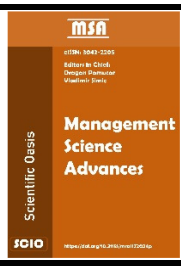
SCIENTIFIC OASIS

Management Science Advances

Journal homepage: www.msa-journal.org
eISSN: 3042-2205



Integrated Reporting Quality as a Determinant of Financial Performance: Evidence from Emerging and Developed Markets

Mert Sarioglu[1], Engin Ozsoz[2], Vladimir Simic[3,*], Karahan Kara[4,5]

1 Yasar University, Faculty of Business, Business Administration Department, Izmir, Türkiye
2 Yasar University, Faculty of Business, International Trade and Finance Department, Izmir, Türkiye
3 University of Belgrade, Faculty of Transport and Traffic Engineering, Vojvode Stepe 305, 11010 Belgrade, Serbia
4 Department of Business, Faculty of Economics and Administrative Sciences, İzmir Democracy University, İzmir, Türkiye
5 Department of Business, Faculty of Economics and Administrative Sciences, OSTIM Technical University, Ankara, Türkiye

ARTICLE INFO

Article history:
Received 9 May 2025
Received in revised form 14 June 2025
Accepted 16 August 2025
Available online 18 August 2025

Keywords:
Financial Performance; Integrated Reporting Quality; Integrated Reporting Framework; Emerging and Developed Markets.

ABSTRACT

This study aims to clarify the effects of integrated reporting quality (IRQ) on financial performance indicators. To do so, this paper is based on measuring IRQ by scoring integrated reports of 82 firms with a 328-firm observation from both emerging and developed markets, where they published integrated reports or integrated annual reports between 2019 and 2022. This study is based on a scoring method that considers the elements of the entire integrated reporting (IR) framework to measure quality and various financial performance indicators. The research brings originality to the literature due to the lack of uniformity among studies, especially in industry and market effects settings, to reveal meaningful results. Unlike the existing literature, the results of this paper are more reliable and consistent, depending on the use of panel data analysis and an endogeneity check. The findings show that a significant relationship exists between IRQ and "return on assets", "return on equity", and "earnings per share" in a varying degree of impact, where "board size" and "audit committee meeting" have no impact. There are no significant differences in whether the integrated reporters are located in emerging or developed markets. Therefore, strict application of the IR framework is essential to ensure IR quality, leading to improved financial performance regardless of the distinction between emerging and developed markets. Firms should consider the IR framework in their practices as a way to improve quality and to be transparent and accountable.

1. Introduction

In addition to financial reports, non-financial reports have also been published by organizations for decades to meet different information needs. These reports have been designed to provide a bro-

* *Corresponding author.*
E-mail address: vsima@sf.bg.ac.rs

https://doi.org/10.31181/msa21202524

ader perspective into a company's business and its operations through the social, human, and environmental points of view [1]. However, these stand-alone reports brought further complexity to the matter of disconnection between a firm's financial and non-financial operations. They lack basic information to assess a company's financial performance along with its non-financial performance, strategy, and potential for future value creation [2-3]. Therefore, the lack of integration of fundamental information may affect the financial performance of firms, shareholders, and various investors negatively. This is also an indicator of why supplementary information is demanded by users of reports [4]. To understand an organization's financial and non-financial performance together with its value creation story over time, an enhanced reporting mechanism evolved under the set of a new reporting framework named Integrated Reporting (IR).

IR aims to explain to the providers of financial capital and the stakeholders how the firms create, preserve, or erode value over the short, medium, and long term, considering each aspect of business [5]. The framework integrates traditional financial reporting into non-financial information regarding environmental, social, and governance aspects, which eventually creates a holistic view for firms in creating value [6-8]. Therefore, the most significant role is undertaken by the IR framework in contributing to IR practice and IR quality (IRQ) positively. In this context, IR enhances the information provided to investors and thus leads to better decision-making in allocating funds more efficiently [9]. This role of IR is believed to be a factor that comes to the fore in improving financial performance, which may accordingly affect financial indicators such as return on assets (ROA), return on equity (ROE), cost of equity capital, return on sales, and earnings per share (EPS) positively. Therefore, a company's objective should be to demonstrate that its business activities can uphold sustainable and profitable growth, which may later provide shareholders with a financial return that matches the risks they have undertaken when allocating funds to the business [10-11]. Moreover, IR is useful in mitigating the effect of information asymmetry, where it will affect financial performance positively [12-13]. Correspondingly, through the role of IR, a positive and significant relationship between the magnitude of IRQ and financial performance is expected.

The financial metrics to measure the performance of a company are expected to have a direct linkage with IR quality on the back of the theories of stakeholder, agency, and signaling that emerge as the drivers behind the reasoning in the implementation of the IR framework [14-15]. The IR principles lead the companies and their agents to provide better disclosures, which may eventually allow them to signal the value of their businesses to their stakeholders successfully [16]. Accordingly, various metrics such as accounting-based ROA and ROE are used as proxies in numerous studies in the literature [17-18]. Besides, with the adoption of the framework by many firms, the studies have begun to flourish at a faster pace in a variety of determinants of IR and IRQ, namely governance mechanisms, non-financial reporting and its performance, and content on firm value [19-20]. The studies that are related to firm value determinants mostly include financial performance-related measures such as ROE, ROA, Tobin's Q, cost of capital, expected future cash flows, and so on [21-22]. These are the critical financial metrics on which there is consensus within the current literature.

Given the aims of IR, the value creation achieved through integrated thinking and better decision-making is expected to bring favorable results for companies [23-24], which may have a positive impact on financial performance [18]. Integrating thinking also contributes to improving a company's bottom line by increasing managers' awareness of the firm's performance in a stakeholder-centric view, which is regarded as a contributor to financial performance [16]. However, the newness of the IR framework appears to hinder companies' understanding of the nature of IR, which may harm financial performance. Moreover, due to the voluntary implementation of the framework except in South Africa, where the IR is mandatory, not all companies can provide the same quality of IR

disclosures. In this regard, the studies show that IR quality is still at an undesirable level [25-26]. Accordingly, the poor IRQ may be a significant issue affecting financial performance. Moreover, as evidenced by the South African experience, at the early stages of IR, some companies opted to just combine annual reports as well as corporate and social responsibility reports together. Differently, others excelled in their reporting standards by communicating their strategic aims, business model, and risks and opportunities in the value creation. This situation has resulted in a variety of quality scores among the companies [24]. Therefore, the better alignment of the IR framework is expected to bring positive results for companies that excel in integrated thinking, which can be measured by financial performance indicators. Correspondingly, considering the benefits of IR, a better financial performance is expected to be met regarding the most widely used accounting-based financial ratios that are considered in the existing literature, such as ROA, ROE, and EPS [13,17]. However, to the best of our knowledge, a gap exists in the literature revealing the effect of IRQ on different financial performance metrics. In other words, it is unclear whether IR, as a new type of corporate report, has an impact on financial performance by providing quality information.

This study also distinguishes the level of reporting quality in emerging and developed markets. IR from developed countries constitutes the majority of the reports at hand since these countries with higher economic progress are inclined to adopt IR standards more often [27]. On the flip side, emerging countries are characterized by weak institutional structures and thus more susceptible to corruption than developed markets [28]. The firms in emerging countries with a low perception of corruption are inclined to have less awareness of disclosing non-financial information because the stakeholders and policymakers are not interested in scrutiny for the sustainability issues, where these companies are not willing to spare any costs for these reports [14]. If the companies in developed countries are more inclined to prepare integrated reports, then there should be a difference in the quality of reports and financial performance between the emerging and developed markets. However, the best of the authors' knowledge implies that the impact of emerging and developed markets is still unclear. Besides, a critical gap is identified within the existing literature regarding measuring IR quality [29], where the different pillars of the IR framework have been considered to score integrated reports rather than considering them holistically [30]. Regarding the previous studies, it is necessary to develop a new IR scoring methodology through the three pillars of the IR framework, which is also the main concentration of this paper. Moreover, to the best of our knowledge, some previous studies regarding IRQ were based on only one-year or two-year data without endogeneity checks [25,30]. Unlike these studies, our study is based on panel data analysis with the Estimated Generalized Least Squares method for 4-year periods and an endogeneity check. Consequently, the main aim of the study is to find the answer to whether the above-mentioned facts come into play in answering the effect of IRQ on financial performance based on ROA, ROE, and EPS in emerging and developed markets. Accordingly, this study promises to introduce a new scoring method considering the entire IR framework, while empirically testing the impact of IRQ on financial performance indicators, including emerging and developed markets. It brings originality to the literature since there is no uniformity amongst the studies, especially in cross-country settings regarding fixed year and industry effect. This paper, therefore, is believed to bring a novelty through providing more reliable and consistent results in terms of data analysis and endogeneity check.

