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How News Reports and ESG Publication Financially Affect Firms

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Abstract

ESG has become a growing and integral part of company activities. Not only is it something investors now take into consideration when choosing stocks, but the question of a firm's Environmental, Social and Governance awareness and actions has integrated itself into something as critical as some banks' decisions to provide loans to a firm. While ESG used to be just a "nice-to-have," there is no denying that it is now a must-have for any company that wants to be a global market leader. Many prior studies have focused on ESG ratings, the types of ESG information disclosed in annual reports and the effect of financial news on firms.

The aim of this research is to take a deeper look at the effect of ESG on firms and find out whether different news feed and news publications concerning a company's ESG activities and circumstances affect its value? Our research shows that there is a weakly significant effect of negative ESG-related news on firms in the window (–1, +1) and no significant reaction to positive news. This means that investors do not statistically significantly react to positive ESG news about firms. We examined 65 publicly traded companies from 7 different markets worldwide over the course of 13 years (from 2009 to 2021). We collected a total of 458 separate news articles from the S&P Global Market Intelligence platform –and classified them into positive and negative depending on the news. We ran OLS regressions of the data points together with financial control variables on a company's CAR in a 5-, 3- and 2-day interval to check for the effect. No significant effect was reported.

Introduction

Over the past several years, a new trend has been arising amongst firms. Previously, a firm's perceived value all came down to the ultimate fact of whether it could generate a profit or not. Over time, other factors emerged with the development of the business sphere as a whole: asset liquidity, demand on the market and expansion potential, customer and supplier loyalty, and many more.

One of the latest boxes every strategically concerned firm would want to check off nowadays is a highly extensive ESG programme. There are many firms that just "go with the flow", implementing ESG strategies just because it's mainstream or expected of them by stakeholders, i.e., consumers or the government. However, many overlook the fact that ESG is truly the future and should be incorporated in every firm. Not because of some moral obligation to give back to society and the future generations, but because ESG is a firm's best bet at implementing the "going concern" principle, or simply put, sustainability. Most firms, especially if they are engaged in heavy manufacturing, exhaust their resources over time. Oil and gas companies are a good example. If no ESG strategy is implemented, fossil fuel resources will be depleted and without adequate compensation or support local communities will become unable to afford the goods and services of firms, and the constant rigorous work and stress could lead to health problems. So, even from a financial point of view, ESG is sort of an investment into a company's future welfare.

ESG is now one of the deciding factors that firms consider in their actions. This has led to an interest from the media. Company-related news used to be strictly operational and financial, such as articles about M&As, the opening of a new factory or an affiliate, new product development, etc. There is no doubt that such news affects the companies' financial components, in particular, stock prices. There is countless research studies backing up this conclusion, i.e., R. Engle and V. Ng (1991) [1]. Thus, we know for a fact that news concerning a company's operations and financials, i. e. its very existence, affects a company, as expected. But do news concerning ESG activities or events linked to ESG have the same effect? We know of separate instances, i.e., the recent Boohoo slavery scandal proves it clearly. The British clothes company Boohoo was accused of using slave labour in some of its sweatshop factories. It was indeed a roller coaster ride for investors in 2020, as demonstrated in Figure 1. Stakeholders are concerned about the entire production and promotion chain of goods, and they will not stand socially immoral behavior. This scandal even caused the company to sever some of its ties with suppliers [2]. Now that ESG is an apparent part and parcel of the firm's activities, we would like to clarify the extent of its impact. However, the above-mentioned Boohoo case may not be particularly representative. The reason behind it is because even though it is an ESG issue, it was, first of all, a very extreme case, which is why it blew up into a scandal, and second, it endangered the future of the firm as a whole, posing a threat to its existence. Therefore, one could argue that it is a serious operational matter in itself. Nornickel's oil spill in 2020 was also accompanied by an approximately 10% drop in the share price in the next couple of days. Once again, these are separate events with catastrophic consequences, so it's no surprise that such ESG events have an impact.

