Integrated Reporting and Shareholder Value Creation: International Evidences

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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. Three effects are analyzed considering both integrated reports in general format, as well as the specific framework of the IIRC Integrated Report: information asymmetry reduction, stock price synchronicity reduction, and earnings predictability increase. Two matched subsamples are constructed using the Propensity Score Matching (PSM) method aiming to minimize unobservable effects in the relationships studied using Diff-in-Diff and regression models with fixed effects. Our findings show that after the adoption of General Integrated Report there is an addition of shareholder value from the three perspectives analyzed, an effect that is not observed in the same proportion in the subsample that adopts the IIRC Integrated Report specifically since in this subsample there is only a reduction in information asymmetry. Therefore, to create additional shareholder value it is not necessary to adopt a specific disclosure format, but it is necessary to implement an informational arrangement integrating financial and non-financial information. Thus, the adoption of an integrated reporting cannot be limited to a symbol of firms' legitimation before the market, it should be an instrument that improves the information quality to the markets, allowing the incorporation of a greater volume of specific information in the stock prices, and assists internal decision making in a way that results in more predictable earnings.
Key Words: Information Asymmetry; Stock Price Synchronicity; Earnings Predictability.

1. Introduction

Identifying to which extent changes in the form companies' disclosure information affect the process of shareholder value creation is of great interest to market agents because it impacts investors' perceptions (Velte & Stawinoga, 2017). Moreover, in recent years, the disclosure of financial and sustainability reports separately, increased the volume of information available in the markets, without necessarily providing greater transparency and understanding of the value creation process of firms (Melloni, Caglio & Perego, 2017; Bernardi & Stark, 2018). In this scenario, the format of the integrated report appears as a natural evolution to overcome the deficiencies of current corporate reports, becoming more useful and meeting effectively the informational demands of stakeholders (Pistoni, Songini & Bavagnoli, 2018). Shareholders are considered the key stakeholders due to their increased exposure to risk and the ability to influence the firm's earnings (Atkinson & Waterhouse, 1997). In this context, this study aims to analyze which is the relationship between the integrated reporting disclosure and shareholder value creation.

An integrated reporting involves the disclosure of the firm's financial and non-financial information in order to demonstrate the impact of one on the other (Eccles & Krzus, 2010). However, it does not necessarily imply the adoption of the International Integrated Reporting Council (IIRC) principles for its integration, as the One Report movement continues to develop

independently of the IIRC (Dumay, Bernardi, Guthrie & Demartini, 2016). In this study, the term "General Integrated Report" is used to refer to general reports that seek to disclosure, in a single document, firms' financial and non-financial information and their interconnections, regardless of the adoption of a specific set of principles. The expression "IIRC Integrated Report" or <IR> identifies a specific set of integrated reports that follow the IIRC's precepts for its preparation.

The interest in mapping the possible benefits of adopting integrated reports has been spreading among regulatory bodies and investors, generating an expansion on research opportunities scope in this area. An example of this is the Concept Release, issued by the Security 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 of the Directive 2014/95/EU by the European Parliament, which mandates large firms in the European Union to disclose non-financial information from 2016, as well as the proposition of target 12.6 for the achievement of the Sustainable Development Goals (SDG) of the United Nations (UN) in 2015, which encourages firms to adopt sustainable practices and integrate sustainability information in their reporting cycles, demonstrate that holistic, but objective, disclosure is an irreversible movement and a theme of great relevance in the international panorama (Camilleri, 2018).

More recently, BlackRock's president, the world's largest asset management company, 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 justification for this expectation is that, with a clearer view on long-term performance, asset pricing and the comparison between their performances can be made more precisely, benefiting capital allocation, and can generate less volatile performances in the long term as impacts internal decision making (BlackRock, 2019). This is a benefit mainly for investors looking for an investment portfolio with the objective of building reserves for their retirement, a frequent purpose (BlackRock, 2019).

The possible benefits of adopting integrated reports have been highlighted in different studies, such as the reduction of information asymmetry (Barth, Landsman & Lang, 2017; Bernardi & Stark, 2018; Flores, Fasan & Mendes-da-Silva, 2019; García-Sánchez & Noguera-Gámez, 2017; Zhou, Simnett & Green, 2017), the decrease in the cost of capital (Zaro, 2019; Zhou *et al*., 2017) and even the increase in firms' value (Algiers, Balatbat & Green, 2015; Barth et al., 2017; Cortesi & Venay, 2019; Lee & Yeo, 2015; Merveskemper & Streit, 2016). However, as the disclosure of these reports is done on a voluntary basis, being mandatory only in South Africa, many studies are limited to using data from that single country (Barth *et al.*, 2017; Bernardi & Stark, 2018; Lee & Yeo, 2015; Zhou *et al*., 2017), not allowing the design of an international context, which limits the understanding of its real benefits.

Another limitation of previous studies analysis is the extent of the effects investigated after the adoption of integrated reporting. As mentioned above, most studies are restricted to information asymmetry, the cost of capital or the value of companies. However, in the literature that analyzes the impact of changes in the form of corporate disclosure in the shareholder value creation, in addition to information asymmetry (Barth et al., 2017; Bernardi & Stark, 2018; Hope, 2003), also can be highlighted stocks price synchronicity (Bissessur & Hodgson, 2012; Kim & Shi, 2012; Morck, Yeung & Yu, 2000; Ntow-Gyamfi, Bokpin & Gemegah, 2015) and earnings predictability (Alipour, Ghanbari, Jamshidinanid & Taherabadi, 2019; Gaio, 2010; Kang, Krishnan, Wolfe & Yi, 2012; Mahjoub & Khamoussi, 2012; Ye, Chen, Wu, 2014). Above all, in the current literature, it is possible to identify a gap related to the analysis of the

relationships of the disclosure of General and IIRC Integrated Reports, with the shareholder value creation, especially through its impact in the amount of companies specific information incorporated in stock prices (synchronicity) and its effect on the quality of accounting information reported by the company (predictability). As far as we know, there is no study with a similar app*roa*ch and sample *Size*.

This study also responds to Dumay et al. (2016) call for researches to critically analyze the possible benefits generated by the adoption of IIRC Integrated Report framework in opposition to general formats, advancing the mapping of information integration effects, regardless of the report format adopted by the companies. Its main difference in relation to previous studies relates to its focus on the investor perspective, analyzing three effects: information asymmetry, stock price synchronicity, and earnings predictability. From the shareholder perspective, increasing transparency through the adoption of integrated reports increases their understanding of the firm's present and future performances, reducing information asymmetry (Bernardi & Stark, 2018). The latter allows stock price composition to be more based on the company's specific information, and less on market or industry information. When there is greater incorporation of company-specific information at its price, it detaches itself from the market average (Morck *et al*., 2000).

However, it seems that integrated reporting not only increases transparency but can also be used by managers to internal decision making, since by turning explicit the mechanisms for value creation, the strategy, and mechanisms for allocating capital can be changed, as well as producing changes in the business model (Macias & Farfan-Livero, 2017). These positive effects can impact the earnings quality, making them more predictable and can be maximized if the company establishes integrated thinking that considers a long-term value creation process (IIRC, 2013). Thus, the hypotheses of this study sought to investigate whether the dissemination of integrated reports has fulfilled its dual purpose, which is to improve the dissemination of information to the external market and the internal decision making (Barth *et al.*, 2017), contributing in an effective way to maximize some of the requirements valued by the market when choosing assets.

