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ORIGINAL ARTICLE

Integrated reporting and shareholder value creation: International evidence

Talieh Shaikhzadeh Vahdat Ferreira[1]
https://orcid.org/0000-0002-4621-3533
Email: taliehv@gmail.com

Orleans Silva Martins[2]
https://orcid.org/0000-0002-4966-0347
Email: orleansmartins@ccsa.ufpb.br

[1] Universidade Federal da Paraíba, Centro de Ciências Sociais Aplicadas, Programa de Pós-Graduação em Administração, João Pessoa, PB, Brazil
[2] Universidade Federal da Paraíba, Centro de Ciências Sociais Aplicadas, Departamento de Finanças e Contabilidade, João Pessoa, PB, Brazil

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ABSTRACT

This study analyzes the relationship between integrated reporting and shareholder value creation of public companies in 39 countries, between 2011 and 2018. The integrated report has emerged as a means of meeting the different information needs of stakeholders, but as its presentation is voluntary, there is little information about the different ways of integrating this information and its relationship with the value creation process of companies, a gap that this study seeks to fill. Considering the integrated report in general format (RG) and the specific frameworks of the Global Reporting Initiative (GRI) and the International Reporting and Connectivity Council (IRCC), we present three effects on shareholder value creation: information asymmetry, stock price synchronicity, and earnings predictability. This study expands academic knowledge on the effects of the adoption of different integrated report formats, but can also help policymakers make decisions related to the imposition of forms of disclosure. For companies, it provides evidence that integrated reporting can be used as a market differentiation tool. Firms were grouped into three subsamples using the propensity score matching (PSM) method and their data were analyzed using multilevel regressions and difference-in-differences models. Our findings show that after the adoption of a general integrated report, shareholders gain value in the three selected perspectives (information asymmetry, stock synchronicity, and earnings predictability), mainly for companies located in developed countries. It is not the adoption of a specific disclosure format that matters, but the implementation of an integrated reporting process for financial and non-financial information. Thus, the adoption of integrated reports cannot be reduced to a symbol of legitimization, as it creates value for the shareholder regardless of the framework adopted.

Keywords: integrated reporting, disclosure, information asymmetry, stock price synchronicity, earnings predictability.

Correspondence address

Talieh Shaikhzadeh Vahdat Ferreira
Universidade Federal da Paraíba, Centro de Ciências Sociais Aplicadas, Programa de Pós-Graduação em Administração
Via Expressa Padre Zé, 289, *Campus* I – CEP: 58051-900
Castelo Branco III – João Pessoa – PB – Brazil

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Relato integrado e criação de valor para os acionistas: evidências internacionais

RESUMO

Este estudo analisa a relação entre o relato integrado e a criação de valor para os acionistas de empresas de capital aberto em 39 países, entre 2011 e 2018. O relatório integrado surgiu como um meio de atender às diferentes necessidades de informação dos stakeholders, mas, como sua apresentação é voluntária, há pouca informação sobre as diferentes formas de integração dessas informações e sua relação com o processo de criação de valor das empresas, lacuna que este estudo busca preencher. Considerando o relatório integrado em formato geral (RG) e as estruturas específicas da Global Reporting Initiative (GRI) e do International Reporting and Connectivity Council (IRCC), apresentamos três efeitos sobre a criação de valor para os acionistas: assimetria de informações, sincronicidade do preço das ações e previsibilidade dos lucros. Este estudo amplia o conhecimento acadêmico sobre os efeitos da adoção de diferentes formatos de relatório integrado, mas também pode ajudar os formuladores de políticas a tomar decisões relacionadas à imposição de formas de divulgação. Para as empresas, ele fornece evidências de que o relato integrado pode ser usado como uma ferramenta de diferenciação no mercado. As empresas foram agrupadas em três subamostras usando o método de pareamento por escore de propensão (PSM, do inglês propensity score matching) e seus dados foram analisados usando regressões multiníveis e modelos de diferença em diferenças. Nossos resultados mostram que, após a adoção de um relatório integrado geral, os acionistas ganham valor nas três perspectivas selecionadas (assimetria de informações, sincronicidade de ações e previsibilidade de lucros), principalmente para empresas localizadas em países desenvolvidos. O que importa não é a adoção de um formato específico de divulgação, mas a implementação de um processo de relato integrado para informações financeiras e não financeiras. Assim, a adoção de relatórios integrados não pode ser reduzida a um símbolo de legitimação, pois cria valor para os acionistas independentemente da estrutura adotada.

Palavras-chave: *relato integrado, divulgação, assimetria de informações, sincronicidade do preço das ações, previsibilidade dos lucros.*

1. INTRODUCTION

Identifying the extent to which changes in the way companies disclose information affect the shareholder value creation process is of great interest to market agents, as it affects investors' perceptions (Velte & Stawinoga, 2017). In recent years, the separate disclosure of financial and sustainability reports has increased the volume of information available in the markets, without necessarily providing greater transparency and understanding of the value creation process of firms (Melloni et al., 2017; Bernardi & Stark, 2018).

Integrated reporting involves the disclosure of a firm's financial and non-financial information to demonstrate the impact of one on the other (Eccles & Krzus, 2010). In this scenario, integrated reporting frameworks appear as a natural evolution to overcome the current deficiencies of corporate reports by becoming more useful and effectively meeting the information needs of stakeholders (Pistoni et al., 2018). Shareholders are considered the key stakeholders due to their increased exposure to risk and their ability to influence the firm's earnings (Atkinson & Waterhouse, 1997). Thus, this study aims to analyze the relationship between integrated reporting disclosures and shareholder value creation.

In this study, the term "integrated report in general" (RG) is used to refer to reports that seek to disclose a firm's financial and non-financial information in a single document, regardless of the adoption of a specific set of principles. When we refer to a specific integrated reporting framework, we use the terms "GRI" for integrated reporting that follows the principles of the Global Reporting Initiative (GRI) and "IRCC" for integrated reporting that follows the principles of the International Reporting and Connectivity Council (IRCC). It is important to highlight that we consider the IRCC to be the continuation of the International Integrated Reporting Council (IIRC), after its incorporation by the IFRS Foundation in 2022.

The interest in mapping the possible benefits of adopting integrated reports involves both regulators and investors and is generating relevant research opportunities in this area. An example of the latter is the concept release issued by the Securities and Exchange Commission (SEC), which asks, "How important for investors is the integrated disclosure of reports, as opposed to the separate disclosure of financial and sustainability reports?" (SEC, 2016). Furthermore, the approval by the European Parliament of Directive 2014/95/EU, which requires large firms in the European Union to disclose non-financial information from 2016 on, as well as the 2015 Target 12.6 proposal for the achievement of the United Nations (UN) Sustainable Development Goals (SDG), which encourages firms to adopt sustainable practices and integrate sustainability information into their reporting cycles, show that holistic

but objective disclosure is an irreversible movement and a topic of great importance in the international arena (Camilleri, 2018).

In this sense, the president of BlackRock, the world's largest asset manager, emphasized in his 2018 annual letter the importance of holistic corporate disclosure, including the presentation of a long-term value creation process (BlackRock, 2019). The rationale for this expectation is that with a clearer view of long-term performance, asset pricing and performance comparisons between companies can be more accurate, benefiting capital allocation and managers' internal decision making, resulting in less earnings volatility.

The possible benefits of adopting integrated reports have been highlighted in different studies, such as the reduction of information asymmetry (Barth et al., 2017; Bernardi & Stark, 2018; Flores et al., 2019; García-Sánchez & Noguera-Gámez, 2017; Zhou et al., 2017), the decrease in the cost of capital (Zaro, 2019; Zhou et al., 2017), and even the increase in firm value (Algiers et al., 2015; Barth et al., 2017; Lee & Yeo, 2015; Merveskemper & Streit, 2016).

