

The Improvement Effect of the Integrated Reporting Adoption on the Accuracy of Capital Market Analysts

Abstract: This study evaluated whether integrated reporting issuance IR affects the accuracy of the capital markets analysts' forecasts. To achieve this purpose were chosen companies that adopted IR around the world, forming a treatment group according to difference-in-difference literature. To perform a control group was used the Propensity-Score Matching (PSM). Both groups resulted in data-sample with 13,144 firm-observations from 2009 to 2016. It was verified that after the adoption of the IR by the treatment group, there was an increase in the accuracy of the earnings per share (EPS) forecasts by the analysts even after the implementation of the control terms.

Keywords: Integrated Reporting; Analysts' Forecasts; Difference-in-Differences models.

Introduction

Claims about sustainability and corporate reports in a long-term view have shaped an international movement called Integrated Reporting IR, which is led by the International Integrated Reporting Council (the IIRC), resulting in a framework issued in 2013. This conceptual framework aims to, among other purposes, explain that "An integrated report is a concise communication about how an organization's strategy, governance, performance, and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long-term." (The IIRC, p. 7, 2013).

It is important to highlight that business sustainability is a topic that has been attracted some much attention from the researchers in finance due to its association with practical issues such as cost of equity capital (Ng & Rezaee, 2015), equity financing (Crifo, Forget & Teyssier, 2015), capital allocation efficiency (Bhandari & Javakhadze, 2017), corporate cash holdings (Cheung, 2016), among other relevant aspects of the finance theory.

Adams (2015) highlights that the main characteristics of the IR that has the potential to better align notions of profit maximization with the well-being of society, and the environment is its emphasis on the long-term thinking and encouragement of broader thoughtful of what is value, the value creation process, and business model. This disclaimer was preconized by Adams and Whelan (2009), in general, mean about the corporate social disclosure. Wild and Staden (2013) advocate the need for integration between nonfinancial information and financial figures aiming to build cohesive reports that provide a broad perspective, or a holistic vision, about the firm's operation in short, medium and long-term. Fatemi, Glaum and Kaiser (2017InPress), for instance, identified that Environmental, Social, and Governance performances still closely related to the firms-value.

In this context, the integrated reporting adoption creates a singular opportunity to the companies' better exposure their business model. According to Teece (2010), a business model indicates how the company will transform resources and competencies into economic values. The main aspect of a business model is to highlights how the company acquires and uses different forms of capital, such as physical, financial and intellectual to create value (Beattie and Smith, 2013).

Furthermore, integrated reporting can be seen as an evolution of mainstream corporate statements representing an opportunity to enhance the accountability of reports nearby how firms managed several kinds of resources to create value for their stakeholders (Adams & Simnett, 2011; Adams et al. 2011; Eccles & Krzus, 2010).

Notwithstanding the practical effects of this discussion, Churet and Eccles (2014) report a strong relationship between integrated reporting and ESG quality of management, an indicator of the overall effectiveness of management in creating value over the long term. Serafeim (2015) found that firms which practice integrated reporting have a more long-term oriented investor base with more dedicated and fewer transient investors. Knauer and Serafeim (2014), using the case of a biopharmaceutical firm intensely committed to the safety of its goods and the reliability of its supply chain, indicated that the company had the capability to change their investors base in a way more consistent with their strategy.

In contemplation of the economic consequences of the integrated reporting quality (IRQ), Barth et al. (2016) emphasize that IRQ is associated with stock liquidity, firm value, expected future cash flow, and cost of equity. According to the researchers, the positive association between IRQ and companies' value is determined mostly by the cash flow

outcome, reliable with investors revising their estimates of future cash flow upward as a result of a better understanding of the firm's capitals strategy or future cash flows increasing the decision making by managers.

Most recently, Bernardi and Stark (2016InPress), studied the impact of the integrated reporting enforcement adoption in South Africa on analyst forecast accuracy over the period 2008 to 2012. Using scores of Environmental, Social and Governance (ESG), as an indirect measure of integrated reporting usefulness, the authors demonstrated that after the IR, the ESG scores became more relevant and statically significant to reduce the mismatching between earnings per share forecasted by the analysts when compared with the realized numbers. According to Bernardi and Stark (2016), these findings can be assumed as proof the virtues of the integrated reporting as an effective tool to communicate companies' business model and strategy.

In spite of the previous literature about integrated reporting has been expanded in the last years (e.g.; Ballou et al., 2012; Jensen & Berg, 2012; Parrot & Tierney, 2012; Busco et al. 2013; Beattie & Smith, 2013; Eccles & Serafeim, 2013; Brown & Dillard, 2014; Churet & Eccles, 2014; Stubbs & Higgins, 2014; Adams, 2015; Eccles, Kruz & Ribot, 2015; Flower, 2015; Rowbottom & Locke, 2016; Bernardi & Stark, 2016), there is a lack in papers aiming to evaluate firms which annunciated the issuance of IR in a cross-country perspective. We understand that this is a matter approach for researchers because IR, as previously mentioned by the IIRC, is a global movement aiming to produce corporate reports integrated with sustainable practices. Thus, under this view is essential to comprise how market participants, such as analysts, still perceiving integrated reporting and reacting, or not, about it in their forecasts and estimations. Furthermore, from the standard-setter viewpoint, evaluate an IR in a cross-country structure, might be an opportunity to endorse or enforce this communication tool in their jurisdictions from empirical findings and not only based on their logical understanding. Therefore, a cross-country study evaluating the effect of the IR adoption on the analysts' forecasts accuracy, conducted through difference-in-differences models, brings robustness results potentially matter for analysts, investors, creditors, regulators, and firms.

Using a database from 2009 to 2016, we verified that the adoption of the IR in a cross-country perspective improved the analysts' forecast accuracy. We had used the analysts' accuracy as our dependent term because analysts influence investor demand, thus affecting the commonality in returns (Marcet, 2017). According to Frankel et al. (2006), analysts are prominent intermediates in financial markets spreading information that is useful for investors and managers' decisions. Hence, analysts are potentially able to detect and incorporated insights provided by the integrated reporting about firms' business model and strategy in their forecast. In general means, companies emitters of an integrated reporting using the IIRC framework to elaborate it reduced the deviation in EPS forecasted compared with EPS performed.

Likewise, we also identified that companies located in Latin-American and Russia

a, India and China, which adopted an integrated reporting, demonstrated higher levels of analysts' accuracy than non-issuers from the control group. This finding is relevant because: (i) emerging economies are characterized by the economic instability and, apparently, IR has the potential to help EPS becomes more predictable for analysts and consecutively for investors, potentially reducing the cost of capital and attracting long-term shareholders, as preconized by Serafeim (2015); and (ii) voluntary disclosure is one relevant topic special for emerging market (e.g. The Emerging Market Disclosure Project, 2009), and the integrated reporting reinforces the relevance and the quality of corporations reports.

Furthermore, we also choose to verify specifically emerging-economies, in which companies voluntarily issued an integrated reporting because the existing empirical literature about corporate and social disclosure has generally focused on developed and developing countries and emergent markets remain under-researched although they become the core of attention of international corporate responsibility initiatives (Khlif, Guidara, & Souissi, 2015).

The remainder of this paper is organized as follows. The next section introduces the literature relevant to the analysts' accuracy and how IR creates a virtuous bridge between analysts' forecasts and companies operations. These arguments are essential to understanding the hypotheses raised. Section 3 provides the methodological details about econometric specifications and the composition of the sample data (i.e., Treatment Group and Control Group). Section 4 shows the descriptive statistics and the results found. Section 5 concludes our analysis and indicates some potential ways to futures studies.