Such analysis is performed based on the identification of integrated reporting adopters considering, together, IIRC and Global Reporting Initiative (GRI) databases. Thus, it is possible to compare the adoption of a specific format, the IIRC Integrated Report, and the other forms used for the integration of reports (General), an app*roa*ch not identified in previous studies. The connection of these databases to companies' financial information allowed the raised hypotheses to be analyzed with the aid of multiple regressions, based on difference-in-difference (DiD) methodological design, which increases the robustness and consistency of the findings. The sample is composed of firms that voluntarily released integrated reports in 39 countries, between 2011 and 2018, and its peers that did not integrate reports. The identification of peers companies are performed using the Propensity Score Matching (PSM) method, aiming to minimize the effects of the economic environment that can impact the variables of interest regardless of the adoption of integrated reporting, strongly present in multi-country analyzes (Martinez, 2016; Flores *et al*., 2019; Zaro, 2019).

The main findings confirm that the impact of adopting the General Integrated Report and the IIRC Integrated Report have different effects on the process of shareholder value creation. The adoption of the General Integrated Report adds value in the three perspectives analyzed, whereas the adoption of the IIRC Integrated Report only reduces information asymmetry. There seems to be an effect anticipated by the adoption of the General format. In addition, the statistics of the estimated models for the IIRC Integrated Report subsample are

smaller than those identified for the subsample that adopted General Integrated Report, which confirms the hypotheses that the adoption of the IIRC framework does not provide an additional value creation in relation to other information already integrated by companies.

2. Hypothesis Development

The decision to expand corporate disclosure on a voluntary basis necessarily requires an assessment of its impact on value creation in order to identify whether the costs involved in its preparation are compensated (Merveskemper & Streit, 2016). The integration of financial and non-financial information can maximize the benefits, as it highlights the connections between quantitative and qualitative information, in addition to promoting integrated corporate thinking that can change internal decision-making, positively impacting performance (Macias & Farfan-Livero, 2017). The perception that financial information offers a partial view of the company's present and future performances created a demand for voluntary disclosure frameworks, seeking a more holistic view of the firms' value creation process (Bernardi & Stark, 2018, Camelli, 2018), standing out the framework developed by the GRI, as it remains as the most widely used worldwide in the last decade (KPMG, 2017).

The increase in information demand by different agents combined with the absence of a consensus on which ones would be relevant resulted in bulky and dysfunctional reports. In this context, there is a new informational demand from stakeholders for concise reports that clearly show the interconnections between financial and non-financial information (Zhou *et al*., 2017). The creation of a framework by the GRI has significantly expanded the disclosure of non-financial information in the reports, and its worldwide adoption has made it an instrument of legitimation in the markets (Eccles & Serafeim, 2011). Its simple adoption can legitimize a company, from the perspective of institutional legitimation, or even become a symbol to which the company associates to consolidate its legitimation, from the strategic perspective of legitimation. It should be noted that with the consolidation of IIRC Integrated Report framework as a globally recognized format, it can also be used as a symbol of legitimacy to obtain such benefits (Beck, Dumay & Frost, 2015; Velte & Stawinoga, 2017; Zhou *et al*., 2017; Camelli, 2018; Coluccia, Fontana & Solimene, 2018). Thus, there is an expectation that <IR> will carry more informational content than previous reports.

2.1. Informational Asymmetry

The demand for higher levels of corporate transparency led to an increase in the information disclosed, but, consequently, increased the complexity of making good use of the different reports made available (Zhou *et al*., 2017). To minimize these challenges, some firms have started to publish integrated reports that, in an organized and coherent way, highlight the company's strategy, issues related to corporate governance, performance, and future perspectives, and their respective connections with social and environmental issues (García - Sánchez & Noguera-Gámez, 2017a). However, the effect of voluntary disclosure will largely depend on the quality of the information disclosed, as it will only have a real impact if it is value relevant (Zhou *et al*., 2017).

The integration of reports helps to reduce information asymmetry, as it enables understanding of the interconnections between the financial and non-financial dimensions, expands the range of information disclosed and reduces the uncertainties related to the assessment of the company's performance (Zhou *et al*., 2017). Alone, integration, regardless of the format used, would have the benefit of making information value relevant, which meets the informational needs of stakeholders and enhances decision making related to capital allocation.

In the literature, there is evidence related to the impact of the integrated reporting focused on the South African market, the only market that 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 when the quality of the information disclosed increases (Barth *et al.*, 2017). Studies with international samples, on the other hand, identify divergent results, as there is evidence that integrated reporting can increase corporate transparency, regardless of the format used (García-Sánchez & Noguera-Gámez, 2017) and when IIRC Integrated Report specific 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). Moreover, comparative studies of the effect of different types of reports (General or <IR>) on the information asymmetry were not identified.

Given the above, it is consistent to expect that the General Integrated Reporting can mitigate information asymmetry problems in different countries and that this effect is more pronounced when companies adopt the <IR> framework, as it presents not only 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 suppliers and considering a long-term perspective (Bernardi & Stark, 2018; Zhou *et al.*, 2017). This is our first group of hypotheses.

Hypothesis 1: The integrated report's disclosure is negatively associated with the firm's information asymmetry in different countries, developed or not.

Hypothesis 1a: The negative association between the integrated reports disclosure and the information asymmetry is more pronounced when the company uses the <IR> framework.

2.2. Stock Price Synchronicity

In an efficient market, stock prices reflect investors' expectations regarding the future cash generation of companies, and these expectations are based on both the company's specific information and general market information (Roll, 1988). In the absence of specific information, investors replace them with their expectations of value, built over the information available in the market (Jin & Myers, 2006). In this process, the degree to which stock prices depend on market information can be defined as market synchronicity and the degree to which prices reflect company-specific information as idiosyncratic dependence (Morck *et al*., 2000). Thus, price synchronicity is the tendency that stock prices must move together and in the same direction as the market average (Khandaker, 2011). Therefore, greater synchronicity is associated with greater inefficiencies in the markets, and a better forecast of future profits when there is less synchronicity (Durnev, Morck & Zarowin 2003).

The increase in market synchronicity can occur due to different events, such as the loss of confidence in the company's specific accounting information, the reduction of transparency (Bissessur & Hodgson, 2012), or even limited access to company-specific information (Jin & Myers, 2006). In this sense, the increase in the information quality disclosed leads to a reduction in stock price synchronicity, as it provides more company-specific information, allowing investors to formulate more accurate forecasts of the company (Jin & Myers, 2006). Still, this synchronicity tends to be less in economies that offer greater protection to investors (Morck *et al*., 2000), greater industrialization and a freer press (Bushman & Smith, 2001). However, international evidence is diffuse, diverging especially due to the mandatory and voluntary information flow (Ashbaugh-Skaife, Gassen, & LaFond, 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 company-specific information in the stock price, reducing stock

synchronicity. In addition, it is consistent to assume that integration through the <IR> format, which has been extensively investigated and developed, allows greater incorporation of company-specific information into stock prices, in accordance with Merveskemper and Streit (2016). With this, the second group of hypotheses of the study is formulated.

Hypothesis 2: The integrated report's disclosure is negatively associated with the stock price synchronicity in relation to the market in different countries, developed or not.

Hypothesis 2a: The negative association between the integrated reports disclosure and the stock synchronicity is more pronounced when the company uses the <IR> framework.