However, the studies that analyze the impact of changes in the form of corporate disclosure on shareholder value creation consider a broader set of effects. For instance, in addition to information asymmetry (Barth et al., 2017; Bernardi & Stark, 2018; Hope, 2003), the effect on stock price synchronicity (Bissessur & Hodgson, 2012; Kim & Shi, 2012; Morck et al., 2000; Ntow-Gyamfi et al., 2015) and earnings predictability (Alipour et al., 2019; Gaio, 2010; Kang et al., 2012; Mahjoub & Khamoussi, 2012; Ye et al., 2014) can be also highlighted.

In this sense, this study contributes to the literature by expanding the evidence on the effects of adopting the integrated report, with an emphasis on three effects: information asymmetry, stock price synchronicity, and earnings predictability. Increasing transparency through the adoption of integrated reports improves the understanding of the company's current and future performance, reducing information asymmetry (Bernardi & Stark, 2018). In the latter case, the stock price is based more on company-specific information and less on market or industry information. When there is greater incorporation of company-specific information in the price, it diverges from the market average (Morck et al., 2000).

Moreover, it seems that integrated reporting not only increases corporate transparency, but can also be used by managers for better internal decision making, since by making the mechanisms of value creation explicit, the company's strategy and capital allocation can be changed and lead to changes in the business model (Macias & Farfan-Livero, 2017). For example, considering the specific IRCC framework, the positive effects of the implementation of "integrated thinking" can impact earnings quality, making them more predictable (IIRC, 2013).

This analysis is performed by considering three different samples of companies that have integrated reports, in order to verify whether the adopted format has the capacity to change the results. One sample considers integrated reporting adopters regardless of the format adopted, denominated "Integrated Reports in General" (RG), and the other two samples specifically segregate those that adopt the GRI format (GRI) and those that adopt the IRCC format (IIRC). The connection between these databases and the companies' financial information allowed the hypotheses raised to be analyzed using multilevel regressions based on the difference-in-differences (DiD) methodological design, which increases the robustness and consistency of the findings.

The main findings confirm that the adoption of integrated reports cannot be reduced to a symbol of legitimization, as it creates value for shareholders regardless of the formed adopted. Thus, we contribute to the understanding of the effects of different integrated reporting formats on information asymmetry, price synchronization, and earnings predictability from an international perspective. As far as we know, this is an innovation in the recent literature.

This is important because integrated reporting disclosures are voluntary, and many studies are limited only to South Africa, where such disclosures are mandatory (Barth et al., 2017; Bernardi & Stark, 2018; Lee & Yeo, 2015; Zhou et al., 2017). Therefore, we offer an international context design. Moreover, this study also responds to Dumay et al. (2016) call for research to critically analyze the possible benefits of adopting the IRCC integrated reporting framework as opposed to general formats, thus advancing the mapping of information integration effects considering the reporting format.

2. HYPOTHESIS DEVELOPMENT

The perception that financial information offers a partial view of the company's current and future performance has created a demand for voluntary disclosure frameworks, seeking a more holistic view of the firm's value creation

process (Bernardi & Stark, 2018). The creation of a framework by the GRI has significantly expanded the disclosure of non-financial information in reports, and its worldwide adoption has made it a tool of legitimization in the markets (Eccles & Serafeim, 2011).

The increased demand for information by various agents, combined with the lack of consensus on which information is relevant, has resulted in bulky and dysfunctional reports. In this context, stakeholders have a new information demand for more concise reports that not only provide more information about the company, but also clearly demonstrate the interconnections between financial and non-financial information, effectively enhancing their understanding of the value creation process of firms (Zhou et al., 2017). In this sense, it is important to determine whether this disclosure regime (integrated reporting) has been used by companies only as a legitimization tool or whether it can enhance corporate transparency, reducing information asymmetry and firms' stock market synchronicity, and positively impact earnings predictability.

2.1 Information Asymmetry

The demand for higher levels of corporate transparency has led to an increase in the amount of information disclosed, but it has also increased the complexity of making good use of the various reports available (Zhou et al., 2017). To minimize these challenges, some firms have started to publish integrated reports that highlight in an organized and coherent way the company's strategy, corporate governance issues, performance, future prospects, and their respective links with social and environmental issues (García-Sánchez & Noguera-Gámez, 2017a). However, the effectiveness of voluntary disclosure largely depends on the quality of the information disclosed (Zhou et al., 2017).

The integration of reports helps to reduce information asymmetry, as it expands the range of information disclosed, enables the understanding of the interconnections between financial and non-financial dimensions, and reduces the uncertainties related to the assessment of the firm's performance (Zhou et al., 2017). Alone, integration, regardless of the format used, can provide the benefit of more comprehensive reporting, making the value of information relevant.

In the literature, the effects of integrated reporting are mainly documented considering the South African market, as it is the only market that has adopted an integrated framework as mandatory for corporate disclosure (Barth et al., 2017; Bernardi & Stark, 2018; Zhou et al., 2017). The findings of these studies suggest that there is a negative relationship with information asymmetry, which can become more significant as the quality of the information disclosed increases (Barth et al., 2017).

Studies with international samples, on the other hand, show mixed results, as there is evidence that integrated reporting can increase corporate transparency regardless of the format used (García-Sánchez & Noguera-Gámez, 2017) and when the specific IRCC integrated reporting framework is used (Flores et al., 2019). However, there is also evidence that no improvements in the information environment were observed after such adoption (Martinez, 2016). No studies were identified that relate these different reports and frameworks (general, GRI and IRCC) and their effects on information asymmetry.

Given the above, using the specific GRI and IRCC databases, where there is exact identification of the integrated reporting form used, we expect that the adoption of the integrated report in general (RG) can mitigate information asymmetry problems, making possible a reduction in analyst forecast error, reducing this divergence of results in international samples. As the IRCC framework explicitly promotes the guidelines not only on the connections between different types of capital, but also seeks to carry out this disclosure in a concise way, focusing on the material information for capital providers and considering a long-term perspective (Bernardi & Stark, 2018; Zhou et al., 2017), we expect a more pronounced effect on information asymmetry when firms adopt the IRCC framework. These are our first hypotheses:

Hypothesis 1: The disclosure of integrated reports in general (RG) is positively associated with analyst forecast accuracy.

Hypothesis 1a: The positive association between the disclosure of integrated reports and analyst forecast accuracy is more pronounced when the company uses the IRCC framework.

2.2 Stock Price Synchronicity

In an efficient market, stock prices reflect investors' expectations regarding the firm's future cash generation

based on both firm-specific information and general market information (Roll, 1988). In the absence of specific information, investors substitute their value expectations based on the information available in the market (Jin & Myers, 2006). The degree to which stock prices depend on market information can be defined as market synchronicity, and the degree to which prices reflect firm-specific information can be defined as idiosyncratic dependence (Morck et al., 2000; Khandaker, 2011). Therefore, greater synchronicity is associated with greater inefficiencies in the markets, and there will be a better forecast of future earnings when there is less synchronicity (Durnev et al., 2003).

The increase in market synchronicity can occur due to different events, such as the loss of confidence or even limited access to firm-specific information (Jin & Myers, 2006) and the reduction of firm transparency (Bissessur & Hodgson, 2012). In this sense, the increase in the quality of disclosed information leads to a reduction in stock price synchronicity, as it provides more firm-specific information, allowing investors to formulate more accurate forecasts (Jin & Myers, 2006). Nevertheless, this synchronicity tends to be lower in economies with greater investor protection (Morck et al., 2000), greater industrialization, and a freer press (Bushman & Smith, 2001). However, the international evidence is mixed and varies, especially with respect to mandatory and voluntary information flows (Ashbaugh-Skaife et al., 2005).