2. Background and Hypotheses Development

This section reviews the most relevant literature on analyst forecast accuracy and IR. It also develops our hypotheses about the association between integrated reporting and the accuracy of analysts' forecasts in the contexts of emerging economies.

2.1. Analyst forecast accuracy

According to Kelly and Ljungqvist (2012), financial analysts play an essential role in capital markets, facilitating the pricing of stocks and serving as information intermediates among firms and outsiders. One of the most relevant impacts of the analysts' activity is the reduction of the agency problems between managers and shareholders and of information asymmetry for investors (Bowen, Chen & Cheng 2008; Lang, Lins & Miller, 2004; Boubarki & Bouslimi, 2016). Given their central role in the functioning of capital markets, previous studies devoted much effort to investigating and discussing the factors influencing analysts forecast accuracy.

One key variable is disclosure quality. Several authors (Barron et al., 1999; Barth et al., 2001; Hope, 2003; Plumlee, 2003) find that better disclosure quality improves forecast accuracy because it enhances analysts' understanding of the company's performance and future outlook. The better disclosure also helps to lower the cost of processing and to interpret the disclosures, again leading to improved earnings forecasts (Lehavy et al., 2011). Other studies focus on voluntary disclosure and posit that it improves overall disclosures quality thus enhancing analysts' understanding of companies' prospects through an improvement of the information environment (Beyer et al., 2010).

Also, non-financial information plays a role in analysts' activity. Prior content-analytic studies indicate of analyst reports have fundamentally measured the extent to which several kinds of financial information and non-financial information are used to improve the forecast activity (Abhayawansa & Guthrie, 2016). According to Dhaliwal et al. (2011, 2012) and Nichols and Wieland (2009), analysts use non-financial information, and this helps – if such information are value relevant or help reduce acquisition and processing costs - in reducing forecasts errors.

Information complexity is another crucial construct that explains the ability of analysts to forecast companies' future performance. According to Allen et al. (2016, p. 85) “whether analysts can effectively fulfill this function depends largely on the complexity of corporate information.” Some transactions are complex and affect the ability of analysts to assimilate this new information, leading to higher information asymmetry (Plumlee, 2003; Gu & Wang, 2005). Krishnaswami and Subramaniam (1999) revealed that a better comprehension of complex transactions and firms' strategy tend to enhance companies value. It is a relevant topic because analysts' forecasts represent a reasonably good proxy for markets expectations of future earnings (La Porta, 1996).

Previous literature has also documented that new information and its features, such as informativeness and reliability, increase analysts' accuracy (Bowen, Davis & Matsumoto, 2002; Hope, 2003; Dhaliwal et al., 2012; Ayres, Huang & Myring, 2016). Additionally, this new information not necessarily is only regarded as financial data. Abhayawansa and Guthrie (2016) report that intellectual capital information, for example, has been used by analysts to evaluate the earnings persistence, growth rates, future cash flow, and risk premium (Thomas, 2003; Bailey et al., 2003; Holland, 2004, Boedker, Mouritsen, & Guthrie, 2008).

2.2. Integrated Reporting

Integrated Reporting IR is an “a concise communication about how an organization's strategy, governance, performance, and prospects, in the context of its external environment, lead to the creation of value over the short, medium and long-term” (IIRC, 2013, p. 7).

Since the publication of the IR Framework in 2013, many researchers from a variety of fields investigated IR, its main features and its consequences for the companies implementing it. To provide an overall discussion of IR and the IIRC framework goes beyond the scope of the present paper. We will rather focus on four IR features, that are relevant for the development of our hypotheses and that arguably represent the main innovations introduced by the IR framework.

The first feature is the materiality and conciseness principles, which are tightly related. An IR should be “concise” (see the definition provided above), therefore should only disclose material matters. According to the IIRC (2013) ‘matter is material if it could substantively affect the organization’s ability to create value in the short, medium or long-term’ (IIRC, 2013, p. 33). Since the definition of the material topics is very challenging, the IIRC requires companies to involve the highest governing body in the materiality determination process. The research theme of materiality has also attracted the attention of the academic debate (see de Villiers et al., 2014; Higgins et al., 2014; Unerman and Zappettini, 2014).

The second feature is the connectivity principle, which requires companies to “show a holistic picture of the combination, interrelatedness, and dependencies between the factors that affect the organization’s ability to create value over time” (IIRC, 2013). These factors (capitals, performance, company features) should not be viewed as “silos”, but as integrated and IR should disclose the interrelations between them (for instance: it should disclose how employee training impacted on financial performance).

The third feature is not a guiding principle (such as materiality and connectivity), but it is rather the content of an integrated reporting. IR should provide information not only on the performance of a company but also on its external environment, governance, business model, risks and opportunities, strategy and future outlook. All these contents should follow the guiding principles. Therefore they should only focus on material information and on the show how they are connected.

Finally, IR relies on integrated thinking that is the active consideration by an organization among the relationships between its various operating and functional units and the capitals that the firms use or impact on. The integrated thinking preconized by the IIRC (2013) is closely related to the value creation process, because of exposures the connectivity of information flow into management reporting, analysis, and decision-making.

2.3. Hypothesis 1: Accuracy of Analysts’ Forecasts and Integrated Reporting in an international setting

We argue that IR implementation may influence the accuracy of the analysts’ forecasts through three channels.

First, the materiality principle requires companies to disclose only the information that is likely to impact the ability of the company to create value. This is likely to reduce the analysts’ costs of information acquisition and processing by relieving the information overload faced by investors, which –as shown by previous literature - have cognitive limitations (see Zhou et al., 2017). Materiality is also likely to decrease information complexity because IRs need to be concise.

Analysts can be considered sophisticated users of companies’ report, who are proficient in aggregate financial and non-financial information to provide forecasts of earnings and cash-flows (Schipper, 1991). The second channel through which IR may influence analysts’ forecasts is the connectivity principle. Such principle (and the integrated thinking approach) requires companies to integrate information, thus helping analysts in “aggregating financial and non-

financial information” and in understanding the ways in which different factors can influence the value creation process. In other words, the connectivity principle is expected to increase forecast accuracy.

The IR requires companies to broaden the scope of reporting, including information on governance, business model, strategy, etc. It is therefore likely that analysts will find new value-relevant information in IRs that were not disclosed anywhere else before. For instance, a broader disclosure of the business model is fundamental for analysts to understand the value creation process. As reported by the IIRC (2013) the value creation process is the ability of an organization to create value for itself and others. Besides, IR allows the analysts to gather information about other types of capitals that affect firms’ value creation process. According to the IIRC (2013) organizations depend on several kinds of capitals to keep their continuity and achieve their purposes. Furthermore, these capitals are under constant modification increasing or decreasing companies’ value, and for this reason are fundamental to be comprehensive by external users of corporate reports. According to Bernardi and Stark (2016), it is not possible to assume that IR affects directly accounting numbers. However, it is expected that does affect the information available and, consequently, analyst forecast accuracy after to the first the IR issuance.

To sum up (see also Zhou et al., 2017), IR has the potential to improve analysts forecast accuracy by (i) providing additional value-relevant information, (ii) providing a better disclosure and presentation of information disclosed in other company reports, thus lowering analysts’ processing and interpretation costs.

Therefore, our first hypothesis is formulated below:

H1 – There is an improvement in the accuracy of analysts forecast after the beginning of the Integrated Reporting period, considering the treatment group.