2.3. Earnings Predictability

Earnings are the most accurate measure for assessing current performance and making valuations projections (Dechow & Schrand, 2004). The earnings quality depends on the proportion of earnings derived from recurring sources. Therefore, high-quality earnings will be sustainable in future periods and can be assessed through their persistence or predictability (Lipe 1990, Dechow *et al*., 2010). Earnings persistence is the probability that current earnings will repeat in the future, and predictability is given by the smallest error in estimating future earnings from past earnings (Lipe, 1990; Francis *et al.*, 2004; Dechow *et al*., 2010; Gaio, 2010; Yeh, Chen & Wu, 2014). Therefore, the earnings predictability is one of the factors that most worries investors, since less predictable earnings, determine the risk premium and impact the valuation of companies (Graham, Harvey & Rajgopal, 2005).

The construction of corporate information in an integrated way can not only increase companies' transparency but also be used by managers for internal decision making (Beck *et al.*, 2015), which can positively impact the earnings quality. The integration of information presupposes greater communication between the different areas of the organization, enabling a clearer identification of how the company uses or affects the environment in which it operates (IIRC, 2013). Empirical evidence points that the increase in earnings quality is associated with the characteristics of the company and the industry in which it operates (Gaio, 2010), with the degree of commitment to disseminate social and environmental information (Alipour *et al.*, 2019; Mahjoub & Khamoussi, 2012) and to the implementation of government mechanisms related to market transparency (Yeh *et al*., 2014).

Therefore, it is coherent to assume that the integration of financial and non-financial information, in general, can not only increase firms' transparency but also generate a positive effect on internal decision making, being associated with the predictability of earnings. As the IIRC provides guidelines for the establishment of integrated thinking that should permeate internal decision making and impact the analyzes related to the adopted business model (IIRC, 2013), it is expected that firms that use <IR> framework for corporate disclosure will obtain more pronounced benefits than the others. Thus, the last set of hypotheses is presented.

Hypothesis 3: The integrated report's disclosure is positively associated with a firm's earnings predictability in different countries, developed or not.

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

3. Method

The sample is composed of firms that voluntarily released integrated reports from 2011 to 2018 (treatment group) and their peers, who did not integrate reports (control group), identified with the Propensity Score Matching (PSM) method. The study period starting point is marked by the disclosure of the "Discussion paper towards integrated reporting: communicating value in the 21st century" of the IIRC, released in 2011, which invited

companies from all over the world to join voluntarily the principles of Integrated Reporting (Melloni *et al*., 2017). The data were collected from six sources: IIRC Examples Database, GRI Report List, Thomson Reuters Eikon Database, MSCI Indexes, IFRS.org, and Worldwide Governance Indicator. All variables are winsorized by 1% to minimize outliers' effects.

In this study, two samples of integrated report are used: (i) subsample IRT, which comprises all companies that have General Integrated Reports, in any format, that is the one suggested by IIRC and the ones included in the GRI basis; (ii) subsample IRP, which comprises only companies that used the specific IIRC Integrated Report framework. We eliminate duplicate firms (151), that located in South Africa (162, due to mandatory adoption), and the ones that did not have financial information available (292). Our subsamples have 780 (IRT) and 269 (IRP) firms with integrated reports, which are identified in the regressions as dummies variable (IR) that assumes 1 (one) when the report is integrated, and 0 (zero) otherwise.

3.1. Identification of Peer Companies

For comparative analysis of integrated report disclosure effects, control groups are built using the PSM method, widely used to isolate the effects of an intervention and solve the problem of the multidimensionality of pairing. We use the nearest neighbor matching criterion with replacement, which consists of matching each component treated with the control that holds the closest propensity score (Austin, 2011). We considered all firms that did not publish integrated reports and are located in the same 39 countries of the complete sample, which results in the identification of 44,206 distinct companies, to be matched to the 780 firms in IRT sample (about 1.8% of the total firms). The criteria used to establish the pairing are the country in which the company is located; the industry, defined according to Thompson Reuters classification, and the firms' *Size*, measured by the logarithm of total assets. These covariant variables are selected due to their significant influence and strong correlations with unobservable variables that influence the performance of both groups (Matinez, 2016; Flores *et al.*, 2019; Zaro, 2019).

After estimating the PSM, all treated observations are paired, having 780 firms in the treated group and 3,666 firms in the control group (totaling 4,446) in the IRT subsample, 269 firms in the treated group and 1,502 firms in the control group (totaling 1,771) in the IRP subsample. The quality of the pairing is verified by the *ptest* package available on Stata, proposed by Sant'Anna and Song (2019), which calculates Kolmogorov-Smirnov and Cramer-von Mises tests in which the null hypothesis is that a parametric model would be the correct specification for the PSM. The reported *ptests* are 0.894 and 0.983 for the IRT and IRP samples, respectively, making it possible to reject the null hypothesis at a 5% level, confining that the control and treatment groups are properly balanced. In addition, the percentage of mean sample bias before PSM and after pairing is reduced from 56.0% to 0.7% in the IRT subsample, and from 73.1% to 0.4% in the IRP subsample, remaining in both cases below 1%.

3.2. Econometric Model

To test the proposed hypotheses, the Difference-in-Difference (DiD) app*roa*ch is used, which has a quasi-experiment analysis design to compare the difference in results before and after a treatment (Bernardi & Stark, 2018). Considering that IIRC 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 integrated reports adoption impact in the shareholder value creation (VA_{it}) considers three effects: informational 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*) that isolates the effect of integrated reports adoption only in the period after the adoption (from 2014 onwards in the case of the control group). In addition, control variables at the firm and country levels, and fixed effects for year, industry and country (δ_t, γ_s and θ_j), are included, as shown in Equation 1.

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

We expect β_3 different from zero and statistically significant, indicating that the adoption of integrated reports influences the shareholder value creation, especially in the period after the adoption of the IIRC framework. Moreover, according to the hypotheses, we expect coefficients with a positive relationship with the analysts forecast accuracy (H_1) and the earnings predictability (H_3), and with a negative relationship with the stock synchronicity (H_2). The estimations in Equation 1 are performed with ordinary least squares (OLS) with fixed effects and robust errors, in order to control the heterogeneity of countries and the effects of omitted variables, unobserved or difficult to measure, which can be expressed in the form of bias (Dong & Stettler, 2011).

3.3. Variables of Interest

We use the 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, thus, are 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). According to Hope (2003) and Flores *et al.* (2019), this proxy is measured for each company *i* in year *t*, according to Equations 2.

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

Where *AFA* is the analysts forecast accuracy; *EPS_A* is the actual earnings per share reported by the firm at the end of the year *t*; *EPS_F* is the consensus of analysts' projections for earnings per share 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*. Given the low liquidity of transactions at the beginning of the year, it is considered the first quote reported until the third business day of each year. The closer to zero the *AFA* value, the greater is analysts' projections accuracy and, consequently, indicates less information asymmetry. Thus, as the integrated report disclosure increases the transparency of companies, 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 determination coefficient (R^2) of the market model (Morck *et al.* 2000). According to Ntow-gyamfi et al. (2015) and Gul, Kim & Qiu (2010), we measure synchronicity at the company level through the logistic transformation of this coefficient, according to Equations 3 and 4. Where 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 MSCI; and ε_{it} is the residual of the equation. For the estimation of the market model, daily data are used, which generated an R^2 for each company, each year.

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

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

Where $Sinc_{it}$ 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 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, due to the incorporation of more specific information obtained from this disclosure, which distances its value from the market average.

