

Investors' reactions on the publication of integrated reports. Evidence from European stock markets

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Abstract: The last decades brought to stock market investors' attention several key issues regarding companies' activity, besides the financial statements. These issues, such as environmental, social, or corporate governance policies are nowadays included in integrated reports issued by many listed companies worldwide. Although these topics seem to currently attract a high interest in the media, our study's aim is to determine whether the listed firms' release of Integrated Reports has any bearing on the issuers' performance on the capital market as assessed by market value, return, and risk. In this respect, we analysed three different stock market time series' reactions – daily close prices, daily logarithmic returns, and risk measured by the Expected Shortfall – to the publication of integrated reports, for a sample of 48 companies, listed on various European stock markets. In order to identify any sudden changes in the analysed time series behaviour, immediately after the publication date, we used the Bai-Perron multiple structural breaks test. Our results show that no consistent, significant reactions occur within the analysed time series immediately after the publication of integrated reports, but only isolated, circumstantial reactions seem to appear. Moreover, it seems that the markets show common significant reactions to certain events, marked by major structural breaks, but none of these events could be related to the publication of integrated reports. Within this context, our paper manages to prove that although it currently constitutes a hot topic worldwide, integrated reporting is not a key feature in the investors' short-term decision-making process.

Keywords: Integrated reporting, stock market, structural breaks, expected shortfall, investor reactions.

JEL Classification: G11, G39, O16.

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Introduction

The growing imperatives of applying the principles of sustainable development in the context

of globalization, exposure to climate change, and technological dynamics are leading national and international companies to adopt

new performance standards that go beyond the economic sphere. Achieving these performance standards is not only in the strict interest of companies but also of a set of stakeholders (investors, business partners, communities). International institutions, companies, and researchers are developing various strategic frameworks for managing stakeholder relations, both general and sector-specific (Khalilzadeh et al., 2021), integrated reporting being one of the tools to concretize these frameworks. Therefore, making the performance information public has become a business practice.

Thus, in the last decade, the number of users of integrated reporting (IR) has increased substantially, serving the purpose of companies to focus not only on financial reporting but also on non-financial issues. This way, companies seek to align their activities with the changes/expectations of the society within which they operate, but also with various regulations, which are becoming increasingly important worldwide. The International Integrated Reporting Council (IIRC) defined integrated reporting as promoting “a more cohesive and efficient approach to corporate reporting,” focusing on different reporting directions and presenting all the factors that influence or could significantly influence a company’s ability to create value in time (IIRC, 2013, p. 3).

The use of integrated reporting can bring certain benefits to companies, as they increase their corporate reputation through responsibility and transparency (Oliviera et al., 2019; Suttipun, 2017). However, there are still many views in the literature that address challenging theoretical-conceptual issues or practical implications. Thus, a number of studies point out the fact that there still low levels of knowledge about IR, suggesting that these topics should be included in the formal education, namely in the academic curricula (Adhariani & Villiers, 2018). There have also been identified some theoretical and empirical challenges generated by the adoption of integrated reporting, mainly as a consequence of different ways of understanding and implementing it within organizations (Villiers et al., 2014). Other reasons refer to the fact that organizational systems and processes are not entirely compatible and data analysis represents a difficult task (McNally et al., 2017), or because of the approach flexibility and lack of prescription concerning actual disclosures and metrics (Dumay et al., 2017)

and as the qualitative differences of the Integrated Reports (Iredele, 2019).

The publication of integrated reports, by including in the same document a set of non-financial information, together with those related to financial performance leads to an increase in information transparency for a wide range of stakeholders, among which investors (individual or institutional) occupy an important position.

1. Theoretical background

Integrated reporting is a strategic and future-oriented communication about how organizations attract various available resources, relationships, and capital in order to create value over time. The International Integrated Reporting Council identifies six broad categories of capital used by organizations: financial capital, manufactured capital, intellectual capital, human capital, social capital including relationship capital, and natural capital. The long-term vision of the International Council for Integrated Reporting is represented by a business environment in which integrated thinking is incorporated into business techniques, facilitated through integrated reporting (IR) as the norm of corporate reporting. According to IIRC, the integrated thinking of an organization is achieved by considering all the relationships between its operational and functional units, as well as by the capital used by the organization or by the capital that can influence the organization (IIRC, 2021).

Integrated reporting is an emerging topic in literature, with articles highlighting both its advantages and disadvantages. The advantages of integrated reporting include diverse information being presented in a concise manner, improved information quality for financial capital providers, and high and multi-dimensional information value of the content elements of the integrated reporting framework/structure (IIRC, 2013). The barriers or difficulties in its implementation include the ambiguous definition of integrated reporting (Dumay et al., 2016; Feng et al., 2017; Tweedie & Martinov-Bennie, 2015) and related terms, namely “integrated thinking” and “value creation,” the lack of regulation in the structure of integrated reports (Adams, 2015), the potential costs of its implementation (Steyn, 2014; Velte & Stawinoga, 2017) and the major differences in data presentation, as well as in terms of complexity and volume of content (Bădițoiu, 2019; Chaidali & Jones, 2017).

The decision to publish such integrated reports is currently voluntary in most national legislatures, except for South Africa, where it is compulsory for companies listed on the Johannesburg Stock Exchange (Druckman, 2022; Eccles et al., 2019).

Over the past two decades, companies' social and environmental information has often been published in reports that are independent and separate from financial reports, or through media such as sustainability websites. The complexity of business organizations, due to the development of corporate structures, and the influence of stakeholders has made it necessary to complement "financial reporting" with "integrated reporting," a more detailed reporting system that describes how the activities of large companies influence public interests, society, and the environment.