2.4. Hypothesis 2: Voluntary Disclosure, Emerging Markets, and Integrated Reporting

Disclosure is one topic straightly related to the corporate governance due to its potential reduction in information asymmetry (Diamond and Verrechia, 1991). According to the Djodot and Nguyen (2008), once disclosure improves the communication among companies and investors, it is expected some actual benefits from its increase such as better financial performance statement, reduce risk and raise investor confidence.

According to the Graham, Harvey and Rajgopal (2005) firms that practicing voluntary disclosure agreed that this initiative reduces information asymmetry between managers and stakeholders. Moreover, these authors also identified that these companies tend to believe that voluntary disclosure increases the certainty about forecast performances. These results are supported by the literature approach once authors such as Glisten and Milgron (1985), Diamond and Verrechia (1991), and Kim and Verrechia (1994) demonstrated that as the disclosure’s level increases, the informational asymmetry tends to be reduced. This mechanism contributes to efficient resource allocation in capital markets (Dye, 2001).

Wang, Sewon, and Claiborne (2008) explain that voluntary disclosure is the information that exceeds the mandatory disclosure. Gibbins, Richardson and Waterhouse (1990) indicate that companies improve voluntary disclosure to accommodate external factor that pressures their activities such as agency costs, litigation costs, information asymmetry, and cost of capital (Leftwich, Watts & Zimmerman, 1981; Hughes, 1989; Skinner, 1994; Botosan, 1997; Healy, Hutton & Palepu, 1999).

Voluntary disclosure has been attracted emphasis because investors are looking for responsible and sustainable opportunities to allocate resources aiming to obtain steady returns in a long-term view. One of the most prominent initiative about this topic is the United Nations Principles for Responsible Investment (“the PRI”) which is based on the premise that institutional investors and asset managers have a duty to act in the best long-term interests of their investors and therefore, need to consider how environmental, social, and governance (ESG) issues can affect the performance of investment portfolios (OECD & UNEP, 2007).

The Emerging Markets Disclosure Project (2009), among other relevant issues, indicates that there are several differences in reporting practices between the voluntary disclosure about Environmental, Social, and Governance issued by public companies located in emerging markets.

Salter (1998) mentioned that emerging markets are those countries in which capital markets have developed to the stage of contributing to the national pool and are usually able to receive some foreign direct investment.

Previous researchers appointing that disclosure level, as a proxy of good practices of corporate governance, have a positive association with companies' financial performance and their market valuation as well as the value relevance of accounting information in companies located in emerging markets (Newell and Wilson, 2002; Lopes, Walker and Silva, 2016).

It is relevant to highlight that IR can be considered a piece of voluntary information disclosed by companies, except for South-African firms, and in this context it is possible to conjecture that corporations located in emerging markets, which choose issue an integrated reporting under the IIRC framework, potentially are trying to demonstrate better practices of corporate governance, less informational asymmetry between inside and outside users of its reports, and an integrated thinking related to the management of its business model.

For this reason, it is considered that companies located in emerging markets, which voluntarily adopted IR practices are those who are seeking to differentiate itself from its competitors through the improve of corporative reports allowing that users of this information, such as analysts, understanding better its business models.

Therefore, our second hypothesis is formulated below:

H2 – There is an improvement in the accuracy of analysts forecast after the beginning of the Integrated Reporting adoption for companies located in emerging markets comparative with local competitors.

3. Methodology

This section presents the most relevant details about the methodological procedures related to sample selection, descriptive statistics, and econometric specifications.

3.1. Sample selection

To test both hypotheses was build a sample data considering two groups, being first a treatment group, composed of firms that have been issued IR, and a second one combined by companies that did not issue an integrated reporting respectively called control group.

The companies that issued an IR were identified within the IIRC website and were checked one by one to assure that only remain in the group of issuers firms that have been released integrated reporting since 2013, and in accordance with the IIRC's framework. Afterward, this initial procedure was excluded from the private sample companies and public agencies. The total amount of companies in the treatment group is 317 firms dispersed among 26 jurisdictions plus South-Africa considered distinctly due to the enforcement adoption of IR.

To develop a control group were employed the Propensity Score Matching PSM (Rosenbaum and Rubin, 1983) considering all companies located in the same jurisdictions of the treatment group, and which operate in the same business industries, who did not release an IR. The total of companies forming the control group is 2,127.

Since the structure considering a treatment and a control group was created, our data were obtained from Thomson Reuters Datastream© from 2009 to 2016, performing 13,144 firm-observations dispersed in 96 industries.

TABLE 1 – HERE

Table 1 presents the sample data by jurisdiction. South-Africa, until now, is the only country in which IR is enforced to all public companies listed on Johannesburg Stock Exchange (JSE), due to this characteristic South-African firms were used to perform robustness tests as preconized by Lu and White (2014). Additionally, the relationship between the analysts' accuracy and public companies listed on JSE was studied by Bernardi and Stark (2016) and Zhou et al.;

(2017), providing us an ideal field to assure that our data still correct and not biased through the robustness tests development.

Japan is the most expressive country in the sample composition, when considered the number of firms-observation as well as in the treatment group with 588 lines representing 28.12% of this column, and 4,610 observations, around 36% of the control group, making 35.07% of all databases.

The United States of America appears as the second one jurisdiction with more data in the sample, however, it is important to highlight that this result came from the total amount related to the control group, countries like Brazil, Italy, and Spain, have more companies which adopted the IIRC framework to produce an IR than US companies, despite the US is the largest capital market in the world.

3.2. Econometric Specifications

Several studies have employed the difference-in-difference estimation among a variety sample of investigations (e.g., Bertrand, Duflo & Mullainathan, 2004; Diether, Lee & Werner, 2009; Petersen, 2009; Thompson, 2011; Cameron, Gelbach & Miller, 2011). Nevertheless, the general econometric technique behind these studies is the evaluation of the potential impact created by one specific event on a dependent variable considering a group exposed to this happening, usual called as the treatment group, compared to another set of individuals that were not exposed to this incident, respectively named as a control group, considering, at least, two different periods being before and after the event.

Angrist and Pischke (2008) mentioned that these two dimensions are labeled in the difference-in-difference set up as states and time because this is the archetypical example in applied econometrics. Under this context was structured an application, in which the principal evaluation is the interaction between the effect of the IR adoption by the treatment group (states), and the period after this event (time).

$$Acc_{ij+1} = \varphi + \beta_1 AdoptIR_{ij} + \beta_2 PostIR_{ij} + \beta_3 Adopt_{ij} * Post_{ij} + e \quad (1)$$

where: ACC is the accuracy of the analyst forecast for firm i in period j . φ is a permanent component as well as β 's are the estimated parameters. $AdoptIR_{it}$ represents a dummy variable indicating one for companies who adopted IR and zero otherwise. $PostIR_{it}$ denotes a second binary term being one for the period after the IR adoption and zero for previous time. It is highlighted that was only considered companies that adopted IR in 2013, when was issued the IIRC Framework, this methodological procedure was employed aiming to align the start point of the treatment group. $Adopt_{it} * Post_{it}$ represents the interaction among both variables and it is the main interest term of this equation, because conjugates the adopters and the period after the IR adoption, allowing to isolate the specific effect of this new way to report companies' activities and performances.

