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The value relevance of environmental, social, and governance disclosure: Evidence from Dow Jones Sustainability World Index listed companies

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The value relevance of Environmental, Social and Governance disclosure. Evidence from DJSI World listed companies.

ABSTRACT

The relationship between a company’s sustainability practices and its financial performance has been investigated with different methods and from different theoretical perspectives. This study aims to answer the following questions: 1) Do investors react to the publication of sustainability reports on company websites? 2) Has the market reaction to the publication of the sustainability report increased in the last few years? In this study, 170 report disclosures were considered from 55 listed companies from all over the world in the period from 2009 to 2016. To analyse the impact of the report publications on the security returns, 33 different event windows were analysed. Results show two significant event windows and an increasing level of significance in the reports released after 2013.

KEYWORDS: Value relevance, ESG data, Sustainability report, Event study, listed companies

1. Introduction

The relationship between a company's sustainability practices and its financial performance has been investigated from different theoretical perspectives (Alexander & Gentry, 2014; Lu & Taylor, 2018; Margolis & Walsh, 2003; Orlitzky, 2005; Ruf, Muralidhar, Brown, Janney, & Paul, 2001). Some studies demonstrate that sustainability generates financial returns (Du, Bhattacharya, & Sen, 2010; Sen, Bhattacharya, & Korschun, 2006; Washburn, 2009), while others have found a negative relationship (Brammer, Brooks, & Pavelin, 2006; Griffin & Mahon, 1997; Madorran & Garcia, 2016; Seifert, Morris, & Bartkus, 2003; Teoh, Welch, & Wazzan, 1999).

UN Global Compact (2004) and UNEP Finance Initiative (2005) have recently circulated the concept of ESG (environmental, social and governance) information «that ties corporate social performance and corporate financial performance together» (Lo & Kwan, 2017, p. 607) to emphasize the materiality of and the need to incorporate issues related to corporate social responsibility (CSR), environmental impact and corporate governance in investment decisions (Cucari, Esposito De Falco, & Orlando, 2018). Therefore, scrutiny of corporate reports for ESG issues has gained importance among investors (EY, 2014; LSE Group, 2018; Nasdaq, 2017). However, research is inconsistent as it found both positive, negative and no reaction at all to ESG information disclosure (Cañón-de-Francia & Garcés-Ayerbe, 2009; Chetty, Naidoo, & Seetharam, 2015; Gladyssek & Chipeta, 2012; Keele & DeHart, 2011; Luffarelli & Awaysheh, 2018; Yadav, Han, & Rho, 2016).

This study aims to provide additional insight on the value relevance of corporate commitment to ESG aspects by answering to the following questions: 1) Do investors react to the publication of sustainability reports on company websites? 2) Has the market reaction to the publication of the sustainability report increased in the last few years?

This study focuses on the publication of sustainability reports because they entail structured and highly informative ESG data that are particularly welcomed by investors (Dawkins, 2005), who search for an integrated analysis of the impact of CSR activities on key business metrics (Du et al., 2010). As reported by practitioners and academics (Cohen & Olsen, 2015; PwC, 2014), the primary sources of non-financial information accessed by analysts and investors are CSR/sustainability reports (for 89% of them according to ACCA, 2013), followed by annual reports and integrated reports.

This study spans over a period of eight years to check whether attention to non-financial information is really increasing as latest studies claim (Ioannou & Serafeim, 2015; Luo, Wang, Raithel, & Zheng, 2015; Morgan Stanley, 2015; Park & Ravenel, 2013; PwC, 2014). Bloomberg indicates a growing interest in ESG data over the period 2009-2014, signalling a peak in 2014 when the number of its customers using ESG data grew from 9,669 to 17,010 (CFA Institute, 2015). This turning point can be ascribed to several factors, but it is primarily the result of the issuance of some novel regulations and frameworks on ESG reporting in 2013: i) the publication of the Integrated Reporting Framework guidelines by the IIRC; ii) the enforcement of the revised UK Companies Act that obliged all UK incorporated entities to include non-financial information in the Strategic Report; iii) the European Parliament resolution of February 6, 2013 on CSR preparing the path for the adoption of the 2014/95/EU Non-financial Directive; and iv) the publication of the Impact assessment of the Non-financial Directive by the European Commission (EC, 2013).

