease stakeholder trust, and negatively impact firm performance (Hrasky & Smith, 2008). This complexity highlights the important role of readability in shaping stakeholder perceptions.

Research about the impact of IRR on firm performance remains limited, while some studies have analysed this relationship (Dalwai et al., 2021; Hassan et al., 2019; Mankayi et al., 2023; Vitolla et al., 2019). For instance, Hassan et al. (2019) found that the readability of annual reports positively affects profitability (ROA). However, Dalwai et al. (2021) show that the readability of annual reports does not significantly affect firm performance based on ROA. Therefore, the mixed findings highlight the need for further research in determining how the readability of integrated reporting affects firm performance. This study uses ROA accounting-based measures of firm performance. The hypothesis developed is as follows:

H2: Integrated reporting readability positively affects firm performance based on return on assets.

2.4. Board of directors size moderated by integrated reporting quality affects firm performance

Corporate governance aims to harmonize the interests of a company's various stakeholders, including shareholders, senior executives, customers, suppliers, investors, government, and society, through a system of mechanisms, practices, and processes instituted by the board of directors (Herenia et al., 2024). The board constitutes a fundamental element of corporate governance by overseeing management and strategically guiding the organization's vision, mission, and goals, which directly affect firm performance (Kijkasiwat et al., 2022). The board functions as a control mechanism, monitoring managerial actions and making strategic decisions by aligning corporate objectives with stakeholder demands (Garcia-Torea et al., 2016). In stakeholder theory, BS highlights the board's role in representing the diverse interests of various stakeholder groups within the company. An effective board must pay attention to the information needs of stakeholders (Chouaibi et al., 2022; Elsayed, 2011; Guest, 2009). According to agency theory, the separation of ownership and control causes agency problems, as managers may prioritize personal or group interests, not always aligning with shareholders (Jensen & Meckling, 1976). Consequently, a strong control mechanism is necessary to ensure managers align with company goals and shareholders' interests (Cooray

et al., 2020). The board and integrated reporting serve as tools to mitigate information concealment and manipulation arising from agency problems (Cooray et al., 2020).

BS plays a key role in supporting high-quality and comprehensible integrated reporting, which increases stakeholder trust, reduces information asymmetry, and supports overall firm performance. A larger board potentially brings a wider range of expertise, resources, and perspectives that can improve the quality of integrated reporting (Fayad et al., 2022; Vitolla et al., 2020). Companies with larger boards tend to provide better oversight, clarity, materiality, and accuracy in reporting, ultimately boosting firm performance through increased stakeholder confidence and improved investor decision-making (Kijkasiwat et al., 2022). However, other studies have also highlighted the potential drawbacks of larger boards. Lipton and Lorsch (1992), a board of more than ten members, will make it more difficult for all of them to express their ideas and opinions. An overcrowded board can lead to communication inefficiencies, coordination difficulties, and slower decision-making, resulting in losses to stakeholders and the company losing its competitive market position (Guest, 2009; Lipton & Lorsch, 1992).

Previous research has examined the impact of BS on the IRQ and firm performance, with mixed results. Several studies have demonstrated a positive correlation between BS and the IRQ (Fayad et al., 2022; Vitolla et al., 2020). In contrast, other studies find a negative impact of a large board and firm performance (Alabdullah et al., 2021) and reduce the quality of materiality disclosure (Fasan & Mio, 2017). The conflicting empirical findings make BS a potential moderator in the relationship between IRQ and firm performance. Smaller boards may facilitate enhanced oversight, tighter disclosure quality control, whereas larger boards may encounter challenges in coordination issues, conflicts, or diluted strategic focus, especially given the complexity of integrated reporting that combines financial, non-financial, and ESG elements. Consequently, based on the findings of previous research, the hypothesis developed is as follows:

H3: The board size negatively moderates the relationship between the integrated reporting quality and firm performance based on return on assets.

2.5. Board of directors size moderated by integrated reporting readability affects firm performance

The role of BS may change when considering the readability of integrated reporting. According to agency theory, the board of directors is responsible for overseeing management's decisions, ensuring transparency, and enhancing the quality and clarity of disclosures to align managers' interests with those of shareholders (Mersni & Ben Othman, 2016). Readability facilitates clear and comprehensible communication between companies and stakeholders (Dalwai et al., 2021). Integrated reporting disclosures that are clear and easy to understand help stakeholders, such as investors, creditors, regulators, and the public, to grasp complex information more effectively, reduce information asymmetry, and foster trust (Bacha & Ajina, 2020). Readability relates to the form and style of communication, requiring diverse perspectives and skills to tailor information for various stakeholder groups and reduce complexity. The extensive knowledge and diversity of opinions within a larger board of directors can influence policy decisions, leading to a more inclusive and accessible communication strategy, particularly enhancing the readability of integrated reports (Elsayed, 2011; Huynh et al., 2022).

