

MARKET AND COMPANY EFFECTS OF VOLUNTARY IR ADOPTION - A QUESTIONABLE TOPIC IN THE CASE OF EUROPEAN COMPANIES

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Abstract: *The primary purpose of Integrated Reporting <IR> is to explain how an organization creates value over time to financial capital providers. Using shareholder theory lenses, this study explores the effects of voluntary <IR> adoption on the capital market and value of the company. Thus, is analyzed the relation between a self-constructed Disclosure Index Score (measuring the alignment degree of an integrated report with <IR> Framework) and analysts forecast error, respectively Tobin's Q. The analyzed sample is formed of 98 integrated reports produced by 61 European companies, published on IIRC website for 2013-2017 period. The results highlight that, as the analyzed report is more aligned with <IR> Framework, analysts forecast error increases while the value of the company decreases. Consequently, information disclosure in a voluntary <IR> setting, affects in a negative manner analyst forecast errors while the proprietary costs and competition sensitive information, exceed the benefits of <IR> adoption. The current study contributes to existing knowledge by exploring the voluntary adoption of integrated reporting using quantitative analysis and focusing on the European context.*

Key Words: *integrated reporting, company value, analyst forecasts*

JEL codes: M20, M40

Introduction

Integrated Reporting (IR) transformed itself in less than 20 years from an emerging trend in corporate reporting into a consolidated institutionalized practice (Eccles *et al.*, 2015). Even more, some authors consider IR like a necessity (Humphrey *et al.*, 2017) to “promote a more cohesive and efficient approach to corporate reporting that draws on different reporting strands and communicates the full range of factors that materially affect the ability of an organization to create value over time” (IIRC, 2013). Corporate disclosure is critical for the functioning of an efficient capital market (Healy & Palepu, 2001) comprising of regulated reports (financial statements, footnotes, management discussion and analysis, and other regulatory filings) and voluntary communication (management forecasts, analysts’ presentations and conference calls, press releases, internet sites, and other corporate reports). Moreover, there are other disclosures, regarding company’s activities, made by information intermediaries, like financial analysts, industry experts and the financial press (Healy & Palepu, 2001). Even though corporate reporting embeds financial statements, management commentary, environmental and CSR reporting, corporate governance and remuneration, there is no interconnectivity among the presented information in these reports (Aldama *et al.*, 2012; Idowu *et al.*, 2016).

Financial reporting and stand-alone sustainability reports are not able to offer an integrated view of the organization and its activities, even though they have become more complex and extended (Simnett & Huggins, 2015), they might contain similar information that increase the reader’s effort

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to understand the company. Even in case of sustainability and corporate governance matters, investors prefer the shift towards integrated reporting (IIRC, 2017), where these issues can be financially quantified both with their costs and benefits, not only narratives. The various mandatory and voluntary reports issued by a company are prepared individually, which might lead to information overlapping or lack of coherence among generated reports, which would hamper the decision-making process (Frias-Aceituno *et al.*, 2013).

The current reports are missing a logical and holistic view of the business model and its contribution to value creation is very complex due to information volume and disjointed contained information, while integrated reports offer the overall vision to investors for understanding company's logic and valuating it in a more effective way (IFA, 2017).

While traditional corporate reporting contains numerous, disconnected and static communications, integrated reporting focuses on value creation over short, medium and long term emphasizing the conciseness, strategic focus and future orientation, connectivity of information, the capitals and their interdependencies based on integrated thinking. (Paolucci & Cerioni, 2017).

Integrated Reporting aims to put together financial and non-financial information, underlining the interdependencies between them, improve the quality of information available to providers of financial capital, identify the material issues that affect the business, which will lead to a better allocation of the resources and an integrated decision-making process (Eccles & Serafeim, 2014).

Majority of IR related studies are qualitative (De Villiers *et al.*, 2014; Idowu *et al.*, 2016; Romolini *et al.*, 2017; Aluchna *et al.*, 2019; Adhariani & de Villiers, 2019) and just few are quantitative, but even so, the quantitative studies focuses on mandatory adoption of IR for the companies listed on Johannesburg Stock Exchange (Barth *et al.*, 2017; Zhou *et al.*, 2017; Pavlopoulos *et al.*, 2019) highlighting that the mandatory adoption of IR and a higher quality of disclosure / alignment with <IR> Framework lead to a higher value and performance of the company and reduced analyst forecast error and dispersion.

Some studies analyze the relation between the voluntarily adoption of non-financial reports (alike: CSR, Corporate Responsibility Reporting, GRI Reporting, Environmental Reporting) and company value, performance while others explore the effect of mandatory IR, using a Disclosure Index Score based on the IIRC Prototype Framework, measuring the quality of the integrated report. Nevertheless, there are few quantitative studies regarding adoption of Integrated Reporting and its effects, both for the company and investors (Frias-Aceituno *et al.*, 2014; Zhou *et al.*, 2017; Barth *et al.*, 2017), but in a mandatory IR adoption environment and focusing on South Africa. Moreover, the literature on voluntarily adoption of standards is scarce - in contrast for example with mandatory adoption of IFRS standards (Daske *et al.*, 2008; Li, 2010).

Current study examines the effects of integrated reports quality on the capital market and on the value of the company, on a voluntary adoption environment. In this sense we analyze whether-or-not the alignment degree of the analyzed reports with <IR> Framework reduces the analysts forecast error and leads to higher value of the company (measured using Tobin's Q), through the lenses of shareholder theory, finding that:

- Analysts forecast error increases as the analyzed report is more aligned with <IR> Framework (effects of voluntary IR adoption on the capital market);
- Value of the company decreases as the analyzed report is more aligned with <IR> Framework (effects of voluntary IR adoption on value of the company).