Integrated reporting has its origins in the first King Code of Corporate Governance (CG) principles from South Africa, otherwise recognized as "King I," which emerged in 1994. Later, the modified version of King I, respectively King II report, implemented during the Johannesburg Earth Summit, presented "Integrated Sustainability Reporting" as the novel area of non-financial reporting (Dumay et al., 2016). The first national jurisdiction that took up this type of reporting in March 2010 according to the statements of King III was South Africa. At the Johannesburg Stock Exchange (JSE) listed companies must create and disclose an integrated report. The International Integrated Reporting Council (IIRC) (previously recognized as the International Integrated Reporting Committee) was established in August 2010 with the role of creating an internationally acknowledged IR framework. It serves as an assistant to companies in the drafting of integrated reports (Liu et al., 2019) that present information about their strategy, governance, risks, and performance in a clear and concise manner. The framework was created to highlight future value creation for all stakeholders (Villiers et al., 2017). Since June 2021, the two organizations [Integrated Reporting Council (IIRC) and the Sustainability Accounting Standards Board (SASB)] have merged to form the global organization called the Value Reporting Foundation.

The decisive factor contributing to a company's survival or increase in value is primarily its corporate governance policies, with numerous studies linking the performance of an economy

to the quality of its corporate governance practices (Gregg, 2001; Kiel & Nicholson, 2002). Integrated reporting is in many cases seen as an indicator of effective corporate governance, which is vital in terms of attracting new investors (KPMG, 2017). Disclosure of relevant information on a company's corporate governance thus becomes one of the essential components in the content structure of integrated reporting (IIRC, 2013), primarily based on the legitimacy theory that integrated reporting mainly serves to legitimize an organization's activities (Deegan, 2002). Several research directions address the relationship between the adoption of integrated reporting and some of the corporate governance variables: shareholder structure (Mähönen, 2020; Suttipun & Bomlai, 2019), mechanisms and principles of corporate governance (Cooray et al., 2020; Hichri, 2021), board characteristics (Tiron-Tudor et al., 2020; Vitolla et al., 2020), fiscal risk management practices (Segal et al., 2017) or stakeholder engagement model (Isnurhadi, 2020). Thus, the adoption of integrated reporting can lead to increased transparency and reduced information asymmetries (Hamad et al., 2020).

The integrated reporting framework includes a set of non-financial information, together with those related to financial performance within the same document. This approach leads to an increase in information transparency for a wide range of stakeholders, among which investors (individual or institutional) occupy an important position. Investors can thus form a more complete picture of the overall activity and performance of organizations, and information asymmetry is reduced by additional information provided to financial investors (García-Sánchez & Noguera-Gámez, 2017). However, studies analysing the impact of integrated reporting on financial markets lead to inhomogeneous conclusions: some of them highlight a positive relationship between IR and financial market reactions, while others do not identify such a relationship.

By analysing a sample of companies listed in South Africa, Lee and Yoo (2016) conclude on the existence of a positive relationship between IR and the market value of companies, considering that this result is determined by the reduction of information processing costs by investors, being all the more significant the more complex the organizational environment. In the same South African financial

market (where integrated reporting is mandatory), the study by Cosma et al. (2018) showed a positive reaction of the markets to the announcement of the publication of integrated reports, being more significant for companies in non-financial sectors. Regarding voluntary reporting, the results of a study conducted on 38 global organizations (Giorgino et al., 2017) indicate that the voluntary publication of the integrated report by a firm has a significant effect (a shock type effect) on the market value of the shares of that company. Another study, conducted on 490 firms in the Japanese financial market, also shows a positive market reaction to the publication of integrated reports, more significant than the one manifested after the publication of CSR reports alone (Nakajima & Inaba, 2021).

On the other hand, there are also studies that do not reveal a significant or consistent link between integrated reporting and the evolution of financial markets. Using a sample made up of Australian companies, Stubbs et al. (2014) analysed the relevance perceived by investors in the decision-making process of the model based on six types of capital proposed by IIRC (financial, manufactured, intellectual, human, social & relationship, and natural; IIRC, 2013), as an integrated reporting model. The results show that there is a gap between the information provided by companies based on this framework and the information required by financial capital providers to make investment decisions (Stubbs et al., 2014). A study conducted in South Africa on 40 listed companies showed a higher reactivity (measured by CAAR – cumulative average abnormal returns) of markets to the quality of financial information than to the overall information contained in the integrated reports (Willows & Rockey, 2018). Moreover, Landau et al. (2020), using the Ohlson model in order to estimate the market value of a sample of 50 European companies (STOXX Europe 50) prove a negative impact of IR publication on the market value of companies, stating that this impact can be mitigated by a higher quality of IR.

At a more specific level, when discussing punctually about the impact of integrated reporting on investors' reactions, Ulupui et al. (2020), while analysing the Indonesian Stock Exchange, found that integrated reporting has a positive, yet insignificant impact on investors' reactions.

The usefulness of IR, as perceived by investors, consists in the fact that it implicates environmental matters, social and employee related matters, human rights matters, anti-corruption matters and valuable supply chain information. These can be useful in the process of investment decisions making, especially on the long-term (Adams, 2015; Liu et al., 2019; Velte & Stawinoga, 2017). On the other hand, there are studies that rather highlight investors' focusing on financial information such as profitability and market prices evolution (Adegboye-gun et al., 2020; Ferreira & Martins, 2020).

These results suggest that IR could be of good use to stakeholders (especially investors) to form an overview of companies' performance and how they create value. However, this potential advantage has some associated perceived costs: there is a perception among capital providers that integrated reporting increases reporting costs and, implicitly, agency costs (Nakajima & Inaba, 2021). It is, therefore, necessary to find a balance between the costs of reporting and the added value generated by it.