For the analysis of this relationship, it is considered data from the second half of the sample (daily data between 2015 and 2018). The focus on this segment of the sample is justified by two reasons: the development of the IIRC framework itself, and due to the firms' learning curve in using it, factors that can change the quality of the report's implementation and, therefore, the possible changes in stock synchronicity. Due to the complexity of its implementation, since it is based on principles, it is expected that, over time, companies gain learning and can improve their implementation. The importance of this implementation experience has been largely documented in studies related to IFRS implementation (Cai, Rahaman & Courtenay, 2014; Houque & Monem, 2016).

To measure the earnings predictability, we use the standard deviation of error of the earnings persistence model (Lipe, 1990). We assume that past results can explain current results (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 income tax of company *i* in year *t*, weighted by total assets at the end of period *t-1*; X_{it-1} is the profit before income tax of company *i* in year *t-1*, weighted by total assets at the end of the period *t-2*; and ε_{it} is the residual of the model, whose standard deviation indicates the predictability of the firm's earnings, according to Lipe (1990), Francis et al. (2004), Gaio (2010), and Yeh et al. (2014), as detailed in Equation 6.

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

Therefore, the closer to zero is $Pred_{it}$ ($\varepsilon_{it} \approx 0$), the more persistent the firm's earnings are, as predictability reflects less variation in earnings (Lipe, 1990). Given that the sample is composed of companies that operate in different industries and are in different countries, the calculation of the standard deviation to obtain predictability is made in relation to the average of the residues for each industry, in each country.

3.4. Control Variables

We identify in the literature some important phenomena that need to be controlled at the firm level: company *Size* (*Size*), market-to-book (*MB*), reporting quality, like Environmental, Social and Governance (*ESG*) and return on assets (*ROA*). We also control countries' factors: IFRS experience (*IFRS_E*) and the country's corporate governance quality (*WGI_C*).

Larger companies are required by their stakeholders to disclose more information due to higher agency costs, which reduces informational asymmetry (García-Sánchez & Noguera-

Gámez, 2017; Zaro, 2019). These companies also present earnings with higher quality, showing a direct relationship between the *Size* and earnings predictability (Gaio, 2010; Yeh *et al*., 2014). The relationship between stock price synchronicity and *Size*, however, has not yet reached a consensus. This is because, if the firm is an industry leader or has great representativeness in relation to the market, it can be a reference for the pricing of other firms, or be a driver of market performance as a whole, expanding its synchronicity with the market, even if its stock price incorporates specific information (Piotroski & Roulstone, 2004; Bissessur & Hodgson, 2012).

The Market-to-book (*MB*) is considered a measure of growth opportunity, and firms with greater *MB* tend to use voluntary information disclosure more widely, aiming to reduce information asymmetry, which enables 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 development of the business cycle in which past data may not be useful for predicting the future, having as a natural outcome less predictable earnings (Yeh *et al.*, 2014). Still, according to the signaling theory, the most profitable firms (*ROA*) are more interested in voluntarily disclosing information in order to obtain greater economic benefits on good news and differentiating themselves in the market. We expect that companies with higher *ROA* have more possibility to carry out projects related to sustainability (Barth *et al*., 2017), which leads to a reduction in asymmetry and synchronicity (Bernardi & Stark, 2018; Flores *et al;* 2019; García-Sánchez & Noguera-Gámez, 2017), besides providing more persistent earnings (Alipour *et al.*, 2019; Kang *et al.*, 2012; Mahjoub & Khamoussi, 2012).

The expansion of non-financial information (like *ESG*) in the reports also suggests an increase in the relevance of this type of information, which may minimize firm's information asymmetry (Zhou *et al.*, 2017; Bernardi & Stark, 2018; Flores *et al*., 2019), reducing stock synchronicity (Grewal, Haumptmann & Serafeim, 2018). Firms committed to the disclosure of non-financial information usually adopt practices that benefit their performance, generating a positive impact in earnings predictability (Mahjoub & Khamoussi, 2012; Kang *et al*., 2012).

Regarding countries' characteristics, due to the complexity of implementing the IFRS standards (*IFRS_E*), their benefits seem to expand 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 IFRS adoption expands. On the other hand, the effect on stock synchronicity is controversial, because there are studies identifying a reduction after the IFRS adoption (Kim & Shi, 2012), and other indicating a temporary effect, reversed after some years (Bissessur & Hodgson, 2012; Dasgupta, Gun & Gao, 2010). And the IFRS adoption increases the variability of earnings, reducing its predictability (Doukakis, 2010). Finally, the higher the country's corporate governance quality (*WGI_C*), we expect an improvement in markets' informational environment, enabling the incorporation of more specific information from firms (Coluccia *et al*., 2018) and preventing the use of earnings management practices, which can generate less predictable earnings (Houqe & Monem, 2012). Table 1 describes the expected variables and signs.

Table 1 –Synthesis of Control Variables

Code	Description / Expected Signs	*AFA*	*Sync*	*Pred*
Size	Firm's *Size* is given by the natural logarithm of the total assets at the end of year t.	+	+/-	+
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 net income divided by its total assets at the end of year t.	+	-	+
ESG	Report quality is measured by the annual *ESG* Score from Thomson Reuters.	+	-	+
IFRS_E	IFRS experience is the number of years since the mandatory IFRS adoption.	+	+/-	-
WGI	Country corporate governance quality is identified through the 6 dimensions of the WGI index.	+	-	-

4. Results

Table 2 presents the descriptive statistics of the main variables analyzed in this study, considering the division of the complete sample into two groups: treated and control companies. The average of the three variables of interest (*AFA*, *Sync* and *Pred*) is lower in the treated group than in the control group, with statistically different means, a fact that is in agreement with the hypotheses proposed, and with the previous literature, indicating that companies that publish integrated reports benefit from greater transparency (García-Sánchez & Noguera-Gámez, 2017; Zhou *et al*., 2017; Bernardi & Stark, 2018; Flores *et al*., 2019).

In the treated group, on average, for every US$ 1.00 of the firm's stock price at the beginning of the year, there is an error in earnings forecasts (lack of accuracy) of around US$ 0.0447, while in the control subsample this error is about US$ 0.0481. With regard to stock synchronicity, in the treated group the average of -0.2360 indicates that the coefficient of determination (R^2) of the relationship between the firm's stock returns and the market returns are 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 *t* statistics presented in the last column of Table 2 (p-value <0.05).

The firms that publish integrated reports (treated group) are larger than the firms that usually do not disclose this type of report, which converges with the prediction that larger firms have greater structure and demand for information (García-Sánchez & Noguera-Gámez, 2017; Zaro, 2019). These firms also present higher growth opportunities, as they tend to have greater scope in the transparency (Bushman & Smith, 2001; Gul *et al.*, 2010; Flores *et al.*, 2019).

Table 2 – Descriptive Statistic of the Complete Sample (IRT)

Variables	Treated			Control			Means Difference (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: *APA* is the analysts forecast accuracy; *Sync* is the stock return synchronicity; *Pred* is the earnings predictability; *Size* is the natural logarithm of the total asset; *MB* is the market-to-book index; *ESG* is the Environment, Social and Governance score; *ROA* is the return on asset; *IFRS_E* is the IFRS experience; *WGI_C* is the consolidation of the six dimensions of the Worldwide Governance Indicators.

Among the control variables, it is possible to highlight that the companies 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 who 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 IFRS experience (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 the IFRS adoption. The only control variable that shows a reduction in the treated group is the *WGI_C*, indicating that the adoption of integrated reporting practices is more frequent by companies located in countries with a worse degree of corporate governance, which denotes the search for a substitutive effect.