According to legitimacy theory, how organizations structure their integrated reporting disclosures, particularly regarding length, complexity, and clarity, significantly influences their ability to fulfil stakeholder expectations and sustain their social license to operate (Kiliç & Kuzey, 2018; Stone & Lodhia, 2019). Legitimacy theory emphasizes that reducing narrative complexity in integrated reporting by being clear and unbiased about the company's activities can increase the legitimacy of the organization (Haat et al., 2008). The choice of language, formal or informal, technical or concise, can shape stakeholder perceptions, potentially affecting impressions of corporate performance and governance (du Toit, 2017). Consequently, companies that emphasize readability demonstrate their dedication to transparent, credible, and operational reporting, aligning their communication practices with evolving social norms and stakeholder expectations.

Research by Herenia et al. (2024) found that firm performance positively and significantly impacts the readability of the board chairman's statement. The accounting experience of board members also influences the readability of the accounting narrative, indicating that boards may respond to management signals to pursue personal interests. Their moderation analysis shows that corporate governance positively and significantly moderates the relationship between the readability of the chairman's statement and firm performance (Herenia et al., 2024). Consistent with Etuk and Dorathy (2023), large BS can significantly enhance the annual reports' readability for oil and gas companies in Nigeria. The concept of readability is fundamentally tied to communication and accessibility, where the advantages of diversity and expertise within a larger board often surpass the potential drawbacks of coordination. This suggests that BS influences both what is reported (quality) and how it is presented (readability) in different ways, helping explain previously conflicting moderation results. In integrated reporting, BS can improve readability by incorporating diverse stakeholder perspectives and enhancing communication effectiveness, thereby increasing stakeholder understanding and trust for improved firm performance. Therefore, based on the findings of previous research, the hypothesis developed as follows:

H4: The board size positively moderates the relationship between the readability of integrated reporting and firm performance based on return on assets.

3. METHODOLOGY

3.1. Sample and data

The study's population comprises non-financial companies listed on the stock exchanges of ASEAN countries, particularly Indonesia, Malaysia, Thailand,

and Singapore, from 2020 to 2022. This research focuses exclusively on non-financial companies, such as those in the industrial, technology, energy, resources, healthcare, infrastructure, properties, consumer cyclicals, and non-cyclicals services sectors, that publish integrated reporting. The financial sector is excluded because of its distinct industry characteristics, where the higher value of financial instruments can lead to significant differences in some of the variables examined. This study uses secondary data, which are the companies' annual reports in an integrated format. The data were accessed from the stock exchange websites of each country: the Indonesia Stock Exchange, Bursa Malaysia, Stock Exchange of Thailand, and Singapore Exchange, as well as the companies' official websites included in the research sample.

This study used a purposive sampling method to determine the sample based on the criteria set by the researcher (Table 1). Table 1 presents a total of companies listed on the stock exchanges of Indonesia, Malaysia, Thailand, and Singapore between 2020 and 2022 were 3.152. However, 515 companies were excluded from the sample as the study only used non-financial firms. Among these, 2.533 companies did not engage in integrated reporting, whereas 104 companies implemented such integrated reporting during the study period, which is relatively limited. Consequently, the sample of companies that released integrated reports over the three years resulted in 312 observations (3 years * 104 companies). After further refining to eliminate outlier data, 172 observations were retained, and the final number of observations used in this study was 140. This sample of observation represents 65 companies with integrated reporting from Indonesia, Malaysia, Thailand, and Singapore over the period 2020–2022.

Table 1. Research sample criteria

Sample criteria	*Indonesia*	*Malaysia*	*Thailand*	*Singapore*	*Total*
Companies that were listed on the Indonesia, Malaysia, Thailand, and Singapore Stock Exchanges in 2020–2022	870	787	841	654	3.152
Excludes non-financial sector companies in Indonesia, Malaysia, Thailand, and Singapore from 2020–2022	106	56	188	165	515
Companies that did not publish investment reports (IR) in 2020–2022	719	679	648	487	2.533
Total companies that published IR in 2020–2022	45	52	5	2	104
Total sample (3 years * 104)					312
Data outliers					172
Total of data observations					140

3.2. Variable measurement

Firm performance (*FP*) is the dependent variable, which is assessed using profitability metrics, specifically the *ROA*. *ROA* is determined by dividing the net profit of the company for a given year by the total assets for that same year (Islam, 2020).