Figure 1. Boohoo Group PLC stock price in May 2020 – May 2021

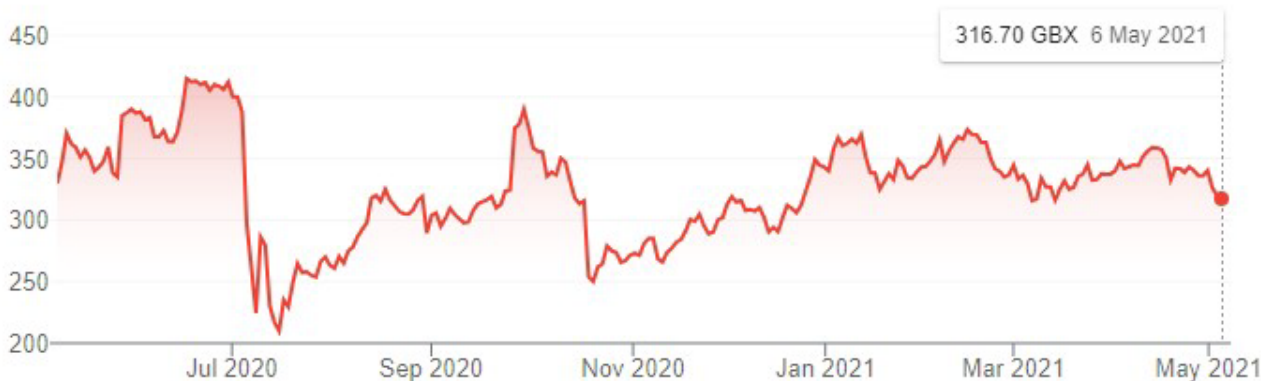Every company in the world is affected by ESG standards in one way or another. We have already observed that this new trend is slowly but steadily increasing its effect on firms. As shown in Figure 2, both the number of voluntary and mandatory instruments (these are different kinds of reports and statistics) is increasing over time.

Figure 2. The dynamics of voluntary and mandatory instruments of non-financial reports [3]
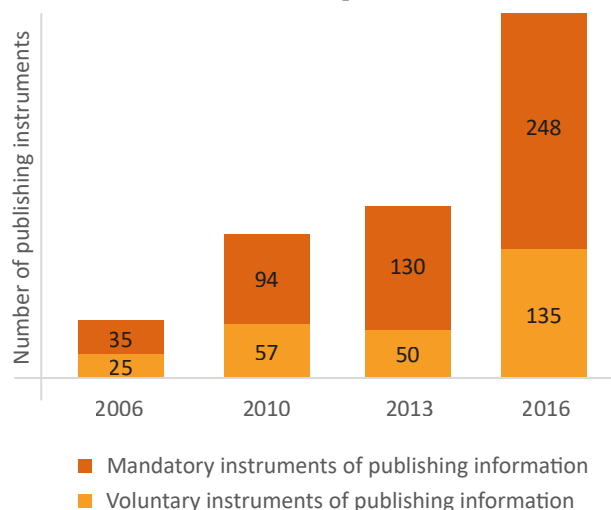
The main challenge faced by all ESG-related activities is that of taxonomy, i.e. categorization or classification. This means there is no single standard for ESG metrics in companies around the world. This is more of an issue when dealing with non-financial reporting. Since there is no universal standard, the reporting varies vastly. Firms tend to stick to standards created by large funds and rating agencies like MSCI, Sustainalytics, etc.; however, they vary amongst themselves. The reports are not within the scope of our research, as such research has been conducted multiple times, in particular in the previously mentioned study by E. Fedorova, D. Afanasev, R. Nersesyan and S. Ledyaeva (2020) [3].

However, the issue of taxonomy is extrapolated to news articles as well. Since there are no universal standards, it's hard to react appropriately to certain news., such as the amount of emissions. Factors such as the firm's industry, asset size, geography and revenue have to be considered, and it is not something that can be done in a split second, like it can with financial indicators. We feel that this issue is worth highlighting as it is related to one of the limitations of this research.

This research is **relevant** for several reasons. First, it is within the scope of the author's professional interest and is likely to be extremely useful in the future. ESG is a must-have for any respectable international company, and knowing the specific effects of different types of news publications and reports will allow to predict a company's future value and performance. Secondly, this research could provide practical insight to real investors and businessmen willing to acquire, invest and value a firm. With the help of this research and market best-practice insight, they would be able to tell what an appropriate news feed concerning a

company's ESG should be. If news publications are completely different from these expectations, that would raise a huge red flag. And finally, the addition of sentiment and language specifics to the analysis would add to the already existing research. This is the case because, to the best of the author's knowledge, there is no existing research concerning the link between the effect of publication of comprehensive ESG factors and the financial performance and value of a firm.