The analyst forecast accuracy was measured through two variables, as previously defined by Bernardi and Stark (2016) and respectively presented below.

$$Acc1 = \log \left[\frac{|AEPS - MedFEPS|}{MVPS} \right] \quad (2)$$

and

$$Acc2 = \log \left[\frac{|AEPS - MedFEPS|}{|AEPS|} \right] \quad (3)$$

where: $AEPS$ is equal to the actual earnings per share corresponding to the median consensus one-year-ahead forecast of earnings per share. $MedFEPS$ signifies the first median consensus analyst forecast of one-year-ahead earnings per share produced after the financial year-end. $MVPS$ is the market price per share of the firm at the financial year-end prior to the date of the consensus analyst forecast.

It is highlighted that the use of Bernardi & Stark (2016) approach, considering two measures of the accuracy, was done in order to increase the robustness of the statistical tests. Furthermore, were employed fixed, time and other specific controls, aiming to reduce the impact of several events that potentially affect the analyst's perception about companies reports (Pope & McLeay, 2011; Glaum et al., 2013; Preiato, Brown & Tarca, 2015; Bernardi & Stark, 2016).

Global Reporting Initiative guidelines (GRI), and Management & Discussion Analysis (MD&A) were incorporated in the complete version of our regression approach to mitigate the effect of others source of information that can impact the analyst's evaluation (Serafeim, 2015). Moreover, it is important to mention that in this study Environmental, Social and Governance (ESG), was considered a control and not a proxy of integrated reporting once IR considers more source of capitals, which have to be properly disclosed.

Equation (4) represents the entire version of the regression model.

$$Acc_{ij+1} = \varphi + \beta_1 AdoptIR_{ij} + \beta_2 PostIR_{ij} + \beta_3 AdoptIR_{ij} * PostIR_{ij} + \sum_{k=1}^w C_{kit} + \sum_{i=1}^n F_i + \sum_{j=1}^s T_j + e_{ij} \quad (4)$$

Equation (4) includes several control variables proposed in the prior literature to reduce the effect of bias in the estimators. C_{kit} denotes the control variables k for firms i in period j , employed to reduce the sample heterogeneity and other potential impacts on the analysts' forecast accuracy from the companies' specificities. The first group of control variables is Environmental, Social, and Governance (ESG), Global Reporting Initiative (GRI), and Management, Discussion, and Analysis (MDA), which were included as control terms to isolate the effect of the IR on the analysts' forecasts, and moderate the impact of others non-financial information sources than Integrated Reporting (SERAFEIM, 2015).

The others k controls measured were: (Lag_Acc) the one year lag of the accuracy, used to reduce the impact of the predictability acquired by analysts that cover one specific company or industry at the time; (NoA) the number of the analysts that follow a company i in the period j , it was employed to mitigate the cross-reference among the analysts that covered specific companies or industries; (LMV) the log of market value, used to reduce the size heterogeneity among the firms-observation; (BM) the book to market representing one control related to the market's expectations regarding to the companies' performance; (ROA) the return on assets as a proxy of firms' profitability; (LOSS) as a weighted measure of the losses on total assets; and (LEV) the financial leverage.

The term F_i denotes firm fixed effects, most appropriate, industry and country, inserted to weight particularities from the economic environment when the companies still operating. Lastly, T_j is the timeline added in Equation (4) from 2009 to 2016, to control potential yearly effects such as the increase of the analysts' knowledge about one company or sector that potentially improve the accuracy, however, there is no relation with additional corporate disclosure.

We estimate this model to test both hypotheses (1) and (2) taking into consideration the accuracy forecast measures for firm i at time j (Bernardi & Stark, 2016). φ refers to a constant term. $AdoptIR$, as previous mentioned in Equation (1), denotes a dummy variable indicating one for companies who adopted IR from 2013 and zero otherwise. $PostIR_{ij}$ is a dummy signifying 1 for periods after the IR adoption, from 2013 to 2016, and zero for previous fiscal years. Under the logical approach considered in H1n and H2n, whether the IR adoption improved the analysts' forecast accuracy it is expected a β_3 negative and statistically significant. For this reason, the interaction between $AdoptIR$ and $PostIR$ is the most relevant term in this specification.

All these variables have been used as control terms by several studies in the fields of integrated reporting (e.g., Qiu, Shaikat & Tharyan, 2016; Serafeim, 2015; Ioannou & Serafeim, 2014), analysts' accuracy (e.g. Bowen, Chen & Cheng 2008; Lang, Lins & Miller, 2004; Boubarki & Bouslimi, 2016), or both (e.g. Bernardi & Stark, 2016; Zhou, Simnett & Green, 2017).

3.3. Descriptive Statistics

Table 2 presents the summary of descriptive statistics for the databases considering the split between the treatment group (Panel A) and control groups (Panel B) as previous preconized.

TABLE 2 – HERE

Comparing both groups, treatment and control, it is possible to verify that with the exception of the variables Acc2, BM and LAcc2, all other terms presented higher averages for the group of companies who are adopting the IR compared to firms that did not present their reports in accordance with the IIRC's guidelines.

It is important to note that the average of the ESG, GRI and MDA variables, which represent non-financial information presented voluntarily to the users of the corporate reports, are higher for the treatment group compared to the control group. These results potentially indicate that companies, who prepared themselves an integrated reporting, are more likely to disclose additional information than traditional financial statements. In addition, management and discussion analysis represents the companies' self-assessment about their economic and financial performance during an exercise, highlighting issues considered by firms matter for stakeholders, shareholders, and analysts. This conceptualization about the MDA maintains proportional relations with one of the main relevant topic released by the IIRC's framework that is materiality, as previously mentioned.

This trend to present more voluntary information on the part of the IR adopters might be, in some measure, linked to the fact that there are on average to such companies a higher number of analysts who cover them, around 11 by firm, comparatively to the organizations that compose the control group, approximately 7 by firm, according to averages computed for NoA.

The other control terms BM, ROA, LOSS, LEV and Lag_Acc1 and 2 revealed different mean behaviors for both groups, which in a way, corroborates the importance of the addition of such variables, as done in previous studies (e.g. Zhou, Simnett & Green, 2017; Qiu, Shaukat & Tharyan, 2016; Bernarndi & Stark, 2016; Boubarki & Bouslimi, 2016 Serafeim, 2015; Ioannou & Serafeim, 2014; Bowen, Chen & Cheng 2008; Lang, Lins & Miller, 2004), as a form to strengthen the analyzes carried by mitigating the particular features of the companies, sectors and markets studied.

The panels C and D of Table (2) present the correlation matrices of Pearson and Spearman, respectively calculated for the treatment and control groups. Previous to the correlations' analysis, it is important to emphasize that the variables denoting the accuracy of the analysts, Acc1 and Acc2, can be better comprehended if taken as errors' measurement, in module, among the EPS forecasted by the analysts one year before to the EPS performed by the companies, respectively, weighted by the market value per share (MVPS) in relation to the term Acc1 and divided by the actual earnings per share (AEPS) regarding to Acc2. Hence, the verification of negative and statistically significant signals in the correlations between the variables Acc1 and Acc2 with other terms would potentially denote an increase in the analysts' forecasts as it could be reducing the error between projected EPS compared to those performed.

Taking into consideration firstly the IR adopters (Panel C), it is possible to verify that non-financial information measures (ESG, GRI, and MDA) still negatively correlated with Acc1 and Acc2, in most of the times. However, there was no consensus on this relationship. The other control terms present different trends among themselves.

Regarding the no IR adopters (Panel D), it is important to highlight that ESG, GRI, and MDA, still negatively correlated with Acc1 and Acc2 in all situations, such as the variable NoA. The other variables have no only one standard association between them, for this reason, it will be not commented here.