Within the above-described context, we consider that highlighting the structural breaks (Bai & Perron, 1998, 2003) in the series of close prices, and daily returns as well as in the series of risk (measured by the Expected Shortfall) could be used as a method of estimating the influence of integrated reporting on the capital market investment behaviours. A structural break is a sudden, unexpected change in the parameters of the regression function that defines the evolution of a time series. These types of changes are usually determined by major and sudden shifts within the evolution of the analysed phenomenon. On the capital market, such major changes can be triggered by certain factors such as: economic crises (Kalsie & Arora, 2019), macroeconomic conditions (Clemente et al., 2017; Klose, 2014), government regulation changes (Klose, 2014; Turtle et al., 2015), exogenous (i.e., pandemic) shocks (Karavias et al., 2022), but also the way in which the issuer company is perceived by investors (Ballinari & Behrendt, 2020). Taking into consideration the last category of factors, these major shifts can and may be caused by the opinions and perceptions of investors, which could be altered by novel information provided by the issuer.

The Chow test is frequently used when attempting to identify single breaks in the mean

of the analysed series, occurring at given moments of time. However, if these parameters change, and the analysed series displays several structural breaks instead of a single well determined one, occurring not only in mean, but also in variance, at unknown moments in time, the Bai-Perron test is a more suitable choice. As Bai and Perron (1998) and Perron (2018) suggest, if a one-break model is applied when actually multiple breaks exist, and the underlying function of the time series evolution is a linear trend function, the results are biased. Bai and Perron (1998) consider the possibility that multiple structural changes may occur at unknown dates, testing both for the occurrence of certain structural changes and for the number of breaks. In this respect, the Bai-Perron test was used, in order to identify the presence of structural changes as well as the occurring dates, using the close prices, returns and Expected Shortfall risk time series.

2. Research methodology

The main research purpose of this study is to find out if the publication of integrated reports by the listed companies has any impact on the issuers' performance on the capital market, measured by market value, return and risk.

Based on the above-mentioned purpose, the research objective is formulated as follows: Investigate the way in which IR influences the perception of investors, determining major shifts in their investment behaviour, with effects on the price, the returns, as well as the risk of the issuer's shares. To achieve the research objective, the identification of any structural breaks within the market value (or within the returns series, or within the risk series) determined by the publication of integrated reports of European companies will be pursued.

In order to highlight the connection between making integrated reporting available to the public and the companies' performance, we chose to analyse the occurrence of shocks (in the form of structural breaks) in the market value of these companies, as a result of the publication of integrated reports.

Thus, as a first step for achieving the research objective, we established the database used, namely the online IIRC, section "<IR> Reporters" where we identified and selected those companies in Europe that use this form of reporting. This geographical area was chosen in order to give a reasonable dimension

to our study, as Europe encompasses globally relevant financial markets that have a relatively homogeneous behaviour. The IIRC online database consisted of 155 companies in Europe that claim to apply the <IR Framework>.

The next step is to analyse the companies' reports in order to identify the date of their publication, the reference year being 2019. For this purpose, we analysed the official websites of the companies, their press releases within the financial media, the "news" section, the shareholders' section, etc. We also approached certain companies via e-mail in order to obtain information on the publication dates of their reports. The reports regarding the 2019 financial year were published in 2020, for most of these companies. For reasons related to the possible negative effects generated by the COVID 19 pandemic context, we extended this study to reports published in 2019 and 2021.

Thus, for the initial database, consisting of 155 European companies, the aim was to identify the publication date of their reports. It should be noted that, although these companies are included in the IIRC online database, stating that they apply the IR Framework when analysing the structure and actual content of the reports, it can be seen that not all of them publish integrated reports in the full sense of the concept. Many remain faithful to the classic forms of reporting (annual reports, sustainability reports, reports on social responsibility programs – CSR reports, etc.). At the same time, the integrated reports published by companies can have various names, such as: "Annual Report," "Integrated Report," "Integrated Review," "Annual and Sustainability Report," "Consolidated Management Report," and "Annual Accounts" or just "Report." Of the 155 analysed companies, the official date of publication of the integrated reports was identified for only 58 companies. Ten of these were not listed on stock exchanges. Thus, the symbols of the remaining 48 companies were later collected through Yahoo Finance to conduct this case study.

The study was focused only on European companies based on the purpose of composing a relatively homogeneous sample from an economic/politic/social point of view. As many such phenomena could trigger structural breaks in the time series included in our analysis, we tried to construct a homogeneous sample that would mainly be affected by the same "big" identifiable events.

date. However, we are aware of the fact that the changes that have occurred can also be determined by the content of the reports, not only by simply publishing them.

Tab. 1 presents the selected companies and the publication dates of their integrated reports,

as well as the first date immediately following the publication of the reports when a structural break was identified. Tab. 1 presents the structural breaks identified in all three analysed time series: close prices, logarithmic returns series, and Expected Shortfall risk series.

Tab. 1: The first structural breaks after the publication of integrated reports – Part 1