Thus, the ultimate **goal** of this research is to answer the question of what kind of dependency there is between a firm's performance and value and news reports and publications on said company's ESG. To reach our goal, we need to attain the following **objectives:**

1) Familiarize ourselves with the theory and create an overview of existing research.
2) Create a pool of several existing firms from different markets.
3) Consider industry specifics and account for them as a separate variable.
4) Analyze the collected data to check for evident tendencies.
5) Search for hidden factors/tendencies with the help of models.

The **object** of this research are 65 publicly traded companies from the telecommunications, pharmaceutical, clothes/apparel, mining, retail, IT, oil/gas and many other industries operating in markets from around the world. The **subject** of this study is their Cumulative abnormal returns over 5-, 3- and 2-day periods, various news published about the companies, ROA, ROE, company size, profit margin and leverage. As we already mentioned, this topic is not a new one. However, the specifics of this research make its results a **scientific novelty**. First of all, to the best of our knowledge, all the existing research considers either only the publication of ESG reports, specific types of firms (small- and medium-sized) or a specific geographic region (North America / Europe, etc.). We will consider firms of all sizes in different industries, with different ESG programs and in all existing markets. Also, we have only seen research that does not incorporate dividends when measuring the return on stocks, while we include all dividends. All these factors will allow our results to be more universal and applicable to any firm in the world.

Literature Review and Hypotheses Evaluation

Other authors have already made contributions to the topic of the general relationship between ESG and firm value. Even though no research completely satisfies our needs, there have been several articles published on topics close to or at least in the field of our research. There are 2 main points to our research – the ESG component and the effect on returns component. So we feel we have to look at the complete spectrum of ESG-related papers that have to do

with the financial aspect. As a result, the total amount of literature can be grouped into 4 categories:

1) Research on the companies' motivation to report – what the incentives behind publishing ESG reports are.

2) How different types of reporting – integrated, i.e. ESG reports combined with annual reports, stand-alone, i.e. separate ESG reports or reports on CSR and a complete lack of ESG reports – affect firm performance or value.

3) Research as a social experiment, rather than based on empirical analysis, i.e. asking interviewees questions about their attitude towards ESG metrics when forming a portfolio, reviewing random companies, etc.

4) And lastly, the articles most relevant to this research that analyze the effect of external information about ESG activities and news of companies on firm value. They capture ideas like sentiment and some even come close to our research and use news publications on ESG.

Research on companies' motivation to report – what the incentives behind publishing ESG reports are

The first article is written by De Silva Lokuwaduge, Chitra Sriyani and Heenetigala Kumudini (2017) [4], and examines the top 30 metal and mining companies in Australia. Their research uses Chi-squared testing to check their hypotheses, which stated that there is no significant difference between the mining companies' ESG reporting practice and motivation to report, and that there is a significant difference between the mining companies' ESG reporting practice and the underlying motivation of ESG reporting. They come to find that there are perceived pressures from stakeholders to report ESG information, and Australian mining companies are motivated to report this information in order to overcome the pressure they receive from their powerful stakeholders. This study further reveals that the reports that could create negative reactions from the stakeholders, such as industry disputes and grievances, were either not mentioned or least mentioned in the reports; as noted by the previous research of, the expectation may be to strategically create a positive attitude among stakeholders to manage (or manipulate) them in order to gain their approval or to divert their disapproval.

Another study was conducted by Zhou Shan (2016) [5], researching 75 Chinese companies on the Chinese Stock Exchange in 2005–2012. They used uni- and multivariate statistical analyses of ESG reporting and its relation to environmental and financial performance. In addition to descriptive statistics, t-tests and analyses of variance (ANOVA), they used linear panel regression to find out whether firms that publish environmental reports achieve higher financial returns. The authors discovered that ownership status and membership in certain stock exchanges influence the frequency of ESG disclosure. In turn, ESG reporting influences both environmental and financial performance. They conclude that the main driver of ESG

disclosure is accountability, and that Chinese corporations are catching up to their western peers with respect to the frequency of ESG reporting as well as with respect to its quality. So, in short, a positive result of ESG disclosure was also found here.