Moreover, we found that **presentation of risks and opportunities**, **performance** of the company and its **outlook**, **impact the analysts forecast accuracy**, while **performance** of the company and the **basis of presentation and preparation** of the integrated report impact company value.

The research's results arise various questions concerning the <IR> adoption as the future corporate norm (only on Johannesburg Stock Exchange <IR> being mandatory), as for European

headquartered publicly listed companies a higher alignment degree with <IR> Framework is not direct translated into a higher value of the company and lower analysts forecast error.

The study contributes to current knowledge by, at least: (i) researching the voluntary adoption of integrated reporting, as majority of studies research on the mandatory IR adoption, (ii) enriches the quantitative category of studies analyzing integrated reporting adoption, (iii) uses a sample of European headquartered publicly listed companies.

The remainder of the paper presents the literature review and hypothesis development (Section 1), empirical analysis (Section 2), followed by results and discussion (Section 3) and conclusions, limitations and future research of our study (Section 4).

Literature review and hypothesis development

Literature review

Mandatory and voluntary information disclosure is a common practice among companies in order to mitigate agency and political costs and to reduce information asymmetries (Frias-Aceituno *et al.*, 2014). Voluntary information disclosure represent free choices of company's management to provide in excess of requirements, accounting and other information deemed relevant to the decision needs of users of their annual reports (Meek *et al.*, 1995). Nevertheless, changes in a firm's disclosure are likely to coincide with changes in company's economics and governance and are unlikely to be random events (Haley & Palepu, 2001).

The aim of mandatory reporting is to reduce information asymmetry which occurs in the relation between the principal (the shareholder / investor), which delegates the work to another party, the agent (management) (Eisenhardt, 1989; Haley & Palepu, 2001) herein the shareholders theory. Agency costs represent the sum of the principal's monitoring expenditures, the agent's bonding expenditures, and any remaining residual loss (Hill & Jones, 1992).

Traditional financial reporting (Serafeim, 2015) serve mainly as an information function while integrated reporting aims to improve the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital (IIRC, 2013). Nevertheless, good quality of financial reporting is a key pillar of <IR> Framework and offering, together, a more complete image of the company and its activities (IIRC, 2017). An effect of disclosing new information is the change of the share price, part of its variation being influenced by financial statements. Accounting information (Francis & Schipper, 1999) is relevant when: it captures intrinsic value towards which share prices drift, it comprises information used in valuation models, it changes investor's expectations or there is a relation of this information with the market value of the firm, this last form being used in case of value relevance research. Furthermore, the investor's behavior is not influenced only by mandatory disclosed financial information, but also by non-financial information and voluntary disclosed information. In this regard, the integrated reports are the second source of information, after annual reports, for decision-making of investors (IIRC, 2017 – E&Y 2017 global investors survey). Moreover, 57% of the respondents (investors) consider the information in the integrated reports very useful.

In case of voluntarily disclosure, literature advocates that voluntarily disclosure has the function to reduce information asymmetry (Leuz & Wysocki, 2016), integrated reporting being a communication tool with investors. Among investors there are other actors like employees, customer and regulatory agencies, requiring other type of information from companies which might voluntarily disclose it, but which might lead to proprietary costs (eg. competitive disadvantage, increased competition and political costs, government regulation), influencing the decision of voluntary disclosure (Meek *et. al.*, 1995). There are six forces that affect managers' disclosure decisions for capital market reasons (Healy & Palepu, 2001): capital market transactions, corporate control contests, stock compensation, litigation, proprietary costs, and management talent signaling. Among the effect on capital market, which are translated in expected future cash flows, IR adoption can also lead to lower cost of capital (IIRC, 2017). Nevertheless, executive management should balance the

potential benefit of information disclosure, with the related costs of preparing the information and exposure of competitive sensitive information. Consequently, we can expect for voluntary information disclosure when the direct and indirect costs do not exceed the related benefits.

There are three types of economic consequences of voluntary disclosure for companies on the capital markets: improved liquidity for their stock in the capital market, reductions in their cost of capital, and increased following by financial analysts (Haley & Palepu, 2001). Voluntary disclosure theory asserts that voluntary disclosures help to improve the information environment of companies by enhancing analysts' understanding of companies' prospects (Zhou *et al.*, 2017). Analysts collect information from public and private sources, evaluate the current performance and make forecasts about the future prospects of the company, recommending that investors buy, hold or sell the stock (Healy & Palepu, 2001).

Stand-alone financial information / reporting has lost its relevance over the years, as it cannot surprise the relationships developed by the companies, its customer base and brand, human capital, etc. representing non-financial information disclosed mainly on a voluntary basis. In this regard, financial and CSR information, combined, explain better the market valuations made by investors, rather than only financial information (Klerk & de Villiers, 2012).

Prior literature highlights that non-financial information is presented both on a mandatory and voluntary basis and refers especially to CSR and IR reporting. CSR information via the integrated report would accomplish the same role for the agency relationship between board of directors and other stakeholders as financial reporting serves as a control mechanism between shareholders and managers (Frias-Aceituno *et al.*, 2013). The stakeholders category includes, but is not limited to: employees, customers, suppliers, creditors, communities, and the general public (Hill & Jones, 1992).

The CSR studies are mainly focused on US companies and analyze the impact / effects / correlation of CSR reporting (disclosure) on the capital market, company performance or value. Studies analyzing Integrated Reporting mainly focus on South Africa, where Integrated Reporting is adopted on a mandatory basis, and analyze the effects of IR adoption / quality on the capital market and company value. The amount of voluntary CSR disclosure is higher (lower) for companies with high (low) level of returns, measured using the share price (Deegan, 2007).