This study assumes that the integration of financial and non-financial information enhances market participants' understanding of the firm's value creation process and increases the incorporation of firm-specific information in stock prices, thereby reducing stock synchronicity. In addition, we assume that integration based on the IRCC framework allows for greater corporate transparency and, therefore, greater incorporation of firm-specific information into stock prices. Thus, the second set of hypotheses is presented:

Hypothesis 2: The disclosure of integrated reports in general (RG) is negatively associated with stock price synchronicity with the market.

Hypothesis 2a: The negative association between the disclosure of integrated reports and stock price synchronicity is more pronounced when the company uses the IRCC framework.

2.3 Earnings Predictability

Earnings are the most accurate measure for assessing current performance and making valuation projections (Dechow & Schrand, 2004), and their quality depends on the proportion of earnings derived from recurring sources. Thus, high-quality earnings will be sustainable in future periods and can be assessed by their persistence or predictability (Lipe 1990, Dechow et al., 2010). Earnings persistence is the probability that current earnings will be repeated in the future, and predictability is given by the smallest error in estimating future earnings from past earnings (Lipe, 1990; Dechow et al., 2010; Gaio, 2010; Yeh et al., 2014). Therefore, earnings predictability is one of the main concerns of investors because less predictable earnings determine the risk premium and impact the firm's valuation (Graham et al., 2005).

The construction of corporate information in an integrated way can not only increase the transparency of companies, but can also be used by managers for decision making (Beck et al., 2015), positively impacting earnings quality. The integration of information presupposes greater communication between the different areas of the organization, enabling clearer identification of how the company uses or affects the environment in which it operates (IIRC, 2013).

Therefore, we assume that the integration of financial and non-financial information can not only enhance the transparency of firms, but also have a positive effect on internal decision making, which may be associated with more predictable earnings. As the IRCC provides guidelines for the establishment of integrated thinking, which should permeate internal decision making and impact the analyses related to the adopted business model (IIRC, 2013), it is expected that firms that use the IRCC framework will obtain more pronounced benefits than others. Thus, the last set of hypotheses is presented:

Hypothesis 3: The disclosure of integrated reports in general (RG) is positively associated with a firm's earnings predictability.

Hypothesis 3a: The positive association between the disclosure of integrated reports and earnings predictability is more pronounced when the company uses the IRCC framework.

3 METHOD

The sample is composed of firms that voluntarily disclosed integrated reports from 2011 to 2018 (the treatment group). The control group is formed of peer companies identified by propensity score matching (PSM) (they do not integrate reports). The starting point of the study period is marked by the disclosure of the IRCC's discussion paper "Towards Integrated Reporting: Communicating Value in the 21st Century," published in 2011, which invited companies from all over the world to voluntarily join the principles of integrated reporting (Melloni et al., 2017). The data were collected from six sources: IRCC Examples Database, GRI Report List, Thomson Reuters Eikon, MSCI Indexes, IFRS.org, and Worldwide Governance Indicator. All variables are winsorized at 1%.

We use three integrated reporting samples: (i) the RG sample, which comprises all the companies that adopt integrated reporting in general, regardless of the format, and are listed in the GRI and IRCC databases; (ii) the GRI subsample, which includes only those firms in the GRI database and not listed in the IRCC database; and (iii) the IRCC subsample, which comprises only those companies that integrated their reports and are listed in the IRCC database. Further details on the samples are provided in Table 1.

Table 1
PSM sample construction

	RG	GRI	IRCC
Companies with an integrated report in the databases	1,385	853	532
South African companies	(162)	-	(162)
Companies with no data in Eikon Reuters	(272)	(186)	(86)
Duplicate companies in the databases	(16)	(7)	(9)
GRI-integrated companies that use the IRCC format	(135)	(135)	-
Subtotal	**800**	**525**	**275**
Do not have PSM covariance information	(20)	(14)	(6)
Total	**780**	**511**	**269**

Source: *Prepared by the authors.*

Our subsamples include 780 (RG), 511 (GRI), and 269 (IRCC) firms with integrated reports, which are identified in the regressions as a dummy variable (IR) that takes the value 1 (one) if the report is integrated and 0 (zero) otherwise.

3.1 Identification of Peer Companies

For the comparative analysis of the effects of integrated report disclosure, control groups are built using the PSM method with the nearest neighbor matching criterion with replacement (Austin, 2011), which is widely used to isolate the effects of an intervention and solve the problem of multidimensional pairing. For that, we considered all firms located in the same 39 countries as the full sample that did not publish integrated reports, resulting in the identification of 44,206 different companies to be matched with the 780 firms in the RG sample (about 1.8% of the total firms). These covariant variables to establish the pairings (country, industry, and firm size) were selected due to their significant influence and strong correlations with unobservable variables that affect the performance of both groups (Martinez, 2016; Flores et al., 2019; Zaro, 2019).

After estimating the PSM, the quality of the pairing was verified using the *ptest* package available in Stata (Sant'Anna & Song, 2019), identifying results of 0.894 (RG), 0.888 (GRI), and 0.983 (IRCC), confirming that the control and treatment groups were properly balanced. In addition, the percentage of mean sample bias after pairing remained below 1% for all samples.

3.2 Econometric Model

To test the proposed hypotheses, the difference-in-differences (DiD) approach is used. Considering that the IRCC released its suggested framework for international use in 2013, encouraging the preparation of 2014 reports based on it, 2014 is defined as the treatment date for the control group. The analysis of the impact of the adoption

of integrated reports on shareholder value creation (VC_{it}) considers three effects: information asymmetry (H_1), stock price synchronicity (H_2), and earnings predictability (H_3). These effects are individually related to three dummy variables that identify (i) the adoption of integrated reports (*IR*), (ii) the period after the adoption of these reports (*POS*), and (iii) the interaction between these two variables (*IR*POS*), which isolates the effect of the adoption of integrated reports only in the period after the IRCC framework. In addition, firm and country level control variables and year and industry fixed effects (δ_t and γ_s), are included, as shown in Equation 1.

$$VC_{it} = \alpha + \beta_1 IR_{it} + \beta_2 POS_{it} + \beta_3 \left(IR_{it} * POS_{it} \right) + \sum FirmControls_{it} + \sum CountryControls_{jt} + \delta_t + \gamma_s + \varepsilon_{it} \quad (1)$$

We expect β_3 to be different from zero and statistically significant, indicating that the adoption of integrated reports influences the creation of shareholder value, especially in the period after the adoption of the IRCC framework. Moreover, according to the hypotheses, we expect positive coefficients in the models with analyst forecast accuracy (H_1) and the earnings predictability (H_3), and negative coefficients in the models with stock synchronicity (H_2).

The models were estimated using hierarchical linear modeling (HLM) because they have variables at two levels (firm and country). In terms of information quality, the country-level information environment plays a complementary role (Langbein & Knack, 2010; Houqe & Monem, 2016), which is why we control for the country's governance quality and International Financial Reporting Standards (IFRS) experience. These country-level variables have a relevant influence on the firm-level variables, which justifies the appropriateness of HLM given the variation within and between levels (Dong & Stettler, 2011).