To reach results, this paper analyzed 82 firms with a final sample size of 328 firm observations, which published IR under the name of Integrated Report or Integrated Annual Report between 2019 and 2022. The results are estimated by using random-effect panel regression analysis. The results showed that IRQ and financial performance metrics should be evaluated together, where the evidence is of critical importance for the literature, IR practitioners, investors, and policy-makers.

The structure of this paper is organized into seven main sections. In Section 2, we outline the related literature. Section 3 gives the theoretical background and hypothesis development. Section 4 gives the research methodology, while Section 5 provides a data analysis and results. Section 6 offers an endogeneity check. Section 7 deals with the concluding remarks.

2. Literature Review

2.1 Integrated Reporting

The outlook of the business environment has been changing for years, depending on different factors such as COVID-19, corporate scandals, economic crises, and so on. In the business environment, various external and internal stakeholders exist, so they should be informed about every business activity of corporations [31]. Corporate reporting practices make it possible to provide essential information such as firm-specific information and performance-related information [32-33]. Therefore, corporate reporting practices have been the most vital communication tools for informing stakeholders concerning business activities. A variety of reporting approaches have therefore been experienced for years by reporting entities to build a bridge between corporations and stakeholders. These reporting practices are mostly known as financial reporting and non-financial reporting, such as environmental, social, and governance (ESG), sustainability, and IR.

Mandatory financial and voluntary non-financial reports have been the most useful reporting tools. However, they have recently failed to provide a holistic picture concerning the financial, environmental, social, and governance matters in one report [2,34]. The complexity and length of current reports lead to confusion in investors' decisions is criticized as well [35]. Consequently, the need for a new reporting approach emerged to ensure an effective communication role, where it is resulted in the adoption of the IR approach.

The number of corporations that embrace IR practice has been increasing in recent years, considering available reports that have been published on the Websites of corporations. According to IIRC [5], IR is addressed as an effective and efficient way of corporate reporting, which contributes to the quality of information by means of a framework. All these processes result in improving the decision-making process and allocation of capital positively for each external and internal stakeholder. Therefore, IR does not only mean presenting the financial and non-financial reports together, as it may appear. Regarding these factors, the IR literature has been expanding year by year.

Through integrated thinking, IR enables the better presentation of information by considering six capitals together with the business model and governance [36-37], which relates to the quality of information. In addition, the studies show that IR and corporate governance are associated with each other [4,38]. Apart from these studies, IRQ has recently been addressed in the literature [26,39]. However, most of these studies addressed the IR framework partially or differently to measure IRQ. Moreover, to the best of our knowledge, some of these studies were only based on one- or two-year data; i.e., they did not consider endogeneity in their studies [19-20,30]. Thus, IRQ is a critical factor for the benefit of users of information, in which quality is possible to be ensured by the best implementation of the IR framework. In this context, a positive association is expected between how well the IR framework is implemented and its impact on IRQ, which in turn is thought to affect financial performance. Moreover, given the critical shortcomings of previous studies, panel data and endogeneity control are required to reach consistent results. Therefore, the results of this study are expected to bring novelty to the literature, IR practitioners, and policy-makers.

2.2 Integrated Reporting Framework and Integrated Reporting Quality

The main purpose of reporting practices is to provide report users with the information necessary to prove that they are transparent, accountable, responsible, and fair in their business activities. Accordingly, it is expected that the entire process will be met with high quality. According to previous studies, appropriate consideration of International Financial Reporting Standards (IFRS) and Global Reporting Initiative standards is a contributing factor to the quality of financial and non-financial reporting [40-41]. Considering the previous lines, it is also believed that IRQ is the most significant criterion that needs to be met. In this context, a critical role has been played by the IR framework to encourage improvement in IRQ.

Since 2013, the International Integrated Reporting Council (IIRC) has been the leading force behind the implementation of IR worldwide, which operates under the IFRS Foundation today. In this manner, a framework has been issued and updated by IIRC since 2013. As noted by IIRC [5] and Songini *et al.* [26], IRQ is tightly correlated with how the framework is embraced by reporters. Moreover, IRQ is a critical concern that should be enhanced to provide better information by means of a strictly implemented IR framework. Therefore, the implementation of the entire IR framework has a significant role in IRQ.

The IR framework consists of three major parts, which are fundamental concepts, guiding principles, and content elements [5]. Considering the framework, fundamental concepts are the first part, whose aim is to provide knowledge about how value is created using different capitals. The second part relates to guiding principles, which include seven principles. These principles are strategic focus and future orientation, connectivity of information, stakeholder relationships, materiality, conciseness, reliability and completeness, and consistency and comparability. Content elements are the final part of the framework that reflects on the organizational overview and external environment, governance, business model, risks and opportunities, strategy and resource allocation, performance, outlook, and basis of preparation and presentation. In short, IR practice through the implementation of the entire framework is expected to improve the quality of IR, which is believed to have a positive impact on financial performance.

2.3 Financial Performance and Integrated Reporting Quality

The vast majority of studies consider the impact of information quality as one of the main determinants of a company's financial performance, which could be assessed through ROA, ROE, EPS, as well as Tobin’s Q ratios [22,42]. These studies highlight that the adoption of higher IR standards within a company would lead to better transparency and accountability for that company’s operations, and this eventually leads to improved financial profitability. This is the most favorable financial result as the outcome. However, the previous literature has not been conclusive on whether the IRQ or the adaptation of it brings positive results. Soriya & Rastogi [43] showed that the ROA ratios of the selected Indian companies are positively affected by the quality of IR disclosures. While the mentioned study was limited to the perspectives of Indian companies, no evidence of the application of the IR framework was presented. The same results were also obtained by Pavlopoulos *et al.* [17], as the research posited that firms with higher IRQ had favorable financial outcomes on the ROA metric. Akisik & Gal [13] in their study of North American firms, proved a positive and significant relationship between the adaptation of IR principles and the financial metrics of ROA and ROE. Besides, Matemane & Wentzel [44] indicated that a significant positive relationship between EPS and IRQ exists in their study of South African listed banks, though no significant relationship was observed

for ROE and ROA metrics. Moreover, the mentioned study only focused on South African banks, where there was no evidence regarding the different IR practitioners from different countries and industries. The same insignificance and conflicting results were also observed in the study by Buallay *et al.* [22], in which the IRQ had no meaningful impact on the performance ratios of ROA and ROE of Islamic Banks in the Gulf Cooperative Council (GCC) region. Conversely, in a similar study, Chouaibi *et al.* [42] confirmed the positive relationship between IRQ and ROE in their Islamic banking study. The results from Conway [45] showed that better IRQ in South African companies proved slightly negative results in ROA ratios. This was attributed to the early stages of IR in South Africa since the firms were still managing to become familiar with the process and the costs associated with the IR standards. Therefore, no clear conclusions have yet been reached when previous studies are taken into consideration. Moreover, the results of these studies showed that the main focus points are mostly country-specific, and no generalizing results have been presented considering the effect of different industries and emerging and developed markets. To the best of our knowledge, no consistent and reliable results were also provided, considering the methodological approaches such as panel-estimated generalized least squares and endogeneity checks. Furthermore, there is no certainty as to whether or not the firms that prepare IR are listed in the IFRS database and how they apply the IR framework. Depending on the best of the authors' knowledge, these are considered as points that have been overlooked within current literature.

Some studies, on the other hand, focus on elements of IR disclosures, namely the ESG ratings. Vitale *et al.* [18] examined the impact of ESG disclosures on the operating return on assets (OROA), return on sales (ROS), and ROE ratios of the globally selected firms. The results indicated that the non-financial mandatory environmental and social disclosures have a significant positive effect on OROA, ROE, and ROS, suggesting that the mandatory regulations lead companies to become more transparent in their operations. This, eventually, reduces information asymmetry and increases efficiency, and in return increases operating and shareholder profitability as a result. Chininga *et al.* [46] also verified the same positive impact of ESG ratings on the bottom-line performance of the firms measured through ROE and Tobin's Q ratios for South African firms. Although an association between non-financial reporting practices and financial metrics has been reported, the main focus of these studies is still country-specific. Moreover, no evidence is presented on the impact of voluntary reporting, as ESG reporting is voluntary. Furthermore, this perspective has not been concretized by studies on IR and IRQ.