The independent variables are the *IRQ* and *IRR*. Previous studies have evaluated *IRQ* using various methods (Kiliç & Kuzey, 2018; Pistoni et al., 2018; Songini et al., 2022). This study applies a scoreboard analysis based on eight content elements from the integrated reporting framework, following the approaches of earlier studies (Islam, 2020; Pistoni et al., 2018; Qian et al., 2023). These elements include:

1) an overview of the organisation and external environment, covering vision, mission, culture, ethics, ownership, activities, structure, and markets;

2) the business model, describing how inputs are transformed into outputs to achieve strategic goals over short, medium, and long terms;

3) risks and opportunities, outlining internal and external factors affecting the company;

4) strategy and resource allocation, detailing plans to reach goals and allocate resources involving stakeholders such as suppliers and customers;

5) governance, covering the skills and roles of leadership in decision-making and risk management;

6) performance, presenting qualitative and quantitative results, targets, risks, and assumptions;

7) outlook, disclosing challenges related to strategy, environmental impact, and long-term value creation;

8) basis of presentation, explaining the data measurement and reporting standards, including the reliability of non-controlled entities' information (IIRC, 2024).

The scoreboard model used in this study includes 80 disclosure items scored on a trichotomous scale: 0 if an item is not disclosed, 1 if disclosed without a detailed explanation, and 2 if fully explained. A company's *IRQ* score ranges from 0 to 160. Higher scores across the eight content elements indicate better *IRQ*.

This study measures the readability using the Flesch reading ease (FRE) formula, which evaluates word and sentence length (Courtis, 1995). The word and sentence length factors indicate readability difficulty by reflecting how quickly readers can recognize words and how much they can remember the words. FRE is a widely used readability metric (Bacha & Ajina, 2020; Courtis, 1995; du Toit, 2017; Hassan et al., 2019; Raimo et al., 2021). Using the software "Readable", this study calculated FRE scores ranging from 0 to 100, where lower scores mean the text is harder to read and higher scores mean it is easier. The FRE formula is presented in Eq. (1). Courtis (1995) provides comparison standards for FRE scores based on description categories, education levels, and reading styles (Table 2).

$$FRE = 206.835 - (1.015 * Average\ sentence\ length) - (84.6 * Average\ syllables\ per\ word) \quad (1)$$

Table 2. Flesch reading ease score categories

Rating	*Description of style*	*Educational attainment level*	*Typical style of a magazine*
0–30	Very difficult	Postgraduate degree	Scientific
30–50	Difficult	Undergraduate degree	Academic
50–60	Fairly difficult	Grades 10–12	Quality
60–70	Standard	Grades 8–9	Digests
70–80	Fairly easy	Grade 7	Slick fiction
80–90	Easy	Grade 6	Pulp fiction
90–100	Very easy	Grade 5	Comics category

This study considers *BS* as a moderating factor that can improve or reduce the effect of dependent and independent variables. The number of board members at the end of the fiscal year is used to determine *BS*. In addition, control variables such as firm size (*FS*), financial leverage (*FL*), and board diversity (*BD*) were incorporated to minimise the influence of external factors on the findings. *FS* is assessed using the natural logarithm of total assets (*Ln*), as larger companies generally attract more investor attention. *FL* is determined by dividing total debt by total assets, which reflects a company's capacity to manage debt and fulfil its obligations. *BD* is measured by the proportion of female board members compared to the total number of directors, highlighting that the beneficial effects of diverse characteristics, backgrounds, and viewpoints can provide a broader perspective (Kiliç & Kuzey, 2018).

3.3. Research methodology

This study employs a quantitative approach using STATA 17 to analyse panel data that combines time series and cross-sectional data from non-financial companies listed on stock exchanges in Indonesia, Malaysia, Thailand, and Singapore during 2021–2022. Panel data regression with interaction terms is used to estimate both direct and moderating effects, with *BS* as the moderator, capturing variations across time and sectors for more reliable results.

The analysis includes classical assumption tests (normality, multicollinearity, autocorrelation, and heteroscedasticity) and descriptive statistics. Regression models (common, fixed, and random effects) are compared using Chow, Hausman, and Lagrange multiplier tests to select the best model. Moderated regression analysis (MRA) assesses the moderating impact of *BS*, and robustness tests to confirm the stability of the model, to improve the reliability of inferences by taking into account clustering within companies and potential outlier data.