3.3 Variables of Interest

We use analyst forecast accuracy (*AFA*) to quantify the information asymmetry related to each company. The choice of *AFA* is based on the fact that analysts are market agents specialized in processing corporate information and are thus the first to benefit from greater corporate transparency (Hope, 2003; García-Sánchez & Noguera-Gámez, 2017; Zhou et al., 2017; Bernardi & Stark, 2018; Flores et al., 2019). Following Hope (2003) and Flores et al. (2019), this proxy is measured for each company *i* in year *t*, as in Equation 2:

$$AFA_{it} = \frac{-\left| EPS\_A_{it} - EPS\_F_{it} \right|}{Stock\ price\ at\ the\ beginning\ of\ the\ year_{it}} \quad (2)$$

where *AFA* is analyst forecast accuracy, *EPS_A* is the actual earnings per share reported by the firm at the end of year *t*, and *EPS_F* is the consensus of analyst forecasts for the same period. The difference between these two variables is weighted by the stock price of company *i* at the beginning of year *t* (considered to be the first price reported by the third business day of each year). The closer the *AFA* value is to zero, the greater the analyst forecast accuracy. Thus, as the disclosure of integrated reports increases firm transparency, we expect a positive relationship with an increase in this accuracy, indicating a smaller distance between the projected and reported EPS.

Stock price synchronicity is measured as the result of the coefficient of determination (R^2) of the market model (Morck et al., 2000). Following Ntow-gyamfi et al. (2015) and Gul et al. (2010), we measure firm-level synchronicity through the logistic transformation of this coefficient, as in equations 3 and 4. R_{it} is the return of firm *i* on day *t*; R_{mt} is the market return of each country on day *t*, according to the market index provided by the Morgan Stanley Capital International (MSCI); and ε_{it} is the error term. We used daily data, which generated an R^2 for each company in each year.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (3)$$

$$Sync_{it} = \log\left(\frac{R_{it}^2}{1 - R_{it}^2} \right) \quad (4)$$

$Sync_{it}$ is the synchronicity between the stock return *i* and the market return *m* in year *t*; and R_{it}^2 is the coefficient of determination obtained in Equation 3. When applying the logarithmic transformation, the values of R_{it}^2 equal to or less than 0.5 are transformed into values equal to zero or negative, and the higher values of this variable reflect greater synchronicity. The lower the value of *Sync*, the greater the efficiency of stock prices in reflecting specific information from firms. According to H_2, we expect the disclosure of integrated reports to have a negative relationship with stock synchronicity.

To measure earnings predictability, we use the standard deviation of the error of the earnings persistence model (Lipe, 1990). We assume that past earnings can explain current earnings (Dechow & Schrand, 2004; Francis *et al.*, 2004), according to Equation 5:

$$X_{it} = \beta_0 + \beta_1 X_{it-1} + \varepsilon_{it} \quad (5)$$

where X_{it} is the earnings before tax of company *i* in year *t*, weighted by total assets at the end of *t-1*; X_{it-1} is the earnings before tax of company *i* in year *t-1*, weighted by total assets at the end of *t-2*; and ε_{it} is the error term, whose standard deviation indicates the predictability of the firm's earnings (Lipe, 1990; Francis et al., 2004; Gaio, 2010; Yeh et al., 2014), as shown in Equation 6:

$$Pred_{it} = -\delta(\varepsilon_{it}) \quad (6)$$

The closer $Pred_{it}$ ($\varepsilon_{it} \approx 0$) is to zero, the more persistent the firm's earnings are. In this calculation, we consider the average of the residuals for each industry in each country.

3.4 Control Variables

We identify some important phenomena that need to be controlled for at the firm and country level. The descriptions of the variables and the expected signs for each variables of interest are presented in Table 2. Larger companies are required by their stakeholders to disclose more information due to higher agency costs, which reduces information asymmetry (García-Sánchez & Noguera-Gámez, 2017; Zaro, 2019). These companies also report higher quality earnings, showing a direct relationship between firm size and earnings predictability (Gaio, 2010; Yeh et al., 2014). However, there is no consensus on the relationship between stock price synchronicity and firm size. This is because if the firm is an industry leader or highly representative of the market, it can be a reference for the pricing of other firms or a driver of market performance, thus increasing its synchronicity with the market, even if its stock price incorporates specific information (Piotroski & Roulstone, 2004; Bissessur & Hodgson, 2012).

Market-to-book (*MB*) is considered a measure of growth opportunities, and firms with greater *MB* tend to use voluntary information disclosure more widely to reduce information asymmetry, enabling the incorporation of more specific information in their pricing (Bushman & Smith, 2001; Gul et al., 2010). However, companies with greater growth opportunities are at a stage of business cycle development where past data may not be useful for predicting the future, which naturally leads to less predictable earnings (Yeh et al., 2014).

Table 2
Synthesis of control variables

Code	Description / Expected Signs	Level	AFA	Sync	Pred
Size	The firm's size is given by the natural logarithm of total assets at the end of year t.	Firm level	+	+/-	+
MB	Market-to-book is the firm's market value divided by its book value at the end of year t.		+	-	-
ROA	Return on assets is the firm's operating income divided by its total assets at the end of year t.		+	-	+
ESG	ESG (i.e., environmental, social, and governance) is measured by the annual ESG score from Thomson Reuters Eikon.		+	-	+
IFRS_E	IFRS experience is the number of years since the mandatory adoption of IFRS.	Country level	+	+/-	-
WGI	The country's corporate governance quality is measured through the 6 dimensions of the World Bank's WGI index (World Giving Index).		+	-	-

Source: *Prepared by the authors.*

According to signaling theory, the most profitable firms (*ROA*) are more interested in voluntarily disclosing information in order to obtain greater economic benefits from good news (Barth et al., 2017). Therefore, we expect that companies with higher *ROA* have greater disclosure practices, which leads to a reduction in asymmetry and synchronicity (Bernardi & Stark, 2018; Flores et al.; 2019; García-Sánchez & Noguera-Gámez, 2017), in addition to more persistent earnings (Alipour et al., 2019; Kang et al., 2012; Mahjoub & Khamoussi, 2012).

The expansion of non-financial information (such as *ESG*) in reports also suggests an increase in the relevance of this type of information, which may minimize the firm's information asymmetry (Bernardi & Stark, 2018; Flores et al., 2019), reducing stock synchronicity (Grewal et al., 2018). Firms committed to the disclosure of non-financial information usually adopt practices that benefit their performance, which has a positive impact on earnings predictability (Mahjoub & Khamoussi, 2012; Kang et al., 2012).

Regarding country characteristics, due to the complexity of implementing the IFRS standards (*IFRS_E*), their benefits seem to increase over the years (Houqe & Monem, 2016). We expect an increase in market transparency and a reduction in information asymmetry as the number of years since the mandatory adoption of

IFRS increases. On the other hand, the effect on stock synchronicity is controversial, as some studies find a reduction after IFRS adoption (Kim & Shi, 2012), while others show a temporary effect that is reversed after a few years (Bissessur & Hodgson, 2012; Dasgupta, Gun & Gao, 2010). And IFRS adoption increases the variability of earnings, reducing their predictability (Doukakis, 2010).

Finally, we expect that the higher the country's corporate governance quality (*WGI_C*), the better the information environment in the market, enabling the incorporation of more specific information from firms (Coluccia et al., 2018) and preventing the use of earnings management practices, which can lead to less predictable earnings (Houqe & Monem, 2012).

3.5 Descriptive Statistics

Table 3 presents the descriptive statistics of the main variables, considering the division of the full sample into two groups: treated and control companies. The means of the three variables of interest (*AFA*, *Sync,* and *Pred*) are lower in the treated group than in the control group, with statistically different means. In the treated group, there is an average earnings forecast error (lack of accuracy) of around US$ 0.0447 per US$ 1 of the firm's stock price at the beginning of the year, while in the control subsample this error is about US$ 0.0481.