Voluntary adoption of sustainability policies impacts the organizational processes and performance of the company, in the sense that companies who adopted sustainability policies are more likely to have established processes for stakeholder engagement, to be more long-term oriented and exhibit higher measurement and disclosure of nonfinancial information (Eccles *et al.*, 2014). Moreover, these companies, outperform in term of stock market and accounting performance their counterparts that did not adopted sustainability policies, measure and disclose more nonfinancial data (Eccles *et al.*, 2014).

Over time, voluntary CSR adoption shifted its impact on analysts valuation of company's future financial performance from pessimistic, in the 90's, to optimistic, in 2007, more experienced analysts from known brokerage houses being the first to shift their recommendations (Ioannou & Serafeim, 2015). Nevertheless, no significant link between company's CSR rating and analysts forecast errors was found. Voluntary issuance of stand-alone CSR reports is associated with lower analyst forecast errors (Dhaliwal *et al.*, 2012). Thus, voluntarily nonfinancial disclosure (in majority of countries CSR report issuance is not mandatory) is associated with improved information environment, playing a complementary role to financial disclosure.

There are mixed effects of mandatory IR adoption on capital market, company value and cost of capital for companies listed on JSE.

Analyst forecast error and cost of equity capital reduces as integrated report's level of alignment with <IR> Prototype Framework increases but analyst forecast dispersion does not (no correlation) (Zhou, *et al.*, 2017). Thus, the level of alignment of integrated reports with the <IR> Framework has a stronger effect in influencing analyst forecast error than analyst forecast dispersion.

There is a significant relation between integrated reporting quality (measured using overall ESG score) and analysts forecast accuracy after IR adoption on JSE (primarily driven by Environmental disclosure component, followed by Governance), but no relation before mandating IR (Bernardi & Stark, 2017). Consequently, mandating IR significantly impacts analyst forecast accuracy.

By contrast, integrated reporting quality is not associated with greater analyst target price forecast accuracy nor with reduction of cost of capital (Barth *et al.*, 2017).

There is a negative relationship between information asymmetry (analyst forecast accuracy) and information disclosure in integrated reports (dummy variable) (García-Sánchez & Noguera-Gámez, 2017). Consequently, using integrated reporting as a information tool, can help mitigating agency problems and improve the information among investors.

For North American companies standalone integrated reporting does not provide sufficient benefits for shareholders, but when there is an external assurance regarding the effectiveness of internal control over financial reporting, the benefits of IR on the market value are enhanced (Gal & Akisik, 2019). This can be explained by the fact that financial information is used by the company further on for its KPIs, quantification / business impact of risks and opportunities, market context.

Exploring the relation between voluntary IR issuance (dummy variable) and analysts forecast accuracy in an international setting, findings show that IR adoption improves analysts' ability to make accurate earnings forecasts (Flores *et al.*, 2019). Moreover, the results highlight that IR improves analysts' ability to make accurate predictions to a larger extent in North America (a shareholder-based governance regime) than in Europe (a stakeholder-based governance regime) (Flores *et al.*, 2019), as IR is considered by analysts a shareholder-oriented rather than a stakeholder-oriented tool. This is consistent with the aim of the IIRC to create a tool who primarily serves the interests of financial capital providers.

The first effects of mandatory Integrated Reporting adoption, on the company value, were analyzed for companies listed on Johannesburg Stock Exchange. Results show that company valuation (using Tobin's Q) is positively associated with Integrated Reporting disclosures (using an integrated reporting score based on <IR> Framework), also, IR mitigating information asymmetry between corporate insiders and external suppliers of capital (Lee & Yeo, 2016). Moreover, there is a positive relation between integrated reporting quality and company value, measured using Tobin's Q; larger annual increases of IRQ have larger increases in company's value. (Barth *et al.*, 2017).

Value relevance of earnings per share increases after mandatory IR adoption while the value relevance of book value of equity decreases after IR adoption for companies listed on Johannesburg Stock Exchange (Baboukardos & Rimmel, 2016).

Investigating whether <IR> adoption is more effective in creating high earnings quality for companies that issue <IR> on a mandatory basis than companies that adopted <IR> on a voluntary basis, finding show that integrated reporting is more effective in case of mandatory adoption (Pavlopoulos *et al.*, 2019). Moreover, companies with a high IR disclosure quality tend to display a high market value per share (share price) and companies with high levels of IR disclosure quality have resulted in abnormal stock returns being positively associated with earnings quality (Pavlopoulos *et al.*, 2019).

Similarly, current study aims to explore the effects of voluntarily adoption of integrated reporting (quality of the reports) on the capital market and value of the company, with focus on European headquartered publicly listed companies.

Hypothesis development

This study analyzes the effects of voluntary IR adoption on the capital market and on the value of the company. As IIRC suggests, IR adoption should be on comply or explain basis, but, excepting Johannesburg Stock Exchange, <IR> Framework is adopted on a voluntarily basis. Consequently, as

is Europe integrated reporting is adopted on a voluntary basis, we will use the voluntary disclosure theory to develop our working hypothesis.

Integrated reporting is consistent with developments in financial and other reporting (IIRC, 2013), meaning that serves as an information tool to providers of financial capital, aiming to improve the information quality, centered on investor's needs (IIRC, 2017). Thus, it focuses on the ability of a company to create value over short, medium and long term, in a concise manner, with focus on the strategic and future direction, using the connectivity of information, the capitals and their interdependencies.