One more study about the factors that influence ESG reporting was conducted by M. Arayssi, M. Jizi and H.H. Tabaja (2019) [6]. They studied 184 usable firm-year observations for 2008–2017 in Gulf countries to try to find out what the most influential ESG reporting factors were. In this research, examining publicly listed companies over a 10-year period shows that higher board independence and female board participation facilitate the transmission of a firm's positive image by improving social responsibility. Independent boards of directors and women' participation serve as catalysts to strike an effective balance between firms' financial targets and social responsibilities. In contrast, boards chaired by chief executive officers are less supportive in executing a social agenda and, consequently, reporting their ESG activities. So we see that diversity in general, and board diversity in particular, positively affects ESG performance and disclosure and, in turn, firm performance.

A more formal approach is taken by P. Sharma, P. Panday and R.C. Dangwal (2020) [7]. They study Indian companies listed at Bombay Stock Exchange in 2013–2016 and apply Ordinary Least Square (OLS) models to examine the relationship between the ESG disclosure index and the independent variables, namely the financial performance, market performance, FIIs' (foreign institutional investors') stake and leverage after statistically controlling the effects of a firm's size and the industry type of the companies. Their results indicate that financial and market performance has a positive and significant association with the level of ESG disclosure, whereas FIIs stake and leverage have a negative and significant association with the level of ESG disclosure. There was nothing particularly unexpected here.

Sector-specific research was conducted by L. Conca, F. Manta, D. Morrone and P. Toma (2021) [8]. There were 57 European-listed companies (EU28) in the agri-food sector observed in 2010–2018 in this paper. The authors used several OLS regressions of ROA, Profit margin and Tobin's Q on lnSIZE, LEV, GROWTH, EBITDA, lnCASH, ESG_1, ENV_1, SOC_1, GOV_1 to check for the relationships among ESG practices and firm performance and value. They find out that ESG disclosure practices impact corporate profitability; specifically, evidence is provided for the existence of a positive relationship between profitability and disclosure practices of strictly environmental and social information and a negative effect between a company's market value and disclosure practices relating to governance.

Y. Xiang and J.L. Birt (2020) [9] also had something to say about the factors that influence ESG internet disclosure. They looked at the Top 200 Australian firms by Market Capitalization from ASX 200 in 2018. This paper constructs a disclosure index featuring a wide range of both financial and non-financial disclosures, including social

media strategy. This study then investigates the firm characteristics associated with the level of internet disclosure. The authors find that a firm's internet reporting is associated with firm size, financial performance and analysts' coverage, but not associated with the percentage of independent board members. A firm's social media strategy is associated with firm size and its environmental, social and corporate governance (ESG) ranking. However, this article was less insightful to us for the purpose of our research.

The last article from this group comes from the Indian authors S. Bhattacharya and D. Sharma (2019) [10]. This study considers a sample of 122 firms from the list of 500 companies listed on the Bombay Stock Exchange (BSE) 500. Ordered logistic regressions were used with credit ratings as predicted variables; ESG scores as predictor variables and market capitalization, net debt to equity, and total debt-to-asset as control variables. It was found that overall ESG performance and performance of individual components (environment, social and financial variables such as market capitalization, and debt to equity ratio) had significant positive indicators of creditworthiness as measured by the credit rating. The governance score had a positive and insignificant relationship with credit rating. Market capitalization was observed to have a significant direct relationship with credit worthiness. On the other hand, the number of independent directors in companies showed a significant inverse relationship with creditworthiness. ESG significantly impacted the credit rating in the desired direction only for small- and mid-level firms; for large firms which already had a higher credit rating, ESG showed no effect. It was also found that the credit rating itself significantly determined the extent of overall ESG reporting and disclosure of its components.

