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ARTICLE

Integrated reporting and earnings quality: An analysis in the Brazilian context

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Abstract

Purpose – This study aims to analyze the relationship between the adoption of Integrated Reporting and earnings quality in the Brazilian context.

Theoretical framework – Earnings quality may signal a more sustainable, ethical and transparent behavior of company management. Therefore, it can serve as an indicator of changes in management practices associated with the implementation of Integrated Thinking.

Design/methodology/approach – The study employed a panel data model, considering a sample of 630 observations from non-financial Brazilian companies from 2017 to 2020. The data for companies adopting Integrated Reporting were manually collected from the companies' corporate disclosures.

Findings – The analysis of Integrated Reporting quality revealed a significant relationship with earnings quality. This may indicate that these companies are making internal changes in terms of information transparency, and it is also expected that they are under less pressure to deliver short-term results.

Practical & social implications of research – The research findings are relevant for shareholders, as they highlight how integration can drive internal changes within the company. For regulators and society, it provides an opportunity to anticipate the effects of adopting ISSB standards, as this body has incorporated the IIRC.

Originality/value – It allows for indirect observation of changes in company management and managerial opportunism. Brazil represents a relevant context due to the publication of CPC 09 and the high number of Integrated Reporting adopters.

Keywords: Integrated Reporting, Sustainability, ESG, Earnings quality.

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1 Introduction

Due to the impacts of human actions on the environment and society, and the role of corporations in addressing them, Integrated Reporting (IR) has been proposed with the aim of changing the disclosure process of organizations (International Integrated Reporting Council, 2013). To support this change, the implementation of Integrated Thinking is expected to consider the connectivity of financial and non-financial aspects in the decision-making process (Haji & Anifowose, 2016). As a result, corporate disclosures should be concise and holistically demonstrate how strategy, governance, performance, and organizational perspectives lead to value creation over time (International Integrated Reporting Council, 2013).

Given the needs and objectives of IR, the adoption of Integrated Thinking has the potential to bring about changes in company management (Haji & Anifowose, 2016). As a result of these changes, a more ethical stance and a greater commitment to transparency are expected (Rezaee & Tuo, 2019; Soriya & Rastogi, 2021; Vitolla et al., 2020). This strategic shift tends to imply that voluntary disclosure of IR is associated with higher information quality. Preliminary evidence can be found in Bandara and Wijesinghe (2023), who found a positive effect of the adoption of IR on information quality by analyzing 53 companies (26 IR adopters) listed in Sri Lanka. In order to deepen this analysis, this study uses a Brazilian sample and focuses on one of the elements of accounting information quality: earnings quality. Previous articles have presented it as a metric for assessing the quality of the information content of reported earnings (Dechow et al., 2010).

In light of this discussion, it is important to understand how this relationship occurs in companies that have adopted IR. To extend the discussion, which has been limited to adopters and non-adopters, we sought to assess whether the quality of IR can influence the propensity to manage earnings and, consequently, reduce earnings quality. In other words, in addition to the expected effect of improved earnings quality as a result of the adoption of IR, we examined whether the higher quality of IR itself increases the incentive to improve earnings quality.

Therefore, the question that the research sought to investigate is: How does the adoption of IR relate to earnings quality? By investigating this question, this article aimed to analyze the relationship between the adoption of IR and earnings quality in the Brazilian context. In addition, the environmental, social and governance (ESG) score was used as a proxy for the quality of IR (Serafeim, 2015) to also assess whether IR quality is related to earnings quality.

To test this effect, we analyzed the disclosures of the 200 largest Brazilian companies in terms of asset size between 2017 and 2020. This analysis consisted of a manual collection in which we searched for the terms "IIRC," "Integrated Reporting" and "integrated report" in the text of the reports. The results of the panel data test showed a positive and statistically significant relationship between IR quality and earnings quality. The results indicate that companies that adopt IR and have higher scores on ESG issues have higher levels of earnings quality.

Given the novelty of IR compared to balance sheets, sustainability reports and other corporate social responsibility (CSR) initiatives, this study was justified by the scarcity of evidence on the benefits of adopting IR. Benefits have already been documented in terms of increased company value, improved analyst forecasts, and reduced cost of equity and cost of debt associated with IR adoption (Barth et al., 2017; Bernardi & Stark, 2018; Flores et al., 2019; Zaro et al., 2022).

Evidence on the incorporation of the concept of Integrated Thinking into management is still limited (Obeng et al., 2020), which is why this study differs from others in that it analyzes a sample of companies that is comprehensive in the Brazilian market, with experience in this type of reporting, and studies this relationship in an emerging country. The relevance of studying the Brazilian institutional environment is demonstrated by the engagement in IR disclosure. A study by the IFAC - International Federation of Accountants (2021) shows that Brazil is one of the countries with the highest IR disclosure: 36% of the 50 largest companies in Brazil have already included IR in their disclosures, while the global average is 16%.