No.	Issuer company	Integrated report publishing date			First structural break								
					After the publishing date (daily close price)			After the publishing date (rate of return)			After the publishing date (expected shortfall)		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
1	ABN AMRO	13/03	11/03	10/03	28/05	08/10		06/08	15/05		12/06	08/07	
2	AEGON	22/03	18/03	18/03	28/05	13/07		03/06	12/08		12/06	26/06	
3	AGGREKO	22/03	19/03	18/03	05/06	21/09		14/06	19/03	11/02	12/06	06/07	
4	AKZO NOBEL	07/03	10/03	10/03	28/05	07/07		31/05	19/03		14/06	03/06	
5	ANGLOAMERICAN	04/03	09/03	24/02	28/05	10/07		31/05	23/03		06/09	29/05	
6	ANTOFAGASTA	12/04	14/04	07/04	28/05	01/07		31/05	05/08		31/07	15/05	
7	ARCELORMITTAL	29/04	27/05	24/05	28/05	09/10		31/05	21/08		12/06	02/07	
8	ASSICURAZIONI GENERALI	08/04	06/03	01/04	28/05	06/03		03/06	18/03		12/06	03/06	
9	ASTRAZENECA	05/03	03/03	11/02	22/07	15/04	24/02	31/05	16/03		13/06	10/06	26/02
10	ATLAS COPCO AB	08/03	06/03	11/03	03/06	19/05		31/05	23/03		18/07	12/05	
11	ATOS	07/05	08/06	10/05	28/05	30/06		03/06	06/08		12/06	29/06	
12	AXA	24/04	30/06	29/04	28/05	17/07		20/06	05/08		12/06	30/06	
13	BAM GROUP	26/02	25/02	25/02	12/06	06/03		01/07	26/02		12/06	05/03	
14	BASF	26/02	28/02	26/02	28/05	28/02		31/05	20/03		12/06	05/03	
15	BAYER AG	27/02	27/02	25/02	28/05	05/03		31/05	20/05		12/06	05/03	26/02
16	BHP GROUP	17/09	14/09		15/10	02/12		28/10		24/02	18/09	15/10	
17	BOLIDEN	08/03	11/03	10/03	28/05	10/07		31/05	12/03		03/07	28/05	
18	BP	29/03	18/03	22/03	05/06	20/08		11/06	18/03		12/06	17/07	
19	BRITISH LAND	15/05	27/05	26/05	28/05	14/07		04/06	25/09		12/06	08/07	
20	CLARIANT	11/03	09/03	17/03	28/05	21/07		03/06	23/03		12/06	17/07	
21	COCA COLA HBC AG	15/03	19/03	18/03	28/05	21/07		11/06	05/08		12/06	06/07	
22	CREST NICHOLSON	18/02	17/02	16/02	28/05	12/03	24/02	03/06	21/02		12/06	26/02	
23	ENAGAS	18/03	30/04	19/04	12/06	12/05		13/06	29/07		12/06	20/07	
24	ENBW	28/03	26/03	25/03	28/06	31/03		19/07	21/04		23/08	26/05	
25	ENI	05/04	02/04	12/05	28/05	28/07		31/05	01/10		12/06	02/07	
26	FERROVIAL	04/04	05/03	25/02	05/06	06/03		04/06	18/03		12/06	05/03	
27	FORTRESS REIT LIMITED	31/10	26/10			09/12						07/02	

Tab. 1: The first structural breaks after the publication of integrated reports – Part 2

No.	Issuer company	Integrated report publishing date			First structural break								
					After the publishing date (daily close price)			After the publishing date (rate of return)			After the publishing date (expected shortfall)		
		2019	2020	2021	2019	2020	2021	2019	2020	2021	2019	2020	2021
28	G4S	12/03	11/03	16/03	03/06	17/07		11/06	23/03		12/06	26/06	
29	GECINA SA	17/04	13/03	18/03	12/06	09/10		31/05	18/03		12/06	08/07	
30	GIVAUDAN SA	25/01	24/01	29/01	29/05	06/05	24/02	12/06	12/03	23/02	29/08	31/01	11/02
31	GRUPA LOTOS SA	07/03	12/03	06/04	28/05	29/07		31/05	12/03		19/07	15/04	
32	INDITEX	13/03	18/03	10/03	05/06	09/10		31/05	18/03		12/06	02/07	
33	ING GROUP	07/03	05/03	11/03	28/05	05/03		31/05	18/03		12/06	05/03	
34	JOHNSON MATTHEY PLC	14/06	23/06	18/06	31/07	13/07		03/07	16/09		16/07	08/07	
35	KESKO CORPORATION	08/03	06/03	19/03	07/06	09/03		25/06	23/03		08/07	05/10	
36	KONINKLIJKE PHILIPS NV	26/02	25/02	23/02	28/05	28/02		12/06	16/03		12/06	05/03	26/02
37	KPN	25/02	24/02	22/02	28/05	24/02	24/02	05/06	16/03	22/02	05/09	04/06	22/02
38	MELIA HOTELS	27/02	26/02	25/02	28/05	03/03		20/06	18/03		29/07	03/06	26/02
39	MILLICOM INTERNATIONAL CELLULAR SA	01/03	02/03	12/03	28/05	06/03		12/06	19/05		12/06	05/03	
40	MONDI SA	26/03	24/03	23/03	28/05	25/09		31/05	20/08		12/06	28/05	
41	NN GROUP	14/03	12/03	11/03	28/05	13/07		31/05	16/03		12/06	02/07	
42	NOVO NORDISK	01/02	05/02	03/02	07/06	15/04	10/02	29/05	20/03	24/02	19/06	22/04	09/02
43	PALFINGER AG	18/02	08/02	25/02	28/05	21/02		28/06	01/04		16/08	06/05	
44	PIRELLI & C. SPA	15/05	15/04	20/04	28/05	05/10		12/06	07/08		12/06	02/07	
45	RANDSTAD NV	12/02	11/02	09/02	31/05	04/03		20/06	23/03		20/08	21/02	26/02
46	ROYAL DSM	08/03	27/02	02/03	31/05	19/05		13/06	16/03		31/07	14/05	
47	SABAF SPA	20/05	04/06	06/05	28/05	22/09		04/06	21/09		02/08	02/07	
48	SAP SE	28/02	27/02	04/03	28/05	29/05		24/06	19/03		12/06	05/03	

Source: own (using R)

In Tab. 1, the highlighted cells contain structural break dates occurring within the first seven to ten days after the publication date of integrated reports.

As among the structural break dates identified by the Bai-Perron test, we identified certain dates repeating for several companies, we decided to analyse the behaviour of several main stock market indexes from the main global Stock Exchanges, in the vicinity of these days. Thus, we would be able to capture any contagion effects triggering the specific, common structural breaks that appeared in our study.

To carry out this study, we collected daily data on 9 main stock market indexes and furtherly analysed the close prices time series, daily logarithmic returns series, and Expected Shortfall risk series. The closest preceding and following structural breaks in respect to the identified repeating date are listed in Tab. 2–4.