The investors' perception of the firm value is also another financial performance sought in the studies. The companies' acceptance of IR guidelines is considered to increase value creation by investors as they can fully realize the firm's potential on the back of improved transparency of the firm's operations, as evidenced by Pavlopoulos *et al.* [17]. The study claims that companies with higher IR disclosures are inclined to have higher market value per share. Additionally, the enhanced IRQ can pave the way for a reduction in the cost of capital, meaning higher free cash flows and higher firm value, which can be positively perceived by the investors, as supported by García-Sánchez & Noguera-Gámez [47] and Vitolla *et al.* [48]. However, Wahl *et al.* [21] and Matemane & Wentzel [44] did not find any significant relationship between IR and a firm's value, which was measured through Tobin's Q metric that took the market capitalization value of a firm into account. Similar to Conway [45] and Wahl *et al.* [21], Soriya & Rastogi [43] did not find any association between the IRQ and the firm's value. Therefore, this is attributed to the lack of clarity in IR standards for stakeholders, their preference for financial reports over non-financial reports, and the lagged effects of IR that may not be immediately available. Sun *et al.* [9], covering Chinese companies in their research, concluded that the companies with higher integration levels of ESG disclosures, while providing improved

transparency for stakeholders, experience a deterioration in the firm's value. The negative relationship is attributable to the less-transparent characteristics of Chinese culture and the low understandability of higher levels of ESG disclosures, which creates complexity for investors. The same negative results were also obtained in the study by Buallay *et al.* [22], in which Tobin's Q ratio is negatively affected by the IRQ in Islamic Banks in GCC countries, whereas it was the opposite for the conventional banks in the same region, making the results conflicting.

Several studies in the literature, also analyzed whether the IRQ or the adaptation of the various pillars of a framework has any relationship with the financial performance of a firm based on the determinants of ROA or ROE [14,49]. All in all, the studies in the literature look for the relationship between the IRQ and adaptation of the framework, and the financial performance of the firm. The adoption of integrated thinking by the management would create value for the firm, and this would eventually lead to improved efficiency and thus profitability. On the other hand, due to the non-mandatory IR regulations, not all countries and companies adopt IR standards. Moreover, considering the IR is still in the early stages (i.e., the IIRC framework was finalized in 2013), there is still more room to grow for the IR to be implemented and adopted globally. Due to very similar reasons, the studies in the literature also remain limited, considering the short history of IR. While most of these studies lack in measuring IR quality [29], they also considered one- or two-year data without endogeneity checks [19-20]. These drawbacks may all prevent the results from being generalized. In addition to the new scoring methodology and robust methodological approach, the impact of emerging and developed markets and different industries should also be considered. Under these considerations, improved IRQ is expected to contribute to ROA, ROE, and EPS ratios, which are thought to be the key indicators of financial performance.

3. Theoretical Background and Hypothesis Development

Stakeholder theory is one of the driving forces of IR since it examines the reasoning behind the adoption of voluntary disclosures [49]. While the firms value profitability, they do not recognize profit as the driver in the value creation but instead as an outcome in the process of doing business [50]. Managerial decisions are at the core of the stakeholder theory in creating economic value for the firms, as the managers are responsible to the stakeholders of the firms in generating an outstanding performance for the firm [50]. Therefore, companies are under higher pressure from their stakeholders to provide more disclosures. Thus, providing integrated financial and non-financial information along with high-quality through IR practice may result in better financial performance. Conveying a clearer purpose for the firm through better relationships and communication with the stakeholders, as well as the efficient allocation of resources of a company, should pave the way for improved financial performance [45].

Due to the reliance on managerial decisions, the stakeholder theory provides a comprehensive opportunity to link with agency theory [51]. The agency theory is one of the grounding aspects of corporate governance, and it arises from the separation of ownership and control [52]. Managers controlling the firm are regarded as the corporate insiders and act as the agents [21]. To maximize the firm and shareholder value, the agents are in place to run the businesses, and in the case that there is a conflict of interest when the agents act on behalf of their own interests, this can lead to agency costs and information asymmetry between investors and managers. Increased agency costs can be mitigated by increasing governance mechanisms to act as a check on management and voluntary disclosures to reduce information gaps [53]. Accordingly, by providing more reliable

information to investors and stakeholders and making non-financial information more accessible, the IR framework can play a role in mitigating agency problems, which can contribute to quality.

Agency theory cannot be considered without the signaling theory because signaling theory, in the application of corporate reporting, takes the disclosure of information into account as a signal to the stakeholders. Accordingly, it conveys the message that managers may choose ways to signal to the shareholders and draw the investors' attention to the fact that their company has better quality and value than the other companies [54]. This prevents the information asymmetry that may arise due to the lack of good-quality information [55]. In this context, the managers will provide the investors with voluntary disclosures that will make their companies look valuable enough to invest in.

Considering the literature and theoretical background, it is believed that IR practices are the most prominent way for any business to communicate with each stakeholder. The IRQ is the driving force to contribute to the decision-making process positively, which is possible through implementing the IR framework as a whole. Therefore, it is believed that the IR framework is a critical indicator of high-quality IR, which can improve financial performance through the proxies of accounting-based metrics such as ROA, ROE, and EPS positively. From this point of view, the following theoretical framework in Fig. 1 is proposed.

Few studies indicate that IRQ has a positive and significant impact on the ROA of firms adopting the IR reporting [43], whereas Akisik & Gal [13] proved a significant positive relevance between the adaptation of IR and the ROA and ROE metrics. Some studies, on the contrary, do not posit any relevance with the IRQ and ROA as well as ROE [22,45]. The studies on the financial metric of EPS, on the other hand, are very limited, as only one study to our knowledge provided a significant relevance between EPS and IRQ [44]. However, the results were limited to the South African sample. Moreover, to the best of our knowledge, the majority of the mentioned studies have not yet considered the three pillars of the IR framework together in measuring quality [29]. While the IRQ should be improved through the implementation of three pillars [5], the measurement method regarding IRQ has not included the pillars at the same time yet in the current literature. Also, no evidence has been provided on the impact of IRQ on different financial performance metrics**.** Moreover, in the light of previous studies, three significant financial metrics have not been indicated together yet to show to different impacts of different ratios. Accordingly, the previous studies on the impact of IRQ on financial metrics provide heterogeneous results that further fuel the need for new research on this.

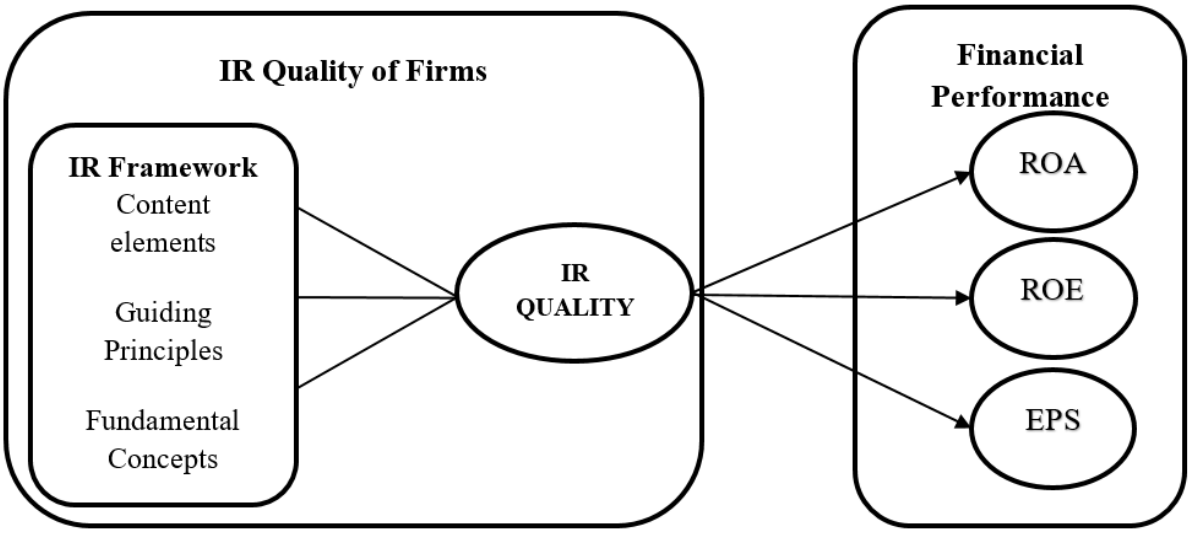


Fig. 1. Theoretical framework

There are numerous studies in the literature regarding the impact of stand-alone ESG and governance reports on financial performance since these reporting guidelines existed earlier than the implementation of the IR framework. The related studies indicate significant relevance between the quality of non-financial reports and the ROA and ROE of the firms studied [18,46]. Considering the positive impact of these non-financial reporting guidelines on firms' financial metrics, one could be intrigued whether such a positive and significant relationship could also be observed when applied to IRQ. In view of the previous parts and Fig. 1, three hypotheses are proposed that examine each financial performance metric individually, which follow as:

i. *H1* – There is a positive and significant relationship between IRQ and ROA.
ii. *H2* – There is a positive and significant relationship between IRQ and ROE.
iii. *H3* – There is a positive and significant relationship between IRQ and EPS.