4.1. Informational Asymmetry Analysis

The Difference-in-Difference (DiD) estimation compared the analysts' forecast accuracy (*AFA*) between the treated and the control groups. Both in the period before and after the treatment, *AFA* present average values closer to zero (greater accuracy) for the treated group, which published integrated reports, as shown in Table 3. This indicates that *AFA* is higher among companies that publish integrated reports, even before they receive treatment.

Analyzing the complete sample (IRT), the treated and the control groups show a significant difference only in the pre-adoption period of the <IR> model. On the other hand, in the IRP subsample, the difference remains statistically different in the pre- and post-adoption periods of the IIRC Integrated Report. This suggests that the integrated reporting tends to alter the accuracy of the analysts' forecasts, giving support to H_1, and that the adoption of the IIRC Integrated Report framework can specifically expand the *AFA*, as predicted in H_{1a}.

Table 3 – Difference- in- Difference of AFA

Panel A – Period pre-adoption		**IRT**		**IRP**	
		N	**AFA**	**N**	**AFA**
Treated	(1)	1.511	-0,043	670	-0,003
Control	(2)	5.959	-0,048	3.042	-0,011
Difference	(1) – (2)		**0,006***		**0,008*****
t-Test			*1,86*		*4,81*
Panel B – Period pos-adoption		**N**	**AFA**	**N**	**AFA**
Treated	(1)	3.453	-0,046	1.230	-0,002
Control	(2)	11.434	-0,048	5.676	-0,014
Difference	(1) – (2)		**0,002**		**0,074*****
t-Test			*1,15*		*9,53*

Note: Significance level: * 10%, ** 5%, *** 1%. The treated group refers to companies that have adopted integrated reports in general (IRT) or IIRC Integrated Report framework (IRP) and the control group refers to companies that have not undergone this treatment.

Table 4 present the estimations based on Equation 1 for the analysts' forecast accuracy (*AFA*). *AFA* is only affected by the disclosure of integrated reports when the characteristics of companies and countries are controlled (models 2 and 3). Both for the general format (IRT) and for the specific <IR> model (IRP) the effect of the disclosure is negative ($\beta_1 < 0$). The post-adoption period (from 2014) does not impact *AFA* (β_2 not significant). However, among the firms with integrated reports in the post-adoption period (*IRT*Pos*), a positive association is observed ($\beta_3 > 0$), as expected, in both subsamples. So, the voluntary integration of corporate information through integrated reports offers the market a greater volume of relevant information, reducing information asymmetry. These findings are in accordance with the literature (Barth *et al.*, 2017; García-Sánchez & Noguera-Gámez, 2017) and converge with the specific case of information asymmetry reduction identified in the South African market, where its adoption is mandatory (Barth *et al.*, 2017; Zhou *et al.*, 2017; Bernardi & Stark, 2018).

In line with the findings observed in the DiD estimation, we can affirm that the adoption of integrated reports in general (IRT) increases the accuracy of the analysts forecast accuracy (*AFA*), confirming H_1 hypothesis. However, observing, in general, the coefficients of interest (β_1 and β_3), it is noted that the results obtained for the IRP subsample are not more pronounced

than those found for the IRT sample, besides the adjusted R^2 is lower in the subsample that adopts the IIRC Integrated Report, evidence that does not confirm the sub-hypothesis H_{1a}.

Overall, the control variables at the firm level (*Size*, *MB*, *ESG*, and *ROA*) are significant and positive associated with *AFA*, as expected (Barth *et al*., 2017; García-Sánchez; Noguera-Gámez, 2017; Bernardi & Stark, 2018). The control variables at the country level (*IFRS_E* and *WGI_C*) are not significant for the IRT subsample and in the IRP subsample the coefficient β_8 (*IFRS_E*) indicates a positive and significant relationship, showing that the IFRS experience has the ability to improve the quality of the information environment, which in turn increases the analysts forecast accuracy (Demmer, Pronobis & Yohn, 2019; Cai, Rahman & Courtenay, 2014; Houqe & Monem, 2016). WGI is also not significant.

Seeking to explore the relationships identified from different perspectives, and considering that the sample has great heterogeneity in terms of countries and companies, we make an additional analysis by segmenting the sample between developed and non-developed countries, according to the MSCI classification, and in companies larger or smaller than the median for each country. In both subsamples, significant relationships are only identified between the *AFA* and the variable of interest (*IR*Pos*) when the sample is segmented by the country's development, models that are also shown in Table 4 (Develop and N_Devel).

Table 4 – IR and the Analysts Forecast Accuracy

Sample	**IRT**					**IRP**				
Variables	**(M1)**	**(M2)**	**(M3)**	**Developed**	**N_Devel**	**(M1)**	**(M2)**	**(M3)**	**Develop**	**N_Devel**
(α) Constant	-0,0902***	-0,238***	-0,237***	-0,0101***	-0,179***	-0,0053	-0,0372***	-0,0388***	-0,0219	-0,0225
	(-4,71)	(-4,16)	(-4,15)	(-0,20)	(-5,84)	(-1,16)	(-3,10)	(-3,20)	(-1,24)	(-0,97)
(β_1) IR	0,0028	-0,0083**	-0,0089**	-0,0162***	0,0096	-0,0008	-0,0041***	-0,0033***	-0,0030**	-0,0046
	(0,89)	(-2,21)	(-2,33)	(-3,99)	(1,55)	(-0,82)	(-3,23)	(-2,70)	(-2,07)	(-0,81)
(β_2) Pos	-0,0025	-0,0011	-0,0017	-0,0038	0,0059	-0,0001	-0,0019	-0,0009	0,0005	-0,0074
	(-0,72)	(-0,27)	(-0,42)	(-0,75)	(0,82)	(-0,03)	(-1,22)	(-0,63)	(0,29)	(-0,98)
(β_3) IR*Pos	**0,00511**	**0,0081***	**0,0089****	**0,0127****	**-0,0071**	**0,0049*****	**0,0049*****	**0,0037*****	**0,0018**	**0,0126***
	(1,34)	**(1,83)**	**(1,98)**	**(2,54)**	**(-0,93)**	**(3,61)**	**(3,28)**	**(2,63)**	**(1,02)**	**(1,73)**
(β_4) Tam		0,0013*	0,0014*	0,0036***	-0,0011		0,0008**	0,0007*	0,0013***	-0,0004
		(1,89)	(1,91)	(4,25)	(-1,18)		(1,99)	(1,94)	(4,60)	(-0,62)
(β_5) MB		0,0010***	0,0010***	0,0020***	0,0006		0,0001	0,0001	0,0003	-0,0001
		(2,68)	(2,66)	(3,61)	(1,61)		(0,47)	(0,50)	(1,52)	(-0,02)
(β_6) *ESG*		0,0001***	0,0002***	0,0002***	0,0002***		0,0001**	0,0001**	0,0001	0,0001**
		(3,21)	(3,24)	(3,25)	(2,62)		(2,45)	(2,42)	(0,56)	(2,54)
(β_7) *ROA*		0,576***	0,577***	0,5950***	0,5680***		0,140***	0,139***	0,0575***	0,2180***
		(17,43)	(17,40)	(33,91)	(33,75)		(6,62)	(6,59)	(7,56)	(15,62)
(β_8) *IFRS_E*			-0,0009	-0,0022	-0,0019			0,0009**	-0,0011	0,0004
			(-1,31)	(-1,12)	(-1,38)			(2,07)	(-1,64)	(0,47)
(β_9) *WGI_C*			-0,0135	-0,0934***	0,0252			0,0091	-0,0048	0,0221
			(-0,77)	(-3,49)	(1,05)			(1,36)	(-0,51)	(1,16)
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22.357	13.024	13.024	7.363	5.661	10.618	7.040	7.040	4.002	3.038
F Statistic	33,19***	29,44***	27,34***	49,70***	47,70***	18,32***	12,06***	11,68***	11,75***	14,80***
Adjusted R^2	0,064	0,225	0,225	0,217	0,257	0,101	0,149	0,150	0,101	0,157