IR has gained notoriety over time, most notably with the merger of the IIRC (International Integrated Reporting Council) and the SASB (Sustainability Accounting Standard Board) to form the Value Reporting Foundation, and in 2021, with the celebration of the 10th anniversary of the IIRC and the release of the first revision of the International Framework for Integrated Reporting. During COP 26 in 2021, the creation of the International

Sustainability Standards Board - IFRS Foundation was announced, combining the Climate Disclosure Standards Board (CDSB - a CDP initiative) and the Value Reporting Foundation (de Villiers & Dimes, 2023).

As noted above, there is widespread debate about the reliability and comparability of sustainability information. For example, regulators around the world are exploring the possibility of requiring mandatory sustainability performance reporting. Understanding how internal decision-making processes are altered by initiatives such as IR, the Sustainability Accounting Standards Board (SASB), or the Task Force on Climate-Related Financial Disclosures (TCFD) is important for understanding the potential impacts of the mandatory adoption of the International Sustainability Standards Board's (ISSB) international sustainability disclosure standards. This is essential for standard-setters, investors, analysts and companies and demonstrates the relevance of this study.

The study contributes to filling a gap in the literature by analyzing the benefits of IR adoption in relation to earnings quality, a topic that remains under-researched, especially in emerging markets such as Brazil. By examining a comprehensive sample of large Brazilian firms with IR experience, the study provides empirical evidence on the relationship between IR quality and earnings quality in a relevant institutional context (de Villiers & Dimes, 2023; Radwan & Xiongyuan, 2024). The study also contributes to the theoretical discussion on the impact of Integrated Thinking on management, a concept that still has limited empirical evidence, especially in Brazil.

On a more practical level, the study's findings are relevant to regulators, investors, analysts and companies, particularly in light of the global trend toward mandatory sustainability reporting. The results indicate that the adoption of IR and the integration of ESG factors into corporate strategies are associated with tangible benefits, such as higher quality earnings, which may encourage more companies to adopt these practices, but emphasize that adoption alone does not lead to this outcome, but rather quality disclosure. Finally, the study contributes to the discussion on the potential impacts of the mandatory adoption of international sustainability disclosure standards, as they do not guarantee the effective application of Integrated Thinking or the quality of the report, a relevant issue in view of the publication of IFRS S1 and IFRS S2 (de Villiers & Dimes, 2023, Radwan & Xiongyuan, 2024).

2 Literature review and hypothesis development

The adoption of IR aims to encourage a more ethical stance and greater commitment to transparency on the part of companies due to better decisions achieved through Integrated Thinking and a more engaged shareholder base (Rezaee & Tuo, 2019; Sanches et al., 2020; Soriya & Rastogi, 2021).

2.1 IR and corporate responsibility

The discussion on sustainable practices of companies has become a demand for consumers, investors and governments (Arvidsson & Dumay, 2022), given the environmental and social impact of companies and their ability to contribute to solving humanity's greatest challenges. The Sustainable Development Goals (SDGs) represent some of the main challenges facing humanity, and the actions of companies and their transparency are important for progress towards these goals. The study by Pizzi et al. (2021) provides evidence that the adoption of CSR practices can not only improve the image of companies, but also contribute to the implementation of the SDGs and improve CSR performance.

The 2030 Agenda, which sets out the SDGs, requires member states to encourage companies, especially transnational corporations, to adopt sustainable practices and to integrate sustainability information into their financial statements (United Nations, 2015, p. 22). The capital market is one of the social instruments for encouraging or punishing certain behaviors, and one of the inputs for analyzing the attitudes of companies is the statements presented by the companies themselves (Arvidsson & Dumay, 2022). In this dimension, there have been long-standing efforts to represent companies' actions in a way that adequately informs about their relationship with ESG issues. One of the more recent tools that has been explored is IR.

By applying the Integrated Reporting Framework, it is hoped that information will be structured and presented in a more aligned way, minimizing information asymmetry in the various reports produced by the company, and implementing long-term thinking (Sanches et al., 2020). It is also expected that there will be greater clarity in terms of monetizing aspects related to the sustainability of the organization, seeking to reflect relationships and interdependencies in social and environmental aspects, among others, making it possible to provide users with more information to project future business performance (Haller & van Staden, 2014). It is important to note that the benefits of integrated disclosure may differ in intensity, depending on the investor's short- or long-term horizon. According to Serafeim (2015), long-term investors tend to hold shares in companies that disclose long-term perspectives and, consequently, use IR more to capture information for decision making. This can reduce market pressure on the company for very short-term results and the opportunistic behavior of managers (Fasan et al., 2016; Rezaee & Tuo, 2019).