Regarding stock synchronicity, the average of -0.2360 in the treated group indicates that the coefficient of determination (R^2) of the relationship between the firm's stock returns and the market returns is below the 0.50 value and smaller for this subsample than for the control group (-0.3317), revealing that the firms in the treated group carry more firm-specific information in their prices. The earnings predictability of the treated group is also greater, since the standard deviation of the predictability error is smaller (-0.0331) than the standard deviation of the control subsample (-0.0425).

All these differences in means are statistically significant, according to the *t* statistics presented in the last column of Table 3 (p-value <0.05). The firms that disclose integrated reports (treated group) are larger than the firms that usually do not disclose this type of report, which is consistent with the prediction that larger firms have greater structure and demand for information (García-Sánchez & Noguera-Gámez, 2017; Zaro, 2019). These firms also have greater growth opportunities, as they tend to have greater scope for transparency (Bushman & Smith, 2001; Gul et al., 2010; Flores et al., 2019).

Table 3
Descriptive statistics of the full sample (RG)

Variables	Treated			Control			Difference in Means (t Stat.)
	N	Mean	Standard Deviation	N	Mean	Standard Deviation	
AFA	4,964	**-0.0447**	0.0975	17,393	**-0.0481**	0.0975	-1.99***
Sync	3,090	**-0.2360**	0.9673	14,431	**-0.3317**	0.9655	-4.99***
Pred	4,207	**-0.0331**	0.0410	19,180	**-0.0425**	0.0572	-10.03***
Size	6,187	22.4193	2.2001	28,670	21.7048	2.2924	-22.39***
MB	6,083	2.1978	2.4286	27,970	1.9319	2.4894	-7.58***
ESG	3,502	65.7221	14.9329	10,772	53.4191	17.9878	-36.58***
ROA	6,185	0.0395	0.0758	28,664	0.0210	0.0948	-14.37***
IFRS_E	6,240	6.0016	4.6590	29,328	4.2119	4.6800	-27.45***
WGI_C	6,240	0.9316	0.7642	29,328	1.0500	0.6275	13.06***

Source: *Prepared by the authors.*

Among the control variables, the firms in the treated group have higher *ESG* values (65.72) than those in the control group (53.41), suggesting that companies seeking to integrate their reports have higher levels of non-financial information disclosure than those that choose not to adopt this practice, according to Zhou et al. (2017), Bernardi and Stark (2018), and Flores et al. (2019). The *ROA* of treated companies is also higher than that of control firms (3.95% against 2.10%), confirming that firms with higher profitability are more interested in voluntarily disclosing information (Kang et al., 2012; Mahjoub & Khamoussi, 2012).

The firms in the treated group also have greater experience with IFRS (6.00 years, against 4.21 in the control group), indicating that the integration of reports is a practice adopted with greater intensity in countries that also commit to IFRS adoption. The only control variable that shows a reduction in the treated group is

WGI_C, which suggests that the adoption of integrated reporting practices is more frequent among companies located in countries with a lower level of corporate governance, indicating the search for a substitution effect by the companies.

4 RESULTS

Considering the RG sample, the means of the three variables of interest (*AFA*, *Sync*, and *Pred*) are lower in the treated group than in the control group, with statistically different means. This finding is consistent with the proposed hypotheses and with the previous literature, indicating that firms that disclose integrated reports benefit from greater transparency (García-Sánchez & Noguera-Gámez, 2017; Zhou et al., 2017; Bernardi & Stark, 2018; Flores et al., 2019).

Moreover, some characteristics can be confirmed when we compare the means of the two groups. Treated companies are larger, which is consistent with the prediction that larger firms have greater structure and demand for information (García-Sánchez & Noguera-Gámez, 2017; Zaro, 2019); have higher growth opportunities, as they tend to have greater scope of transparency (Bushman & Smith, 2001; Gul et al., 2010; Flores et al., 2019); have higher *ESG* values, suggesting that companies that integrate reports have higher levels of non-financial information disclosure than others that do not disclose (Zhou et al., 2017; Bernardi & Stark, 2018; Flores et al., 2019); and have higher *ROA*, confirming that firms with higher profitability are more interested in voluntarily disclosing information (Kang et al., 2012; Mahjoub & Khamoussi, 2012).

4.1 Information Asymmetry Analysis

In the DiD estimation for analysts' forecast accuracy (*AFA*), we observe, in Table 4, a significant difference in the pre-and post-adoption periods only in the IRCC subsample. This indicates that *AFA* is higher among companies that disclose an IRCC integrated report even before they receive treatment and is maintained thereafter, suggesting that the specific adoption of the IRCC framework tends to alter the *AFA* as predicted in H_{1a}.

Table 4
Difference-in-differences of AFA

		RG		GRI		IRCC	
Panel A – Before adoption		**N**	**AFA**	**N**	**AFA**	**N**	**AFA**
Treated	(1)	1,511	-0.043	840	-0.048	670	-0.003
Control	(2)	5,959	-0.048	4,626	-0.050	3,042	-0.011
Difference	(1) – (2)		**0.006***		**0.002**		**0.008*****
t-Test			*1.86*		*0.45*		*4.81*
Panel B – After adoption		**N**	**AFA**		**AFA**	**N**	**AFA**
Treated	(1)	3,453	-0.046	2,209	-0.052	1,230	-0.002
Control	(2)	11,434	-0.048	8,659	-0.050	5,676	-0.014
Difference	(1)– (2)		**0.002**		**-0.002**		**0.012*****
t-Test			*1.15*		*0.70*		*9.53*

Note: *Significance level: * 10%, ** 5%, *** 1%.*
Source: *Prepared by the authors.*

The results of the estimations based on Equation 1 for *AFA*, reported in Table 5, confirm that only the firms that adopted the IRCC guidelines (IRF) showed an increase in *AFA* in Model 1 in the post-adoption period ($\beta_3 > 0$). Therefore, H_1 can only be confirmed for this subsample of companies that specifically adopt the IRCC guidelines. For the other two subsamples (RG and GRI), *AFA* is only affected by the disclosure of integrated reports in the period after (β_3) when controlling for firm and country characteristics (models 2-4). It is worth noting that in the three subsamples, when the treated group is considered for the whole period, a negative relationship is observed ($\beta_1 < 0$), which means that only in the period after the adoption of voluntary integration, regardless of the format, there is a greater volume of relevant information, reducing information asymmetry.

These findings follow the literature (Barth et al., 2017; García-Sánchez & Noguera-Gámez, 2017) and converge with the specific case of reducing information asymmetry identified in the South African market,

where adoption is mandatory (Barth et al., 2017; Zhou et al., 2017; Bernardi & Stark, 2018). This result is more pronounced for the subsample that adopted the IRCC framework, especially when we consider the control of company characteristics (M1, M2, and M4), when $\beta_3 > 0$, confirming sub-hypothesis H_{1a}.

Overall, the control variables at the firm level (*Size*, *MB*, *ESG*, and *ROA*) are significantly and positively associated with *AFA*, as expected (Barth et al., 2017; García-Sánchez; Noguera-Gámez, 2017; Bernardi & Stark, 2018), and at the country level (*IFRS_E* and *WGI_C*), only IFRS_E shows the ability to influence integrated reporting, suggesting that for some firms, its adoption can encourage companies to follow the market with greater transparency, but other firms tend to have higher corporate transparency to differentiate themselves (Houqe & Monem, 2016).