This study differs from previous research, as it does not analyse how announcements of specific social or environmental aspects, e.g., inclusion in the FTSE4Good index, impact company market value (Jiang & Luo, 2018). Such announcements may magnify the positive image of a company (Branco & Rodrigues, 2006) but do not provide comprehensive data helpful to interpret its financial performance (Chetty et al., 2015; Curran & Moran, 2007). Moreover, this study has a worldwide

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scope, while most of the previous research was limited to some developed countries such as the US, Canada, Australia and the EU (Zuraida, 2016). This article is organised into four sections. The first two sections present the reasons for investigating the value relevance of ESG information disclosure and provide a review of previous studies. The data and methods are then presented. The two final sections describe the findings from the analysis and their implications.

2. Value relevance

In the literature, the concept of value relevance is not new (Amir, Harris, & Venuti, 1993; Miller & Modigliani, 1966). Many applications of the value relevance analysis have focused on accounting variables (Aboody et al., 2002; Brown & Sivakumar, 2003; Francis & Schipper, 1999; Holthausen & Watts, 2001; Ohlson, 1995). Nevertheless, this kind of analysis has also been used to investigate the impact on the stock price of non-accounting variables (Amir & Lev, 1996; Barth & McNichols, 1994; Carnevale, Mazzuca, & Venturini, 2012; Hirschey et al., 2001; Hughes, 2000; Lapointe-Antune et al., 2006; Xu, Magnan, & André, 2007). From these studies, it emerges that accounting information, alone, is not enough to explain the firm's market value and its variations. Therefore, the influence of non-financial variables on companies' market value continues to be a relevant issue in the academic debate. From this theoretical framework, this work focuses on the value relevance of ESG information published in sustainability reports (Campbell & Slack, 2008; De Villiers, Hsiao, & Maroun, 2017; La Torre, Sabelfeld, Blomkvist, Tarquinio, & Dumay, 2018; Lombardi, Trequattrini, Cuozzo, & Cano-Rubio, 2019; McBrayer, 2018). The evidence of research focused on the value relevance of ESG disclosure is limited. Some studies only examine environmental-related aspects. For example, Hassel, Nilsson and Nyquist (2005) investigated the relationship between market value and environmental performance. Cormier and Magnan (2007) examined the impact of voluntary environmental reporting on companies' multiple of earnings from Canada, France and Germany (three countries that employ different reporting and governance regimes). Sinkin, Wright and Burnett (2008) studied the relationship between the adoption of an eco-efficient business strategy signalled by the issuance of corporate environmental reports and firm value using the Ohlson (1995) model. Moneva and Cuellar (2009) also analysed the relation between firms' market value and environmental reporting, but their findings on Spanish companies suggest a significant influence of financial, environmental disclosure (investments, costs and contingencies), unlike the non-financial one. Alternatively, Semenova, Hassel, and Nilsson (2010) found a significant positive relationship between the market value of equity and environmental performance for 300 listed Swedish companies. Other academic studies have preferred focusing on the value relevance of social and/or sustainability reporting. For example, Greeves and Ladipo (2004) used value relevance analysis to examine the association between sustainability reporting and the performance of companies that have made a visible commitment to it. The authors found that companies following GRI standards for reporting present higher operating margins, lower beats and slower revenue growth. Similarly, Schadewitz and Niskala (2010) studied the value relevance of Finnish GRI-compliant reporters in the period 2002-2005. The results obtained show that GRI standards represent an important explanatory factor for firms' market value. A different result was found by Cardamone, Carnevale and Giunta (2012), who analysed the value relevance of social reports on a sample of 178 Italian companies listed on the Milan Stock Exchange from 2002 to 2008. Their findings show a significant negative correlation between firms' market value and social report publication. Most of these studies focus on one single country like South Africa (De Klerk & De Villiers, 2012) or Canada (Berthelot, Coulmont, & Serret, 2012). An international comparison is offered by Carnevale

et al. (2012), who found no significant correlation between stock prices and social reporting within a sample of European listed banks in the period 2002 to 2008. However, their results change by moving to a cross-country analysis. While, in some countries, social reporting produces a significant positive influence on stock prices, in other countries this influence remains significant but negative. Also, the study of Carnevale and Mazzuca (2014) has an international scope. They analysed 14 countries with a total of 113 banks considered socially responsible over the period 2002–2011. They concluded that, even though the economic crisis hits all banks, socially responsible or not, European banks that published sustainability reports fared better during the crisis.