2.2 Earnings quality

Earnings quality seeks to analyze whether accounting information is being produced and disclosed with quality (Barth et al., 2017). This is because accounting earnings are among the main accounting measures of business performance (Dechow et al., 2010). In this regard, after reviewing more than 300 studies on the characteristics or attributes of earnings, Dechow et al. (2010) believe that earnings quality exists when they have the ability to provide more information about the true characteristics of a company's financial performance, noting their relevance to the decision making of users of accounting reports.

Despite the importance of earnings quality, there is ample evidence of earnings management practices (Fasan et al., 2016; Habib et al., 2022; Lourenço & Branco, 2015). Earnings management can be understood as an accounting practice that occurs when managers of an entity use discretionary judgments, manipulation of actual activities, or other mechanisms to manipulate accounting and financial reports and transactions (Dechow et al., 2010). The objective may be to meet market expectations about the company's performance, smooth income, increase the managers' compensation based on results, or interfere with the outcomes of contractual transactions that depend on the reporting of such information (Fasan et al., 2016; Healy & Wahlen, 1999; Lourenço & Branco, 2015). It is important to note that earnings management is different from fraud, as it occurs within the limits of the law (Healy & Wahlen, 1999). From the point of view of analyzing the internal decision-making process, the association of earnings management with less favorable decisions, such as less efficient investments, has been documented (Cavalcanti et al., 2020).

Although the earnings management literature focuses primarily on financial issues, non-financial elements also influence the quality of financial reports. Previous studies have documented the association between higher earnings quality and sustainability disclosure practices. The results of Rezaee and Tuo (2019) show that the quantity of sustainability disclosures is negatively associated with earnings quality, while the quality of sustainability disclosures is positively associated. This suggests that the mere adoption of an initiative may be opportunistic, according to legitimation theory. Velte's (2021) study found a negative relationship between environmental performance and earnings management. In the same vein, Habib (2023) presented results showing that there is a correlation between low ESG performance and earnings management, and that the adoption of ESG strategies is positively related to market value and financial performance. A similar finding was reported by Dai (2024). This indicates how multifaceted the effects and causes of earnings management are.

In support of these findings, Obeng et al. (2020) specifically analyzed the relationship between IR adoption and earnings management. The results indicated that IR adoption is associated with higher earnings quality, so this result may indicate that greater transparency and disclosure of non-financial aspects can mitigate information asymmetry and thus be associated with better information quality. Bandara and Wijesinghe (2023) also report results of a positive effect of companies disclosing IR on the quality of accounting information, but using metrics other than earnings management. Taken together, these results support the intuition that IR adoption not only contributes to mitigating information asymmetry by reporting material information about the various resources and impacts, but also that Integrated Thinking, when pervasive in an organization, guides an ethical stance and greater commitment to transparency (Rezaee & Tuo, 2019; Soriya & Rastogi, 2021; Vitolla et al., 2020).

The theoretical gap that emerges from these studies relates to the applicability of IR as a transparency mechanism in an institutional context with low applicability of laws. In addition, it involves a less developed capital market and a less developed structure of institutional discussion and programs for the protection of ESG issues compared to the European Union, such as Brazil.

In summary, the study contributes by investigating how the adoption and quality of IR positively impacts the quality of accounting information, especially earnings, through more ethical, transparent and long-term management.

2.3 Hypotheses

The literature suggests that the quality of accounting information improves with IR adoption (International Integrated Reporting Council, 2013; Eccles & Krzus, 2010; Barth et al., 2017). The detailed disclosure of IR provides more clarity on expected cash flows for decision making and can be associated with high quality reporting (Barth et al., 2017). One of the ways found in the literature to measure the quality of accounting information is to measure the quality of earnings, as accounting earnings is one of the main measures of company performance (Dechow et al., 2010; DeFond, 2010). In this regard, Zhou et al. (2017) report a negative relationship between IR quality and analyst forecast errors, suggesting that this relationship is due to a lower level of information asymmetry. Similarly, Bernardi and Stark (2018) report a positive relationship between IR and analyst forecast accuracy, suggesting that this is due to the type of environment and the governance disclosures considered in the preparation of integrated reports.

The study by Radwan and Xiongyuan (2024) attempted to analyze the relevance of IR quality through value relevance analysis. Analyzing data from 128 companies in Asia and a total of 752 observations, the multiple linear regression models presented results indicating that the relevance of information and the quality of earnings and the accuracy of analysts' forecasts measured this relationship. This evidence raises questions about the relationship between the quality of companies' IR and the quality of their earnings.