Table 5
IR and analyst forecast accuracy

Samples	RG				GRI				IRCC			
Variables	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**
(α) Constant	-0.0902***	-0.1271***	-0.1285***	-0.1259***	-0.0649***	-0.1347***	-0.1351***	-0.1638***	-0.0075***	-0.0423***	-0.0467***	-0.0348***
	(-4.71)	(-12.49)	(-11.48)	(-8.06)	(-1.16)	(-3.10)	(-9.77)	(-8.11)	(-3.20)	(-7.27)	(-7.79)	(-4.44)
(β_1) IR	0.0028	-0.0033	-0.0033	-0.0093***	-0.0002	-0.0077*	-0.0070*	-0.0170***	-0.0007	-0.0014	-0.0007	-0.0033*
	(0.89)	(-1.15)	(-1.15)	(-2.83)	(-0.06)	(-1.84)	(-1.67)	(-3.50)	(-0.40)	(-0.86)	(-0.43)	(-1.75)
(β_2) Pos	-0.0025	-0.0005	-0.0006	-0.0023	-0.0100**	-0.0037	-0.0030	-0.0045	-0.0001	-0.0006	0.0003	-0.0013
	(-0.72)	(-0.16)	(-0.18)	(-0.57)	(-1.99)	(-0.81)	(-0.66)	(-0.85)	(-0.01)	(-0.25)	(0.16)	(-0.51)
(β_3) IR*Pos	**0.0051**	**0.0042**	**0.0043**	**0.0097****	**0.0060**	**0.0057**	**0.0046**	**0.0151****	**0.0048****	**0.0042****	**0.0028**	**0.0041***
	(1.34)	**(1.21)**	**(1.22)**	**(2.38)**	**(1.08)**	**(1.12)**	**(0.90)**	**(2.54)**	**(2.24)**	**(1.99)**	**(1.36)**	**(1.72)**
(β_4) Size		0.0018***	0.0018***	0.0013**		0.0021***	0.0020***	0.0030***		0.0012***	0.0012***	0.0007**
		(4.68)	(4.68)	(2.17)		(4.30)	(4.04)	(3.59)		(5.32)	(5.31)	(2.24)
(β_5) MB		0.0025***	0.0025***	0.0010***		0.0029***	0.0030***	0.0021***		0.0006***	0.0006***	0.0001
		(8.98)	(7.24)	(3.13)		(7.57)	(7.71)	(4.60)		(3.48)	(3.57)	(0.61)
(β_6) *ROA*		0.5332***	0.5333***	0.5768***		0.5737***	0.5742***	0. 5778***		0.1279***	0.1273***	0.1380***
		(57.74)	(57.71)	(47.37)		(47.07)	(47.12)	(36.35)		(19.26)	(19.17)	(17.84)
(β_7) *IFRS_E*			-0.0001	-0.0012**			0.0010**	0.0006			0.0010***	0.0006***
			(-0.07)	(-2.05)			(2.39)	(1.10)			(4.00)	(2.61)
(β_8) *WGI_C*			0.0019	0.0052			-0.0008	-0.0015			0.0003	-0.0005
			(0.35)	(0.86)			(-0.13)	(-0.23)			(0.18)	(-0.27)
(β_9) *ESG*				0.0001***				0.0002***				0.0001***
				(3.36)				(3.67)				(2.90)
Observations	22,357	22,349	22,349	13,024	16,334	16,198	16,198	9,912	10,618	10,602	10,602	7,040
Wald	398.60***	4,452.52***	4,452.28***	2,969.93***	214.33***	2,945.28***	2,951.89***	1,766.92***	189.42***	669.12***	687.39***	544.18***
ICC	8.28%	9.16%	9.21%	11.05%	8.45%	9.07%	10.53%	10.54%	5.01%	5.81%	5.55%	4.27%

Note: *The values in parentheses represent the t-test of the coefficient. Significance level: * 10%, ** 5%, *** 1%.*
Source: *Prepared by the authors.*

According to the ICC results, the country where the companies are located is a relevant characteristic to consider in the multilevel analysis. In each model, it indicates the percentage of *AFA* variation that is explained by country-level characteristics, which exceeds 10% in the RG and GRI subsamples. This confirms the choice of HLM estimation.

To explore the identified relationships from different perspectives, and considering that the sample has high heterogeneity in terms of countries and companies, we conducted a robustness analysis by segmenting the sample between developed and non-developed countries, according to the MSCI classification, and between larger and smaller companies, considering the median total assets for each country. The results showed significant relationships between *AFA* and the variable of interest (β_3) among firms located in developed countries and with a larger size only in the RG and GRI subsamples.

These results are in line with the findings of previous studies that observed a reduction in information asymmetry after the disclosure of integrated reports, especially in countries with greater legal protection, and that larger

companies tend to have a higher level of disclosure (García-Sánchez & Noguera-Gámez, 2017; Zaro, 2019).

4.2 Stock Synchronicity Analysis

Table 6 shows that the DiD analyses related to stock price synchronicity in the three subsamples show significant differences in the pre-treatment period and slightly higher post-treatment values in the GRI (7.70) and IRCC (3.11) subsamples. This means that the adoption of integrated reporting, regardless of the format, can contribute to the incorporation of firm-specific information in the stock price, thereby reducing its market synchronicity.

Table 6
Difference-in-differences of SYNC

		RG		GRI		IRCC	
Panel A – Before adoption		**N**	**SYNC**	**N**	**SYNC**	**N**	**SYNC**
Treated	(1)	2,033	-0.181	1,161	-0.140	788	-0.120
Control	(2)	10,992	-0.380	7,929	-0.321	4,501	-0. 209
Difference	(1) – (2)		**0.199*****		**0.181*****		**0.088****
t-Test			*8.35*		*6.01*		*2.43*
Panel B – After adoption		**N**	**SYNC**		**SYNC**	**N**	**SYNC**
Treated	(1)	4,206	-0.219	2,788	-0.206	1,364	-0.221
Control	(2)	18,322	-0.353	14,032	-0.036	7,509	-0.307
Difference	(1) – (2)		**0.134*****		**0.153*****		**0.086*****
t-Test			*7.93*		*7.70*		*3.11*

Note: *Significance level: * 10%, ** 5%, *** 1%.*
Source: *Prepared by the authors.*

Table 7 shows that in the three samples, when the whole analysis period is considered, the firms that integrated reports are unable to incorporate firm-specific information to distance themselves from the average market return ($\beta_1 > 0$). Only after the treatment (*IR*Pos*) do the stock returns differ from the market average returns ($\beta_3 < 0$) in the RG and GRI subsamples, and after controlling for company and country characteristics. These findings confirm hypothesis H_2 and are in line with previous studies (Jin & Myers, 2006; Morck et al., 2000).

The findings for the IRCC subsample, which comprises only those companies that adopt the IRCC integrated reporting format, show results in the same direction (negative association between *Sync* and *IR*), but β_3 is not significant in M1 and has a lower magnitude and confidence level than in the full sample (RG) in the other models (M2, M3, and M4), which does not confirm sub-hypothesis H_{2a}.