4. Research Methodology

4.1 Sample Size and Data Collection

The sample of this study constitutes 82 firms that published integrated reports between 2019 and 2022 from both emerging and developed markets, as well as various industries. The sample size of the study was selected from the website of the IFRS Foundation under the section of "Integrated Reporting Examples Data", which consists of 496 reporters' firms in total. This database includes practitioners who perform IR, adhering to the three pillars of the IR framework, which is very significant for the consistency of the results. Although the database lists the firms that prepare IR, it was observed that some firms' reports are still named as "corporate report", "annual report", and "impact report". Therefore, to achieve consistent results, only those reporters who published their reports under the name "integrated report" or "integrated annual report" were selected.

Considering the accessibility of integrated reports from both emerging and developed markets, and firms that do not continue to prepare IR, the years between 2019 and 2022 stand out to draw meaningful results with the highest sample size. Also, the related timeframe can be considered to show results regarding the post-COVID-19 period. Accordingly, in total, 82 firms were determined from both emerging and developed markets for the years 2019, 2020, 2021, and 2022, resulting in a final sample size of 328 firm observations. The distribution of the final sample size regarding the industries and emerging and developed markets is presented in Table 1.

In this study, the data necessary to reach the results were collected from the integrated reports of 82 companies listed on the IFRS website. First of all, the website of the IFRS Foundation (https://examples.integratedreporting.org/ir-reporters/) was used to determine integrated reports. We then ensured that each integrated report listed on this Website also follows the IR framework. Among the companies, those that published an "integrated report" or "integrated annual report" were identified and analyzed using the developed scoring method based on the IR framework to measure IR quality between 2019 and 2022. In addition, data on ROA, ROE, EPS, and other control variables were collected from integrated reports. In case these data are not included in the integrated reports, these data were collected through the financial statements and websites of the firms.

Table 1
Distribution of the sample size

Industry	Developed	Emerging
Financial services	**5**	**4**
Food & beverage	**5**	**3**
Chemicals	**3**	**2**
Manufacturing	**6**	**4**
Infrastructure & construction	**4**	**2**
Mining	**5**	**4**
IT	**5**	**3**
Transportation	**4**	**2**
Health	**4**	**2**
Telecommunications	**4**	**3**
Energy	**5**	**3**
Total	**50**	**32**
Final sample size	**82**	
Total observations between 2019-2022	**328**	

4.2 Research Model

The main objective of this study is to test the impact of IRQ on financial performance indicators. Considering the theoretical framework and the related literature, it is believed that improvement in IRQ has a significant impact on ROA, ROE, and EPS. Therefore, three different models are proposed, which are tested by using the panel Estimated Generalized Least Squares (panel EGLS). In terms of Model 1, Model 2, and Model 3, IRQ is the independent variable, which is addressed as the main predictor of ROA, ROE, and EPS, respectively. Therefore, ROA, ROE, and EPS are the dependent variables of Model 1, Model 2, and Model 3. Moreover, Tobin's Q ratio, total assets size, board size, and number of meetings held by the audit committee are included as the control variables of each model. Following the previous literature, Tobin's Q ratio is considered a control variable of regression models [43,45]. Furthermore, in this study, control variables related to corporate governance are used. In this context, board members may contribute to the quality of decision-making through the emergence of different views [56]. Accordingly, it is expected that the involvement of different board members may impact IRQ. Also, audit committees act as monitoring mechanisms to oversee the information and the quality of it, and thus they are important actors of governing mechanisms in reducing the information gaps. Therefore, the number of held meetings may impact IRQ. Finally, year and industry effects are considered constants in each model, while each model is tested with and without market effects, considering emerging and developed markets. All these are addressed in the regression equations below, where we use the panel EGLS method to reach results. In addition, regarding these models, the two-step System Generalized Method of Moments (GMM) technique is performed to deal with possible endogeneity problems [57].

i. *Model 1* – The effects of IR quality on ROA:

$$\boldsymbol{ROA_{i,t}} = \boldsymbol{\beta 0} + \boldsymbol{\beta 1}\, \boldsymbol{IRQ}_{i,t} + \boldsymbol{\beta 2}\, \boldsymbol{TobinsQ_{i,t}} + \boldsymbol{\beta 3}\, \boldsymbol{TotalAssetsSize_{i,t}} + \boldsymbol{\beta 4}\, \boldsymbol{BoardSize_{i,t}} + \boldsymbol{\beta 5}\, \boldsymbol{NumberOfAuditMeeting}_{i,t} + \boldsymbol{Industry} + \boldsymbol{Year} + \boldsymbol{e_{i,t}}. \quad (1)$$

ii. *Model 2* – The effects of IR quality on ROE:

$$\boldsymbol{ROE_{i,t} = \beta 0 + \beta 1\, IRQ_{i,t} + \beta 2\, TobinsQ_{i,t} + \beta 3\, TotalAssetsSize_{i,t} + \beta 4\, BoardSize_{i,t} + \beta 5\, NumberOfAuditMeeting_{i,t} + Industry + Year + e_{i,t}.} \quad (2)$$

iii. *Model 3* – The effects of IR quality on EPS:

$$\boldsymbol{EPS_{i,t} = \beta 0 + \beta 1\, IRQ_{i,t} + \beta 2\, TobinsQ_{i,t} + \beta 3\, TotalAssetsSize_{i,t} + \beta 4\, BoardSize_{i,t} + \beta 5\, NumberOfAuditMeeting_{i,t} + Industry + Year + e_{i,t}.} \quad (3)$$

According to the models above, *i* represents the firm, *t* refers to the year, and *e* refers to the error term.

4.3 Variables and Measurement

In accordance with the research question of the paper, three different models are tested to draw conclusions, which have three different financial performance indicators as outcomes. Accordingly, ROA, ROE, and EPS are the dependent variables of Model 1, Model 2, and Model 3, respectively, which are measured through the ROA, ROE, and EPS ratios of the firms that are reported on their integrated reports or financial statements.

IRQ is expected to be improved by reporting organizations, which is possible through the implementation of the IR framework [5]. Accordingly, IRQ is addressed as the independent variable of each model, which is measured by scoring integrated reports' firms. Eighteen questions are adapted from the IR framework that was published by IIRC [5] to score integrated reports. The IR framework is grounded on three main parts, which are fundamental concepts, guiding principles, and content elements. Three of these questions relate to fundamental concepts, seven to the guiding principles, and eight to the content's elements. In light of these questions, the integrated reports were scored according to a 4-point scale. On this scale, there are "0=absence of information", "1=poor information", "2=balanced information partially supported by quantitative data", and "3=excellent information supported by quantitative data". Considering the scale, each part of the integrated reports is analyzed by taking advantage of the content analysis, and then the related parts are scored. For each part of the IR framework, the maximum score can be achieved as 9, 21, and 24 points, respectively, which represent the maximum score of fundamental concepts, guiding principles, and content elements. Accordingly, a total maximum score of 54 points can be obtained. The details regarding the scoring method that was developed are presented in Appendix 1.

This study consists of several control variables, which are Tobin's Q ratio (TobQ), total assets size (TotAssetSiz), board size (BoardSize), and the number of meetings held by the audit committee (NoOfAudMet). Therefore, the control variables are measured as follows regarding the given years. Tobin's Q ratio is measured by $\frac{Market\ Capitalization + Total\ Liabilities}{Total\ Assets}$ [17,21]. Total assets size is measured by taking the natural logarithm of total assets. Board size is measured by considering the total number of board members. The number of audit committee meetings is measured by the total number of meetings that are held. Moreover, in the regression model, the year and industry are considered as fixed effects, which are coded as dummy variables. Lastly, the market effect is measured as a dummy variable, where 0 represents emerging markets and 1 represents developed markets.

5. Data Analysis and Results

5.1 Descriptive Statistics and Correlation

Table 2 presents the descriptive statistics of the variables for each model. Considering Table 2, there are a total of 328 observations between 2019 and 2022, representing the total sample size of 82 firms. The mean statistics of dependent variables regarding the financial metrics, which are ROA, ROE, and EPS, are 4.770, 12.090, and 5.579, respectively. Moreover, the mean value of the independent variable IRQ is 45.536 while the minimum and maximum scores are 38 and 51, respectively. In the previous literature, the IRQ score was found at undesirable levels [25-26], whereas considering the mean score, IRQ is approximately 45.536, which is in the top 25 percentile. In terms of control variables, the mean values for TobinsQ and Natural Logarithm of Total Asset Size are 2.074 and 23.723. Finally, the sample firms have an average of 11 members on the board of directors and seven audit committee meetings.