As an integrated report aims to be a concise communication with providers of financial capital, containing interconnected information, not in silos as in case of various stand-alone reports, it should ease the efforts of company valuation by analysts. With a strategic focus and future orientation, an integrated report should improve the analysts forecast, as this type of information – both financial and non-financial - help analysts to better assess the future results of the company. Being a concise communication, an integrated report should include only relevant information regarding company's business model and value creation. Thus, if analysts can process all the amount of information presented into an Integrated Report this should be reflected in lower analyst earnings forecast error. Consequently, we develop the following hypothesis:

- **H1:** Companies producing integrated reports more aligned to <IR> Framework have lower analyst earnings forecast error.

In a mandatory setting, regarding the effects of IR adoption on the capital market, prior studies show (i) mixed results regarding analyst forecast error reduction as company's level of compliance with IR Framework increases (Zhou, *et al.*, 2017; Barth *et al.*, 2017) and (ii) that after mandating Integrating Reporting for JSE listed companies analyst forecast error reduces (Barth *et al.*, 2017).

In an international setting, voluntary IR adoption reduces analyst forecasts errors, mitigating agency problems and improving the information among investors (García-Sánchez & Noguera-Gámez, 2017). Moreover, IR improves analysts' ability to make accurate predictions to a larger extent in North America headquartered companies where is a shareholder-based governance, than European headquartered companies, where there is a stakeholder-based governance (Flores *et al.*, 2019). Consequently, Integrated Reporting can be considered by analysts a shareholder-oriented tool.

Both, in a mandatory and voluntary adoption environment, integrated reporting quality is positively associated with company value (Lee & Yeo, 2016; Barth *et al.*, 2017; Pavlopoulos *et al.*, 2019). Moreover, the results show that IR adoption is more effective in creating high earnings quality for companies that issue an integrated report on a mandatory basis than companies that adopt it on a voluntary basis.

An increased amount and complexity of information should improve analysts forecast errors, but analysts are known to have cognitive limitation in processing all the complex information presented into an integrated report (Zhou *et al.*, 2017). This can lead to higher errors regarding anticipated future of the company (forecast errors increase), meaning that **a more aligned integrated report with <IR> Framework is negatively correlated with analysts forecast error**. Prior literature find that analysts forecast accuracy are less accurate if they are associated with complex changes to tax laws (Plumlee, 2003 in Zhou *et al.*, 2017) and complex accounting choices negatively affect analysts forecast accuracy and increase dispersion (Bradshaw *et al.*, 2008 in Zhou *et al.*, 2017). Moreover, companies producing less readable 10-K filings are associated with greater dispersion, lower accuracy and greater overall uncertainty in analyst earnings forecasts (Lehavy *et al.*, 2011).

Integrated reporting aims to (i) improve the quality of information available to providers of financial capital to enable a more efficient and productive allocation of capital; and (ii) support integrated thinking, decision-making and actions that focus on the creation of value over the short, medium and long term (IIRC, 2013). But integrated thinking is developed considering the connectivity and interdependencies between the following factors affecting company's ability to create value over time: (i) the capitals its uses or affects, (ii) the capacity to respond to key

stakeholders' legitimate needs and interests, (iii) adaptation of its business model and strategy to respond to its external environment and the risks and opportunities it faces, and (iv) its activities, performance and outcomes in terms of capitals (IIRC, 2013).

The disclosed information regarding company's strategy, business model, opportunities and risks, outlook, markets, and products, reveal company's value-creation process, competitive advantage, future plans, and potential costs that the company might encounter in the future. Based on proprietary disclosure theory, this might negatively impact the value of the company (Lee & Yeo, 2016). Nevertheless, the information included in an integrated report is filtered through the judgement of the board of directors and management team, and sensitive information should not be presented in a manner that could affect company's value. If the benefits of <IR> adoption exceed the costs, we expect this to be translated into higher value of the company. Consequently, we develop the following hypothesis:

- **H2:** Companies producing integrated reports more aligned to <IR> Framework record higher value of the company.

Contrary, if integrated report's **alignment degree with <IR> Framework is negatively correlated with company's value**, the proprietary costs and competition sensitive disclosed information, exceeds the benefits of <IR> adoption.

Empirical analysis

This study examines the **effects of voluntary adoption of integrated reporting** (via the alignment degree of the analyzed reports with IIRC Framework) **on the capital market and on the value of the company**. Analyzed sample is formed of **Europe headquartered publicly listed companies**, who's integrated reports were published on IIRC's website (until February 2019) in the *Examples Database* section, now rebranded as *Leading Practices*. The Examples Database section presents emerging practices on integrated reporting and how companies apply the <IR> Framework's guiding principles and content elements (IIRC, 2013). Resulted a 98 integrated reports sample voluntarily issued by 61 companies (initially there were 69 companies and 111 reports), for 2013-2019 period. By contrast, companies listed on Johannesburg stock exchange are enforced to publish an Integrated Report or to explain in case they do not publish it.

Previous studies analyzing integrated reporting alignment degree or quality are based on IIRC Framework or IIRC Prototype Framework, and use a scale to assess the quality of disclosure, give a grade or just check the presentation of that element (Zhou *et al.*, 2017; Lee & Yeo, 2016; Pistoni *et al.*, 2018).

Nevertheless, self-constructed indexes have at least two limitations: researcher's judgment involved in the process of coding and computing the disclosure scores, and the disclosures provided in publicly available documents issued by companies (Healy & Palepu, 2001). Moreover, when applying the disclosure checklist can lead to subjectivity, as it is closely linked to user's previous experience and judgement.

Thus, to reduce subjectivity, we used a dummy variable based on the IIRC Framework, easing the usage of our model by various information users which are not specialized. A disclosure index could also capture general disclosure transparency as one of integrated reporting aim is to improve disclosure transparency (Zhou *et al.*, 2017).