As an alternative method, this study can also be developed using panel data regression analysis combined with the industry sector (sector-wise analysis). This method deepens the study by examining whether the impact of integrated reporting and *BS* varies across industries, as unique sector characteristics may affect reporting and governance practices. Such an analysis can reveal industry-specific differences and offer more targeted policy recommendations relevant to each sector.

3.4. Empirical model

Regression Model 1 (see Eq. (2)) is a panel data regression equation without moderating variables, to test the effect of quality and readability of integrated reporting on *FP*. The subsequent equation represents a panel data regression model without moderating variables:

$$FP_{i,t} = \alpha + \beta_1 IRQ_{i,t} + \beta_2 IRR_{i,t} + \beta_3 FS_{i,t} \quad (2)$$

Then, regression Model 2 [see Eq. (3)] is a panel data regression equation with moderating variables to test the *BS* in influencing the quality and readability of integrated reporting on *FP*. The subsequent equation represents a panel data regression with moderating variables:

$$FP_{i,t} = \alpha + \beta_1 IRQ_{i,t} + \beta_2 IRR_{i,t} + \beta_3 FS_{i,t} + \beta_4 FL_{i,t} + \beta_5 FL_{i,t} + \beta_6 BD_{i,t} + \beta_7 IRQ_{i,t} * BS_{i,t} + \beta_8 IRR_{i,t} * BS_{i,t} + \varepsilon_{i,t} \quad (3)$$

where,

- i = entity;
- t = time;
- α = alpha coefficient of the constant (intercept);
- β = beta coefficient of the independent variable;
- *IRQ * BS* and *IRR * BS* = Interaction between *IRQ* or *IRR* with the *BS* variable;
- ε = error.

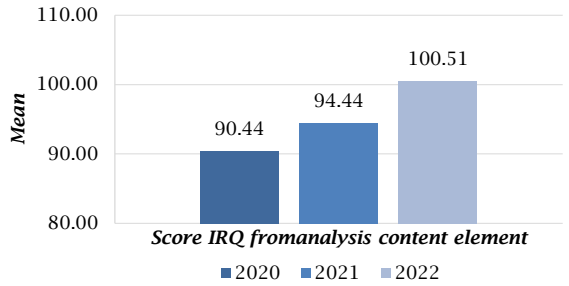
4. RESULT

4.1. Descriptive statistics

In Table 3, descriptive statistics provide the information obtained regarding the minimum, maximum, mean, and standard deviation for each variable in this study. The sample includes data from 140 non-financial companies in ASEAN countries (Indonesia, Malaysia, Thailand, and Singapore) that published integrated reporting during 2020–2022. *FP*, measured by *ROA*, has a mean value of 1.33, indicating that the average non-financial company in the sample was able to generate a profit of 1.33% on its total assets. The minimum *ROA* value is -6.29, obtained by the Dialog Group in Malaysia in 2020, and the maximum is 9.33 by *Bukaka Teknik Utama* in Indonesia in 2021.

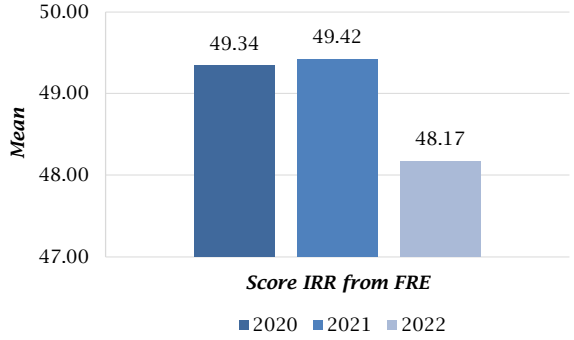
IRQ has a mean of 95.12, indicating that many companies have not fully followed the integrated reporting framework by IIRC. The minimum *IRQ* value is 33, by Singapore Airlines in 2020, and the maximum *IRQ* is 141, by Boustead Holdings in Malaysia in 2021–2022. A shown in Figure 1, the average *IRQ* increased steadily over time — from 90 in 2020, to 94 in 2021, and 100 in 2022 — indicating progressive efforts by ASEAN companies to enhance the quality of integrated reporting.