Table 2
Descriptive statistics

	ROA	ROE	EPS	IRQ	TobQ	TotAssetSize	BoardSize	NoOfAudMet
Mean	**4.770**	**12.090**	**5.579**	**45.536**	**2.074**	**23.723**	**11.020**	**7.637**
Median	**3.662**	**11.015**	**2.165**	**46.0**	**1.164**	**23.718**	**11.0**	**7.0**
Maximum	**48.699**	**87.372**	**92.830**	**51.0**	**25.073**	**28.724**	**20.0**	**12.0**
Minimum	**–22.433**	**–63.270**	**–29.050**	**38.0**	**0.475**	**18.617**	**4.0**	**5.0**
Std. Dev.	**7.219**	**16.220**	**12.053**	**2.424**	**3.342**	**1.933**	**2.884**	**1.280**
Skewness	**1.524**	**0.352**	**3.996**	**–0.892**	**5.050**	**0.015**	**0.305**	**0.543**
Kurtosis	**11.852**	**8.422**	**26.2911**	**4.083**	**30.341**	**3.028**	**3.162**	**3.475**
Observations	**328**	**328**	**328**	**328**	**328**	**328**	**328**	**328**

Table 3 shows the average value of IRQ scores considering the effects of emerging and developed markets as market effects. Therefore, Table 3 provides information on the three main parts of the scores of the IR framework. The overall IRQ average score is improved for 2022 compared to 2019, but no major differences are observed compared to the annual IRQ average scores. Moreover, in terms of emerging and developed markets, no substantial changes are noticed concerning the mean of IRQ scores.

Table 3
IR quality scores for years

	Year							
	2019		**2020**		**2021**		**2022**	
	Market effects		**Market effects**		**Market effects**		**Market effects**	
	Emerging	**Developed**	**Emerging**	**Developed**	**Emerging**	**Developed**	**Emerging**	**Developed**
	Mean	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**
Fundamental concepts	**7**	**7**	**8**	**8**	**7**	**8**	**8**	**8**
Guiding principles	**17**	**17**	**18**	**17**	**17**	**18**	**18**	**18**
Content elements	**19**	**20**	**20**	**20**	**20**	**21**	**21**	**21**
Total IRQ score	**44**	**45**	**45**	**45**	**45**	**46**	**46**	**47**

Table 4 shows the Pearson's correlation coefficient of the variables of each model. In Table 4, *n*=328, while "**" and "*" denote the significance level of Pearson's correlation coefficient at the level 0.01 and 0.05, respectively. The correlation results reveal that a positive correlation exists

between a dependent variable and an independent variable in Model 1, Model 2, and Model 3. In other words, according to Table 4, IRQ is significantly and positively correlated with ROA, ROE, and EPS. Pearson's correlation coefficient also indicates the linearity between dependent and independent variables. Moreover, the multicollinearity does not pose an issue until the coefficients between explanatory variables reach 0.8 or 0.9. Considering the results, the highest correlation was between IRQ and ROA, as 0.482. Moreover, unacceptable levels of multicollinearity were not observed between explanatory variables of this study, where low-level correlation was observed. Therefore, no restrictions were determined to apply to further data analysis.

Table 4
Correlation between the variables

	ROA	ROE	EPS	IRQ	TobQ	TotAssetSiz	BoardSize	NoOfAudMet
ROA	**1**							
ROE	**0.358****	**1**						
EPS	**0.315****	**0.344****	**1**					
IRQ	**0.482****	**0.371****	**0.313****	**1**				
TobQ	**0.092**	**0.056**	**0.013**	**–0.147****	**1**			
TotAssetSiz	**0.111****	**0.089**	**0.115***	**0.273****	**–0.198****	**1**		
BoardSize	**0.079**	**0.178****	**–0.020**	**0.229****	**–0.117***	**0.311****	**1**	
NoOfAudMet	**0.272****	**0.399****	**0.202****	**0.243****	**–0.176****	**0.377****	**0.193****	**1**

5.2 Results of the Panel Regression Analysis

In order to test the hypotheses and answer the research question, in this part of the study, we performed panel EGLS. Prior to conducting this analysis, it was assessed whether the use of a fixed effect or random effect regression model was appropriate for each model. Hausman test statistics help to reveal the appropriateness of the regression model. Regarding the results of the Hausman test statistic, the null hypotheses for the fixed effects model were rejected, in which the use of random effects for panel EGLS was appropriate in each model. Therefore, the three proposed models were tested, and the results are shown in the following tables.

According to Table 5, the result of the random effects panel regression model indicated that a positive and significant relationship exists between IRQ and ROA at the 1% level. In Table 5, "***", "**", and "*" represent statistical significance at 1%, 5%, and 10 %, respectively. Therefore, the hypothesis (H1) cannot be rejected as expected, and thus we can confirm that IRQ is a significant determinant of ROA based on consideration of the IR framework measuring IR Quality. The results are parallel with the findings of Soriya & Rastogi [43] in the Indian perspective and Pavlopoulos *et al.* [17], which indicate that firms with higher IR quality perform better in terms of financial metrics. The results also confirm the findings of Vitale *et al.* [18], which posits that, similar to IRQ, as part of non-financial reporting standards, ESG reporting quality also acts as a positive determinant of financial performance. Model 1, including both the market effects and industry effects, also explains 33.6% of the variance in the dependent variable. In addition, the control variables of the TobinQ ratio and TotalAssetsSize have a significant relationship with ROA at the 10% level. However, no significant evidence was found on the control variables of board size and the number of audit committee meetings, as opposed to initially expected. Besides, if the same test is repeated with market effects in Step 2, no significant changes are observed in the results of actual Model 1, indicating the level of reporting quality in emerging and developed markets has no distinguishing differences. Considering the relationship between ROA and total assets, it is believed that integrated reports provide critical

financial and non-financial information about firms' assets and that better-quality integration of this information affects the financial performance of firms.

Table 5
Results of regressions for the models

Variables	Model 1				Model 2				Model 3			
	Step 1		Step 2		Step 1		Step 2		Step 1		Step 2	
	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat	Coef.	t-Stat
Constant	-55.393***	-5.062	-56.010***	-4.949	-17.521***	-2.793	-17.733***	-2.687	-25.670***	-3.394	-24.933***	-3.308
IRQ	1.626***	8.043	1.628***	8.033	4.221***	9.196	4.240***	9.228	1.740***	6.134	1.738***	6.114
TobQ	0.245*	1.700	0.250*	1.712	0.691**	2.200	0.734**	2.310	0.342	1.537	0.338	1.502
TotAssetSiz	-0.569*	-1.676	-0.533	-1.382	-0.249	-0.340	0.047	0.059	-1.683**	-2.657	-1.727**	-2.484
BoardSize	0.182	0.932	0.173	0.862	0.584	1.405	0.498	1.168	0.185	0.573	0.199	0.601
NoOfAudMet	-0.582	-1.258	-0.581	-1.252	-1.427	-1.376	-1.410	-1.359	-0.480	-0.719	-0.485	-0.725
Year Effect	Included		Included		Included		Included		Included		Included	
Industry Effect	Included		Included		Included		Included		Included		Included	
Market Effect	No		Included		No		Included		No		Included	
Observation	328		328		328		328		328		328	
R-squared	0.336		0.336		0.393		0.394		0.251		0.254	
Prob(F-Stat)	0.000		0.000		0.000		0.000		0.000		0.000	
Durbin-Watson	1.793		1.800		1.908		1.916		1.892		1.899	

Table 5 illustrates the results regarding the random effects panel regression Model 2. Conforming to this table, Model 2 indicated that there is a positive and significant relationship between IRQ and ROE at 1% level. Thus, hypothesis 2 (*H2*) cannot be rejected as we expected. Our results confirmed the findings of Chouaibi *et al.* [42] on the relationship between IRQ and ROE, whereas Akisik & Gal [13] also supported our results, though their study only takes the adaptation of IR standards into account. Vitale *et al.* [18] and Chininga *et al.* [46] verified the same positive and significant relationship between non-financial ESG reporting quality and ROE. The Model 2 predicts 39% of the variance in the dependent variable. On the other hand, the TobinQ ratio has a significant and positive relationship at 5% level, whereas other control variables of TotalAssetsSize, board size, and the number of audit committee meetings have no relevance. When the same test was repeated for market effects in Step 2, no major differences were observed for Model 2, indicating that the origin of the company, whether it was from a developed or emerging market, had no significance. Also, it is believed that the integrated presentation of information on net income and shareholders' equity through IR also plays a role in this relationship. In light of these results, a conclusion is drawn that IR quality has an effect on ROE corresponding to the IR framework.