The studies on the value relevance of ESG information share the tendency to focus on the largest companies and use GRI for assessing ESG disclosure. For example, De Klerk, De Villiers and Van Staden (2015) studied 69 out of the largest companies quoted on the British market in 2008. Through the application of GRI criteria, as well as the information extracted from the KPMG report, they concluded that British investors valued the socially responsible companies analysed in that particular year. Bowerman and Sharma (2016) studied the UK and Japan markets and found out that only investors in the UK consider CSR disclosure in their information set for investment decision-making. Kaspereit and Lopatta (2016) examined whether relative corporate sustainability as measured by the Sustainable Asset Management (SAM) ranking and sustainability reporting in terms of GRI application levels are associated with a higher market valuation for a sample composed of the 600 largest European companies over the period 2001–2011. They found that membership in the Dow Jones Sustainability Index (DJSI), which is based on the SAM sustainability ranking, is associated with a higher market valuation over the period. Temporally, the empirical evidence is less conclusive when GRI sustainability reporting is analysed. However, Kaspereit and Lopatta (2016) did not provide a cross-country comparison. Miralles-Quiros, Miralles-Quiros and Arraiano (2017) examined whether CSR disclosure following GRI guidelines provides relevant information and incremental value to investors on the European stock markets of Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Spain, Sweden and the United Kingdom over the period 2001–2013, considering the singularities of each market as well as the impact of the international financial crisis. The overall results reveal that European investors as a whole valued this type of information, especially in the years before the international financial crisis. However, they also observed differences among markets.

Since non-financial information is voluntary and not standardised, it is difficult to properly test market reaction. In order to check if financial and non-financial amounts are value relevant, many techniques can be used; the most popular one is event study analysis.

3. Data and methods

3.1. Sample identification

To empirically investigate the impact of the publication of ESG reports (the ‘event’) on the value of company securities, the authors selected companies listed on the Dow Jones Sustainability World Index (DJSI World) from 2009 to 2016. This period reduces the effects of the economic crisis of 2008 and the impact of the Non-financial Directive by the European Commission in force since 2018.

Inclusion in this stock index means that every organisation and its report has undergone a detailed screening. It is a signal that reduces the uncertainty of the quality of sustainability information (Lackmann, Ernstberger, & Stich, 2012; Oberndorfer, Schmidt, Wagner, & Ziegler, 2013). Therefore, reports can be assumed as material for investors who shall be more prone to consider the non-financial information included.

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Companies had to be included in the DJSI World for eight consecutive years. This selection overcomes the limitations of previous studies having short-time frames (Hawn, Chatterji, & Mitchell, 2018) and avoids impacts on stock returns due to the inclusion or deletion of a company in the DJSI World. Additions and deletions may be interpreted as positive or negative events on their own, which generate an investors’ reaction (Cheung, 2011; Consolandi, Jaiswal-Dale, Poggiani, & Vercelli, 2009; Lackmann et al., 2012; Robinson, Kleffner, & Bertels, 2011).

Analysing the impact of a specific announcement requires the elimination of possible confounding effects (Hawn et al., 2018; Keele & DeHart, 2011). Therefore, the authors eliminated the companies for which market value could have been affected by key events other than the announcement of the ESG report publication that occurred on nearby dates as suggested by Du, Yu, Bhattacharya and Sen (2017). Thanks to the LexisNexis database that screens approximately 10,000 global news sources every day, all companies were checked for the following confounding events: the publication of annual, half-year or quarterly financial reports, the awarding of sustainability certifications, the occurrence of unusual transactions like a merger or acquisition, earnings announcements, the appointment of a new CEO or Chairman, the application of extraordinary fines or penalties and the inclusion/exclusion from other sustainability indexes, e.g. FTSE4Good.

To find the publication/release dates of the ESG reports, the authors looked for the presence of the selected companies on the GRI database and identified the names of reports. Since the inclusion in the DJSI World is not related to the adoption of a specific reporting standard, knowing reports’ names significantly improves the speed of online search. Company websites were used to search for ESG reports (i.e., in the press release sections or the media centre) using the name of reports. When names were unknown, the search used terms including sustainability, sustainable, CSR, citizenship and socio-environmental report, reporting, disclosure and so on. When the company search engine offered no results, the authors recurred to Google and typed the following keywords: "company name" AND "name of the report" AND "release" OR “announce” OR “issue”. Lastly, a search on the following specialised digital media repositories was run: Csrwire.com, CsrHub.com and 3blmedia.com. Release date identification was achieved when a public article describing the event and the date of the report publication was found. From the initial sample of 62 listed companies, a total of 55 companies publishing 170 reports were identified and analysed.