3. Research results

Following the above-described study, in 2019, only one structural break was identified after the publication of the integrated reports of

Tab. 2: Structural breaks within the stock market indices daily close prices

No.	Stock market index	Closest structural break date			
		Before 28/05/2019	After 28/05/2019	Before 24/02/2021	After 24/02/2021
1	AEX	16/05/19	07/06/19	05/01/21	
2	DJI	28/05/19	09/10/19	05/02/21	08/03/21
3	FCHI	16/05/19	04/09/19	09/11/20	01/03/21
4	FTSE	16/05/19	05/06/19	02/12/20	
5	GDAXI	16/05/19	09/10/19	15/12/20	05/03/21
6	GSPC	16/05/19	14/06/19	05/01/21	
7	NYA	24/05/19	16/10/19	05/01/21	
8	OMX	16/05/19	09/09/19	10/11/20	26/02/21
9	FTSEMIB.MI	24/05/19	14/10/19	03/02/21	

Source: own (using R)

Tab. 3: Structural breaks within the stock market indices daily logarithmic returns

No.	Stock market index	Closest structural break date			
		Before 31/05/2019	After 31/05/2019	Before 24/02/2021	After 24/02/2021
1	AEX	17/05/19	28/10/19	12/08/20	05/03/21
2	DJI	21/05/19	04/11/19	29/01/21	
3	FCHI	17/05/19	30/10/19	29/01/21	
4	FTSE	17/05/19	04/11/19	12/08/20	26/02/21
5	GDAXI	17/05/19	29/10/19	29/01/21	
6	GSPC	17/05/19	04/11/19	02/09/20	04/03/21
7	NYA	21/05/19	04/11/19	24/02/21	
8	OMX	17/05/19	04/11/19	21/12/20	
9	FTSEMIB.MI	17/05/19	24/10/19	29/01/21	

Source: own (using R)

the companies in the established interval of 7 days, in the Expected Shortfall time series for BHP Group.

As for 2020, one can notice that there are several cases in which structural breaks are identified in the period immediately following (seven days) the publication of the integrated reports. Those cases appear for all three analysed time series: close prices, return, and risk. However, the shocks/structural breaks identified on the market in 2020 cannot be correlated only with the publication of the integrated

reports, as the year 2020 was substantially influenced by the COVID-19 pandemic effects. Shock effects identified in about one week after the publication of the integrated reports, in 2020, occurred for 11 companies when using the daily close prices time series: Assicurazioni Generali, BASF, Bayer AG, ENBW, Ferrovial, ING Group, Kesko Corporation, Koninklijke Philips NV, KPN, Melia Hotels, Millicom International Cellular SA. For the following 9 companies, structural breaks were identified in 2020, when analyzing the returns time series:

Tab. 4: Structural breaks within the stock market indices risk measured by expected shortfall

No.	Stock market Index	Closest structural break date					
		Before 12/06/2019	After 12/06/2019	Before 05/03/2020	After 05/03/2020	Before 26/02/2021	After 26/02/2021
1	AEX		23/08/19	19/02/20	16/03/20	17/12/20	13/04/21
2	DJI		24/06/19	25/02/20	17/03/20	12/01/21	
3	FCHI		24/06/19	19/02/20	17/03/20	20/08/20	16/03/21
4	FTSE		24/06/19	19/02/20	17/03/20	21/01/21	
5	GDAXI		14/08/19	19/02/20	17/03/20	18/12/20	13/04/21
6	GSPC		24/06/19	08/11/19	17/03/20	12/01/21	
7	NYA		24/06/19	08/11/19	17/03/20	20/08/20	13/04/21
8	OMX		24/06/19	08/11/19	16/03/20	21/01/21	
9	FTSEMIB.MI		07/08/19	18/02/20	17/03/20	18/12/20	13/04/21

Source: own

Aggreko, BAM Group, Boliden, BP, Crest Nicholson, Gecina, Grupa Lotos SA, Inditex, and NN Group. When analysing the risk time series, for 2020, the following 5 companies were identified to have structural breaks immediately after the publication date: AXA, BASF, Bayer AG, Ferrovial, and Givaudan SA.

A small number of structural breaks were identified in 2021 in the period immediately following the publication of the integrated reports, in the following cases: KPN and Novo Nordisk (using daily closing prices), KPN (using the rate of return time series), and Bayer AG, Koninklijke Philips NV, KPN, Melia Hotels and Novo Nordisk (using the risk time series).

Also, common structural breaks data were identified (28.05.2019 and 24.02.2021 in the case of using daily closing prices, 31.05.2019 and 24.02.2021 in the case of using rates of return, and 12.06.2019, 05.03.2020, and 26.02.2021 when analysing the risk time series) for several companies, but at a significant distance in time from the date of publication of the integrated reports. This shows that, although there were some shocks concerning the analysed companies' performances within the stock market, these events cannot be correlated with the integrated reporting. In this respect, we conducted a second study to verify the structural breaks at the level of various main market indices (AEX, DJI, FCHI, FTSE, GDAX, GSPC, NYA, OMX, FTSEMIB.MI) and we found that they are only occurring in the particular

cases of the analysed companies, and not at the global level of the stock markets. The structural breaks identified near the above-mentioned commonly observed days, occurring at a global stock market level are presented in Tab. 2 (using the close prices time series), Tab. 3 (using the rates of return time series), and respectively Tab. 4 (using the risk time series – also obtained with the Expected Shortfall method).

In our opinion, a possible explanation for the multiple occurrences of structural breaks in the case of 28.05.2019 might be related to the fact that on Monday, 27.05.2019, the stock exchange was closed both in the United States and in the United Kingdom, for Memorial Day (a legal holiday in both countries). Thus, a "Holiday Effect" might have occurred and subsequently generated the observed structural breaks. Also, those structural breaks having a high number of occurrences (e.g., 28.05.2019, or 24.02.2021) are actually situated near the reference date set by the board of directors – the date when the shareholder status is considered for the distribution of dividends. This event may explain the presence of certain sharp changes in the stock prices, resulting in structural breaks.