Table 7
IR and stock synchronicity

Samples	**RG**				**GRI**				**IRCC**			
Variables	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**
(α) Constant	0.0898**	-1.1689***	-1.3321***	-1.1721***	0.0686	-1.3317***	-1.2049***	-0.9943***	0.1689***	-1.3555***	-1.3962***	-1.2139***
	(2.17)	(-16.49)	(-15.63)	(-7.63)	(1.58)	(-17.65)	(-15.38)	(-5.65)	(3.09)	(-11.95)	(-11.59)	(-6.06)
(β_1) IR	0.1886***	0.1298***	0.1634***	0.1269***	0.1270***	0.06311*	0.0706**	0.0408	0.1679***	0.1278***	0.1528***	0.1199**
	(7.54)	(4.98)	(6.24)	(3.60)	(3.92)	(1.96)	(2.19)	(0.92)	(4.43)	(3.29)	(3.91)	(2.44)
(β_2) Pos	0.0297	0.0461	0.0867***	0.0602	-0.0200	-0.0175	-0.0076	0.0097	0.0350	0.0359	0.0695	0.0096
	(0.95)	(1.45)	(2.71)	(1.39)	(-0.55)	(-0.48)	(-0.21)	(0.20)	(0.62)	(0.63)	(1.22)	(0.14)
(β_3) IR*Pos	**-0.1084*****	**-0.1259*****	**-0.1810*****	**-0.1403*****	**-0.0876****	**-0.0925****	**-0.1045*****	**-0.0925***	**-0.0740**	**-0.0878***	**-0.1395*****	**-0.1056***
	(-3.48)	**(-3.94)**	**(-5.62)**	**(-3.20)**	**(-2.21)**	**(-2.35)**	**(-2.65)**	**(-1.69)**	**(-1.56)**	**(-1.82)**	**(-2.69)**	**(-1.75)**
(β_4) Size		0.0606***	0.0612***	0.0584***		0.0674***	0.0654***	0.0571***		0.0694***	0.0700***	0.0630***
		(22.97)	(23.25)	(8.82)		(23.38)	(22.26)	(7.53)		(15.33)	(15.48)	(7.30)
(β_5) MB		0.0020	0.0026	0.0065*		-0.0003	0.0002	0.0042		0.0110***	0.0118***	0.0135***
		(0.92)	(1.19)	(1.93)		(-0.14)	(0.08)	(1.02)		(2.97)	(3.17)	(2.84)

Table 7
Cont.

Samples	RG				GRI				IRCC			
Variables	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**
(β_6) ***ROA***		0.1421**	0.1255**	0.0341		0.1518**	0.1451**	0.0643		0.2091*	0.1874	0.0119
		(2.36)	(2.09)	(0.28)		(2.23)	(2.13)	(0.46)		(1.80)	(1.61)	(0.06)
(β_7) ***IFRS_E***			0.0563***	0.0350***			0.0101***	0.0150***			0.0407***	0.0215***
			(12.24)	(5.90)			(3.70)	(3.08)			(6.56)	(2.94)
(β_8) ***WGI_C***			-0.0964*	-0.2043***			-0.1448***	-0.1882***			-0.1737***	-0.1558***
			(-1.95)	(-4.27)			(-3.72)	(-3.91)			(-3.29)	(-2.75)
(β_9) ***ESG***				0.0024***				0.0025***				0.0021***
				(4.40)				(4.74)				(3.02)
Observations	35,553	34,043	34,043	14,244	25,910	25,494	25,494	10,758	14,162	13,700	13,700	7,553
Wald	2,246.55***	2,941.06***	3,107.26***	1,265.25***	1,043.97***	1,648.12***	1,671.89***	681.24***	632.50***	913.35***	963.45***	20.96***
ICC	4.95%	5.83%	7.95%	4.80%	5.01%	6.07%	4.35%	5.13%	6.61%	7.23%	7.39%	6.42%

Note: *The values in parentheses represent the t-test of the coefficient. Significance level: * 10%, ** 5%, *** 1%.*
Source: *Prepared by the authors.*

Overall, the control variables show positive and statistically significant relationships in all subsamples, except for *WGI*, which has a negative sign. There is no consensus in the literature regarding the effect of size on stock synchronicity, however, large firms (Size) can be considered as a reference for the pricing of other firms in an industry (Bushman & Smith, 2001), and it is not possible to reduce their synchronicity with the market (Piotroski & Roulstone, 2004; Bissessur & Hodgson, 2012).

The positive relationship of *MB* is contrary to the results of previous studies (Gul et al., 2010), but it is also found by Ntow-gyamfi et al. (2015). One possible reason for firms with more growth opportunities having high synchronicity is that under these circumstances, market uncertainties can alter their growth more than other firms. The positive relationship with ROA also goes against the literature, but a similar relationship was found by Ashbaugh-Skaife et al. (2005), because of possible differences in the impact of expanding firm-specific information on the markets when analyzing an international sample.

Following Bissessur and Hodgson (2012) and Dasgupta et al. (2010), the greater the experience with IFRS adoption, the greater the stock synchronicity ($\beta_7 > 0$), because the whole market is obliged to adopt a high minimum standard of information report. The WGI coefficient (β_8) indicates that the greater the degree of corporate governance in a country, the greater the market transparency, which in turn reduces stock synchronicity, as expected. The ICC indicates that the country-level characteristics are important for this analysis, explaining between 4.35% and 7.95% of the variation in stock synchronicity.

In the robustness analyses, segmenting companies by country development level and firm size, the variable of interest (β_3) remains significant for the group of companies located in developing countries and that are larger in size in the RG and IRCC subsamples. Thus, it can be assumed that adoption by larger companies in developed countries has the potential to differentiate them from the other market players. This finding can be explained by the fact that larger firms are more closely monitored by analysts and thus their pricing has the potential to incorporate more disclosed information than smaller firms (Flores et al., 2019) and that the specific adoption of the IRCC guidelines better promotes corporate transparency to the market.

4.3 Earnings Predictability Analysis

Table 8 compares the earnings predictability in the pre- and post-treatment periods and, according to the DiD analyses, shows a significant increase in earnings predictability in the treated group in the post-adoption period in all samples, providing support for hypothesis H_3.

Table 8
Difference- in-differences of earnings predictability

		RG		GRI		IRCC	
Panel A – Before adoption		**N**	**Pred**	**N**	**Pred**	**N**	**Pred**
Treated	(1)	854	-0.028	551	-0.031	303	-0.024
Control	(2)	3,077	-0.035	2,428	-0.035	1,209	-0.028
Difference	(1) – (2)		**0.006*** **		**0.005***		**0.004**
t-Test			*2.94*		*1.85*		*1.56*
Panel B – After adoption		**N**	**Pred**	**N**	**Pred**	**N**	**Pred**
Treated	(1)	3,353	-0.034	2,163	-0.038	1,184	-0.027
Control	(2)	16,103	-0.044	12,640	-0.043	6,212	-0.034
Difference	(1) – (2)		**0.010*** **		**0.005*** **		**0.007*** **
t-Test			*9.30*		*4.29*		*5.42*

Note: *Significance level: * 10%, ** 5%, *** 1%. The treated group refers to companies that have adopted integrated reports in general (RG), as classified by the GRI or IRCC integrated reporting frameworks, and the control group refers to companies that have not undergone this treatment.*
Source: *Prepared by the authors.*

The findings in Table 9 partially confirm the previous results, as only the RG subsample shows a positive and significant relationship for β_3. It is worth noting that the treated group, considering the whole analysis period, shows significant associations (β_1) in all models. However, the direction of the relationship changes between them, since in M1 the sign is positive, indicating an increase in earnings predictability, but when firm and country characteristics are considered (models 2-4), the sign of the relationship becomes negative ($\beta_1 < 0$).

This finding indicates that it is only in the period after the adoption of integrated reporting that companies actually experience an increase in earnings predictability, as stated in hypothesis H_3. The coefficients of the variable of interest (β_3) did not show significance in all models for the GRI and IRCC subsamples, so it is not possible to infer the effect for these groups. Therefore, H_{3a} is not confirmed. One possible explanation for the latter is that when the RG sample is divided into the GRI and IRCC subsamples, the number of observations is reduced to such an extent that the estimations do not report significant results.

In line with the literature (Kang et al., 2012; Mahjoub & Khamoussi, 2012; Alipour et al., 2019), *Size* and *ROA* show a positive and significant relationship, indicating that larger and more profitable firms have greater earnings predictability ($\beta_4 > 0$ and $\beta_7 > 0$). Alternatively, *MB* has a negative relationship with *Pred* ($\beta_5 < 0$), which is consistent with the assumption that past data for firms undergoing expansion may not be a good predictor of future earnings (Yeh et al., 2014). The *ESG* and *IFRS_E* variables are only significant for the GRI subsample and have a positive relationship, as expected from the literature.