3.2 Event study analysis

Event study analysis (Ball & Brown, 1968; Fama, Fisher, Jensen, & Roll, 1969; Fama, 1991; MacKinlay, 1997) is a statistical technique used in accounting and many other research fields to understand if a given event affected the returns of specific securities, in a circumscribed time period (*event window*). In the last few decades, event study analysis has been applied to understand the value relevance of ESG data (table 1).

INSERT TABLE 1 HERE

When performing an event study, the date in which the analysed event occurred and the event windows selected for the analysis have to be precisely defined (sometimes event windows include some days before the date of the analysed event, *leakage period*). The estimated (normal or expected) returns of analysed companies over the event windows have to be calculated using a statistical or economic model, which allows to obtain the *abnormal returns*, the differences between actual returns and expected ones. For firm *i*, event date τ and the conditioning information X_{τ} :

$$AR_{it} = R_{it} - E(R_{it}|X_t) \quad (1)$$

In this study, normal returns were calculated using the *market model*, a simple linear regression model assuming that the return on a generic i -th security at time t (R_{it} , *explained variable*) depends on the return on the market portfolio at the same time (R_{mt} , *explanatory variable*).

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (2)$$

Using data for R_{it} and R_{mt} , the coefficients can be estimated, and the regression line can be written:

$$\hat{R}_{it} = \hat{\alpha}_i + \hat{\beta}_i R_{mt} \quad (3)$$

From which:

$$AR_{it} = R_{it} - E(R_{it}|X_t) = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \quad (4)$$

Data used to perform the market model refer to the so-called *estimation window* which is not usually overlapped with the selected event windows. The maximum leakage period used in this study is 4 trading days and the test period consists of 200 trading days ending 216 trading days before the date of the analysed event. The length of the estimation window (L_1) is important for the effectiveness and strength of event studies. From an econometrical point of view, abnormal returns are forecast errors presenting the following distributional parameters:

$$AR_{it} \sim N \left(0, \sigma_{\varepsilon_i}^2 + \frac{1}{L_1} \left(1 + \frac{(R_{mt} - \hat{\mu}_m)^2}{\hat{\sigma}_m^2} \right) \right) \quad (5)$$

The distributional parameters of abnormal returns and market model regression errors are identical, except for the variance (higher in forecast errors than in regression residuals). Nevertheless, this difference becomes shorter and shorter if the test period increases and could be ignored when the length of the test period is big enough. This is the reason why the authors selected a test period of 200 trading days.

Abnormal returns can be aggregated through time, obtaining *cumulative abnormal returns* (CARs) referring to the selected event windows. A CAR can be viewed as the random variable consisting of the sum of as many abnormal returns as the days composing the event window analysed. Therefore, the distributional parameters of the CARs (as L_1 is high enough) are the following:

$$CAR_i(\tau_1, \tau_2) \sim N(0, (\tau_2 - \tau_1 + 1) \sigma_{\varepsilon_i}^2) \quad (6)$$

Finally, the *average cumulative abnormal return* (*CARs*) can be considered.

$$CAR(\tau_1, \tau_2) = \frac{1}{N} \sum_{i=1}^N CAR_i(\tau_1, \tau_2) \quad (7)$$

Its distributional parameters, asymptotic with respect to L_1 and N (the number of events analysed), are the following:

$$CAR(\tau_1, \tau_2) \sim N\left(0, \frac{1}{N^2} \sum_{i=1}^N \sigma_i^2(\tau_1, \tau_2)\right) \quad (8)$$

The distributional parameters for *CARs* and *CARs* allow to test the evidence against the null hypothesis that the given event has no impact on the behaviour of the security returns.

4. Empirical evidence

In this study, 170 report disclosures were considered from 55 worldwide listed companies between 2009 and 2016. Only 5 documents were published in 2009, the others were disclosed in the following periods (minimum 22/maximum 26 per year). Figure 1 shows the data grouped by origin country.