Conclusions

The reactions of various categories of stakeholders to the publication of non-financial information in integrated reports (i.e., environment, social and governance) may vary depending

on their objectives, the nature of their relations with the company (active or passive relations) or their individual values. Some categories may put a greater value on non-financial aspects, so that effects of integrated reporting can be detected at their level (Velte & Stawinoga, 2017). Other categories maintain their options to refer to companies based purely on financial criteria. Among these stakeholders categories, investors consider that non-financial aspects do not yet have sufficient relevance for their investment decisions, focusing primarily on financial aspects such as the profitability of companies and the evolution of market prices (Ferreira & Martins, 2020).

Our study, conducted through an analysis of investors' reactions on the capital markets, confirms this second approach: the results highlight the fact that the publication of integrated reporting does not have an immediate impact on stock markets, also suggesting that capital market investors do not assign high importance to integrated reports, but rather to reports containing only financial information.

The study analysed the possibility of significant and rapid reactions of the market, similar to structural breaks, as a result of integrated reports publishing. However, the application of Bai-Perron tests did not reveal the existence of such reactions. The novelty of our study is represented by the attempt of tracking the appearance of any structural breaks as a direct result of the publication of integrated reports, by analysing the prices, returns and Expected Shortfall risk time series.

A potential cause for this conclusion could be related to various problematic issues of the integrated reporting mentioned by the literature, such as conciseness, different accepted formats, length (Chaidali & Jones, 2017), differences in data presentation, as well as in terms of complexity and volume of content (Bădițoiu, 2019). This way, investors cannot react promptly to the information presented in these reports, as the content is difficult to analyse, in many cases taking up to a week or more after publication. The results of our study are consistent with the ones obtained by Adegboyegun et al. (2020), according to whom, integrated reporting does not have a significant impact on corporate performance in the short run, but only in the long run. According to them, long-term investors are more interested in non-financial

information than short-term investors, who care more about the financial status of the issuers. A similar result was obtained by Dima et al. (2013), who conclude that financial information has a certain prevalence over non-financial one on the evolution of stock market prices.

Overall, our research reflects the fact that investors' reactions to the publication of integrated reports are weak, circumstantial, and rather isolated, as investors seem to be more sensitive to socio-political events (elections, terrorist attacks, medical/military and geostrategic crises, authorities' announcements on macro-economic or monetary policy indicators, etc.) or events that solely affect/influence a certain market. The absence of structural breaks after the publication of integrated reports only highlights the non-existence of the immediate (very short-term) impact of the IR on investors' behaviour, without revealing information on their actions on medium and long term. On the other hand, identifying the exact cause leading to the occurrence of structural changes is no longer relevant since they are not revealed immediately after the publication of the integrated reports. However, we consider that information transparency is important for strategic stakeholder integration. In recent years, there has been an increase in interest in responsible investments, with a growing number of investors orienting their portfolios towards stocks and investment funds that promote socially responsible practices towards the environment or community (Tiron-Tudor et al., 2022).

As a future research topic, we consider that a study on reactions' asymmetry could be a potentially interesting view. Even in the case of isolated reactions, it would be interesting to study if the intensity of these reactions is stronger with respect to negative information or bad news than with respect to good news or positive information.

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References

- Acerbi, C., & Tasche, D. (2002). On the coherence of expected shortfall. *Journal of Banking and Finance*, 26, 1487–1503. <https://doi.org/10.48550/arXiv.cond-mat/0104295>
- Adams, C. A. (2015). The international integrated reporting council: A call to action. *Critical Perspectives on Accounting*, 27(1), 23–28. <https://doi.org/10.1016/j.cpa.2014.07.001>
- Adegboyegun, A. E., Alade, M. E., Ben-Caleb, E., Ademola, A. O., Eluyela, D. F., & Oladipo, O. A. (2020). Integrated reporting and corporate performance in Nigeria: Evidence from the banking industry. *Cogent Business and Management*, 7(1), 1736866. <https://doi.org/10.1080/23311975.2020.1736866>
- Adhariani, D., & Villiers, C. (2018). Integrated reporting: Perspectives of corporate report preparers and other stakeholders. *Sustainability Accounting, Management and Policy Journal*, 10(1), 126–156. <https://doi.org/10.1108/SAMPJ-02-2018-0043>
- Artzner, P., Delbaen, F., Eber, J.-M., & Heath, D. (1999). Coherent measures of risk. *Mathematical Finance*, 9(3), 203–228. <https://doi.org/10.1111/1467-9965.00068>
- Bădițoiu, B. R. (2019). The integrated reporting “stakeholder relationships” principle in the European financial sector. In Proceedings of DOKBAT 2019 – 15th Annual International Bata Conference for Ph.D. Students and Young Researchers: Vol. 15. Tomas Bata University in Zlín, Faculty of Management and Economics.
- Bai, J., & Perron, P. (1998). Estimating and testing linear models with multiple structural changes. *Econometrica*, 66(1), 47–78. <https://doi.org/10.2307/2998540>
- Bai, J., & Perron, P. (2003). Computation and analysis of multiple structural change models. *Journal of Applied Econometrics*, 18(1), 1–22. <https://doi.org/10.1002/jae.659>
- Ballinari, D., & Behrendt, S. (2020). Structural breaks in online investor sentiment: A note on the nonstationarity of financial chatter. *Finance Research Letters*, 35, 101479. <https://doi.org/10.1016/j.frl.2020.101479>
- Chaidali, P., & Jones, M. J. (2017). It’s a matter of trust: Exploring the perceptions of integrated reporting preparers. *Critical Perspectives on Accounting*, 48(C), 1–20. <https://doi.org/10.1016/j.cpa.2017.08.001>
- Clemente, J., Dolores Gadea, M., Montañés, A., & Reyes, M. (2017). Structural breaks, inflation and interest rates: Evidence from the G7 Countries. *Econometrics*, 5(1), 11. <https://doi.org/10.3390/econometrics5010011>
- Cooray, T., Gunarathne, A. D., & Senarathne, S. (2020). Does corporate governance affect the quality of integrated reporting? *Sustainability*, 12, 4262. <https://doi.org/10.3390/su12104262>
- Cosma, S., Soana, M. G., & Venturelli, A. (2018). Does the market reward integrated report quality? *African Journal of Business Management*, 12(4), 78–91. <https://doi.org/10.5897/AJBM2017.8469>
- Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures – A theoretical foundation. *Accounting, Auditing & Accountability Journal*, 15(3), 282–311. <https://doi.org/10.1108/09513570210435852>
- Dima, B., Cuzman, I., Dima, S. M., & Șărămăt, O. (2013). Effects of financial and non-financial information disclosure on prices’ mechanisms for emergent markets: The case of Romanian Bucharest Stock Exchange. *Journal of Accounting and Management Information Systems*, 12(1), 76–100.
- Druckman, P. (2022). *South African reflections on integrated reporting*. IIRC, IFRS Foundation. <https://www.integratedreporting.org/news/south-african-reflections-on-integrated-reporting/>
- Dumay, J., Bernardi, C., Guthrie, J., & Demartini, P. (2016). Integrated reporting: A structured literature review. *Accounting Forum*, 40(3), 166–185. <https://doi.org/10.1016/j.accfor.2016.06.001>
- Dumay, J., Bernardi, C., Guthrie, J., & Torre, M. (2017). Barriers to implementing the International Integrated Reporting Framework: A contemporary academic perspective. *Meditari Accountancy Research*, 25(4), 461–480. <https://doi.org/10.1108/MEDAR-05-2017-0150>
- Eccles, R. G., Krzus, M. P., & Solano, C. (2019). *The quality of integrated reporting around the world*. The CLS Sky Blog, Columbia Law School’s Blog on Corporations and the Capital Markets. <https://clsbluesky.law.columbia.edu/2019/04/23/the-quality-of-integrated-reporting-around-the-world/>
- Feng, T., Cummings, L., & Tweedie, D. (2017). Exploring integrated thinking in integrated reporting – An exploratory study in Australia. *Journal of Intellectual Capital*, 18(2), 330–353. <https://doi.org/10.1108/JIC-06-2016-0068>
- Ferreira, T. S. V., & Martins, O. S. (2020). Integrated reporting and shareholder value creation: International evidences. In Proceedings