Note: All regressions have fixed effects at the industry, country and year levels with robust errors. The values in parentheses represent the *t*-test of the coefficient. Significance level: * 10%, ** 5%, *** 1%. *IR* is a dummy that assumes the value 1 (one) for the adoption of integrated reports in general (IRT) or IIRC Integrated Report (IRP), and 0 otherwise; *Pos* is a dummy variable that assumes value 1 (one) to identify the post-adoption period, and 0 otherwise; *IR*POS* is the interaction between the IR and POS dummies; *APA* is the analysts forecast accuracy; *Sync* is the stock return synchronicity; *Pred* is the earnings predictability; *Size* is the natural logarithm of the total asset; *MB* is the market-to-book index; *ESG* is the Environment, Social and Governance score; *ROA* is the return on asset; *IFRS_E* is the IFRS experience; *WGI_C* is the consolidation of the six dimensions of the Worldwide Governance Indicators; *Develop* considers only the sample of firms located in developed countries; and *N_Devel* considers the group of firms located in non-developed countries.

In the regressions of the IRT subsample, significant relationships can be observed only in the subsample of firms located in developed countries, and the group of treated firms shows a negative and significant relationship between IR and *AFA* ($\beta_1 < 0$), becoming positive only when post-adoption observations are considered ($\beta_3 > 0$). This result agrees with the findings of García-Sánchez and Noguera-Gámez (2017), who observed a reduction in information asymmetry after the disclosure of integrated reports, especially in countries with greater legal protection. On the other hand, the regressions that consider the IRP subsample, identify that the reduction of asymmetry after the adoption of the IIRC Integrated Report seems to be concentrated in non-developed countries ($\beta_3 > 0$). Therefore, the results suggest that the IIRC Integrated Report has a different effect from other integration formats in general and is more effective in increasing the analysts' forecast accuracy (*APA*) in more opaque information environments. Thus, <IR> can be considered an instrument that has the potential to make earnings more predictable and a format that expands the disclosure of relevant information to the market.

4.2. Stock Synchronicity Analysis

The analyses related to stock price synchronicity are focused on the period starting in 2015. Since in that year most of the sample was already in the post-adoption period, there is strong collinearity between the *Pos* variables and the *IR*Pos* interaction. Thus, the *Pos* variable (alone) is omitted from the regressions, maintaining the interaction variable.

Table 5 shows that firms that adopt General Integrated Report (IRT) have a positive and significant relationship with the stock price synchronicity in all models ($\beta_1 > 0$). This result indicates that this group is unable to incorporate specific information in order to distance themselves from the average market return. When we consider the treated group only in the post-adoption period (*IR*Pos*), the coefficient is negative and significant ($\beta_2 < 0$) when the firms' and countries' characteristics are controlled (models 2 and 3). Thus, we can see that after the treatment, the stock returns differ from the average of market returns. This finding is in line with the literature, where greater disclosure can reduce the stock synchronicity (Jin & Myers, 2006; Morck *et al.*, 2000), confirming the hypothesis H_2. In the IRP subsample, the coefficients β_1 and β_2 are not significant. Thus, it cannot be said that the adoption of the IIRC Integrated Report changes the stock synchronicity of treated group in a more pronounced way than that firms that adopt General Integrated Report, which does not confirm the sub-hypothesis H_{2a}.

Most control variables show positive and statistically significant relationships in both subsamples, except for *ROA*. A similar result was identified by Ashbaugh-Skaife et al. (2005), which justifies the positive relationship based on possible differences in the impact of expanding specific information in the markets when an international sample is being analyzed. Additionally, as mapped in the literature (Piotroski & Roulstone, 2004; Bissessur & Hodgson, 2012), large firms (Tam) can be considered references for the pricing of other firms in an industry (Bushman & Smith, 2001), which leads them to have a large representation in relation to the market as a whole, or even to have a broadly diversified product portfolio, not be possible to reduce their synchronicity in relation to the market.

The positive relationship of *MB* ($\beta_4 > 0$) also goes against the literature (Gul *et al.*, 2010), however, it is also identified by Ntow-gyamfi et al. (2015). One possible reason for firms with more growth opportunities have high synchronicity is that, in these circumstances, market uncertainties can alter their growth more broadly than other firms. In accordance with Bissessur and Hodgson (2012) and Dasgupta et al. (2010), the expansion of the experience with the IFRS adoption results in greater stock synchronicity ($\beta_7 > 0$). Regarding WGI, the coefficient β_8 is

positive and significant, indicating that the greater the degree of corporate governance in a country, captured by WGI, the greater the synchronicity of prices in that market.

Table 5 – IR and Stock Synchronicity

Sample			**IRT**					**IRP**		
Variables	**(M1)**	**(M2)**	**(M3)**	**Bigger**	**Smaller**	**(M1)**	**(M2)**	**(M3)**	**Bigger**	**Smaller**
(α) Constant	-0,206	-1,458***	-1,833***	-1,926***	-2,880***	-0,0911	-1,167***	-1,544***	-1,535**	-0,886
	(-1,54)	(-5,29)	(-6,46)	(-5,09)	(-3,88)	(-0,61)	(-3,72)	(-4,26)	(-2,28)	(-1,00)
(β_1) IR	0,129**	0,126*	0,141*	0,178*	0,0656	0,158	0,122	0,0478	0,145	-0,0607
	(1,96)	(1,66)	(1,83)	(1,85)	(0,37)	(1,34)	(0,96)	(1,05)	(0,84)	(-0,25)
(β_2) IR*Pos	**-0,0379**	**-0,129***	**-0,143***	**-0,164***	**-0,151**	**-0,0616**	**-0,0750**	**-0,0707**	**-0,0687**	**0,0475**
	(-0,57)	**(-1,65)**	**(-1,81)**	**(-1,67)**	**(-0,84)**	**(-0,51)**	**(-0,58)**	**(-0,54)**	**(-0,39)**	**(0,19)**
(β_3) Tam		0,0470***	0,0460***	0,0678***	0,0382		0,0474***	0,0464***	0,0451**	0,0001
		(5,52)	(5,40)	(5,49)	(1,31)		(4,17)	(4,09)	(2,42)	(0,01)
(β_4) MB		0,0131***	0,0127***	0,0140**	0,0094		0,0186***	0,0183***	0,0191**	0,0176**
		(2,83)	(2,74)	(2,37)	(1,38)		(2,87)	(2,82)	(1,98)	(2,17)
(β_5) *ESG*		0,0025***	0,0024***	0,0024***	0,0032**		0,0027***	0,0027***	0,0038***	0,0020
		(3,24)	(3,17)	(2,63)	(2,00)		(2,73)	(2,71)	(2,97)	(1,17)
(β_6) *ROA*		-0,0198	-0,0261	0,0929	-0,0228		-0,249	-0,254	-0,0406	-0,392
		(-0,12)	(-0,16)	(0,37)	(-0,11)		(-1,13)	(-1,14)	(-0,09)	(-1,27)
(β_7) *IFRS_E*			0,0972***	0,100***	0,118***			0,0994***	0,0996***	0,130***
			(4,58)	(3,91)	(2,94)			(3,42)	(2,70)	(2,83)
(β_8) *WGI_C*			1,081***	1,046***	1,620**			1,143**	0,985	1,983**
			(2,99)	(2,61)	(1,97)			(2,33)	(1,60)	(2,33)
Industry FE	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim
Country FE	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim
Year FE	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim
Observations	17.521	7.443	7.443	5.332	2.111	7.017	3.890	3.890	2.368	1.522
F Statistic	29,05***	18,38***	18,24***	12,21***	4,55***	13,50***	11,02***	10,72***	6,23***	3,50***
Adjusted R^2	0,072	0,098	0,101	0,103	0,081	0,074	0,098	0,101	0,127	0,112