Figure 1. Average the quality of integrated reporting per year



The *IRR* has a mean value of 49.08, placing it in the difficult readability category, with a score between 30 and 50. Figure 2 shows that the average *IRR* was 49.34 in 2020, then increased to 49.42 in 2021, and decreased to 48.17 in 2022. This indicates that companies in ASEAN, especially Indonesia, Malaysia, Thailand, and Singapore-generally produce reports that are difficult to understand, roughly equivalent to a bachelor's degree level and an academic magazine reading style, based on Courtis' (1995) readability standards. The *IRR* minimum value is 31, by the Malakoff Corporation in Malaysia in 2020, and the maximum value is 63, by the BTS Group Holdings in Thailand in 2020.

Figure 2. Average the readability of the integrated reporting score per year



The *FS* variable, measured as natural logarithms of total assets, has a mean of 9.64, indicating that the average large company in the sample holds about 86.959 billion. *FL*, calculated as dividing total debt by total assets, has a mean of 29.22 (29%), meaning that 29% of the companies' total assets in the sample are financed by debt, with the remaining 71% funded by equity or other sources. *BD*, measured by the proportion of female directors on the board, has a mean of 0.19, 19%, showing that female representation remains low and boards are predominantly male in four ASEAN companies. Most companies in the sample have not achieved optimal gender balance in their board of directors. Lastly, *BS* is measured based on the number of board of directors members in a company. It has a mean value of 7.24, indicating most companies have around seven board members.

Table 3. Statistics descriptive

Variable	*Obs.*	*Mean*	*Std. deviation*	*Min*	*Max*
ROA	140	1.33	2.66	-6.29	9.33
IRQ	140	95.12	28.80	33.0	141.0
IRR	140	49.08	4.33	31.0	63.0
FS	140	9.64	2.02	3.81	14.24
FL	140	29.22	15.01	0.05	63.08
BD	140	0.19	0.16	0.0	0.67
BS	140	7.24	3.18	2.0	15.0

4.2. Correlation and multicollinearity analysis

Table 4 presents the Pearson correlation and multicollinearity among the study variables along with associated significance levels. The correlation between *IRQ* and *ROA* is positive but not significant, while between *IRR* and *ROA* is negative and also not significant, indicating other factors may moderate this relationship. The correlation between *BS* and *ROA* is both positive and significant ($r = 0.15$, $p < 0.01$). *IRQ* shows a strong positive correlation with *BS* ($r = 0.69$, $p < 0.001$), and *IRR* is also positively correlated with *BS* ($r = 0.17$, $p < 0.01$), indicating that governance affects the quality and readability of integrated reporting on *FP*. Variance inflation factors (VIF) below 10 (between 1.15 and 3.60) and tolerances above 0.1 (between 0.278 and 0.871) suggest multicollinearity is not a concern in our regression models.

Table 4. Pearson correlation and multicollinearity

Variables	*Obs.*	*ROA*	*IRQ*	*IRR*	*FS*	*FL*	*BD*	*BS*
ROA	140	1.0000						
IRQ	140	0.0950	1.0000					
IRR	140	-0.0821	-0.0403	1.0000				
FS	140	0.2002**	0.5488***	0.0951	1.0000			
FL	140	-0.1926*	0.1330*	0.1607*	0.3334***	1.0000		
BD	140	0.0658	0.3866***	-0.1323*	0.1863*	-0.0309	1.0000	
BS	140	0.1577*	0.6859***	0.1750*	0.7637***	0.2879**	0.2545**	1.0000
VIF	140		2.22	1.15	2.54	1.17	1.19	3.6
Tolerance	140		0.451	0.871	0.394	0.861	0.843	0.278

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

4.3. Model estimation

The model selection for analyzing *FP* based on *ROA* involved the Chow, Hausman, and Lagrange multiplier tests to identify the most suitable method among the common effect model (CEM), fixed effect model (FEM), and random effect model (REM). According to Table 5, the Chow test showed a Prob. > F-value below 0.05, indicating FEM as the initial choice. However, the Hausman test yielded a Prob. > Chi-square value above 0.05, favouring REM instead. To confirm, the Lagrange multiplier test was performed, showing a Prob. > Chi-bar value below 0.05, which supports using the REM as the best model. The REM accounts for intercept differences through company-specific error terms and helps address heteroscedasticity issues effectively.