of XX USP International Conference in Accounting. *Accounting as a Governance Mechanism*.

García-Sánchez, I. M., & Noguera-Gámez, L. (2017). Integrated reporting and stakeholder engagement: The effect on information asymmetry. *Corporate Social Responsibility and Environmental Management*, 24(5), 395–413. <https://doi.org/10.1002/csr.1415>

Giorgino, M., Supino, E., & Barnabè, F. (2017). Corporate disclosure, materiality, and integrated report: An event study analysis. *Sustainability*, 9(12), 2182. <https://doi.org/10.3390/su9122182>

Gregg, S. (2001). 'Stakeholder' theory: What it means for corporate governance. *Policy: A Journal of Public Policy and Ideas*, 17(2), 33–38.

Hamad, S., Draz, M. U., & Lai, F.-W. (2020). The impact of corporate governance and sustainability reporting on integrated reporting: A conceptual framework. *SAGE Open*, 10(2), 2158244020927431. <https://doi.org/10.1177/2158244020927431>

Hichri, A. (2021). Corporate governance and integrated reporting: Evidence of French companies. *Journal of Financial Reporting and Accounting*, 20(3/4), 472–492. <https://doi.org/10.1108/JFRA-09-2020-0261>

International Integrated Reporting Council (IIRC). (2013). *The International <IR> Framework*. Retrieved January 12, 2022, from <https://integratedreporting.org/wp-content/uploads/2015/03/13-12-08-THE-INTERNATIONAL-IR-FRAMEWORK-2-1.pdf>

International Integrated Reporting Council (IIRC). (2021). *The International <IR> Framework*. <https://www.integratedreporting.org/wp-content/uploads/2021/01/InternationalIntegratedReportingFramework.pdf>

Iredele, O. O. (2019). Examining the association between quality of integrated reports and corporate characteristics. *Heliyon*, 5(7), e01932. <https://doi.org/10.1016/j.heliyon.2019.e01932>

Isnurhadi, I., Oktarini, K. W., Meutia, I., & Mukhtaruddin, M. (2020). Effects of stakeholder engagement and corporate governance on integrated reporting disclosure. *Indonesian Journal of Sustainability Accounting and Management*, 4(2), 164–173. <https://doi.org/10.28992/ijSAM.v4i2.129>

Kalsie, A., & Arora, A. (2019). Structural break, US financial crisis and macroeconomic time series: Evidence from BRICS economies. *Transnational Corporations Review*, 11(3),

250–264. <https://doi.org/10.1080/19186444.2018.1475087>

Karavias, Y., Narayan, P. K., & Westerlund, J. (2022). Structural breaks in interactive effects panels and the stock market reaction to COVID-19. *Journal of Business and Economic Statistics*, 1–14. <https://doi.org/10.1080/07350015.2022.2053690>

Khalilzadeh, M., Kebriyaii, O., Šaparaukas, J., & Lepkova, N. (2021). Towards an efficient approach for identification and selection of stakeholder engagement strategies: A case study. *E&M Economics and Management*, 24(4), 56–71. <https://doi.org/10.15240/tul/001/2021-4-004>

Kiel, G. C., & Nicholson, G. J. (2002). Real world governance: Driving business success through effective corporate governance. *Mount Eliza Business Review*, 5(1), 17–28.