INSERT FIGURE 1 HERE

The sustainability reports analysed were released by firms belonging to 36 different industries (according to the DataStream taxonomy). Banks are the most recurring type (8 different credit institutions and 25 reports analysed), while pharmaceutical companies are in second place (4 firms and 12 reports). 33 different event windows were analysed; more profoundly, regarding the period including four days before the event and four days after it, all the event windows from 1 to 9 days, containing the day of the event, the previous or the subsequent ones, were considered (Giorgino, Supino, & Barnabè, 2017).

INSERT FIGURE 2 HERE

Concerning the *CARs*, 53 out of 170 observations highlight a statistically significant impact of the report publication on the returns of disclosing firms on, at least, one event window (more than 66% of them are significant at 5% on, at least, 3 event windows analysed). They were released by firms listed in 15 out of 17 countries, especially in the UK and Germany (Figure 3).

INSERT FIGURE 3 HERE

CARs and *CARs* (for all firms in all event windows analysed) were calculated and tested against the null hypothesis that the report publication has no impact on the behaviour of the security returns. No event window shows an average statistically significant impact of the report publication on the returns of disclosing firms at the 5% significance level (the part of Figure 4, which is beyond the two solid lines). However, if 10% significance level (the section beyond the two dotted lines) is considered, two event windows—EW(-1;3) and EW(-1;4) with a *p*-value of 0.079 and 0.096 respectively—are statistically significantly different from 0.

INSERT FIGURE 4 HERE

To understand if the impact of the sustainability report publication has increased in the last few years, a comparison between older and newer ESG disclosure was performed. Out of 53 significant publications (in, at least, 1 out of the 33 event windows analysed), almost 55% were published later than 2013, which is the cut-off year considered here because of the reasons put forward in section 1 (i.e., the increase of ESG information users, the issuance of the IIRC Framework and new regulations at the EU level). Therefore, the ratios between significant and non-significant publications (in, at least, one event window) until and after 2013 were compared. More profoundly, two independence tests for categorical variables were performed to evaluate how likely it is that any observed difference between these two ratios arose by chance. Table 2 shows the contingency table for the variables *significant CAR/non-significant CAR* and reports published *until 2013/after 2013*.

INSERT TABLE 2 HERE

Since expected counts are higher than 5 for all the cells of the corresponding theoretical table, a *Pearson's Chi-squared test* can be used. It is clear that the ratio between significant and non-significant *CARs* increased after 2013 (in fact, it doubled from 33% to 66%). This result is statistically significant with a *p*-value of 0.037. A *Fisher's exact test for count data* was also performed to confirm this result and presented a statistically significant result with a *p*-value of 0.045.

5. Discussion & Conclusions

The analyses highlight two important results which deserve to be discussed; first of all, more than 31% of securities analysed show *CARs* that are statistically and significantly different from 0. Therefore, ESG information produces, for a sizeable number of firms, evident impacts on their market value. This phenomenon affects all regions/countries, except the Swedish and Irish firms.

This result is more evident when considering *CARs*, which are not statistically significantly different from 0, at 5% significance level, for all the event windows analysed. On the other hand, two *CARs* are statistically significantly different from 0, at 10% significance level; this suggests that there could be an effect produced by ESG information disclosure on firms' market value although it does not appear too evident. Whatever the causes, it cannot be denied that qualified ESG information affects the market value of firms.

The second result relates to the evaluation of ESG information over time. Considering the events that happened in 2013, a relationship of dependence between the value relevance of sustainability report disclosure and the period when they were published was investigated. Both of the statistical

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tests performed clearly show that ESG information disclosures after 2013 are more value relevant than reports published before.

This study contributes to the academic debate and provides implications for investors and policymakers. First, it expands the field of application of value relevance analysis considering all kinds of industries, without geographical limitations, while the previous literature focused on a specific industry or country (Berthelot et al., 2012; Cardamone et al., 2012; Carnevale & Mazzuca, 2014; Carnevale et al., 2012). Secondly, this article suggests that investors look for long-term sustainability over short-run financial performance; it also indirectly suggests that sceptical investors of ESG information should include it in their resource allocation decisions. Since the market pays attention to ESG information, results encourage greater awareness of sustainability among companies, while it calls for future research on companies that may plan the time of publication to speculate on the impact on the value of shares. Thirdly, findings can also be useful for policymakers when issuing rules for ESG reporting as results indicate that transparency is value relevant; results indirectly support the viewpoint that ESG reporting is likely to improve market efficiency, reinforcing the growing confidence of investors, firms, institutions and practitioners (LSE Group, 2018; Nasdaq, 2017) in ESG information materiality.