Table 5. Model estimation test

Test	*Obs.*	*Significant*			*Result*
Chow	140	Prob. > F	0.0009	> 0.05 (CEM)	FEM
				< 0.05 (FEM)	
Hausman	140	Prob. > Chi	0.2268	> 0.05 (REM)	REM
				< 0.05 (FEM)	
Lagrange multiplier	140	Prob. > Chi-bar2	0.003	> 0.05 (CEM)	REM
				< 0.05 (REM)	

4.4. Regression analysis

Table 6 presents panel data regression results analysing two models: Model 1 without moderation and Model 2 with moderation. In Model 1, which examines *FP* based on *ROA* without moderating variables, the *IRQ* variable has a t-statistic of 0.28 and a p-value of 0.782, indicating a positive but insignificant effect on *ROA*. Thus, *H1* is rejected. This aligns with Qian et al. (2023), that an *IRQ* does not affect *FP* based on *ROE*. For *IRR* in Model 1, the t-statistic is -0.99 with a p-value of 0.322, showing a negative but insignificant effect on *ROA*, thus *H2* is rejected. These findings correspond with Dalwai et al. (2021), that the readability of the annual report does not significantly affect *ROA*-based *FP*.

In Model 2, which includes the moderating variable, *IRQ* has a positive and significant effect on *FP* measured by *ROA*, with a t-statistic of 2.43 and a p-value of 0.015; *H1* is accepted. Aligns with findings from Chouaibi et al. (2022), Islam (2020), and Vitolla et al. (2019a). Conversely, *IRR* shows a negative and significant effect on *ROA*, with a t-statistic of -2.35 and p-value of 0.019, contradicting the hypothesis that *IRR* positively influences *FP*. *H2* is rejected.

Regarding moderation, the interaction between *IRQ* and *ROA* with the *BS* has a negative and significant effect on *ROA*, with t-statistics of -2.56 and p-value of 0.010, indicating that *BS* weakens the positive impact of *IRQ* on *FP*, thus *H3* is accepted. In contrast, the interaction between *IRR* and *ROA* with *BS* reveals a positive and significant effect, with t-statistics of 2.08 and p-value of 0.038, meaning *BS* strengthens the negative effect of *IRR* on *FP*, supporting *H4* is accepted.

Table 6. Regression result

Model	*Obs.*	*ROA*			
		Model 1		*Model 2*	
		t	*Sig.*	*t*	*Sig.*
Constant		0.35	0.725	1.42	0.154
IRQ	140	0.28	0.782	2.43	0.015**
IRR	140	-0.99	0.322	-2.35	0.019**
FS	140	2.54	0.011**	1.34	0.179
FL	140	-2.61	0.009***	-3.05	0.002***
BD	140	-0.07	0.945	0.13	0.900
BS	140			-0.79	0.431
*IRQ * BS*	140			-2.56	0.010**
*IRR * BS*	140			2.08	0.038**

*Note: ***, **, * t-test is significant at the 0.01, 0.05, 0.10 level (2-tailed).*

4.5. Robustness test

The robustness test in this study verifies the consistency and validity of the main findings by substituting *ROA* with *ROE* as the dependent variable. Table 7 shows that *IRQ* has a positive but insignificant effect on *FP*, as measured by *ROE*, while *IRR* has a negative but insignificant effect. When *BS* is included as a moderating variable, *IRQ* has a significant positive impact on *ROE*, whereas *IRR* has a significant negative impact. Moreover, *BS* weakens the effect of *IRQ* on *ROE* but strengthens the effect of *IRR* on *ROE*. These results support *H1*, *H3*, and *H4*, confirming that the study's findings remain robust and consistent with prior analyses.

Table 7. Robustness test for *ROE*

Model	*Obs.*	*ROE*			
		Model 1		*Model 2*	
		t	*Sig.*	*t*	*Sig.*
Constant		-0.11	0.909	1.23	0.218
IRQ	140	0.34	0.736	2.11	0.035**
IRR	140	-0.75	0.453	-2.17	0.030**
FS	140	2.64	0.008***	1.39	0.166
FL	140	-1.45	0.148	-1.77	0.077
BD	140	-0.57	0.568	-0.42	0.674
BS	140			-0.78	0.434
*IRQ * BS*	140			-2.20	0.028**
*IRR * BS*	140			2.00	0.046*

*Note: ***, **, * t-test is significant at the 0.01, 0.05, 0.10 level (2-tailed).*

5. DISCUSSION

The findings of this study provide very important *H1* is rejected, because *IRQ* has a positive but insignificant effect on *FP* measured by *ROA*. Although a positive effect indicates that higher *IRQ* scores correspond to enhanced *FP*, the insignificance of this effect may be attributed to the limited implementation of integrated reporting in ASEAN countries, especially in Indonesia, Malaysia,

Thailand, and Singapore. Furthermore, companies often perceive integrated reporting merely as a compliance requirement rather than a strategic tool for value creation, resulting in reports that are less detailed and lack transparency regarding firm performance. Many companies have not fully adhered to the integrated reporting framework guidelines established by IIRC and continue to focus on traditional reporting formats. The findings of this study do not align with stakeholder theory, which posits that companies should address the needs and expectations of stakeholders. The low quality of integrated reporting leads to inadequate reports, preventing companies from identifying critical issues for stakeholders, potentially resulting in poor decision-making, decreased stakeholder trust, and reduced firm performance. These results contradict the findings of Anna (2024), Chouaibi et al. (2022), Islam (2020), and Vitolla et al. (2019) that the quality of integrated reporting significantly impacts firm performance.