Klose, J. (2014). Determining structural breaks in central bank reaction functions of the financial crisis. *The Journal of Economic Asymmetries*, 11, 78–90. <https://doi.org/10.1016/j.jeca.2014.08.002>

KPMG. (2017). *The road ahead: KPMG International Survey of Corporate Responsibility Reporting*. Retrieved June 24, 2022, from <https://assets.kpmg/content/dam/kpmg/xx/pdf/2017/10/kpmg-survey-of-corporate-responsibility-reporting-2017.pdf>

Landau, A., Rochell, J., Klein, C., & Zwergel, B. (2020). Integrated reporting of environmental, social, and governance and financial data: Does the market value integrated reports? *Business Strategy and the Environment*, 29(4), 1750–1763. <https://doi.org/10.1002/bse.2467>

Lee, K., & Yeo, G. H. (2016). The association between integrated reporting and firm valuation. *Review of Quantitative Finance and Accounting*, 47(4), 1221–1250. <https://doi.org/10.1007/s11156-015-0536-y>

Liu, Z., Jubb, C., & Abhayawansa, S. (2019). Analysing and evaluating integrated reporting. *Journal of Intellectual Capital*, 20(2), 235–263. <https://doi.org/10.1108/JIC-02-2018-0031>

Mähönen, J. (2020). Integrated reporting and sustainable corporate governance from European perspective. *Accounting, Economics, and Law: A Convivium*, 10(2). <https://doi.org/10.1515/ael-2018-0048>

McNally, M. A., Cerbone, D., & Maroun, W. (2017). Exploring the challenges of preparing an integrated report. *Meditari Accountancy Research*, 25(4), 481–504. <https://doi.org/10.1108/MEDAR-10-2016-0085>

- McNeil, A. J., Frey, R., & Embrechts, P. (2015). *Quantitative risk management: Concepts, techniques and tools* (2nd ed.). Princeton University Press.
- Nakajima, Y., & Inaba, Y. (2021). Stock market reactions to voluntary integrated reporting. *Journal of Financial Reporting and Accounting*, 20(3/4), 516–541. <https://doi.org/10.1108/JFRA-07-2020-0217>
- Oliviera, L., Rodrigues, L. L., & Craig, R. (2019). Intellectual capital reporting in sustainability reports. *Journal of Intellectual Capital*, 11(4), 575–594. <https://doi.org/10.1108/14691931011085696>
- Perron, P. (Ed.). (2018). *Unit roots and structural breaks*. MDPI. <https://doi.org/10.3390/books978-3-03842-812-1>
- Segal, T. G., Segal, M., & Maroun, W. (2017). The perceived relevance of tax risk-management in a South African context. *Meditari Accountancy Research*, 25(1), 82–94. <https://doi.org/10.1108/MEDAR-01-2016-0008>
- Steyn, M. (2014). Organisational benefits and implementation challenges of mandatory integrated reporting: Perspectives of senior executives at South African listed companies. *Sustainability Accounting, Management and Policy Journal*, 5(4), 476–503. <https://doi.org/10.1108/SAMPJ-11-2013-0052>
- Stubbs, W., Higgins, C., Milne, M. J., & Hems, L. (2014). Financial capital provider's perceptions of integrated reporting. *SSRN Electronic Journal*. Elsevier BV. <https://doi.org/10.2139/ssrn.2473426>
- Suttipun, M. (2017). The effect of integrated reporting on corporate financial performance: Evidence from Thailand. *Corporate Ownership and Control*, 15(1), 133–142. <https://doi.org/10.22495/cocv15i1art13>
- Suttipun, M., & Bomlai, A. (2019). The relationship between corporate governance and integrated reporting. *International Journal of Business and Society*, 20(1), 348–364.
- Tiron-Tudor, A., Hurghis, R., Lacurezeanu, R., & Podoaba, L. (2020). The level of European companies' integrated reports alignment to the <IR> Framework: The role of boards' characteristics. *Sustainability*, 12(21), 8777. <https://doi.org/10.3390/su12218777>
- Tiron-Tudor, A., Hurghis, R., & Topor, D. I. (2022). A holistic review of determinants and effects of integrated reporting adoption. *E&M Economics and Management*, 25(4), 100–117. <https://doi.org/10.15240/tul/001/2022-4-007>
- Turtle, H. J., & Zhang, C. (2015). Structural breaks and portfolio performance in global equity markets. *Quantitative Finance*, 15(6), 909–922. <https://doi.org/10.1080/14697688.2014.916411>
- Tweedie, D., & Martinov-Bennie, N. (2015). Entitlements and time: Integrated reporting's double-edged agenda. *Social and Environmental Accountability Journal*, 35(1), 49–61. <https://doi.org/10.1080/0969160X.2015.1007466>
- Ulupui, I. G. K. A., Murdayanti, Y., Yusuf, M., Pahala, I., & Zakaria, A. (2020). Integrated reporting disclosure and its implications on investor reactions. *The Journal of Asian Finance, Economics and Business*, 7(12), 433–444. <https://doi.org/10.13106/JAFEB.2020.VOL7.NO12.433>
- Velte, P., & Stawinoga, M. (2017). Integrated reporting: The current state of empirical research, limitations and future research implications. *Journal of Management Control*, 28(3), 275–320. <https://doi.org/10.1007/s00187-016-0235-4>
- Villiers, C., Hsiao, P. C. K., & Maroun, W. (2017). Developing a conceptual model of influences around integrated reporting, new insights and directions for future research. *Meditari Accountancy Research*, 25(4), 450–460. <https://doi.org/10.1108/MEDAR-07-2017-0183>
- Villiers, C., Rinaldi, L., & Unerman, J. (2014). Integrated reporting: Insights, gaps and an agenda for future research. *Accounting, Auditing & Accountability Journal*, 27(7), 1042–1067. <https://doi.org/10.1108/AAAJ-06-2014-1736>
- Vitolla, V. N., Raimo, N., & Rubino, M. (2020). Board characteristics and integrated reporting quality: An agency theory perspective. *Corporate Social Responsibility and Environmental Management*, 27, 1152–1163. <https://doi.org/10.1002/csr.1879>
- Willows, G. D., & Rockey, J. A. (2018). Share price reaction to financial and integrated reports. *South African Journal of Accounting Research*, 32(2–3), 174–188. <https://doi.org/10.1080/10291954.2018.1514141>