Table 9
IR and earnings predictability

Samples	**RG**				**GRI**				**IRCC**			
Variables	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**
(α) Constant	-0.0505***	-0.1983***	-0.1970***	-0.2031***	-0.0479***	-0.1968***	-0.1936***	-0.1897***	-0.0370***	-0.1585***	-0.1575***	-0.1690***
	(-18.54)	(-47.19)	(-40.98)	(-25.38)	(-17.33)	(-44.04)	(-38.26)	(-20.33)	(-15.67)	(-27.96)	(-26.88)	(-18.59)
(β_1) IR	0.0060**	-0.0042*	-0.0042*	-0.0050*	0.0049*	-0.0041	-0.0032	-0.0037	0.0015	-0.0034	-0.0034	-0.0003
	(2.49)	(-1.94)	(-1.92)	(-1.95)	(1.67)	(-1.56)	(-1.23)	(-1.14)	(0.52)	(-1.23)	(-1.21)	(-0.10)
(β_2) Pos	-0.0034	-0.0032	-0.0032	-0.0052*	-0.0027	-0.0027	-0.0021	-0.0022	-0.0028	-0.0026	-0.0026	-0.0030
	(-1.36)	(-1.44)	(-1.41)	(-1.95)	(-0.92)	(-1.04)	(-0.82)	(-0.69)	(-0.84)	(-0.84)	(-0.85)	(-0.91)
(β_3) IR*Pos	**0.0047***	**0.0045***	**0.0045***	**0.0059****	**0.0001**	**0.0012**	**0.0001**	**0.0012**	**0.0039**	**0.0040**	**0.0039**	**-0.0001**
	(1.74)	**(1.87)**	**(1.84)**	**(2.06)**	**(0.01)**	**(0.43)**	**(0.02)**	**(0.34)**	**(1.18)**	**(1.28)**	**(1.26)**	**(-0.02)**
(β_4) Size		0.0071***	0.0071***	0.0068***		0.0071***	0.0068***	0.0062***		0.0055***	0.0055***	0.0055***
		(43.75)	(43.75)	(19.86)		(40.65)	(37.97)	(15.43)		(22.99)	(23.00)	(13.76)
(β_5) MB		-0.0001***	-0.0009***	-0.0004***		-0.0005***	-0.0004***	0.0001		0.0001	0.0001	-0.0002
		(-7.53)	(-7.52)	(-2.78)		(-3.54)	(-3.14)	(0.25)		(0.07)	(0.09)	(-1.41)

Table 9
Cont.

Samples	RG				GRI				IRCC			
Variables	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**	**(M1)**	**(M2)**	**(M3)**	**(M4)**
(β_6) *ROA*		0.1433***	0.1433***	0.1655***		0.1356***	0.1351***	0.1353***		0.0933***	0.0932***	0.1361***
		(42.56)	(42.53)	(28.87)		(35.57)	(35.50)	(20.65)		(17.12)	(17.09)	(17.46)
(β_7) *IFRS_E*			0.0001	-0.0003			0.0012***	0.0007***			0.0001	0.0001
			(0.10)	(-1.14)			(7.37)	(2.98)			(0.08)	(0.38)
(β_8) *WGI_C*			-0.0020	0.0014			-0.0029	-0.0041			-0.0017	-0.0035
			(-0.79)	(0.59)			(-1.04)	(-1.52)			(-0.91)	(-1.79)
(β_9) *ESG*				0.0001				0.0001***				0.0001
				(0.38)				(2.79)				(1.92)
Observations	23,387	23,047	23,047	9,741	17,782	17,416	17,416	7,478	8,908	8,822	8,822	4,993
Wald	1,533.73***	6,737.27***	6,737.47***	2,593.79***	873.84***	4,824.64***	4,894.15***	1,567.62***	890.56***	2,039.93***	2,040.44***	1,350.42***
ICC	6.78%	7.22%	7.40%	5.97%	7.31%	7.81%	9.53%	8.87%	4.40%	4.34%	4.45%	4.51%

Note: *The values in parentheses represent the t-test of the coefficient. Significance level: * 10%, ** 5%, *** 1%.*
Source: *Prepared by the authors.*

In the robustness analysis, the sample segmentation by country development level and firm size shows significant results only for the estimations considering companies located in a developed country and in the full sample (RG). These findings are in line with Yeh et al. (2014).

5 CONCLUSIONS

Our findings show that the use of integrated reports generally maximizes shareholder value in the three selected perspectives, which enables us to affirm that their adoption effect goes beyond a legitimization effect. The adoption of an integrated report, regardless of the form of adoption, effectively transforms data into relevant information, creating greater corporate transparency, which contributes to the reduction of analysts' forecasting errors (confirming H_1). Nevertheless, this adoption reduces stock price synchronicity, increasing the incorporation of specific information by the firm in stock prices (confirming H_2). The robustness analysis shows that these results remain significant for larger companies located in developed countries.

The analysis related to earnings predictability indicates that the benefits of adopting integrated reporting practices not only help the market to understand the firms' value creation process, but at the same time help in management decision marking, resulting in more predictable earnings (confirming H_3). Thus, it is logical to infer that implementing an integrated reporting practice promotes something like "integrated thinking," which positively influences managers' decision making, resulting in more predictable earnings.

However, this can only be concluded for the full sample, as we found no significant difference for the adoption of the IRCC framework. And again, the findings remain similar when we divide the sample into developed and non-developed markets. One possible explanation for this result is that the IRCC framework is a recent and voluntary tool, so some companies may adopt its principals in whole or in part, but do not publicly commit to it as it is still not mandatory and its full implementation can be considered complex. It is also possible that companies voluntarily adopt criteria from more than one framework at the same time. If this is true, these companies are not included in our IRCC sample.

The results indicate that the added value of the three perspectives is not related to a specific disclosure framework, but to an efficient design for how information is disclosed to the market, which gives companies more freedom to find the best way to implement it. This evidence is of great relevance because it can assist in decision making related to the implementation of forms of disclosure that consider the disclosure of non-financial information, such as Directive 2014/95/EU and the recommendations of UN SDG Target 12.6, which requires that this additional disclosure should be made in an integrated manner with the financial information.

Our findings also show that the adoption of integrated reports can change companies' results profile, at least in more developed countries, making their pricing more precise and making their earning more predictable. As

these characteristics are generally sought by investors, the adoption of this type of report can be considered as a relevant indicator for asset selection, as it may be a good indication that assets are appropriately priced and have less volatile returns. For companies, the integrated report can be used as a market differentiation tool, offering advantages that can offset the additional costs of its preparation and assisting in their decision-making process. Thus, we conclude that, regardless of the specific framework, the expansion of information provided by companies in integrated reports creates value for shareholders, especially when the country's information environment is more robust and offers greater protection to shareholders.

Finally, we highlight that in 2022, the IFRS Foundation announced its membership of the Integrated Reporting and Connectivity Council (IRCC), which provides guidance on how to integrate the reports required by the International Accounting Standards Board (IASB) and the International Sustainability Standards Board (ISSB). In 2022, for example, the first two Exposure Drafts were issued for public consultation, which became the first standards in June 2023: IFRS S1 (General Requirements for Disclosure of Sustainability-related Financial Information) and IFRS S2 (Climate-related Disclosures). In terms of future studies, this opens up important research opportunities, both in terms of the scope and coverage of these standards, and in terms of their effects on information quality, whether in developed or emerging countries, as well as in the different sectors of these countries.

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