Note: All regressions have fixed effects at the industry, country and year levels with robust errors. The values in parentheses represent the *t*-test of the coefficient. Significance level: * 10%, ** 5%, *** 1%. *IR* is a dummy that assumes the value 1 (one) for the adoption of integrated reports in general (IRT) or IIRC Integrated Report (IRP), and 0 otherwise; *IR*POS* is the interaction between the IR and POS dummies; *APA* is the analysts forecast accuracy; *Sync* is the stock return synchronicity; *Pred* is the earnings predictability; *Size* is the natural logarithm of the total asset; *MB* is the market-to-book index; *ESG* is the Environment, Social and Governance score; *ROA* is the return on asset; *IFRS_E* is the IFRS experience; *WGI_C* is the consolidation of the six dimensions of the Worldwide Governance Indicators; Bigger considers only the companies that are larger than the country's median; Smaller considers only companies that are smaller than the country' median.

In the additional analyzes that segment the samples by the degree of countries' development and by the *Size* median by country, only the interaction *IR*Pos* in the IRT subsample has a significant relationship. The findings reported in Table 5 confirm that the group that adopts General Integrated Report (IRT) in at least one year of the sample shows a positive and significant association with the stock synchronicity ($\beta_1 > 0$). However, it is only significant among larger firms. This finding reinforces the argument that the existence of larger firms leads to greater synchronicity since the results of these companies have a greater share in the average result of the market (Piotroski & Roulstone, 2004; Bissessur & Hodgson, 2012).

When we analyze the post-adoption period, the coefficient β_2 shows a negative relationship in both estimates, for larger and smaller companies. However, there is only significant among the largest companies, confirming that, after the adoption of the General Integrated Report (IRT) there is an effective reduction in stock synchronicity for larger firms. Thus, considering the period, it is possible to assume that this result may be related to the fact that larger firms are more closely monitored by analysts and, thus, their pricing has the potential to incorporate more information disclosed than smaller firms (Flores *et al*., 2019).

4.3. Earnings Predictability Analysis

Table 6 compares the earnings predictability average value in the pre- and post-treated periods and shows that in both samples the earnings persistence is greater in the treated group than in the control group (smaller standard deviations). This confirms that the treated group has more predictable earnings in both analyzed periods. However, the difference in the pre-adoption period (Panel A) is only significant in the IRT subsample. After the adoption of integrated reports (Panel B), the difference between the treated and control groups is significant in both subsamples, giving evidence of support for hypotheses $\boldsymbol{H_3}$ e $\boldsymbol{H_{3a}}$.

Table 6 – Difference-in-Difference Earnings Predictability

Panel A – Pre-adoption period		**IRT**		**IRP**	
		N	**Pred**	**N**	**Pred**
Treated	(1)	854	-0,028	303	-0,024
Control	(2)	3.077	-0,035	1.209	-0,028
Difference	(1) – (2)		**0,006*** **		**0,004**
t-Test			*2,94*		*1,56*
Panel B – Post-adoption period		**N**	**Pred**	**N**	**Pred**
Treated	(1)	3.353	-0,034	1.184	-0,027
Control	(2)	16.103	-0,044	6.212	-0,034
Difference	(1) - (2)		**0,010*** **		**0,007*** **
t-Test			*9,30*		*5,42*

Note: Significance level: * 10%, ** 5%, *** 1%. *Pred* is the residue of the persistency regression.

Table 7 shows that in the IRT subsample, the treated group shows significant associations ($\boldsymbol{\beta_1}$) in all models. However, the direction of the relationship changes between them, since in model 1 the sign is positive, indicating an increase in the earnings predictability, however, when the firms' and countries' characteristics are considered (models 2-3), the sign of the relationship turns to negative ($\boldsymbol{\beta_1 < 0}$). The post-adoption period suggests a reduction in earnings predictability ($\boldsymbol{\beta_2 < 0}$). On the other hand, the positive and significant association of the interaction with the earnings predictability in the treated group shows an increase in predictability ($\boldsymbol{\beta_1 > 0}$), even when controls at the firm and country-level are inserted. Thus, it shows that it is only in the post-adoption period of integrated reports that the treated group demonstrates an increase in earnings predictability, confirming the hypothesis $\boldsymbol{H_3}$. The coefficients of the variables of interest ($\boldsymbol{\beta_1}$, $\boldsymbol{\beta_2}$ and $\boldsymbol{\beta_3}$) in the models for the subsample of firms that adopted the IIRC Integrated Report (IRP) did not show significant relationships, thus it is not possible to infer the effect of adopting the IIRC Integrated Report on earnings predictability. Therefore, the sub-hypothesis $\boldsymbol{H_{3a}}$ is not confirmed.

In line with the literature (Kang *et al.*, 2012; Mahjoub & Khamoussi, 2012; Alipour *et al.*, 2019), *Size* and *ROA* show positive and significant relationships in all models, in both samples, indicating that larger and highly profitable firms have greater earnings predictability ($\boldsymbol{\beta_4 > 0}$ and $\boldsymbol{\beta_7 > 0}$). Alternatively, *MB* has a negative relationship with *Pred* ($\boldsymbol{\beta_5 < 0}$) in the IRT subsample, which is consistent with the fact that past data of companies under expansion may not be good predictors of future results (Yeh *et al.*, 2014). The other variables for controlling country characteristics (*ESG*, *IFRS_E*, and *WGI_C*) are not significant.

In segmenting the samples by degree countries' development and by *Size*, we find significant results only for the degree of development. For the IRT subsample, we observe that the coefficients of the variables of interest (*IRT*, *Pos*, and *IRT*Pos*) are significant only for firms located in developed countries. The earnings predictability shows negative associations with the adoption of integrated reports and with the post-adoption period ($\beta_1 < 0$ e $\beta_2 < 0$), which implies a reduction in earnings predictability. On the other hand, the coefficient β_3 is

positive, confirming that the treated group in the post-adoption period of the integrated reports show an increase in earnings predictability. These findings suggest that the benefits obtained in relation to *Pred* are concentrated among firms located in developed countries. The controls *Size*, *MB* and *ROA* are statistically significant, as observed in the general model, maintaining the signs of relationships, with exception of *MB* in developed countries, with a positive association, indicating that firms with greater growth opportunities in these countries have larger earnings predictability. This finding is in line with the literature (Yeh *et al*., 2014).