The information related to the random effects panel regression Model 3 is provided in Table 5 alongside the other models. The results of Model 3 revealed that IR quality and EPS are positively and significantly associated with each other at 1% level, which proved that hypothesis 3 (H3) is accepted. Model 3 estimates 25% of the variance in the dependent variable. The results also confirmed the findings of Matemane & Wentzel [44], which was, to our knowledge, the only study that investigated the relationship between EPS and IRQ considering only the South African perspective. In addition, only TotalAssetsSize is found to be significant at 1% and 5% levels in Step 1 and Step 2, respectively, whereas no significant evidence is found on the other control variables of TobinQ, board size, and number of audit committee meetings. As in previous results, no significant changes are determined considering the results without market effects and with market effects in Model 3. In view of these results, it is concluded that IR quality is improved through the consideration of the IR framework, which also contributes positively to the financial performance indicators of firms. Besides, whether the firm is located in an emerging or developed market does not have any

effect on this relationship. Lastly, the integration of profitability-related financial and non-financial information by IR meeting high quality is believed to lead to a higher EPS ratio.

6. Endogeneity Check

Under some circumstances, the same explanatory factors can affect both the dependent and independent variables of the study simultaneously. Moreover, depending on the nature of the dependent variable, the value of the previous year may affect the value of the following year, where the dynamic effect should be considered [42]. Otherwise, the exogeneity may be violated by the effect of reverse causality and simultaneity. This situation is known as endogeneity, which leads to inconsistent and biased results in panel analysis. To deal with endogeneity, GMM was introduced by Hansen [57], and extended into Dynamic and System GMM later [58], which is a critical estimation tool. The main idea behind GMM is based on the use of lagged variables of the endogenous variables while controlling for unobserved heterogeneity and autocorrelation. This technique has been addressed by previous studies that addressed different financial measures as dependent variables, in which they use a lagged variable(s) of a dependent variable(s) as an explanatory variable(s). Given these previous studies and the nature of the dependent variables of each model in this paper, endogeneity may also occur. Since the dependent variables of this study are based on a time series, the present values of the financial measures used in this study may depend on their past values, considering autocorrelation. Therefore, to deal with endogeneity, we consider the two-step System GMM technique where the lagged value of ROA, ROE, and EPS were used as explanatory variables in each model. Moreover, the two-step System GMM results are consistent with the consideration of the Hansen J-test for over-identifying restrictions and Arellano & Bond [58] technique for first-order and second-order serial correlation (AR1 and AR2). Accordingly, taking these techniques into account, we re-run each model considering the fixed year, industry, and market effects, where the results are presented in Table 6.

Table 6
Results of endogeneity checks

Variables	Model 1		Model 2		Model 3	
	Coef.	*t*-stat	Coef.	*t*-stat	Coef.	*t*-stat
Constant	-38.565***	-3.220	-13.827***	-2.794	-31.395***	-2.936
LagROA	0.537***	5.037				
LagROE			0.442***	3.376		
LagEPS					0.756***	3.893
IRQ	1.114***	4.088	3.385***	4.431	1.047***	2.940
TobQ	0.086*	1.776	0.434**	2.114	0.129	1.008
TotAssetSiz	-0.388	-1.174	-0.468	-0.699	-0.519**	-2.258
BoardSize	-0.014	-0.109	0.128	0.370	-0.045	-0.349
NoOfAudMet	-0.023	-0.051	-0.277	-0.257	0.177	0.347
Year Effect	Included		Included		Included	
Industry Effect	Included		Included		Included	
Market Effect	Included		Included		Included	
Observation	246		246		246	
Number of Instruments	32		34		33	
Hansen test (J-statistic)	0.370		0.268		0.576	
AR(1)(p-value)	0.000***		0.000***		0.000***	
AR(2)(p-value)	0.588		0.640		0.846	

According to Table 6, the results of GMM indicated that the previously obtained results were preserved for each model. The number of instruments varies across models due to differences in the lag structure and availability of valid instruments for each dependent variable. In all specifications, the number of instruments is kept below the number of cross-sectional units. Furthermore, the Hansen tests showed that it fails to reject the null hypothesis, supporting the validity of the instrument set. Given the results in Table 6 for AR1 and AR2, the results provided evidence for the existence of first-order serial correlation (AR1) and the absence of second-order serial correlation (AR2). In other words, for each model, while AR1 rejected the null hypothesis, AR2 supported the evidence of no autocorrelation of errors. Correspondingly, these diagnostic results suggest that the instruments are appropriately specified and that endogeneity concerns related to simultaneity and reverse causality are adequately addressed. Accordingly, the consistency and reliability of the results of this study were improved based on year, industry, and market effects.

7. Conclusion

This study examines how the IR quality enhances the value of a firm financially through the investigation of ROA, ROE, and EPS. To understand the impact of IRQ on financial performance, a total of 82 firms over four years, between 2019 and 2022, are examined. An IR scoring method is formulated through the content analysis of the integrated reports on the basis of the IR framework.

The study formulated the research based on three theories; i.e., stakeholder, agency, and signaling theories. Through the stakeholder theory perspective, better decision-making by the management of a firm, in the process of integrated thinking, would mean enhanced value for the firm. Consequently, better communication with the stakeholders would lead to higher firm credibility, which means new and alternative sources of funding and financial performance. From the perspective of agency theory, the higher the IR quality, the higher the transparency would be between the agents of a firm and the shareholders, signifying that the information asymmetry would be reduced. Also, considering the signaling theory, the managers would be inclined to disclose as much as possible to prevent adverse market risks and raise more funds for the firm. Consequently, more transparency would mean more investors investing in the firm and more capital, which eventually increases the firm's ability to do business efficiently and grow in the future. The results of the study have significant evidence to validate these perspectives of improving financial performance through IR quality.

In order to test the hypotheses, we performed the random effect panel EGLS method on all three models. Additionally, the two-step System GMM technique was performed to deal with the possible endogeneity problem, which allowed us to confirm the consistency and reliability of the results of this study. The findings from the study with the random effects model indicated that IR quality has a positive and significant relationship with ROA, ROE, and EPS in each model, accordingly. The corporate governance mechanism is also expected to contribute to the performance measures. Conversely, no significant relationship is found between the audit committee meetings as well as the board size. The overall results indicated that the higher financial performance ratios appear with high levels of IRQ, which supported our three hypotheses in this study. Given the relationship between IRQ and ROA, ROE, and EPS, it is believed that integrated reports provide critical financial and non-financial information about firms' assets, equity, and profitability. Therefore, better integration of this information, along with meeting high quality has a direct impact on financial performance.

Our study also reveals that no meaningful relationship existed between the IRQ scores of the firms from emerging and developed markets. This indicates that the reports prepared by firms in

emerging countries do not have much of a difference from the ones prepared in developed countries. The studies in the literature reveal that emerging countries are characterized by weak institutional structures, which would lead companies to be less inclined to provide non-financial information to investors. Consequently, it is to be expected to see a lower quality of reports amongst the emerging countries. However, this is not observed in our study, which also reveals the importance of the consideration of the IR framework. Accordingly, it is inferred that the strict implementation of the IR framework is crucial to improve IR quality and financial performance without distinction between emerging and developed countries. In other words, the integrated presentation of financial and non-financial information directly affects financial performance regardless of market conditions. This can also be an indication that IRQ is not affected by cultural and organizational differences, along with the different economic conditions of various marketplaces.

7.1 Implications

There are important implications of this study as well:

i. The IR framework is only mandatory in South Africa as of yet, and the managers of firms operating outside South Africa may voluntarily adopt the IR to carry their firms into a more reputable, credible, and transparent status among investors. Although IR is mostly voluntary, adopting this approach will bring many benefits for each stakeholder. It can be thought that quality can be increased with the pressures of mandatory application, but it is observed that there is no difference in terms of the market effects, where it is of great importance to apply the framework successfully.
ii. The shareholders would be entitled to higher quality disclosures that would enable them to better assess the firms and the firms' future intentions in the long run. Shareholders may also consider the integrated reports of firms in different markets in their financial decisions, as there is no difference between emerging and developed markets. Increased compliance with the IR framework will encourage firms to be more transparent and accountable. This can help limit any fraud or scandals that may occur due to the agency's problems and protect the shareholders' value accordingly.
iii. Both the shareholders and stakeholders have access to the ESG information on the firms' activities through IR, which may also help them to use this information in their decision-making process. Therefore, sustainability-sensitive investors and creditors can have the opportunity to better align their intentions in selecting the firms to which they allocate funds through high-quality integrated reports.
iv. The regulators still lag in understanding the IR and its benefits to the companies. In this context, the findings of this paper entice the firms, managers, policy-makers, and regulators to be more aware of the benefits of IR.