There are similarities between the content elements required by IIRC Framework and those identified as being useful in investment decision making by investors and financial analysts (e.g. background information, summary of historical results, key non-financial statistics, projected information and management discussion and analysis) (Botosan, 1997). The content elements required by IIRC Framework are similar to previous studies (Meek *et al.*, 1995), who identified 3 major information groups (and 12 sub-groups) relevant for voluntary presentation of information, based on international trends, standard reporting practices, research and surveys, stock exchanges and public and private standard setters requirements: **strategic information** (general corporate

characteristics, corporate strategy, acquisitions and disposals, research and development, future prospects information), **non-financial information** (information about directors, employee information and social responsibility and value added disclosure) and **financial information** (segment information, financial review information, foreign currency information and stock price information).

To measure the degree of alignment of the analyzed reports with the IIRC Framework we used a **Disclosure Index Score**. We constructed the Disclosure Index Score based on 2013 IIRC Framework's Content Elements (see table no. 1 from Appendix), resulting 8 content elements and 28 dimensions (3 dimensions having more than one component and for the others we analyzed only the dimension). Our approach is similar with the index used in other studies (Zhou *et al.*, 2017; Barth *et al.*, 2017; Lee & Yeo, 2016) to measure integrated report alignment level to IIRC Framework.

Using the report content analysis method, we checked the existence of dimensions / components via a binary variable: "1" if IR presented the element and "0" otherwise. Content analysis method is frequently used in the field of Corporate Reporting, being useful when exploring if a framework is adopted or not (Gal & Akisik, 2019). One of the advantages of usage disclosure index, is that it measures and compares the actual presented information, in the issued reports, with the maximum possible presented information required by a certain framework - **measuring the degree of alignment with IIRC Framework**. If a company had presented all the items it took 1 as value, as DIS takes values between 0 and 1, a value closer to 1 indicating a greater degree of alignment with the framework of the analyzed report.

In order to compute the Disclosure Index Score, we first computed the average value using the scores for each component for Organizational overview and external environment, and dimension, for the other content elements (see table no. 1 from Appendix). Afterwards, we computed the value of DIS as the average of each's content element value; each content element being equally in terms of importance. DIS for each report, was computed as follows:

$$DIS(y)_t = \frac{\sum_{i=1}^m d_i}{m} \quad (1)$$

Where $\sum_{i=1}^m d_i$ represents the sum of the values recorded for each component ("0" or "1") while m represents the maximum number of components (31) check listed.

Based on voluntary disclosure theory, voluntary disclosures help to improve the information environment of companies by enhancing analysts' understanding of companies' prospects, and therefore to reduce the information asymmetry (Zhou *et al.*, 2017). Thus, the **effects of IR adoption on capital markets** is analyzed through the usage of financial and non-financial information by analysts. Moreover, financial information and non-financial information (corporate responsibility reporting), combined, **explain better the market valuations**, rather than only financial information (Klerk & de Villiers, 2012).

Following previous studies (Zhou *et al.*, 2017; Dhaliwal *et al.*, 2012), we will use **analysts forecast error** to measure the effect of integrated reporting disclosure on capital markets. **Analysts forecast error** (F_ERROR) is used as an inverse measure of forecast accuracy (Dhaliwal *et al.*, 2012), being defined as the average of the absolute errors of all forecasts for target earnings per share made in the upcoming year (for the previous year), scaled by the share price (at the fiscal year end of the report):

$$F_ERROR(y)_t = |FC(y)_{t+1} - EPS(y)_{t+1}| / SP(y)_t \quad (2)$$

Where $FC(y)_{t+1}$ is the average forecasted earnings per share at the end of the next fiscal year (year t+1), $EPS(y)_{t+1}$ the actual earnings per share at the end of fiscal year t+1 and $SP(y)_t$ is the share price at the year end of the report (year t). The variables are analyzed in their level form.

Integrated Reporting aims to improve the quality of information available to providers of financial capital, primarily, the purpose being to explain to providers of financial capital how an organization creates value over time. Thus, the more integrated reports align to disclosure requirements of IIRC Framework, it improves the more the quality of produced information increases.

Consequently, reports that are more aligned to IIRC Framework, are expected to be more useful for analysts in the same time reducing the forecasts among the analysts.

Regarding the effects of alignment degree of issued reports with IIRC Framework and **value of the company**, we will use Tobin’s Q (Barth *et al.*, 2017; Daske *et al.*, 2008), which is designed to reflect the market's valuation of a firm's assets relative to their carrying amounts. In the carrying amounts are reflected only the financial view of a company while the market value embeds other non-financial elements. Moreover, the financial statements reflects among the financial capital, only partial, other type of capitals, like: intellectual capital, natural, manufactured, human (recognized based on accounting standards) while social and relationship capital is not reflected at all. Tobin’s Q is computed as total assets minus book value of equity plus market value of equity, scaled by total assets (Daske *et al.*, 2008):

$$\text{Tobin's_Q}(y)_t = [\text{TA}(y)_t - \text{BvE}(y)_t + \text{MvE}(y)_t] / \text{TA}(y)_t \quad (3)$$

Financial data necessary to compute analysts forecast error and Tobin’s Q, was retrieved from Thomson Reuters Eikon database. To perform statistical analysis, we used IBM SPSS 20. Disclosure Index Score values are not normally distributed (test results significance level for Kolmogorov-Smirnov of 0.004 and Shapiro-Wilk of 0.033; being below 0.05 significance level). Consequently, we used non-parametric tests (Mann-Whitney U, Spearman’s rho), and regression analysis to analyze the relationship between DIS respectively analysts forecast errors and Tobin’s Q. Descriptive statistics, obtained results and discussion, are presented in the upcoming paragraph.