The results suffered from difficulties in precisely identifying the release date of ESG reports, which were discarded. Sometimes, the release date of the reports was not available. In other cases, non-coincidental dates were retrieved from different sources.

Future research could explain the determinants of the results found, identifying whether they are related to different geographical locations, stock markets or industries.

The increasing significance of the reports published after 2013 suggests that future research will probably find stronger relationships between the disclosure of ESG information and their impacts on firms' market values. In addition, it encourages researchers to thoroughly analyse the content of the documents with the aim of understanding whether the external pressure on companies' ESG disclosure generated an increase in the quality of reports.

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TABLES

TABLE 1 – Brief overview of recent academic contributions on event study application to ESG data

| TOPIC | AUTHORS | EVENT | RESULTS |
|---|---|--|---|
| CSR REPORT | Wang and Li (2016) | Announcement of publication of a first-time standalone CSR report by Chinese non-financial firms | A negative and statistically significant reaction to the publication of first-time standalone CSR reports |
| | Lo and Kwan (2017) | Announcements of CSR initiatives | Market reacts more positively to ESG initiatives than sustainability initiatives |
| | Jacobs, Singhal, and Subramanian (2010) | Announcements of environmental performance | A non-statistically significant reaction to the aggregated CEI and EAC announcements |
| | Jacobs et al. (2010) | Announcement of partnership with the USEPA Climate Leaders program | A negative and statistically significant reaction to announcement |
| | Lee, Cin, and Lee (2016) | Announcement by Korean daily newspaper of carbon management activity of a specific firm | A negative and statistically significant reaction to announcement |
| | Xu, Zeng, Zou, and Shi (2016) | Announcement of environmental violations of Chinese firms | A negative and statistically significant reaction to announcement |
| INCLUSION OR EXCLUSION FROM A SUSTAINABLE INDEX | Cheung (2011) | Announcement of firm inclusion and exclusion in the DJSI World | A non-statistically significant reaction to the inclusion of a US firm in the DJSI World |
| | Robinson et al. (2011) | Announcement of North American firm inclusion or exclusion from the DSJI World. | A positive and statistically significant reaction to the announcement of firm inclusion in the index |
| | Clacher and Hagendorff (2012) | Announcement that a firm traded on the London Stock Exchange is included in the FTSE4Good index | A positive and statistically significant market reaction on the announcement day of firm inclusion in the FTSE4Good index |
| | Lackmann et al. (2012) | Announcement of firm inclusion in the index DJSI STOXX | A positive and statistically significant reaction to the inclusion of a firm in the DJSSI STOXX in the short term |