H2 is rejected, because *IRR* has a negative but insignificant effect on *ROA*. The negative relationship suggests that a higher *IRR* is associated with lower performance. The insignificant effect of *IRR* may be caused by companies prioritizing profitability indicators as the primary metric for evaluating *FP*. In ASEAN countries, especially Indonesia, Malaysia, Thailand, and Singapore, the adoption of integrated reporting remains limited, and many investors have not yet embraced it as a primary source of information. Reports that are overly complex, too detailed, and lack varied presentation may hinder stakeholder understanding, reducing investor confidence and affecting investment decisions related to firm performance assessment. These finding indicates that investors and stakeholders have not fully utilized and understood integrated reporting for evaluating firm performance. The results do not support stakeholder theory, which emphasizes the importance of presenting clear, concise, and comprehensible information to address stakeholder concerns regarding report complexity and its potential impact on firm performance. Furthermore, legitimacy theory highlights the importance of avoiding legitimacy gaps arising from differences between community expectations and company outcomes, which could hinder the company's legitimacy. Therefore, clear and unbiased communication is essential in addressing stakeholder needs, such as managing information overload to enhance the company's legitimacy (Dalwai et al., 2021; Kiliç & Kuzey, 2018; Stone & Lodhia, 2019). Effective readability enables companies to convey complex information clearly and efficiently, thereby enhancing transparency and stakeholder trust, which positively influences firm performance (Raimo et al., 2021). The study's findings contradict the research of Hassan et al. (2019) and Mankayi et al. (2023), which asserted that the readability of integrated reporting passively and significantly impacts firm performance.

The results show that when *BS* is considered, *IRQ* has a positive and significant effect on *FP*, supporting *H1*. This positive relationship indicates that higher *IRQ* scores lead to better firm performance. High-quality integrated reporting provides a detailed and structured view of strategy, risks, sustainability, governance, and overall performance, increasing transparency. These findings align with stakeholder theory, which holds that companies have obligations not only to shareholders but also to other stakeholders such as employees, customers, suppliers, governments, and communities (Freeman & McVea, 2001). IRQ helps meet diverse stakeholder information needs by delivering comprehensive reports on performance and long-term value creation (García-Sánchez et al., 2013). It also boosts transparency, relevance, accuracy, and credibility, building trust and reducing uncertainty, which enhances reputation and performance (Qian et al., 2023). Legitimacy theory complements this by emphasizing that companies must comply with societal values, norms, and expectations through proper structures and processes (Dowling & Pfeffer, 1975). Firms committed to the integrated reporting framework demonstrate accountability and transparency to investors (Nishitani et al., 2021). Overall, these theories suggest that companies strive to produce high-quality reports that align with stakeholder demands and social norms, thereby strengthening trust, gaining public legitimacy, and improving firm performance.

IRR has a negative and significant effect on *FP* measured by *ROA*, contradicting the research hypothesis, which is therefore *H2* rejected. Although a high IRR score means the report is easier to read, with shorter sentences and simpler language, it may not capture the complexity of information that stakeholders require. Overly simple presentations can suggest that the company is not providing sufficient transparency about its strategy, risks, and performance. Investors and analysts typically seek detailed and accountable information to make informed decisions. When reports lack depth, stakeholder trust and credibility diminish, which can lead to a lower market valuation and reduced firm performance.

H3 is accepted, showing that *BS* negatively and significantly moderates the relationship between *IRQ* and *FP* measured by *ROA*. Larger boards often face challenges in reaching consensus due to differing opinions among members, which can hinder effective oversight and strategic decision-making related to the integrated report. Consistent with Alabdullah et al. (2021), Guest (2009), and Lipton and Lorsch (1992), when the BS exceeds an optimal level, inefficiencies outweigh the benefits, leading to poorer FP. Larger boards struggle to communicate ideas effectively, resulting in the information produced becoming less effective (Guest, 2009). Larger boards also tend to have difficulty reaching agreement, slower decisions concerning reporting, and company strategy. Agency theory explains that conflicts of interest between principals and agents can increase agency costs if not well managed. Therefore, boards must coordinate efficiently and align with shareholder interests to minimize these costs. An optimal BS enhances effectiveness in stakeholder engagement and improves IRQ. Overall, BS and integrated reporting jointly act as key factors in reducing conflicts of interest, lowering agency costs, and boosting corporate transparency and accountability, essential elements in fostering strong company-stakeholder relationships.