Consistent with the publications of the IIRC (International Integrated Reporting Council, 2013) and Eccles & Krzus (2010), companies that adopt the IIRC should provide more detailed disclosures that include a level of integration that results in better quality accounting information. IR tends to provide a detailed context for understanding corporate information by considering non-financial information and analyzing such information holistically, and these attributes generate greater clarity and integrity of reports (International Integrated Reporting Council, 2013; Zhou et al., 2017).

In addition, the ethical behavior of managers is another factor that influences the quality of accounting information. The literature points to evidence that companies with better CSR practices show less evidence of earnings management and manipulation of accruals (Bose & Yu, 2023; Kim et al., 2012). The argument presented suggests that managers with ethical attitudes are more likely to engage in CSR practices and less earnings management.

Since integrity and clarity of information are high quality attributes, adoption of the IIRC should increase the level of earnings quality. We therefore formulate the first hypothesis as follows:

> **H1** IR disclosure is positively correlated with earnings quality.

To further explore the relationship between IR and earnings quality, we also examined how IR quality is associated with earnings quality. In this way, it is possible to distinguish whether there are differences in IR quality in relation to how companies have integrated financial and non-financial factors into their strategies. From changes in positioning and culture to the active consideration of sustainability factors in decision-making processes, changes in ESG performance can be observed (Chouaibi & Hichri, 2021).

Active engagement in incorporating IR into a company's strategies and sustainability performance management is a factor that contributes to the quality of these reports. The literature suggests that IR has the potential to generate organizational benefits by assessing an organization's ability to create value, identifying key strategic points, and intertwining sustainability considerations with the development of a competitive advantage (Busco et al., 2019; Chouaibi & Hichri, 2021; Vitolla et al., 2019). IR quality is closely linked to the company's commitment to integrating dimensions and capitals into the decision-making process, with far-reaching implications for the organization's performance, especially with regard to ESG aspects.

As mentioned above, IR quality is related to the sustainability performance of the company. High CSR performance is associated with better stakeholder engagement, limiting the likelihood of short-term opportunistic behavior, and ESG is an important mechanism for protecting stakeholders in the face of risk (Bénabou & Tirole, 2010; Eccles, 2012; Srivastav & Hagendorff, 2016). As a result, this performance generally reduces transaction costs. Second, companies with better CSR performance are more likely to disclose their CSR activities to the market (Dhaliwal et al., 2011) to signal their long-term focus and differentiate themselves from others (Bénabou & Tirole, 2010). CSR reporting creates a positive feedback loop: (1) it increases transparency around the social and environmental impacts of companies and their corporate governance structure; and (2) it can change the internal control system, which further improves compliance and the reliability of published reports. Therefore, increasing the availability and quality of information reduces the information asymmetry between the company and investors (Botosan, 1997; Khurana & Raman, 2004; Hail & Leuz, 2006; El Ghoul et al., 2011), leading to lower capital constraints (Hubbard, 1997).

According to the literature presented above, the quality of earnings acts as a signal of the level of management's commitment to ethical behavior and transparency. Therefore, it is expected that companies with higher quality IR will have a management transformation that leads to more ethical and responsible behavior (Chouaibi & Hichri, 2021). One of the reasons for this is a commitment to long-term value creation. From another perspective, we can also expect greater transparency due to a maturing understanding of the non-financial factors that affect the business model and result in business model impacts (Vitolla et al., 2019). Such behavior is expected as a result of the application of Integrated Thinking. In addition, a greater commitment to disclosures presented to the market is expected (Busco et al., 2019).

With respect to IR, it is expected that its information will be structured and presented in a more aligned manner, in a way that minimizes information asymmetry and implements long-term thinking, as well as greater clarity on aspects related to the organization's sustainability (Haller & van Staden, 2014; PwC, 2013). In this regard, stakeholder engagement and increased transparency through CSR reporting, together with the practices resulting from the adoption of the IIRC and their impact on improving earnings quality, we formulated the second hypothesis as follows:

H2 IR quality and IR disclosure are associated with better levels of earnings quality.

3 Methodology

This study is a descriptive study that uses archival data and quantitative analysis. The sample chosen includes the 200 largest companies in Brazil in terms of total assets, and the final sample with the data needed for the research totaled 630 observations from 167 companies.

The IR variable, which indicates the companies that declare that they use IR, was collected by manually consulting the virtual investor relations environment on the websites of all 200 companies ranked as the largest by asset size, yielding 56 companies that use the IIRC in their reports. When accessing the investor relations environment, the terms "IIRC," "Integrated Reporting" and "integrated report" were searched for in the text of the published annual reports to prove the adoption of the IIRC. If there were any doubts about the reports observed, questions were sent to the investor relations communication channel of the respective companies.