This previous finding in one hand could be indicating that companies who did not adopt the integrated reporting, might be more successfully using other sources of non-financial information, distinct from IR, to reduce the analyst's error. On the other hand, companies that adopted IR are trying to improve the analysts' forecast through a new corporative reporting that prioritizes concepts such as materiality, relevance, conciseness, among other matter features about business models.

4. Results

In this section are presented the findings of both hypotheses. Firstly are showed the coefficients obtained to the overall sample respectively composed of firms that voluntarily adopted IR around the world. These results allow us to test Hypothesis 1. Subsequently, are demonstrated the findings obtained for Brazil, Russia, India, and China in the BRIC, and South-Africa sample, respectively employed in the Hypothesis 2 test.

4.1. Results for Accuracy of Analysts' Forecasts and Integrated Reporting in an international setting

Table 3 presents the regression results for the Equation (4) specifically applied to the Hypothesis (1) tests. Aiming to verify if the IR adoption produced some increase in analysts' EPS forecast, were considered all companies and countries, except South-Africa firms, due to its enforcement specificities adoption.

TABLE 3 – HERE

The most relevant finding in Table 3 indicates that after the voluntary adoption of IR by the companies present in the treatment group, there was an increase in analysts' EPS forecasts. This result comes from the signal found in the variable *AdoptIR*PostIR* estimated coefficients for all the regressions performed, that is, columns from (1) to (8). It was verified through the fixed-effects panel-data models, that these estimated coefficients were negative in all columns, indicating that the analysts' errors in the EPS prediction were reduced after the year in which the organizations began to release their IR.

Regarding the statistical significance of the *AdoptIR*PostIR* coefficients, were verified significance in six of the eight regressions performed, within columns (3) and (4) for the dependent term *Acc1*, whose coefficients were -0.200 and -0.199, both significant to less than 1.00% ($p < 0.01$); and to the columns from (5) to (8), when the dependent variable was *Acc2*, respectively -0.106, -0.114, significant at less than 1.00% ($p < 0.01$), -0.083 and -0.100, both significant less than 10% ($p < 0.10$).

Therefore, the reliable verification of a negative signal for the *AdoptIR*PostIR* estimated coefficients, followed by statistical significance in six of the eight regressions performed, as well as, using two measures representing the analysts' accuracy (*Acc1* and *Acc2*), allow us to accept the hypothesis H1.

Despite the results found are in line with previous research, such as Zhou et al. Al (2017), and Bernardi and Stark (2016), it is important to mention that they expand the academic literature and practice discussion regarding the disclosure and development of IR concepts, because unlike previous studies, our assessment was based on a cross-country approach comparing adopters of the <IR > with non-adopters, and demonstrating the positive effects of the IR release in jurisdictions where there is no obligation to implement the concepts derived from the IIRC's framework. This finds can be considered as empirical evidence about the relevance of the corporate engagement in the pursuance of corporate reporting that effectively meet the needs of external users, in order to reduce the informational asymmetry among the companies' stakeholders, and not only to meet the regulatory requirements of the environment in which companies are domiciled.

Likewise, it is important to note that such findings were obtained even with the use of control variables representing other sources of non-financial information (ESG, GRI, and MDA) not directly linked to the IR. This result potentially indicates that there is not necessarily a competition between such informational sets, but somewhat a complementarity between them. Taking as an example the estimated coefficients for the ESG variable, it is possible to verify that all of them have negative signals (-0.004, -0.006, -0.004, -0.003, -0.004, -0.004), and high statistical significance, however, the variable *AdoptIR * PostIR* still presenting indications that the IR release improved the analysts' forecast.

The indications that even in the presence of other voluntary sources of disclosure the IR has the ability to increase analysts' forecast, corroborates previously argued arguments that the principles carried on the IIRC's framework involve broader concepts about the six capitals related to the development of a business model, which were potentially not captured by other information sources and / or were not subject to criteria such as materiality and relevance, which can be taken as essential issues to the IR development.

The most relevant control variables from the statistical viewpoint were: *Lag_Acc1 / Lag_Acc2*, *NoA*, *LMV*, *LOSS* and *LEV*, all statistically significant to less than 1.00% ($p < 0.01$), but not necessarily equal significant from the economic perspective.

4.2. Results for Voluntary Disclosure, Emerging Markets, and Integrated Reporting

Latin-America countries (Argentina, Brazil, and Colombia) and Russia, India and China, were chosen as proxies of emerging economies, more appropriately for the wide use of BRICs in previous research in a context of development markets (e.g. Black, Carvalho & Gorga, 2012; Balasubramanian, Black & Khanna, 2010; Klaper, Leora & Inessa, 2004). To include Chinese companies' in this analysis were considered public-firms that released an integrated reporting listed on Hong Kong Stock Exchange (HKSE).

TABLE 4 – HERE

The findings observed for the variable $AdoptIR * PostIR$ in Table 4, indicate an estimated negative sign coefficient for all the eight regressions performed using the fixed effects model presented in Equation (4). Additionally, these coefficients were statistically significant in six of the eight columns, respectively, -1.109, -0.628 and -0.652, significant at less than 5% ($p < 0.05$), when the dependent variable was the term Acc1; and -0.471, -0.446, both significant at less than 1% ($p < 0.01$), and -0.360 significant at less than 5% ($p < 0.05$), when the dependent variable was Acc2.

These results can be taken as indications that companies located in emerging economies that have issued an IR have been able to increase the analysts' forecasting process for the earnings per share in some measure, compared to firms domiciled in the same jurisdictions, however, which did not adopt the IIRC's framework.

In this context, there are robust indications to accept the alternative Hypothesis (2), which is: $H2$. From a broader perspective, such findings may be indicating that companies located in emerging markets, which issue an IR, may be trying to signal to shareholders, creditors, and, specifically in the context of this study, analysts, their better management conditions and stewardship about the six different capitals need for your business model, which meets the integrated thinking concept previous mentioned. Along these lines, the IR adoption can be considered, in some measure, as part of the corporate strategy to differentiate themselves through the voluntary disclosure of information that best meets the external users need, reducing the informational asymmetry.

The other control variables, including those representing other sources of non-financial information (ESG, GRI, and MDA), showed estimated coefficients very similar to those previously verified in Table (3), which confirms the importance of these terms to mitigate sample's disparities.

It is important to mention that the results presented in Tables 3 and 4 and expand the literature about the IR adoption format. In general, means, were found that the integrated reporting issuance increased the EPS' predictability by the analysts', regardless of whether organizations issued their reports according to the IIRC guidelines voluntarily. Thus, restricting this finding to the context of this study, there are no indications that the adoption format has affected the relevance of the IR.

4.3. Robustness tests using South-African firms

As South Africa has converted the IR release into a local compliance issue for its public companies and due to the recent verifications performed by Zhou et al. (2017), and Bernardi and Stark (2016), this jurisdiction was treated as an individual sample and used as basis for robustness tests (Lu & White, 2014), which are presented in Table 5.

TABLE 5 – HERE

The variable PostIR is the most relevant term in Table 5 since it denotes the effect of the IR period of issuance on the analysts' accuracy in the EPS forecast. All the estimated coefficients found were negative highlighting that all of them were followed by statistical significance: -0.375, -0.392, -0.115 and -0.108, significant at less of 1% ($p < 0.01$), when the dependent variable was Acc1; and -0.158, -0.162, -0.133 and -0.094, also significant at less than 1% ($p < 0.01$), considering as dependent variable Acc2. Such findings still aligned with Zhou et al. (2017), and Bernardi and Stark (2016).