Results and discussion

The average score for overall Disclosure Index Score and each content element is highlighted below (in Table no. 1), also representing the degree of presentation of that element on the analyzed sample (98 observations). The most presented content element in the analyzed integrated reports is Business model while the fewest presented element is Outlook. Nevertheless, the relatively high standard deviation recorded for overall DIS and each content element, represents that there are variations among the analyzed reports, possibly explainable by the voluntary adoption of integrated reporting in Europe.

Table 1.

Descriptive statistics for overall Disclosure Index Score and each Content Element

	N	Average	Std. Deviation	Min.	Max.
Disclosure Index Score	98	0.70	0.13	0.32	0.97
Organizational overview and external environment	98	0.83	0.15	0.27	1
Governance	98	0.71	0.16	0.2	1
Business model	98	0.94	0.24	0	1
Risks and opportunities	98	0.74	0.25	0.5	1
Strategy and resource allocation	98	0.70	0.14	0	1
Performance	98	0.76	0.20	0.4	1
Outlook	98	0.44	0.36	0	1
Basis of preparation and presentation	98	0.47	0.41	0	1

Source: author’s projection

The average score for DIS in the analyzed sample is 0.70, while the median is 0.68. The minimum recorded value is 0.32 while the maximum is 0.97. The most encountered value (mode) is 0.61 for 8 reports.

Table 2.

Disclosure Index Score values recorded on years					
	N	Average	Std. Deviation	Min.	Max.
DIS	98	0.70	0.13	0.32	0.97
2013	17	0.63	0.13	0.38	0.89
2014	24	0.67	0.12	0.54	0.96
2015	22	0.71	0.12	0.51	0.97
2016	19	0.74	0.15	0.32	0.96
2017	16	0.73	0.14	0.56	0.97

Source: author's projection

Disclosure Index Score records higher values from year to year, from 0.63 in 2013 to 0.73 in 2017 (table no. 2). This represents an increase in the alignment level to IIRC framework and higher information disclosure by companies. The Disclosure Index Score average level in 2016 is significantly higher of that recorded in 2013 (Mann-Whitney U test significance is 0.014, which is below 0.05 significance level).

In order to analyze the **effects of voluntary IR adoption** (alignment degree of the analyzed reports with IIRC Framework thorough DIS) **on the capital market** (analysts forecast error) and on the **value of the company** (measured using Tobin's Q), we first seek for any possible correlation using Spearman's rho test.

We expect that companies producing integrated reports more aligned to IIRC Framework have lower analyst earnings forecast error. Nevertheless, if a **more aligned integrated report with IIRC Framework is negatively correlated with analysts forecast error**, might signify that analysts cannot incorporate all the information from integrated reports in their forecasts or the information disclosed creates haziness for them.

Also, we expect that companies producing integrated reports more aligned to IIRC Framework record higher value of the company. In case the **high alignment with IIRC Framework is negatively correlated with company's value**, the proprietary costs and competition sensitive information, disclosed in the analyzed integrated reports, might exceed the benefits of integrated reporting voluntary adoption.

Table 3.

Spearman's rho test – Disclosure Index Score and analysts forecast error, Tobin's Q

	Spearman's rho	Analysts forecast error	Tobin's Q
	Correlation Coefficient	0.242*	-0.246*
DIS	Sig. (2-tailed)	0.025	0.020
	N	86	89

* Correlation is significant at 0.05 level (2-tailed)

Source: SPSS computations

Based on the results Spearman's rho test (table no.3) we flag significant correlations between **Disclosure Index Score** and **analysts forecast error** and **Tobin's Q**. Nevertheless, none of the two developed hypotheses are confirmed.

Regarding the alignment degree of the analyzed report with IIRC Framework and analysts forecast error (**effects of voluntary IR adoption on the capital market**) we found an **direct and weak link** (Sig.<0.05;) meaning that **analysts forecast error increases as the analyzed report is more aligned with IIRC Framework**. Thus, as the information amount and complexity presented in integrated reports increases, the analysts forecast errors increases. In this case, analysts cannot

incorporate all the information from integrated reports in their forecasts or the disclosed information in the integrated reports creates haziness for analysts. Thus, we can assume that without a mandatory set-up / adoption of Integrated Reporting, information disclosure in these reports affects in a negative manner analysts' forecast error.

Our results are contrary to previous studies, which found that analyst forecast error reduces as company's level of compliance with IR Prototype Framework increases (Zhou *et al.*, 2017) and no link between integrated reporting quality and analysts' forecast accuracy (Barth *et al.*, 2017), in a mandatory IR setting. Moreover, in a voluntary IR adoption setting, previous research highlights that disclosing an integrated report reduces information asymmetry (analyst forecast errors) (García-Sánchez & Noguera-Gámez, 2017; Flores *et al.*, 2019). The different results can be partially explained by the fact that the above-mentioned studies either analyze the companies listed on JSE where IR is mandatory - while in our study IR is adopted on a voluntary basis by companies, or only analyze the presentation of an IR measured as a dummy, but without checking for the quality of the integrated report in a voluntary IR adoption setting.

Regarding the effects of voluntary IR adoption on value of the company, measured through Disclosure Index Score and Tobin's Q, we found an **indirect and weak link** (Sig.<0.05), meaning that **as the analyzed report is more aligned with IIRC Framework** (DIS records higher values) **the lower the value of the company is** (Tobin's Q record lower values). In this case, it means that the proprietary costs and competition sensitive information, disclosed in the analyzed integrated reports, exceed the benefits of integrated reporting adoption.

Our results are contrary to previous studies, which found a positive association between integrated report quality and company value, in a mandatory integrated reporting adoption setting (Barth *et al.*, 2017) respectively company valuation is positively associated with Integrated Reporting disclosures for companies listed on JSE (Lee & Yeo, 2016). Thus, previous studies find a positive relation between integrated reporting and company value (Tobin's Q), for companies listed on JSE, where integrated reporting is mandatory. We can presume that without mandating integrated reporting, in the voluntarily adoption situation, the costs of producing an integrated report are higher than the benefits.