Financial data and the ESG score, which is used as a proxy for IR quality, were collected from the Refinitiv database. Combining the databases led to a loss of information, resulting in 200 companies for the analysis and 797 observations from the period 2017 to 2020. It was decided to limit the work to this period because in 2017 53 companies already adopted IR, compared to previous years when this number was significantly lower. For example, in 2014, only 9 Brazilian companies adopted IR (Zaro, 2015). After excluding observations from companies in the financial sector due to the specific characteristics of the financial statements of this sector (120 observations), with negative equity (24 observations), and with missing information (23 observations), the final sample consisted of 630 observations from 167 companies.

In this study, the type of earnings management strategy adopted was competency-based, through the calculation of performance discretionary accruals, similar to the studies by Fasan et al. (2016) and Mio et al. (2020). For this purpose, the Modified Jones Model (Dechow et al., 1995) was used as a proxy for discretionary accruals, according to Equation 1, which is one of the most widely used methods in the literature for dividing total accruals into discretionary and non-discretionary.

$$
\begin{aligned}
&\frac{TA_{it}}{Assets_{it-1}} = \beta_0 + \beta_1 \frac{1}{Assets_{it-1}} + \\
&\beta_2 \frac{\Delta Sales - \Delta Receivables}{Assets_{it-1}} + \\
&\beta_3 \frac{Fixed\ Assets}{Assets_{it-1}} + \beta_4\, Sector_i + \varepsilon_i
\end{aligned} \tag{1}
$$

where: TA represents total accruals; $Assets_{it-1}$ is the previous year's total assets; ΔSales is the change in sales from year t-1 to year y; ΔReceivables is the change in net receivables from year t-1 to year t; Fixed Assets is gross fixed assets in year t; and Sector is a dummy variable for each sector in the sample. A detailed description of the variables can be found in Appendix A.

The data were analyzed using a panel data model, shown in Equation 2:

$$lDA = \beta_0 + \beta_1 IR_{ij} + \beta_2 QualitIR_{ij} + \beta_3 IR * QualitIR_{ij} + \beta_4 lSize_{ij} + \beta_5 Leverage_{ij} + \beta_6 ROA_{ij} + \beta_7 Loss_{ij} + \beta_8 Num\,analysts_{ij} + \beta_9 sector_i + \beta_{10} year_j + \varepsilon_i \quad (2)$$

where: IR = indicator variable equal to 1 if IR is adopted, otherwise 0; QualitIR = the proxy for IR quality is Refinitiv's ESG score; LSize = natural logarithm of total assets; Leverage = liabilities divided by total assets; ROA = net income divided by total assets; Loss = dummy indicating years of losses; Num analysts = number of analysts following the company. A detailed description of the variables can be found in Appendix A. A database sample can be can be found in the Supplementary Data 1. The software used for the analysis was Stata, and the Stata script can be found in the Supplementary Data 2.

4 Data presentation and analysis

The data were first presented and analyzed using the descriptive statistics in Section 4.1, which provided an initial understanding of the composition of the sample and the average behavior of the variables of interest. In Section 4.2, the multivariate relationship between the variables was explored, in an attempt to verify whether there were any significant effects of the proposed relationships.

4.1 Descriptive analysis

Table 1 shows the frequency of companies adopting or not adopting IR, divided into Panel A and Panel B.

Panel A shows the frequency of companies by economic sector, identifying which are IR adopters and which are not. It can be seen that adoption of the IIRC is mainly observed in the industrial sector (with 26.67% of all companies), public utilities (20.32%), retail trade (10.63%) and real estate, rental and leasing (10.16%).

Table 1
Frequency of companies adopting or not adopting IR

Panel A: Frequency of companies by sector, identifying IR adopters and non-adopters				
Sectors	Integrated Reporting		Total	%
	NO	YES		
Accommodation and Food Services	8	0	8	1.27
Administrative and Support and Waste Management	4	0	4	0.63
Agriculture, Forestry, Fishing, and Hunting	8	4	12	1.9
Arts, Entertainment, and Recreation	4	0	4	0.63
Construction	20	4	24	3.81
Educational Services	16	4	20	3.17
Health Care and Social Assistance	20	4	24	3.81
Information	18	7	25	3.97
Manufacturing	108	60	168	26.67
Mining, Quarrying, and Oil and Gas Extraction	4	12	16	2.54
Other Services (except Public Administration)	3	0	3	0.48
Professional, Scientific, and Technical Services	4	4	8	1.27
Real Estate, Rental, and Leasing	56	8	64	10.16
Retail Trade	39	28	67	10.63
Transportation and Warehousing	20	17	37	5.87
Utilities	74	54	128	20.32
Wholesale Trade	7	11	18	2.86
Total	413	217	630	100
Panel B: Frequency of companies by year, identifying IR adopters and non-adopters				
Yearo	**NO**	**YES**	**Total**	**%**
2017	99	53	152	24.13
2018	104	54	158	25.08
2019	104	54	158	25.08
2020	106	56	162	25.71
Total	413	217	630	100