It is important to mention that the results presented in Tables 3, 4 and 5 expand the literature about the IR adoption format. In general means, were found that the integrated reporting issuance increased the EPS' predictability by the analysts', regardless of whether organizations issued their reports according to the IIRC guidelines voluntarily or enforced by their local regulators. Thus, restricting this finding to the context of this study, there are no indications that the adoption format has affected the relevance of the IR.

5. Conclusions

This article examines the IR effects on the accuracy of the analysts in a cross-country approach and emphasizing emerging markets. Firstly, were conducted a literature review about the relevance of the integrated reporting in a analysts' perspective, aiming to demonstrated that the materiality conceptualization and an improvement in the understanding of the firms' business model, such as the integrated thinking, issues present in the IIRC's framework, and meets the analysts' need bout corporative information. Hereafter was evaluated why an integrated reporting may be used by companies located in emerging markets to strategically differentiate themselves through voluntary disclosure.

Using a cross-country sample, composed of companies that released their IR compared with their straight market competitors, was found an increase in the analysts' accuracy about the EPS. This conclusion was supported by the evidence that analysts' EPS forecast were closer to actual EPS values for companies that issued an integrated reporting than for those who did not adopt.

In a second evaluation, was found that these results still also present for companies located in emerging markets, Argentina, Brazil, Colombia, Russia, India, and China, respectively, represented by the companies listed in Hong Kong Stock Exchange. South Africa observations also denoted an improvement in analysts' forecast after the IR be incorporated in the local set of rules.

Our results expanded the literature about the IR showing the relevance of this conceptualization for practical users, in this case, analysts, in a broader perspective considering several jurisdictions where were found issuers. In our paper were solely considered issuers of an integrated reporting, companies that adopted the mentioned the use of the IIRC's concepts.

Additionally, was discovered that the integrated reporting IR still relevant for the analysts even for companies with other voluntary disclosure sources from non-financial information, such as Environmental, Social, and Governance (ESG), the use of the Global Reporting Initiative (GRI) guidelines, or those who issued a Management and Discussion Analysis (MDA).

Across the emerging markets were found that there is no difference in terms of the IR relevance to the analysts if a company issued an integrated reporting voluntarily or enforced. In both situations was verified that the IR release increased the analysts' earnings per share forecast.

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Appendix - Tables

Table 1 – Sample Composition

Sample display considering both groups, treatment and control, according to the countries share and the data collected in Thomson Reuters Datastream© from 2009 to 2016. Countries with less than 5 firm-observations were excluded from the sample aiming to reduce the dispersion. South Africa only presents observations for treatment group due to the enforcement adoption of IR since 2013. Japan is the jurisdiction where was found the highest number of firms that voluntarily adopted integrated reporting. On the other hand, the USA was the country where was found the highest number of companies that non-adopt and IR, comparative with their pairs in the treatment group. Solely considering emerging markets, Brazil highlights being the country with more voluntary adopters of IR. Hong Kong, respectively representing China's firms, was the second one. India and Russia, in BRIC's concept, shows together less than 1% of the treatment group total amount.

Treatment Group			Control Group			Total	%
Country	Adopt	%	Country	Non-Adopt	%		
Japan	588	28.12%	Japan	4,022	36.39%	4,61	35,07%
The USA	33	1.58%	The USA	4,142	37.47%	4,175	31,76%
South Africa	818	39.12%			0.00%	818	6,22%
Hong Kong	35	1.67%	Hong Kong	607	5.49%	642	4,88%
United Kingdom	81	3.87%	United Kingdom	487	4.41%	568	4,32%
Brazil	64	3.06%	Brazil	211	1.91%	275	2,09%
France	24	1.15%	France	248	2.24%	272	2,07%
Spain	112	5.36%	Spain	159	1.44%	271	2,06%
Italy	56	2.68%	Italy	184	1.66%	240	1,83%
India	8	0.38%	India	200	1.81%	208	1,58%
Netherlands	77	3.68%	Netherlands	102	0.92%	179	1,36%
Singapore	16	0.77%	Singapore	127	1.15%	143	1,09%
Sweden	8	0.38%	Sweden	81	0.73%	89	0,68%
Sri Lanka	24	1.15%	Sri Lanka	63	0.57%	87	0,66%
South Korea	23	1.10%	South Korea	64	0.58%	87	0,66%
Turkey	8	0.38%	Turkey	72	0.65%	80	0,61%
Australia	16	0.77%	Australia	61	0.55%	77	0,59%
Russia	12	0.57%	Russia	50	0.45%	62	0,47%
Switzerland	16	0.77%	Switzerland	44	0.40%	60	0,46%
Germany	16	0.77%	Germany	43	0.39%	59	0,45%
Denmark	8	0.38%	Denmark	24	0.22%	32	0,24%
Argentina	8	0.38%	Argentina	20	0.18%	28	0,21%
New Zealand	8	0.38%	New Zealand	12	0.11%	20	0,15%
Poland	8	0.38%	Poland	11	0.10%	19	0,14%
Colombia	8	0.38%	Colombia	10	0.09%	18	0,14%
Austria	8	0.38%	Austria	8	0.07%	16	0,12%
Greece	8	0.38%	Greece	1	0.01%	9	0,07%
Total	2,091		Total	11,053		13,144	

Table 2 - Descriptive statistics

Panel A - Descriptive statistics for the key variables here presented to the treatment group. The number of observations (N) is related to the maximum of firm-observations found during the sample composition. As mentioned before our date are provided by Thomson Reuters Datastream©. Acc 1 and Acc2 were computed according to the Equations (2) and (3). ESG is a quality score about non-financial information from 0 to 100 points provided by Asset 4. GRI and MDA are also provided by Asset 4 as dummies variables. GRI is equal 1 if a company adopts the Global Reporting Initiative guidelines and 0 otherwise. MDA would be equal 1 if a company released a management and discussion analysis and 0 if not. NoA is the number of analysts that cover one company. LMV is the natural logarithm of market value for each company over the time. BM is the ratio of the book value and the market value for each company over the time. ROA is the return on asset composed of the ratio of net incomes in period t over the total assets in period $t-1$. LOSS has the same composition of ROA. However, it was only calculated when the net result was negative (loss). LEV denotes the financial leverage computed using the sum of financial liabilities over the equity (net worth). LAcc1 and LAcc2 were calculated using the Equations (1) and (2) lagged in one period.

Variables	Mean	Median	Std. Dev.	N
Acc1	-2.575	-2.655	4.327	2,091
Acc2	0.147	0.127	1.343	2,091
ESG	45.868	57.024	31.746	2,091
GRI	0.580	1.000	0.494	2,091
MDA	0.136	0.000	0.342	2,091
NoA	11.197	10.000	9.640	2,091
LMV	4.494	5.051	3.773	2,091
BM	1.815	1.049	5.485	2,091
ROA	1.623	0.000	5.165	2,091
LOSS	0.043	0.000	0.202	2,091
LEV	35.886	34.000	24.504	2,091
LAcc1	-1.934	-0.306	4.116	2,091
LAcc2	0.115	0.000	1.229	2,091

Panel B - Descriptive statistics for the key variables here presented to the control group. All the explanations about the variables sources and compositions are equal to that presented in Panel A.