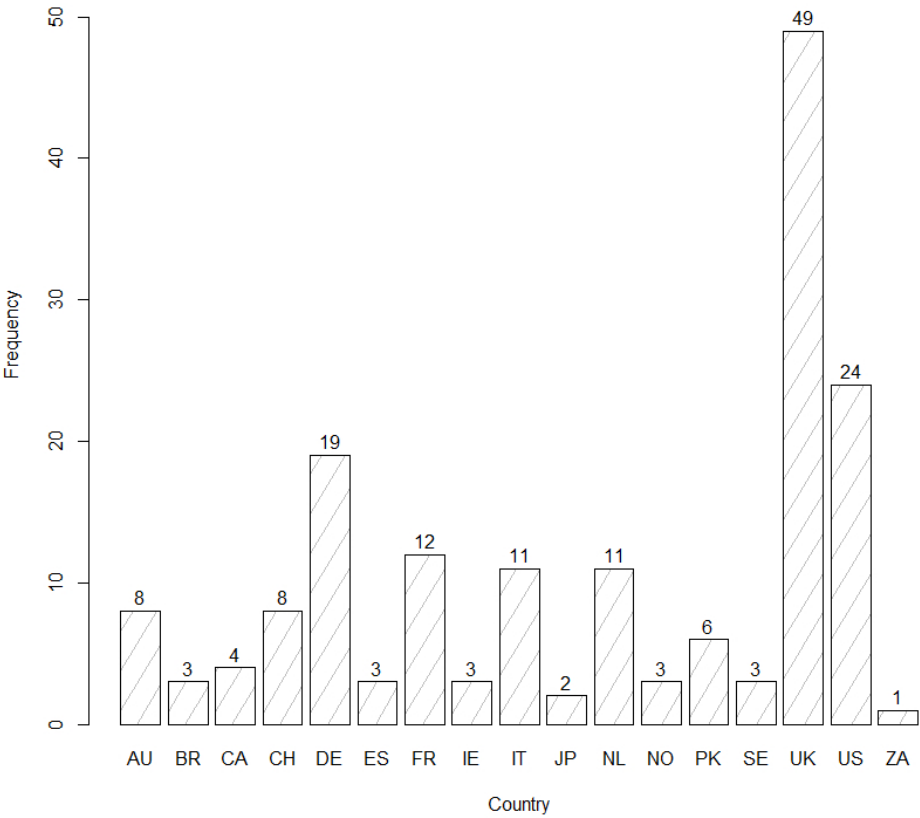
SUSTAINABILITY REPORT

| | | |
|-------------------------------|--|--|
| Kappou and Oikonomou (2016) | Announcement of firm inclusion and exclusions in the index MSCI KDL 40 | A non-statistically significant reaction to the inclusion, but there is a negative and statistically significant reaction to the exclusion |
| Guidry and Patten (2010) | Announcement of the issuance of the sustainability reports | No significant market reaction to the announcement of the release of the sustainability reports. Companies with the highest quality reports exhibited significantly more positive market reactions |
| Jain, Jain, and Rezaee (2016) | Selling dates | A positive and statistically significant reaction to announcements |
| Du et al. (2017) | Release of sustainability reports | Over the long term, firms that release sustainability reports enjoy higher value relevance of sustainability performance |

TABLE 2 - Significant and non-significant publications (in, at least, one event window) until and after 2013 were compared.

| | Until 2013 | After 2013 |
|------------------------|------------|------------|
| Not-significant | 73 | 44 |
| Significant | 24 | 29 |