Still in Table 1, Panel B also shows IR adopters and non-adopters, but with the frequency of companies listed by year. We find that the observations between 2017 and 2020 did not change much in percentage terms. Despite new companies adhering to IR, as well as companies that did not adhere and became part of the companies listed on the B3, the percentage increase between the years studied was 1.58%.

Table 2 presents the descriptive statistics. N indicates the number of observations, with all variables having 630 observations, except for the ESG score, which has only 301 due to the limited scope of its calculation in Brazilian listed companies.

It is important to note that companies have an average IR quality score (QualitIR) of 47.77% with a standard deviation of 23.22%, suggesting that there is a wide variation between the scores, especially when looking at the minimums and maximums.

4.2 IR quality and earnings quality

Table 3 shows the results of the structured panel data analysis to address the hypotheses formulated in this research. Model 1 sought to test the relationship between the voluntary adoption of IR by Brazilian companies and earnings quality. Model 2, similar to the previous model, tested the relationship between IR adoption and earnings quality, adding the number of analysts to the model as a control variable (indicating that the greater the number of analysts following company information, the more likely investors are to incorporate the information into their investment decisions), with the aim of understanding the analyst coverage of companies that adopt IR. Model 3 shows the relationship between IR quality and earnings quality, in line with H2.

It should be noted that discretionary accruals are the metric that will be related to the variables, and a reduction in this metric means higher earnings quality. Therefore, in Table 3, we expect a negative relationship between discretionary accruals and IR, which implies a positive relationship between IR and earnings quality. Similarly, we expect a positive relationship between IR quality and earnings quality, i.e. we expect to see a negative relationship between the interaction of IR and IR quality with the discretionary accruals metric (LDA).

Model 1 and Model 2 used 630 observations. It was found that in both models there was no statistically significant relationship between the voluntary adoption of IR and discretionary accruals, so no relationship with earnings quality was identified, i.e. H1 was not confirmed. Nevertheless, the positive and significant result for Leverage in all models suggests that there is a greater probability of observing discretionary accruals in companies that are more dependent on third-party capital, thus allowing for greater observation of earnings management practices.

For model 3, only 301 observations were used because the QualitIR variable covers a small number of listed companies, limiting the observations for the period. The relationship between the interaction of companies using IR and higher quality IR was negative with discretionary accruals. This relationship is statistically significant at the 10% level. In other words, for every 1 point increase in the IR quality index, the log of discretionary accruals changes by -0.00816, reaching 0.7348 for the company with the highest IR quality index (-0.00816*90.05). This suggests that companies with higher IR quality and IR adopters are less likely to manage earnings, which confirms H2.

Companies that adopt IR showed a variation in the log of discretionary accruals of around 0.460, so it was found that a company with an IR quality index as the minimum value in the sample (1.01) results in a positive relationship with the earnings management indicator of 0.4518 (-0.00816*1.01+0.460). This result indicates a

Table 2
Descriptive Statistics

VARIABLES	(1)	(2)	(3)	(4)	(5)
	N	mean	sd	min	max
LDa	630	10.33	1.203	5.901	12.53
QualidRI	301	47.77	23.22	1.010	90.05
LTam	630	21.51	1.219	19.21	25.54
Leverage	630	61.44	17.71	12.84	95.60
ROA	630	3.513	5.623	-14.31	21.82
Loss	630	0.200	0.400	0	1
N. analysts	630	4.976	4.565	0	15

Table 3
Panel Data Analysis – Discretionary Accruals, IR, and IR Quality

Variables	(1)	(2)	(3)
	LDA Panel FE	**LDA Panel RE**	**LDA Panel RE**
RI	0.113	0.132	0.460**
	(0.0940)	(0.0984)	(0.201)
QualidRI			0.00217
			(0.00237)
RI * QualidRI			-0.00816*
			(0.00426)
LTam	-0.0713*	-0.0570***	-0.0174
	(0.0269)	(0.0215)	(0.0397)
Leverage	0.00546*	0.00507**	0.00932***
	(0.00225)	(0.00219)	(0.00235)
ROA	0.0244*	0.0250***	0.0458***
	(0.00822)	(0.00878)	(0.0159)
Loss	0.497**	0.491***	0.722***
	(0.135)	(0.132)	(0.165)
N analysts		-0.00852	-0.0358*
		(0.00782)	(0.0208)
Constant	11.43***	11.45***	10.43***
	(0.601)	(0.613)	(0.949)
Observations	630	630	301
Number of Years	4	4	4
Sector FE	YES	YES	YES
Year FE		YES	YES

Note: Robust standard errors in parentheses *** p<0.01; ** p<0.05; * p<0.1.

reduction in earnings quality for companies that adopt IR, but with low quality.