Variables	Mean	Median	Std. Dev.	N
Acc1	-0.398	-0.024	3.234	11,053
Acc2	0.179	0.080	1.404	11,053
ESG	16.598	0.000	26.203	11,053
GRI	0.124	0.000	0.330	11,053
MDA	0.039	0.000	0.194	11,053
NoA	7.098	5.000	7.383	11,053
LMV	2.379	2.239	2.428	11,053
BM	3.300	0.850	123.500	11,053
ROA	-0.294	0.000	39.850	11,053
LOSS	0.106	0.000	0.308	11,053
LEV	35.200	31.400	195.900	11,053
LAcc1	-0.087	0.000	2.731	11,053
LAcc2	0.144	0.000	1.239	11,053

Panel C - Correlations for the Treatment Group (N: 2,091) – Pearson (Spearman) correlations coefficients are presented below the diagonal lines.

	Acc1	Acc2	ESG	GRI	MDA	NoA	LMV	BM	ROA	LOSS	LEV	LAcc1	LAcc2
Acc1	-	0.199***	0.103***	0.024	-0.093***	0.162***	-0.916***	-0.788***	0.049**	0.138***	0.250***	0.642***	0.059***
Acc2	0.236***	-	-0.126***	-0.095***	0.074***	-0.120***	0.038*	0.092***	0.053**	0.225***	0.126***	-0.010	0.673***
ESG	0.066***	-0.147***	-	0.738***	0.281***	0.592***	-0.162***	-0.130***	0.138***	0.038**	0.201***	0.001	-0.084***
GRI	0.024	-0.095***	0.782***	-	0.216***	0.453***	-0.046**	-0.064***	0.114***	0.037*	0.159***	-0.078***	-0.065***
MDA	-0.093***	0.072***	0.281***	0.216***	-	0.158***	0.089***	0.099***	0.065***	-0.022	0.041**	-0.148***	0.076***
NoA	0.192***	-0.068***	0.527***	0.423***	0.180***	-	-0.228***	-0.098***	0.251***	0.074***	0.268***	0.114***	-0.107***
LMV	-0.919***	0.033	-0.143***	-0.076***	0.091***	-0.278***	-	0.806***	-0.123***	-0.038**	-0.256***	-0.644***	0.025
BM	-0.281***	-0.018	-0.010	0.014	0.027	-0.034	0.261***	-	0.013	-0.085***	-0.146***	-0.546***	0.087***
ROA	-0.066***	-0.117***	0.079***	0.068***	0.143***	0.136***	-0.024	0.058***	-	-0.399***	0.112***	0.042**	0.087***
LOSS	0.147***	0.275***	0.018	0.037	-0.022	0.092***	-0.043**	-0.042*	-0.275***	-	0.092***	0.069***	0.154***
LEV	0.256***	0.131***	0.151***	0.147***	0.040*	0.273***	-0.258***	0.021	-0.072***	0.114***	-	0.207***	0.108***
LAcc1	0.661***	0.047**	-0.060***	-0.087***	-0.144***	0.125***	-0.648***	-0.213***	-0.042*	0.074***	0.212***	-	0.094***
LAcc2	0.073***	0.659***	-0.120***	-0.080***	0.077***	-0.078***	0.029	0.011	-0.082**	0.173***	0.108***	0.176***	-

Panel D - Correlations for the Control Group (N: 11,053) – Pearson (Spearman) correlations coefficients are presented below the diagonal lines.

	Acc1	Acc2	ESG	GRI	MDA	NoA	LMV	BM	ROA	LOSS	LEV	LAcc1	LAcc2
Acc1	-	0.348***	-0.152***	-0.041***	-0.133***	-0.304***	-0.846***	-0.605***	-0.217***	0.141***	-0.010	0.392***	0.145***
Acc2	0.430***	-	-0.154***	-0.100***	-0.002	-0.059***	0.000	0.226***	0.074***	0.277***	0.161***	0.033***	0.662***
ESG	-0.162***	-0.146***	-	0.641***	0.314***	0.547***	0.075***	0.023**	0.107***	-0.128***	0.174***	-0.147***	-0.131***
GRI	-0.046***	-0.096***	0.702***	-	0.211***	0.363***	-0.004	-0.040***	0.055***	-0.070***	0.171***	-0.040***	-0.089***
MDA	-0.142***	-0.007	0.324***	0.211***	-	0.179***	0.125***	0.070***	0.029***	-0.059***	0.052***	-0.135***	0.011
NoA	-0.279***	-0.074***	0.591***	0.404***	0.199***	-	0.236***	0.224***	0.239***	-0.036***	0.229***	-0.242***	-0.023**
LMV	-0.849***	-0.115***	0.070***	-0.007	0.124***	0.179***	-	0.706***	0.159***	-0.024**	0.042***	-0.345***	-0.005
BM	-0.018*	0.009	-0.008	-0.006	-0.002	0.004	0.010	-	0.272***	0.077***	0.054***	-0.378***	0.204***
ROA	-0.075***	-0.033***	0.045***	0.025**	0.013	0.066***	0.047***	0.626***	-	-0.567***	0.089***	-0.219***	0.111***
LOSS	0.149***	0.283***	-0.124***	-0.070***	-0.059***	-0.045***	-0.047***	0.004	-0.263***	-	0.026**	0.063***	0.210***
LEV	0.006	0.037***	0.024**	0.026**	0.005	0.033**	0.004	-0.005	0.012	-0.006	-	-0.063***	0.152***
LAcc1	0.388***	0.113***	-0.178***	-0.059***	-0.157***	-0.294***	-0.275***	-0.016*	-0.039***	0.074***	-0.014	-	0.193***
LAcc2	0.203***	0.636***	-0.122***	-0.083***	0.006	-0.050***	-0.114***	0.019*	0.008	0.217***	0.019	0.341***	-

Notes: *** significant at 1%, ** significant at 5%, and * significant at 10%.

Table 3 – The adoption of IR on the analyst forecast accuracy – General Countries (Except South-Africa)

This table contains results from fixed-effect regressions of Equation (4) for overall countries mentioned in Table (1), except South-Africa due to the specific features of this country which is the only enforcement adopter of IR. Columns 1 to 4 present the estimation results considering Acc1 as the dependent variable. Columns 5 to 8 refer to Equation (4) estimation considering Acc2 as the dependent term. This sample-data can be considered an unbalanced panel data.