7.2 Limitations

There are several limitations of our study.

i. The period of the study does not include all the years the IR was in effect because the number of companies that provide integrated reports was limited in the initial years of the IR framework. Aside from South Africa, the number of companies that use IR globally

was few, which prevents a cross-country setting to apply in the research in terms of voluntary and mandatory IR.

ii. The reports with the title either "integrated report" or "annual integrated report" are included in the study. Thus, any company with an integrated report under the name of "annual report" is not considered. These companies could also be included in future studies to expand the research sampling or make comparisons.

iii. Only listed companies were chosen to bring a uniform setting to the study. In the future, unlisted companies can also be added to the study, which can enable the comparison of disclosure quality between the privately held and listed firms.

Appendix 1: Scoring of IR quality

No.	Fundamental concepts	A P B E
1	Value: Value that is created by the corporation over time for the corporation itself, shareholders, and stakeholders are addressed.	0 1 2 3
2	The capitals: The major capitals that are used by corporations are explained, such as financial, manufactured, intellectual, human, social, and natural.	0 1 2 3
3	The value creation process is explained, which is based on a business model, capital as inputs, business activities, outputs, and outcomes.	0 1 2 3
No.	**Guiding principles**	**A P B E**
1	Strategic focus and future orientation: Information is provided on the organization's strategy and how value is created over the short, medium, and long term, and the effects of capital are explained.	0 1 2 3
2	Connectivity of information: A holistic picture is provided of a corporation, which contains a combination, interrelatedness, and dependencies between factors and content elements.	0 1 2 3
3	Stakeholder relationship: Information is provided, in which the relationship between major stakeholders is explained.	0 1 2 3
4	Materiality: Presented information is relevant to matters about how a corporation's ability is affected to create value over time.	0 1 2 3
5	Conciseness: Information is presented in a concise manner (length of reports should not be very long)	0 1 2 3
6	Reliability and completeness: Information is presented in a complete manner that is based on both positive and negative sides, which are expected to be free from material error.	0 1 2 3
7	Consistency and comparability: Information is presented in a consistent manner, which is expected to allow comparison between other integrated reports.	0 1 2 3
No.	**Content elements**	**A P B E**
1	Organizational overview and external environment: Information is presented about what a corporation does and under which conditions it operates, depending on the external environment.	0 1 2 3
2	Governance: Information is presented about the governance structure of a corporation (e.g., board diversity, culture, ethics, and values), and how it affects the value creation over time.	0 1 2 3
3	Business model: Information is presented about the business model of a corporation, which explains how inputs are transformed into outputs and outcomes using business activities to create value.	0 1 2 3
4	Risks and opportunities: Information is presented about risks and opportunities (e.g., internal and external) that affect the ability of a corporation to create value, and the ways of dealing with risks are explained.	0 1 2 3
5	Strategy and resource allocation: Information is presented on where a corporation wants to go and how it is achieved through assigning and managing assets.	0 1 2 3
6	Performance: Information is presented about how successful the corporation is in achieving goals and objectives, utilizing both qualitative and quantitative outcomes.	0 1 2 3
7	Outlook: Information is presented about the external environment regarding the challenges and uncertainties that are experienced by corporations, in which the possible implications and expectations are discussed.	0 1 2 3
8	Basis of preparation and presentation: Information is presented about the process of how a corporation decides what matters are covered by IR, and how these matters are quantified and evaluated.	0 1 2 3

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgement

This research was not funded by any grant.

References

[1] Melloni, G., Caglio, A., & Perego, P. (2017). Saying more with less? Disclosure conciseness, completeness and balance in Integrated Reports. *Journal of Accounting and Public Policy, 36*(3), 220-238. https://doi.org/10.1016/j.jaccpubpol.2017.03.001.

[2] Robertson, F.A., & Samy, M. (2015). Factors affecting the diffusion of integrated reporting – a UK FTSE 100 perspective. *Sustainability Accounting Management and Policy Journal, 6*(2), 190–223. https://doi.org/10.1108/sampj-07-2014-0044.

[3] Bernardi, C., & Stark, A.W. (2018). Environmental, social and governance disclosure, integrated reporting, and the accuracy of analyst forecasts. *The British Accounting Review, 50*(1), 16–31. https://doi.org/10.1016/j.bar.2016.10.001.

[4] Velte, P., & Stawinoga, M. (2017). Integrated reporting: The current state of empirical research, limitations and future research implications. *Journal of Management Control, 28*(3), 275–320, https://doi.org/10.1007/s00187-016-0235-4.

[5] International Integrated Reporting Council (IIRC). (2021). International IR Framework. https://integratedreporting.ifrs.org/wp-content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf (Accessed on 11-11-2024).

[6] Stubbs, W., & Higgins, C. (2014). Integrated Reporting and internal mechanisms of change. *Accounting Auditing & Accountability*, 27(7), 1068–1089. https://doi.org/doi: 10.1108/aaaj-03-2013-1279.

[7] Burke, J.J., & Clark, C.E. (2016). The business case for integrated reporting: Insights from leading practitioners, regulators, and academics. *Business Horizons, 59*(3), 273–283, https://doi.org/10.1016/j.bushor.2016.01.001.

[8] Baboukardos, D., Mangena, M., & Ishola, A. (2021). Integrated thinking and sustainability reporting assurance: International evidence. *Business Strategy and the Environment, 30*(4), 1580–1597. https://doi.org/10.1002/bse.2695.

[9] Sun, Y., Xu, C., Ding, R., & Cao, Y. (2023). Does innovation in environmental, social, and governance disclosures pay off in China? An integrated reporting perspective. *Borsa Istanbul Review, 23*(3), 600–613. https://doi.org/10.1016/j.bir.2023.01.001.

[10] Institut Français des Administrateurs (IFA). (2017). The Board of Directors and integrated reporting. https://integratedreporting.ifrs.org/wp-content/uploads/2017/07/IFA_Reporting-Integre%CC%81-2017_EN.pdf (Accessed on 11-11-2024).

[11] Sahoo, S.K., Goswami, S.S., Sarkar, S., & Mitra, S. (2023). A Review of Digital Transformation and Industry 4.0 in Supply Chain Management for Small and Medium-sized Enterprises. *Spectrum of Engineering and Management Sciences, 1*(1), 58-72. https://doi.org/10.31181/sems1120237j.

[12] Barth, M.E., Cahan, S.F., Chen, L., & Venter, E.R. (2017). The economic consequences associated with integrated report quality: Capital market and real effects. *Accounting, Organizations and Society, 62*, 43–64. https://doi.org/10.1016/j.aos.2017.08.005.

[13] Akisik, O., & Gal, G. (2019). Integrated reports, external assurance and financial performance. *Sustainability Accounting, Management and Policy Journal, 11*(2), 317-350. https://doi.org/10.1108/SAMPJ-02-2019-0072.

[14] Girella, L., Rossi, P., & Zambon, S. (2019). Exploring the firm and country determinants of the voluntary adoption of integrated reporting. *Business Strategy and the Environment, 28*(7), 1323–1340. https://doi.org/10.1002/bse.2318.

[15] Belghith Ep Kallel, M., Bouajaja, S., & Elloumi, A. (2024). Developing a Sales Dashboard with Power BI – A Case Study in a Pharmaceutical Company. *Decision Making Advances, 2*(1), 142–147. https://doi.org/10.31181/dma21202438.

[16] Velte, P. (2022). Archival research on integrated reporting: a systematic review of main drivers and the impact of integrated reporting on firm value. *Journal of Management & Governance, 26*(3), 997–1061. https://doi.org/10.1007/s10997-021-09582-w.

[17] Pavlopoulos, A., Magnis, C., & Iatridis, G.E. (2019). Integrated reporting: An accounting disclosure tool for high quality financial reporting. *Research in International Business and Finance, 49*, 13–40. https://doi.org/10.1016/j.ribaf.2019.02.007.

[18] Vitale, G., Cupertino, S., & Riccaboni, A. (2023). The effects of mandatory non-financial reporting on financial performance. A multidimensional investigation on global agri-food companies. *British Food Journal, 125*(13), 99–124. https://doi.org/10.1108/bfj-06-2022-0545.

[19] Vitolla, F., Raimo, N., Rubino, M., & Garzoni, A. (2020). The determinants of integrated reporting quality in financial institutions. *Corporate Governance, 20*(3), 429–444. https://doi.org/10.1108/cg-07-2019-0202.

[20] Vitolla, F., Raimo, N., & Rubino, M. (2020). Board characteristics and integrated reporting quality: an agency theory perspective. *Corporate Social Responsibility and Environmental Management, 27*(2), 1152–1163. https://doi.org/10.1002/csr.1879.