Nevertheless, the benefits of **voluntary integrated reporting adoption on analysts and company** might be seen over a longer time period like in the case of CSR reporting: (i) outperforming in terms of stock market their counterparts who did not adopted CSR (Eccles *et al.*, 2014; 1993-2009 period); (ii) record a positive shift on the correlation between CSR adoption and analysts forecast error, who's forecast were be positively impacted by voluntary CSR reporting (Ioannou & Serafeim, 2015; 1993-2007 period). Also, similar to studies on companies listed on JSE, mandating integrated reporting for certain companies, we might see **a shift in benefits of integrated reporting disclosure** (Baboukardos & Rimmel, 2016; Bernardi & Stark, 2017).

To explore what type on disclosed information (which content elements) **influence the most analysts forecasting behavior**, we analyzed the content elements (scores) in relation with **analysts forecast error, respectively Tobin's Q**.

Table 4.

Spearman's rho test – Content Elements score and analysts forecast error, Tobin's Q

Spearman's rho test	Analysts forecast error			Tobin's Q		
	N	Sig. (2-tailed)	Correlation Coefficient	N	Sig. (2-tailed)	Correlation Coefficient
Organizational overview and external environment	86	0.656	-0.049	89	0.810	0.026
Governance	86	0.483	0.077	89	0.130	-0.162

Business model	86	0.993	-0.001	89	0.944	0.008
Risks and opportunities	86	0.034	0.229*	89	0.169	-0.147
Strategy and resource allocation	86	0.787	0.030	89	0.633	0.051
Performance	86	0.010	0.277**	89	0.005	-0.294**
Outlook	86	0.035	0.227*	89	0.115	-0.168
Basis of preparation and presentation	86	0.911	0.012	89	0.004	-0.303**

* Correlation is significant at 0.05 level (2-tailed)

** Correlation is significant at 0.01 level (2-tailed)

Source: SPSS computations

Based on Spearman’s rho test results (table no. 4), we find that **the presentation of risks and opportunities, performance** of the company and its **outlook, negatively impact the analysts forecast accuracy** (Sig.<0.05) with a **direct and weak link (negative impact)**. The negative relation can be caused by: (i) the overvaluation of risks / opportunities that the company encounters / will benefit, (ii) presentation of an extent information regarding the company’s performance without having some key messages, drivers or linked to financial performance, and (iii) presentation of the anticipated changes that the company expects to encounter, the potential implications, planned measures and related KPIs overwhelm / hinder the analysts judgment.

Based on Spearman’s rho test results (table no. 4), we find that **the presentation of performance** of the company and the **basis of presentation and preparation** of the integrated report, negatively impact the value of the company (Sig.<0.05) with an **indirect and weak (performance) / medium (basis of presentation and preparation) intensity link**. The negative relation can be caused by: (i) presentation of an extent information regarding the company’s performance without having some key messages / drivers or linked with financial performance, respectively (ii) how the company determines what matters to include in the integrated report and how these matters are quantified or evaluated, mislead the investors.

Based on the correlations between content elements and **analysts forecast errors respectively Tobin’s Q, we can presume that analysts carefully analyze:** (i) which are the specific risks and opportunities that affect the organization’s ability to create value over time, and how is the organization dealing with them (**risks and opportunities**), (ii) to what extent has the organization achieved its strategic objectives for the period (**performance**), (iii) what challenges and uncertainties is the organization likely to encounter in pursuing its strategy, and what are the potential implications for its business model and future performance (**outlook**) (IIRC, 2013). Regarding the information relevant for investors, reflected in company’s market capitalization, and further on company’s value, the most relevant information seems to be company’s performance and how does the organization determine what matters to include in the integrated report, and how are such matters quantified or evaluated (basis of preparation and presentation) (IIRC, 2013).

Table 5.

Regression analysis – analysts forecast error, Tobin’s Q & DIS				
Model summary	R	R Squar e	Adjusted R Square	Std. Error of the Estimate
1) Analysts forecast errors & DIS	0.274	0.075	0.064	0.006
2) Analysts forecast errors & Risks and opportunities, Performance and Outlook	0.343	0.118	0.086	0.006
3) Tobin’s Q & DIS	0.239	0.057	0.046	0.788

4) Tobin's Q & Performance and Basis of preparation and presentation	0.310	0.096	0.075	0.776
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Source: SPSS computations

Linear regression analysis (table no. 5) outlines that Disclosure Index Score explain 8% (R square = 0.075) of the analysts forecast errors, respectively 6% of the Tobin's Q (R square = 0.057). The two regressions and coefficients are statistically significant (Sig for 1) = 0.011 and Sig for 3) = 0.024). Moreover, the coefficients have the same sign as in case of Spearman's rho test. Considering only the content elements which are correlated with analysts forecast errors (Risks and opportunities, Performance and Outlook) and Tobin's Q (Performance and Basis of preparation and presentation) we obtain a 12% respectively 10% explanation in the analysts forecast errors, respectively Tobin's Q.

Conclusions, limitations and future research

Disclosure Index Score records higher values on a yearly basis for for publicly listed European-headquartered companies, the average level recorded in 2016 being significantly higher of that recorded in 2013. Nevertheless, the voluntary adoption setting might explain the high variation of the average values recorded for each year. The highest score is recoded for content element Business model while the lowest score is recorded for Outlook.