To evaluate the estimated model, we use the Hausman test (H0: random effects and fixed effects coefficients are similar). If the Hausman test is significant, we reject the null hypothesis that the FE model is the most appropriate. We also apply the Chow (F) test; if it is significant, we reject the null hypothesis that the pooled model is the most appropriate, since the intercepts vary according to the individuals (IDs).

For the results in Table 3, the Chow test was performed, which indicated that the FE panel data model is the most appropriate compared to the pooled model: Model 1 (F = 6.39, p 0.0003), Model 2 (F = 6.45, p 0.0003). In addition, the Hausman test indicated that the FE panel data model is more appropriate than the RE model for Model 1 (p -0.00) and the RE model for Model 2 (p 1.00). For Model 3, the Chow test indicated that the pooled model is the most appropriate compared to the FE panel data model, Model 3 (p 0.2524). We then carried out the Breusch-Pagan Lagrange multiplier test (H0: the variance of the individual residuals is equal to zero). The result of the test for Model 3 indicated that the RE panel data model is preferable to the pooled model (p 0.00), and when the LM B-P is significant, the null hypothesis is rejected, with the RE model being more appropriate than the pooled model.

This finding may indicate that some companies engage in the IR initiative with the aim of improving their reputation, but without indicating internal changes in the implementation of Integrated Thinking. This is reflected in the low quality of IR and low ESG performance. In other words, the results indicate that companies that adopt IR and have low IR quality show signs of earnings management. In this scenario, actions known as greenwashing may be related to earnings management.

The lack of significance of the IR variable, in the absence of quality control, is consistent with the findings of Rezaee and Tuo (2019). In their study, the authors indicated that the amount of ESG information is indeed related to earnings management, which is in line with the greenwashing literature. The study is also consistent with the findings of Velte (2021) and Habib (2023), who found that higher levels of ESG disclosure are associated with lower levels of earnings management. However, this study measured the quality of IR, not its mere adoption.

The variables Leverage, ROA and Loss remained positively related to discretionary accruals in Model 3, i.e., these three variables increased in the indices. However, it is understood that the size of the company and the number of analysts influence the improvement of accounting information, i.e. reduce earnings management.

The results of the study indicate that IR quality is associated with a higher quality of accounting information. The implementation of Integrated Thinking in accordance with the IIRC guidelines has the potential to induce changes in corporate management, with the prospect of promoting stronger ethics and an increased commitment to transparency (Rezaee & Tuo, 2019; Soriya & Rastogi, 2021; Vitolla et al., 2020).

This study also corroborates findings that indicate that IR quality leads to relevant information for the market and satisfies investors' information needs (Hichri & Alqatan, 2024; Radwan & Xiongyuan, 2024). The market has the potential to respond positively to IR quality, with an increase in earnings quality being shown in an Asian sample (Radwan & Xiongyuan, 2024).

In addition, the results of the study are in line with Obeng et al. (2020) and Serafeim (2015), who pointed out that IR adoption and the Integrated Thinking approach have the potential to mitigate market pressures and opportunism on the part of management. This is due to the fact that they hope to build a long-term oriented customer base. This change should reduce pressure from investors, while incorporating sustainability into the company's business model helps to mitigate unethical or opportunistic behavior on the part of decision makers, as identified in this study.

However, some results differed from the evidence presented by Obeng et al. (2020). The adoption of IR alone did not indicate a relationship with earnings management. This can be explained by the institutional characteristics of Brazil, which may reduce the likelihood of full adherence to the initiative and improved information transparency of the firm (Bernardi & Stark, 2018).

From another perspective, Zhou et al. (2017) reported a negative relationship between IR quality and analysts' forecast errors. These studies also reflected how the quality of Integrated Reporting influences how this information has the potential to reduce information asymmetry and demonstrate transparency and improved governance, which are brought about by substantial changes in the company other than the mere adoption of the initiative.

5 Conclusion

Corporate responsibility was structured in response to societal demands for disclosure that includes the ESG impacts of a company's activities. IR was a form of disclosure that emerged to meet this demand, as its structure presents both financial and non-financial information. This report not only makes it possible to estimate the value of the company and the predictability of earnings, but also relates to the quality of earnings. Accounting earnings are one of the main metrics for the quality of accounting information, and their deterioration can be calculated based on the existence of earnings management. This study analyzed the relationship between IR adoption and the earnings quality of Brazilian companies listed on the B3.