Table 7 - IR and Earnings Predictability

Sample				**IRT**				**IRP**		
Variables	**(M1)**	**(M2)**	**(M3)**	**Developed**	**N_Devel**	**(M1)**	**(M2)**	**(M3)**	**Develop**	**N_Devel**
(α) Constant	-0,0932***	-0,256***	-0,256***	-0,246***	-0,230***	-0,0223***	-0,173***	-0,173***	-0,179***	-0,185***
	(-9,31)	(-14,20)	(-14,07)	(-7,63)	(-13,40)	(-3,22)	(-17,10)	(-16,50)	(-5,15)	(-6,97)
(β_1) IR	0,0060***	-0,0049**	-0,0050**	-0,0078***	-0,0015	0,0015	-0,0003	-0,0005	-0,0034	0,0078
	(3,02)	(-2,15)	(-2,21)	(-2,62)	(-0,28)	(0,62)	(-0,14)	(-0,20)	(-1,07)	(0,99)
(β_2) Pos	-0,0034	-0,0049*	-0,0050*	-0,0071**	-0,0022	-0,0027	-0,0029	-0,0031	-0,0077**	0,0073
	(-1,53)	(-1,78)	(-1,83)	(-2,25)	(-0,43)	(-0,92)	(-0,92)	(-0,98)	(-2,20)	(0,91)
(β_3) IR*Pos	**0,0047****	**0,0055****	**0,0056****	**0,0059***	**0,0074**	**0,0039**	**0,0001**	**0,0002**	**0,0014**	**0,0005**
	(2,18)	**(2,23)**	**(2,30)**	**(1,80)**	**(1,21)**	**(1,45)**	**(0,03)**	**(0,10)**	**(0,40)**	**(0,07)**
(β_4) Tam		0,0069***	0,0069***	0,0076***	0,0061***		0,0056***	0,0056***	0,0048***	0,0065***
		(17,29)	(17,35)	(17,18)	(10,81)		(11,56)	(11,62)	(10,10)	(9,42)
(β_5) MB		-0,0004**	-0,0004**	0,0006**	-0,0009***		-0,0002	-0,0002	0,0009***	-0,0009**
		(-2,00)	(-2,00)	(2,35)	(-4,72)		(-0,88)	(-0,88)	(3,23)	(-3,48)
(β_6) *ESG*		0,0001	0,0001	0,0001	-0,0001		0,0001	0,0001	0,0001**	0,0001
		(0,23)	(0,25)	(0,71)	(-0,05)		(1,44)	(1,44)	(2,04)	(0,19)
(β_7) *ROA*		0,166***	0,166***	0,159***	0,171***		0,135***	0,135***	0,112***	0,148***
		(14,24)	(14,24)	(21,17)	(19,08)		(8,69)	(8,68)	(10,86)	(12,09)
(β_8) *IFRS_E*			-0,0003	-0,0001	-0,0002			-0,0001	-0,0010	-0,0010
			(-0,55)	(-0,02)	(-0,24)			(-0,28)	(-0,71)	(-0,75)
(β_9) *WGI_C*			-0,0053	0,0028	-0,0059			0,0012	0,0093	-0,0049
			(-0,50)	(0,17)	(-0,34)			(0,10)	(0,53)	(-0,21)
Industry FE	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim
Country FE	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim
Year FE	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim	Sim
Observations	23.387	9.741	9.741	5.535	4.206	8.908	4.993	4.993	2.817	2.176
F Statistic	46,51***	33,65***	31,84***	60,01***	29,17***	21,58***	23,58***	22,74***	25,19***	18,86***
Adjusted R^2	0,115	0,255	0,255	0,298	0,211	0,127	0,243	0,243	0,255	0,242

Note: All regressions have fixed effects at the industry, country and year levels with robust errors. The values in parentheses represent the *t*-test of the coefficient. Significance level: * 10%, ** 5%, *** 1%. *IR* is a dummy that assumes the value 1 (one) for the adoption of integrated reports in general (IRT) or IIRC Integrated Report (IRP), and 0 otherwise; *Pos* is a dummy variable that assumes value 1 (one) to identify the post-adoption period, and 0 otherwise; *IR*POS* is the interaction between the IR and POS dummies; *APA* is the analysts forecast accuracy; *Sync* is the stock return synchronicity; *Pred* is the earnings predictability; *Size* is the natural logarithm of the total asset; *MB* is the market-to-book index; *ESG* is the Environment, Social and Governance score; *ROA* is the return on asset; *IFRS_E* is the IFRS experience; *WGI_C* is the consolidation of the six dimensions of the Worldwide Governance Indicators; *Develop* considers only the sample of firms located in developed countries; and *N_Devel* considers the group of firms located in non-developed countries.

5. Conclusion

Our findings show that the use of General Integrated Reports maximizes the value of the information disclosed and reduces the processing effort by analysts, creating value for shareholders (confirms the first hypothesis of this study). The IIRC Integrated Report adoption also reduces information asymmetry, however, does not represent additional informational content in relation to the other integrated reporting formats (does not confirm H_{1a}).

Additional analyzes show us that the effect in reducing the asymmetry in the IRT sample is concentrated in companies located in developed markets, while in the subsample that adopts the IIRC Integrated Report (IRP) has the greatest effect in firms located in markets considered undeveloped. This can be explained by the fact that integrated reporting, in general, is a practice

adopted by firms for some years, but, given that in developed markets there are more analysts following firms, their effects are more strongly captured in these markets. Alternatively, the IIRC Integrated Report adoption, which is more recent, enhances the reduction of information asymmetry in undeveloped markets, a fact associated with the set of principles that help firms not only disclose a greater volume of non-financial information but, also, they are more concise and material for the market. Thus, the adoption of the IIRC Integrated Report framework in undeveloped markets can be considered a differential for reducing information asymmetry.

The disclosure of integrated reports in general formats is also associated with the reduction of stock price synchronicity and the increase in earnings predictability (confirming the H_2 e H_3 hypotheses). Additional analyzes demonstrate that the reduction in synchronicity occurs mainly among larger companies, which may be related to the fact that larger companies are more closely monitored by market analysts and have greater trading liquidity, which makes it possible to incorporate information more efficiently. The increase in earnings predictability after integrating reports, in general, confirms that in addition to helping the market understand the firms' value generation process, this report format also promotes "integrated thinking", positively impacting decision making managers, which, in turn, reflects in more predictable results. Again, the most pronounced results are found in developed markets. Although the adoption of the specific IIRC Integrated Report framework has shown associations in the expected direction with stock synchronicity and earnings predictability, we have not found any significance in these analyzes. Thus, we do not confirm H_{2a} and H_{3a}.

In general, the findings confirm that, although the integrated reports are perceived as a legitimation instrument, their adoption goes beyond the creation of a symbol before society, as it effectively generates value for shareholders. The additional value obtained does not show association with a specific disclosure framework but with an efficient arrangement of how information is disclosed to the market, which gives more freedom for firms to search for the best way to implement it. This evidence is of great relevance because it can assist in decision-making related to the imposition of forms of disclosure that consider not only the disclosure of non-financial information but the directive 2014/95/UE and the 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 demonstrate that the adoption of integrated reports can change companies' profile results, at least in more developed countries, making them more predictable. This characteristic is sought by investors in general when the adoption of this type of report is perceived as a relevant indicator for assets selection with less volatile returns for the composition of a portfolio. For companies, the integrated report can be used as an instrument of differentiation in relation to the market, presenting benefits that can offset the additional costs incurred with its preparation. Thus, we conclude that regardless of a specific framework, the expansion of information made available by companies in integrated reports creates value for shareholders, especially when the country's information environment is more solid and offers greater protection to shareholders.

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