FIGURE 1



Sample by country

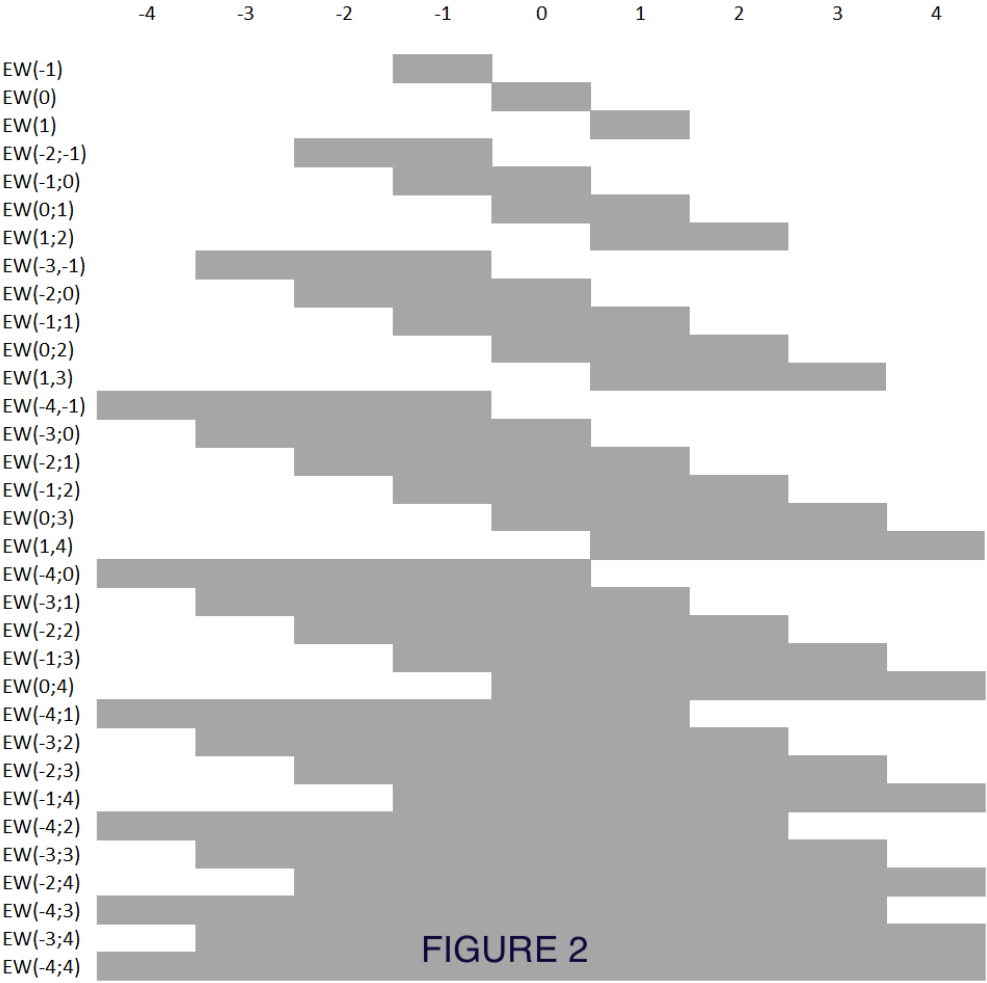
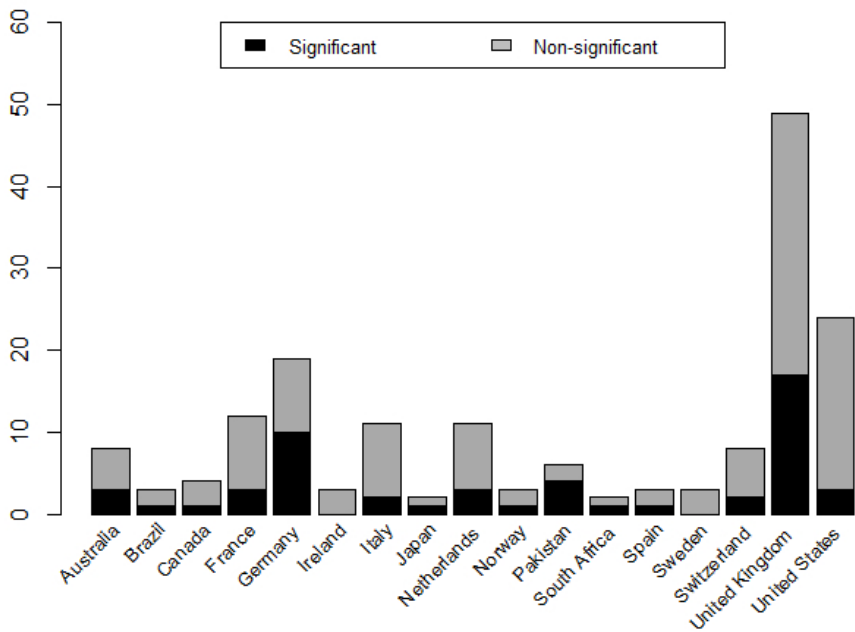


FIGURE 2

Analysed event windows

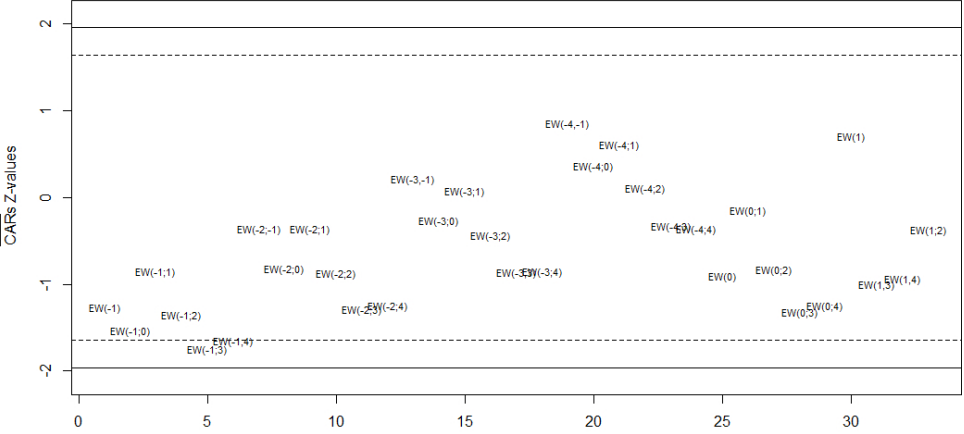
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Figure 3



Abnormal returns impact by country

FIGURE 4



Cumulative abnormal returns significance levels