Regarding the **effects of voluntary IR adoption on the capital market** (alignment degree of the analyzed report with IIRC Framework and analysts forecast error) we found that **analysts forecast error increases as the analyzed report is more aligned with IIRC Framework**. This can be presumed that analysts cannot incorporate all the information from integrated reports in their forecasts or the disclosed information in the integrated reports creates haziness for them.

Obtained results are contrary to previous studies, which found a positive association between integrated report quality (IRQ) and company value, (Barth *et al.*, 2017) respectively company valuation is positively associated with Integrated Reporting disclosures (Lee & Yeo, 2016).

Previous results are obtained in a mandatory integrated reporting adoption setting, while our results can be influenced by voluntary integrated reporting adoption setting in Europe. Nevertheless, benefits of voluntary adoption of integrated reporting might occur over a longer period of time, like is case of CSR (Eccles *et al.*, 2014; Ioannou & Serafeim, 2015; Baboukardos & Rimmel, 2016; Bernardi & Stark, 2017): companies issuing an integrated report outperforming in terms of stock market their counterparts who did not apply integrated reporting or even a shift in effects on analysts forecast accuracy (errors) – positive correlation between forecast and a higher alignment degree with IIRC Framework. To enhance the benefits of integrated reporting on analyst forecasts, there is the possibility of mandating integrated reporting for publicly listed companies, or those exceeding a certain threshold (e.g. size).

We also explored **what type of information negatively influences the most analysts forecasting errors**, finding that **the presentation of risks and opportunities, performance** of the company and its **outlook, impact the analysts forecast accuracy**. This can be caused the fact that: (i) the company does not adequately identify the risks and opportunities that affect the organization's ability to create value over time, and how it deals with them; (ii) does not adequately present the performance against strategic objectives, or (iii) does not present the potential implications for the business model and future performance.

Regarding the effects of voluntary IR adoption on value of the company (alignment degree of the analyzed report with IIRC Framework and Tobin's Q) we found that **the more aligned with the framework is the analyzed report the lower the value of the company is**. This can represent that the proprietary costs and competition sensitive information, disclosed in the analyzed integrated reports, exceed the benefits of voluntary integrated reporting adoption.

Our results are contrary to previous studies, which found a positive association between integrated report quality and company value (Barth *et al.*, 2017), and company valuation is positively associated with integrated reporting disclosures (Lee & Yeo, 2016). These results are obtained in a mandatory integrated reporting adoption setting, while our results can be influenced by voluntary integrated reporting adoption setting in Europe

We also analyzed **what type of information negatively impacts the most the value of the company**, finding that **performance** of the company and the **basis of presentation and preparation** of the integrated report impact its value. Obtained results can be explained through the fact that the company (i) does not adequately present the performance against strategic objectives, (ii) does not adequately expose how does it determines what to be included in the integrated report, and how these matters quantified or evaluated.

Moreover, the linear regression analysis highlights that Disclosure Index Score explain 8% of the analysts forecast errors, respectively 6% of the Tobin's Q. Considering only the content elements which are correlated with analysts forecast errors and Tobin's Q, a 12% respectively 10% explanation is obtained.

Current study contributes to literature by exploring the voluntary adoption Integrated Reporting for European headquartered publicly listed companies, analyzing through quantitative methods the **effects of voluntary adoption of integrated reporting on the capital market** and on the **value of the company**.

Limitations of current study refer to time frame taken into consideration, the size of the sample and the selected region (only Europe).

Future research will explore the negative correlation between Disclosure Index Score and analysts forecast errors and Tobin's Q, to identify possible explanations and drivers. Moreover, a comparative analysis with other regions will be made, to explore whether the obtained results are driven by the voluntary setting.

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Appendix

Table 1.

Disclosure Index Score elements

Content element <i>Key question</i>	Dimension	Component
Organizational overview and external environment <i>What does the organization do and what are the circumstances under which it operates?</i>	Mission, Vision & Values	Mission
		Vision
		Values
	Context	Ownership
		Operating structure
		Principal activities
		Principal markets
		Competitive landscape
		Market positioning
	Key quantitative information	Position within the value chain
		Number of employees
		Number of countries in which the company operates
	Significant factors affecting the external environment and the organization's response	Revenues by countries in which the company operates
Legal, Commercial, Social, Environmental, Political		
Governance <i>How does the organization's governance structure support its ability to create value in the short, medium and long term?</i>	Governance structure, including the skills and diversity	
	Governance and strategy	
	Governance and stakeholders	
	Governance and innovation	
	Remuneration and incentives	
Business model <i>What is the organization's business model?</i>	Descriptive Business model OR Business model including: inputs, business activities, outputs and outcomes	
Risks and opportunities <i>What are the specific risks and opportunities that affect the organization's ability to create value over the short, medium and long term, and how is the organization dealing with them?</i>	Risks	
	Opportunities	

Strategy and resource allocation <i>Where does the organization want to go and how does it intend to get there?</i>	Strategic Objectives	
	Strategies in place to reach the Strategic Objectives	
	Resource allocation	
	KPIs for achievements	
Performance <i>To what extent has the organization achieved its strategic objectives for the period and what are its outcomes in terms of effects on the capitals?</i>	KPIs for targets, risks and opportunities	
	Impact on the Capitals	
	Stakeholder relationships	
	Past, current and future performance	
	Non-financial KPIs	
Outlook <i>What challenges and uncertainties is the organization likely to encounter in pursuing its strategy, and what are the potential implications for its business model and future performance?</i>	Anticipated changes	
	Potential implications	
	Planned measures	
	KPIs to quantify	
Basis of preparation and presentation <i>How does the organization determine what matters to include in the integrated report and how are such matters quantified or evaluated?</i>	Materiality	
	Boundary	
	Methods used	

Source: author's projection based on <IR> Framework