VARIABLES	(1) Acc1	(2) Acc1	(3) Acc1	(4) Acc1	(5) Acc2	(6) Acc2	(7) Acc2	(8) Acc2
AdoptIR	2.561*** (0.17)	2.574*** (0.171)	0.330*** (0.069)	0.029 (0.079)	0.089 (0.081)	0.018 (0.081)	0.158*** (0.051)	0.047 (0.051)
PostIR	- 0.374*** (0.051)	- 0.378*** (0.052)	-0.118*** (0.029)	- 0.118*** (0.029)	-0.158*** (0.016)	-0.162*** (0.016)	-0.136*** (0.018)	-0.100*** (0.017)
AdoptIR*PostIR	-0.106 (0.124)	-0.118 (0.125)	-0.200*** (0.069)	- 0.199*** (0.069)	-0.106*** (0.039)	-0.114*** (0.039)	-0.083* (0.044)	-0.100** (0.044)
ESG		-0.004** (0.002)	-0.006*** (0.001)	- 0.004*** (0.001)		-0.003*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)
GRI		0.418*** (0.129)	0.208*** (0.063)	0.118* (0.062)		0.051 (0.043)	0.028 (0.043)	0.072* (0.038)
MDA		- 0.568*** (0.16)	0.073 (0.076)	-0.003 (0.075)		0.051 (0.054)	0.156*** (0.052)	-0.044 (0.047)
Lag_Acc1 / 2			0.074*** (0.005)	0.067*** (0.006)			0.072*** (0.004)	0.070*** (0.005)
NoA			-0.036*** (0.003)	- 0.037*** (0.003)			-0.006*** (0.002)	-0.026*** (0.002)
LMV			-1.045*** (0.006)	- 1.040*** (0.006)			-0.022*** (0.004)	-0.048*** (0.004)
BM			0.012 (0.001)	0.011 (0.001)			0.013 (0.001)	0.012 (0.001)
ROA			-0.001 (0.001)	-0.001 (0.001)			0.001 (0.001)	0.000 (0.001)
LOSS			1.039*** (0.054)	1.183*** (0.055)			0.775*** (0.036)	0.613*** (0.033)
LEV			0.012*** (0.001)	0.011*** (0.001)			0.011*** (0.001)	0.010*** (0.001)
Constant	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effects	NO	NO	NO	YES	NO	NO	NO	YES
Country fixed effects	NO	NO	NO	YES	NO	NO	NO	YES
Year fixed effects	NO	NO	NO	YES	NO	NO	NO	YES
Observations	12,315	12,308	12,202	12,187	12,315	12,308	12,202	12,187
R ² Adjusted	9,78%	11,38%	70,12%	81,67%	0,150%	2,70%	62,73%	71,92%

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 – The adoption of IR on the analyst forecast accuracy – Emerging Economies

This table contains results from fixed-effect regressions of Equation (4) for Latin-America Countries (Argentina, Brazil, and Colombia) and Russia, India and China, proxies for emerging economies. Columns 1 to 4 present the estimation results considering Acc1 as the dependent variable. Columns 5 to 8 refer to Equation (4) estimation considering Acc2 as the dependent term. This sample-data can be considered an unbalanced panel data.

VARIABLES	(1) Acc1	(2) Acc1	(3) Acc1	(4) Acc1	(5) Acc2	(6) Acc2	(7) Acc2	(8) Acc2
Adopt	1.215 (0.752)	1.433** (0.723)	0.129 (0.296)	0.09 (0.311)	0.433 (0.402)	0.549 (0.399)	0.557** (0.232)	0.049 (0.207)
PostIR	- 0.375*** (0.051)	- 0.390*** (0.052)	-0.118*** (0.029)	- 0.111*** (0.029)	-0.158*** (0.016)	-0.162*** (0.016)	-0.133*** (0.018)	-0.094*** (0.017)
Adopt*PostIR	-1.109** (0.557)	-1.071 (0.562)	-0.628** (0.313)	-0.652** (0.313)	-0.471*** (0.172)	-0.446*** (0.173)	-0.242 (0.197)	-0.360** (0.182)
ESG		- 0.011*** (0.002)	-0.006*** (0.001)	- 0.004*** (0.001)		-0.003*** (0.001)	-0.004*** (0.001)	-0.003*** (0.001)
GRI		0.629*** (0.149)	0.223*** (0.073)	0.162** (0.072)		0.067 (0.051)	0.025 (0.051)	0.110** (0.045)
MDA		- 0.829*** (0.202)	-0.033 (0.096)	-0.143 (0.097)		-0.051 (0.071)	0.087 (0.069)	-0.112* (0.061)
Lag_Acc1 / 2			0.086*** (0.006)	0.071*** (0.006)			0.314*** (0.009)	0.168*** (0.009)
NoA			-0.039*** (0.003)	- 0.042*** (0.003)			-0.007*** (0.002)	-0.030*** (0.002)
LMV			-1.050*** (0.006)	- 1.038*** (0.007)			-0.027*** (0.004)	-0.046*** (0.004)
BM			0.002 (0.001)	0.001 (0.001)			0.002 (0.001)	0.002 (0.001)
ROA			-0.002 (0.001)	-0.001 (0.001)			-0.002 (0.001)	-0.001 (0.001)
LOSS			0.958*** (0.056)	1.118*** (0.058)			0.729*** (0.039)	0.561*** (0.035)
LEV			0.014*** (0.001)	0.012*** (0.002)			0.012*** (0.002)	0.012*** (0.002)
Constant	YES	YES	YES	YES	YES	YES	YES	YES
Industry fixed effects	NO	NO	NO	YES	NO	NO	NO	YES
Country fixed effects	NO	NO	NO	YES	NO	NO	NO	YES
Year fixed effects	NO	NO	NO	YES	NO	NO	NO	YES
Observations	1,219	1,204	1,183	1,165	1,219	1,204	1,183	1,165
R ² Adjusted	1.17%	9.83%	81.84%	84.01%	0.20%	1.79%	59.99%	71.11%

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5 – The adoption of IR on the analyst forecast accuracy – South-Africa (Robustness Tests)

This table contains results from fixed-effect regressions for South-Africa sample considering only a time dummy (PostIR) due to the compulsory adoption of the IR for all public companies listed on Johannesburg Stock Exchange. Columns 1 to 4 present the estimation results considering Acc1 as the dependent variable. Columns 5 to 8 refer to Equation (4) estimation considering Acc2 as the dependent term. This sample-data can be considered an unbalanced panel data.

VARIABLES	(1) Acc1	(2) Acc1	(3) Acc1	(4) Acc1	(5) Acc2	(6) Acc2	(7) Acc2	(8) Acc2
PostIR	-0.375*** (0.051)	-0.392*** (0.051)	-0.115*** (0.029)	-0.108*** (0.029)	-0.158*** (0.016)	-0.162*** (0.016)	-0.133*** (0.018)	-0.094*** (0.017)
ESG		-0.011*** (0.002)	-0.005*** (0.001)	-0.004*** (0.001)		-0.003*** (0.001)	-0.004*** (0.001)	-0.003*** (0.001)
GRI		0.458*** (0.136)	0.193*** (0.068)	0.119* (0.068)		0.047 (0.046)	-0.005 (0.047)	0.067 (0.042)
MDA		-0.536*** (0.178)	0.044 (0.087)	-0.062 (0.087)		0.01 (0.062)	0.125** (0.061)	-0.061 (0.054)
Lag_Acc1 / 2			0.083*** (0.006)	0.065*** (0.006)			0.316*** (0.009)	0.170*** (0.009)
NoA			-0.038*** (0.003)	-0.042*** (0.003)			-0.007*** (0.002)	-0.030*** (0.002)
LMV			-1.054*** (0.006)	-1.041*** (0.007)			-0.031*** (0.004)	-0.050*** (0.004)
BM			0.177 (0.020)	0.168 (0.018)			0.176 (0.021)	0.167 (0.017)
ROA			-0.021 (0.001)	-0.021 (0.001)			-0.020 (0.001)	-0.019 (0.002)
LOSS			0.982*** (0.056)	1.122*** (0.058)			0.980*** (0.053)	1.117*** (0.051)
LEV			0.008*** (0.024)	0.009*** (0.021)			0.006*** (0.021)	0.006*** (0.021)
Constant	YES							
Industry fixed effects	NO	NO	NO	YES	NO	NO	NO	YES
Country fixed effects	NO	NO	NO	YES	NO	NO	NO	YES
Year fixed effects	NO	NO	NO	YES	NO	NO	NO	YES
Observations	813	802	787	761	813	802	787	761
R ² Adjusted	22.85%	26.32%	85.75%	87.52%	0.43%	2.30%	60.36%	71.23%

Standard errors in parentheses
 *** p<0.01, ** p<0.05, * p<0.1