[21] Wahl, A., Charifzadeh, M., & Diefenbach, F. (2020). Voluntary adopters of integrated reporting – evidence on forecast accuracy and firm value. *Business Strategy and the Environment*, 29(6), 2542–2556. https://doi.org/10.1002/bse.2519.

[22] Buallay, A., Al Hawaj, A.A., & Hamdan, A. (2021). Integrated reporting and performance: a cross-country comparison of GCC Islamic and conventional banks. *Journal of Islamic Marketing, 12*(8), 1619–1636. https://doi.org/10.1108/jima-08-2017-0084.

[23] Churet, C., & Eccles, R.G. (2014). Integrated reporting, quality of management, and financial performance. *Journal of Applied Corporate Finance, 26*(1), 56–64. https://doi.org/10.1111/jacf.12054.

[24] Zhou, S., Simnett, R., & Green, W. (2017). Does integrated reporting matter to the capital market?: Does integrated reporting matter to the capital market? *Abacus*, 53(1), 94–132. https://doi.org/10.1111/abac.12104.

[25] Agustia, D., Sriani, D., Wicaksono, H., & Gani, L. (2020). Integrated reporting quality assessment. *Journal of Security and Sustainability Issues, 10*(1), 47–59. https://doi.org/10.9770/jssi.2020.10.1(4).

[26] Songini, L., Pistoni, A., Tettamanzi, P., Fratini, F., & Minutiello, V. (2022). Integrated reporting quality and BoD characteristics: an empirical analysis. *Journal of Management & Governance, 26*(2), 579–620. https://doi.org/10.1007/s10997-021-09568-8.

[27] Jensen, J.C., & Berg, N. (2012). Determinants of traditional sustainability reporting versus integrated reporting. An institutionalist approach. *Business Strategy and the Environment, 21*(5), 299–316. https://doi.org/10.1002/bse.740.

[28] Luiz, J.M., & Stewart, C. (2014). Corruption, South African multinational enterprises and institutions in Africa. *Journal of Business Ethics, 124*(3), 383–398. https://doi.org/10.1007/s10551-013-1878-9.

[29] Mock, M. (2023). The quality assessment of Integrated Reporting: A structured literature review. *Journal of Business Management, 21*, 22–47. https://doi.org/10.32025/jbm23001.

[30] Pistoni, A., Songini, L., & Bavagnoli, F. (2018). Integrated reporting quality: An empirical analysis. *Corporate Social Responsibility and Environmental Management, 25*(4), 489–507. https://doi.org/10.1002/csr.1474.

[31] Deegan, C., & Unerman, J. (2006), *Financial Accounting Theory: European Edition*, McGraw-Hill.

[32] Healy, P.M., & Palepu, K.G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, 31(1–3), 405–440. https://doi.org/10.1016/s0165-4101(01)00018-0.

[33] Eccles, R.G., & Krzus, M.P. (2010). *One Report- Integrated Reporting for a Sustainable Society*, John Wiley&Sons, New York.

[34] Suttipun, M., & Bomlai, A. (2019). The Relationship between Corporate Governance and Integrated Reporting: Thai Evidence. *International Journal of Business and Society, 20*(1), 348-364.

[35] Eccles, R.G., & Saltzman, D. (2011). Achieving Sustainability Through Integrated Reporting. *Stanford Social Innovation Review, 9*(3), 56–61.

[36] Adams, S., & Simnett, R. (2011). Integrated reporting: An opportunity for Australia's not-for-profit sector: Integrated reporting for not-for-profit sector. *Australian Accounting Review, 21*(3), 292–301. https://doi.org/10.1111/j.1835-2561.2011.00143.x.

[37] Morros, J. (2016). The integrated reporting: A presentation of the current state of art and aspects of integrated reporting that need further development. *Intangible Capital, 12*(1). https://doi.org/10.3926/ic.700.

[38] Vitolla, F., & Raimo, N. (2018). Adoption of integrated reporting: Reasons and benefits—A case study analysis. *International Journal of Business and Management, 13*(12), 244–250. https://doi.org/10.5539/ijbm.v13n12p244.

[39] Iredele, O.O. (2019). Examining the association between quality of integrated reports and corporate characteristics. *Heliyon, 5*(7), 1–8. https://doi.org/10.1016/j.heliyon.2019.e01932.

[40] Jiao, T., Koning, M., Mertens, G., & Roosenboom, P. (2012). Mandatory IFRS adoption and its impact on analysts' forecast. *International Review of Financial Analysis, 21*, 56–63, https://doi.org/10.1016/j.irfa.2011.05.006.

[41] Yurisandi, T., & Puspitasari, E. (2015). Financial reporting quality - before and after IFRS adoption using NiCE qualitative characteristics measurement. *Procedia, Social and Behavioral Sciences*, 211, 644–652. https://doi.org/10.1016/j.sbspro.2015.11.091.

[42] Chouaibi, Y., Belhouchet, S., Chouaibi, S., & Chouaibi, J. (2022). The integrated reporting quality, cost of equity and financial performance in Islamic banks. *Journal of Global Responsibility, 13*, 450-471. https://doi.org/10.1108/JGR-11-2021-0099.

[43] Soriya, S., & Rastogi, P. (2023). The impact of integrated reporting on financial performance in India: a panel data analysis. *Journal of Applied Accounting Research, 24*(1), 199–216. https://doi.org/10.1108/jaar-10-2021-0271.

[44] Matemane, R., & Wentzel, R. (2019). Integrated reporting and financial performance of South African listed banks. *Banks and Bank Systems, 14*(2), 128–139. https://doi.org/10.21511/bbs.14(2).2019.11.

[45] Conway, E. (2019). Quantitative impacts of mandatory integrated reporting. *Journal of Financial Reporting and Accounting*, 17(4), 604–634. https://doi.org/10.1108/jfra-08-2018-0066.

[46] Chininga, E., Alhassan, A.L., & Zeka, B. (2024). ESG ratings and corporate financial performance in South Africa. *Journal of Accounting in Emerging Economies, 14*(3), 692–713. https://doi.org/10.1108/JAEE-03-2023-0072.

[47] García-Sánchez, I.-M., & Noguera-Gámez, L. (2017). Integrated information and the cost of capital. *International Business Review (Oxford, England), 26*(5), 959–975. https://doi.org/10.1016/j.ibusrev.2017.03.004.

[48] Vitolla, F., Salvi, A., Raimo, N., Petruzzella, F., & Rubino, M. (2020). The impact on the cost of equity capital in the effects of integrated reporting quality. *Business Strategy and the Environment*, 29(2), 519–529. https://doi.org/10.1002/bse.2384.

[49] Bhatia, M., Mehrotra, V., & Thawani, B. (2023). Firm characteristics and adoption of integrated reporting: An emerging market perspective. *Global Business Review*. https://doi.org/10.1177/09721509231160872.

[50] Freeman, R.E., Wicks, A.C., & Parmar, B. (2004). Stakeholder theory and The Corporate Objective Revisited. *Organization Science, 15*(3), 364–369. https://doi.org/10.1287/orsc.1040.0066.

[51] Freeman, R.E., & McVea, J. (2001). A stakeholder approach to strategic management. *Social Science Research Network*. https://doi.org/10.2139/ssrn.263511.

[52] Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305–360. https://doi.org/10.1016/0304-405x(76)90026-x.

[53] Fiori, G., di Donato, F., & Izzo, M.F. (2016). Exploring the effects of corporate governance on voluntary disclosure: An explanatory study on the adoption of integrated report. *Performance Measurement and Management Control: Contemporary Issues*. Emerald Group Publishing Limited, pp.83–108. https://doi.org/10.1108/s1479-351220160000031003.

[54] Frias-Aceituno, J.V., Rodríguez-Ariza, L., & Garcia-Sánchez, I.M. (2014). Explanatory factors of integrated sustainability and financial reporting. *Business Strategy and the Environment, 23*(1), 56–72. https://doi.org/10.1002/bse.1765.

[55] Campbell, D., Shrives, P., & Bohmbach-Saager, H. (2001). Voluntary disclosure of mission statements in corporate annual reports: Signaling what and to whom?. *Business and Society Review, 106*(1), 65–87. https://doi.org/10.1111/0045-3609.00102.

[56] Post, C., Rahman, N., & Rubow, E. (2011). Green governance: Boards of directors' composition and environmental corporate social responsibility. *Business and Society, 50*(1), 189–223. https://doi.org/10.1177/0007650310394642.

[57] Hansen, L.P. (1982). Large sample properties of generalized method of moments estimators. *Econometrica: Journal of the Econometric Society, 50*(4), 1029-1054. https://doi.org/10.2307/1912775.

[58] Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies, 58*(2), 277-297. https://doi.org/10.2307/2297968.