To this end, a panel data analysis was conducted between 2017 and 2020, with 630 observations from Brazilian companies. Information was collected on IR adoption, IR quality, and financial data. The results suggest that there is no statistically significant relationship between IR adoption and earnings management in isolation. This may be due to Brazil's institutional characteristics, such as enforcement below the world average when the World Bank's force of law variable is analyzed, as well as the lack of a stakeholder-oriented capital market (Dhaliwal et al., 2012, 2014; Hong et al., 2014; Zaro et al., 2022).

However, when analyzing IR quality and earnings quality, a negative and statistically significant relationship was found. Therefore, the companies that adopted IR and had better sustainability performance had better earnings quality. This may indicate that these companies are adopting this initiative to create internal changes in terms of information transparency, and it is also expected that these companies are under less pressure to present short-term results (Mio et al., 2020; Fasan et al., 2016), as they attract a shareholder base with a long-term horizon (Serafeim, 2015).

The results of the research discussed the relationship between IR and various factors such as earnings quality, agency costs and corporate governance. The study found that the adoption and quality preparation of integrated reports can lead to higher quality information and induce changes in corporate management, promoting a more solid ethical base and a commitment to transparency.

Quality disclosure of integrated reports can also mitigate market pressures and opportunism on the part of management (Busco et al., 2019; Serafeim, 2015). However, the study also found that IR adoption alone does not indicate an internal change in management or a relationship with earnings management. The study is also consistent with previous research that shows how IR quality can influence the reduction of information asymmetry and improve governance through substantial changes in the company. These findings contribute to the consideration that Integrated Thinking can lead companies to contribute to the SDGs.

The study has limitations in terms of the metric used to analyze IR quality. Although the metric used is based on previous studies, other ways of measuring IR quality may lead to other analyses that could be explored in future studies. This study sought to identify evidence of changes in company management based on secondary data. Future research could go further with respect to this limitation and seek primary data to verify the reduction in earnings management, the increase in earnings quality, and evidence of the implementation of Integrated Thinking in companies.

In conclusion, future research on IR could explore its importance in improving the quality of accounting information and how it is triggered in academic thinking and in the market. It is also important to use samples from other countries or at an international level, considering more observations, which were limited in this study. Other characteristics could also be included in the study to verify the possibility of mediation between IR and the quality of accounting earnings.

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APPENDIX A. Definition of Variables and Source

Variables	Definition	Source
	Dependent Variable:	
LDA	$\frac{TA_{it}}{\text{Asset}_{it-1}} = \beta_0 + \beta_1 \frac{1}{\text{Asset}_{it-1}} + \beta_2 \frac{\Delta\text{Sales} - \Delta\text{Receivables}}{\text{Asset}_{it-1}} + \beta_3 \frac{\text{Fixed Assetso}}{\text{Asset}_{it-1}} + \beta_4\, Sector_i + \varepsilon_i$	The information was collected from Refinitiv. LDA is the natural logarithm of the discretionary accruals estimated by the modified Jones model, which is the absolute value of the difference between the estimated residual from Equation 1 for company i and the actual total accruals (TA)
TA	It represents the total accruals, calculated by subtracting the income before extraordinary items from the operating cash flows for the year t (Zang, 2012)	The information was collected from the Refinitiv database
Assetit-1	It is the total assets from the previous year	
ΔSales	It is the variation in sales from year t -1 to year t.;	
ΔReceivables	It is the variation in net receivables from year t -1 to year t.;	
Fixed assets	It is the gross fixed assets for the year;	
Sector	Dummy variable for each sector in the sample;	
Year	Dummy variable for each year of the analysis.	
	Main Variable of Interest	
IR	Dummy variable equal to 1 if the company publishes Integrated Reporting.	Manually collected from the Sustainability Report / Integrated Reporting of each company
ESG	ESG Score calculated by Refinitiv	The information was collected from the Refinitiv database
	Firm-level control	
LTam	Represents the natural logarithm of the company's total assets in period t.	The information was collected from the Refinitiv database
Leverage	Represents the proportion of liabilities relative to total assets in the period.	
ROA	Represents the return on assets, calculated as the ratio of net income in period t to total assets in period t -1.	
Loss	Dummy variable equal to 1 for periods when the net income in period t was negative (loss).	
.N. analysts	Number of analysts covering the company	

Supplementary Material

Supplementary Material accompanies this article.

Supplementary Data 1 - Database sample
Supplementary Data 2 - Stata script

Supplementary information related to this article can be found at https://doi.org/10.7910/DVN/BR5IJW

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