H4 is accepted, showing that *BS* positively moderates the relationship between *IRR* and *FP* measured by *ROA*. This means that as the *BS* increases, the impact of *IRR* on *FP* becomes stronger. Larger boards provide stronger governance through improved supervision and oversight, bringing

diverse expertise and perspectives that enhance the accuracy, relevance, and credibility of integrated reporting. This aligns with Kijkasiwat et al. (2022), larger boards have more resources to support strategic decision-making and managing complex reporting. Higher readability of integrated reporting combined with a larger board facilitates better understanding and strategic decisions that incorporate both financial and non-financial considerations, leading to improved firm performance. According to stakeholder theory, a larger board represents stakeholder interests and encourages companies to address those needs. Consequently, companies with larger boards facilitate more comprehensive reporting, build trust and legitimacy, then help companies to achieve strategic objectives, which positively affects firm performance.

6. CONCLUSION

This study explores how the quality and readability of integrated reporting affect firm performance, with BS as a moderating factor. Based on data from non-financial companies in Indonesia, Malaysia, Thailand, and Singapore during the COVID-19 period (2020–2022). The findings show no effect of IRQ or readability, or firm performance. However, when BS is considered, IRQ and readability significantly affect firm performance. Integrated reporting with high-quality, transparent, and substantive enhances performance, while readability complements information quality by making disclosures clearer and easier to understand, fostering better decisions and long-term investment. Furthermore, BS plays an inverse role; smaller boards tend to improve report quality, whereas larger boards enhance the readability of integrated reporting, indicating that board composition shapes how reporting impacts firm performance. BS is not only a governance metric but also a potential moderator that influences how companies communicate value creation through integrated reporting. From 2020 to 2022, integrated reporting adoption increased in ASEAN firms, particularly in Indonesia, Malaysia, Thailand, and Singapore, reflecting a commitment to the IIRC framework. Poor readability may signal a focus on profitability as the primary performance measure, and readability aspects of integrated reporting are still considered factors that do not directly impact firm performance.

These findings have important implications for corporate management, regulators, and stakeholders. Corporate managers, especially in ASEAN countries, are expected to prioritize the quality and readability of integrated reporting as a mechanism to increase profitability, stakeholder trust, and global competitiveness by following international reporting standards and implementing best practices in preparing integrated reports to facilitate investors and other stakeholders' understanding of firm performance and strategy. Regulators should consider these insights by developing policies that encourage effective board structures and present transparent information, easy-to-understand language within a structured reporting system. Given the voluntary nature and lack of specific rules on integrated reporting disclosures, policymakers could adopt the IIRC's integrated reporting framework to harmonize integrated reporting across ASEAN, reducing inconsistency and variation of disclosures. For further research, recommended to consider other variables, such as corporate culture, regulatory compliance level, and the role of technology in the presentation of integrated reports. The methods for measuring readability can be expanded, and qualitative methods, such as interviews with stakeholders, including investors, financial analysts, and regulators, can provide deeper insights into the benefits and challenges of implementing integrated reporting. Therefore, further research should explore additional sources of data quality and readability for integrated reports. Furthermore, other corporate governance factors, such as audit committees, board independence, stakeholder engagement, and managerial and institutional ownership, should be added to future research.

This study has several limitations that need to be considered as evaluation and improvement materials for further research. The sample coverage and research period are limited to non-financial companies listed on the Indonesia, Malaysia, Thailand, and Singapore stock exchanges in 2020–2022, so the results cannot be generalized to the entire industry, especially the financial sector and companies that do not publish integrated reporting. Future research can expand the scope of sectors or countries for more general results. Furthermore, the research period covering the COVID-19 pandemic in 2020–2022 also affects the dynamics of firm performance, which may not reflect normal conditions. In addition, although the BS is used as a moderating variable, other factors in corporate governance, such as board independence, board member background, board compensation, and the audit committee, also have the potential to affect the relationship between the quality and readability of integrated reporting on firm performance. Variations in the adoption of integrated reporting, which is still voluntary and has not been strictly regulated by regulators in ASEAN countries, can also affect the results of the study.

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