How different types of reporting affect firm performance or value

The second group deals with the different types of reporting and its influence on the firm. For example, in the research of L. Mervelskemper and D. Streit (2017) [11], the authors examined 217 publicly listed companies worldwide in 2010–2014. They ran OLS regressions to find out whether the type of ESG reporting influenced the companies; ESG performance or the investors' attitude towards the firms. The results show that the degree to which a firm's ESG performance is valued by investors does depend on its decision to report or not to report on ESG activities at all, irrespective of the specific report type chosen (stand-alone or integrated). More specifically, the issuance of any kind of ESG report is not only associated with a higher degree of value-relevance of ESG performance, but also seems to improve the investors' ability to price ESG activities in the desired (positive) direction. Also, the research provides early empirical evidence that merely publishing an integrated report can even further enhance market valuation of a firm's composite ESG and corporate governance performance to an economically and statistically significant extent at no additional cost, which is a new and critical finding.

Another article by J. Maniora (2017) [12] studies 200 to 300 companies from around the world over the 2002–2011 period. The authors run linear regression models to check whether ESG integrated reporting is beneficial to the firm and whether it brings a sense of Integrated Ethics into the company's business model. The results suggest that IR is a superior mechanism only for the integration of ESG issues into the core business model, but only when comparing IR with the ESG reporting strategies of (a) no ESG reporting and (c) ESG reporting in annual reports. In comparison with (b), stand-alone ESG reporting, the results indicate that IR is negatively associated with the ESG integration level and with the economic and ESG performance. So this research displays mixed results depending on the situation.

A more market-valuation approach is proposed in the research of A. Landau, J. Rochell, C. Klein and B. Zwergel [13]. They examine 50 companies of the STOXX Europe 50 between 2010 and 2016 to see the impact of integrated reporting on the MV of the firms. It is worth noting that the Ohlson model is applied for market valuation and an OLS regression of MV was run on BV, NI, IR and type of ESG information disclosure. As a result of their research, they contribute to existing literature by finding that IR does play a role in the market valuation of a firm's equity. In line with studies of the cost-concerned school, the findings show a negative influence on market valuation unless firms provide an IR with the assurance of a Big 4 audit firm and conduct their report according to the newest GRI guidelines. An assured IR that does not follow the newest GRI guidelines is also penalized by a lower market valuation but to a lower extent. This result is extremely surprising to us because it demonstrates a go-all-the-way approach, not saying that publishing a non-audited and non-GRI-standard report has no effect on MV, but rather that it will affect the company negatively. We would assume that these results would scare the firms that are not dedicated enough to publish audited reports to the latest GRI standard and would leave only the firms that are whole-hearted, so to say, and that have the experience and ability to satisfy the market's ESG requirements.

Social experiments aimed changing the attitude towards ESG

The third group is a cluster of studies that relies on social experiment methods like questionnaires and case study situations. This is less relevant for us, so we will not cover as many articles here, and just use one example from the research study by L. Espahbodi, R. Espahbodi, N. Juma and A. Westbrook [14]. They conducted interviews and an experiment – a between-subject 2 × 2 sequential experiment using graduate students in a Master's of Accountancy program as participants. Participants were provided with the industry, company and selected financial data manipulated to show improving or declining sales and earnings for a medical device company (disguised) and were asked to assess the stock price in the short and long run and to decide what portion of their additional funds to invest in the company. Participants were then provided with ESG

information, manipulated for the ESG priorities to be either included or not included in the company's strategy, and asked to repeat their previous stock price assessments and investment allocation. They found that integration of material ESG priorities into corporate strategy has no significant effect on investors' price assessments and investment allocation, and that financial performance does not strengthen that relationship. Further analysis reveals that perceived relevance and reliability of ESG disclosures have a mediating effect on long-term stock price assessment and investment allocation, and that financial performance has a stronger effect on investors' long-term price assessment and investment allocation when ESG priorities are integrated into corporate strategy. It means that investors, at least represented by this sample group, do not incorporate ESG factors into their main decision to invest in a firm or to price it. This result is critical for us, as we will be looking at the effect of ESG news publications on a firm's MV and performance. When comparing 2 firms, we don't exclude the possibility that ESG could be a deciding factor. That means that if 2 firms demonstrate equal or very similar performance, value, competitive advantage, etc., essentially, they are the same, from a financial perspective. Let's presume that one firm actively performs ESG activities and publishes reports, while the other doesn't – in that case we believe the investor would pick the former, However, sacrificing financial performance for social responsibility doesn't seem like a rational investment strategy in today's day and age. We will look deeper into this idea in our research.

The effect of external ESG information on firm value

And finally, the fourth group, which utilizes methods most similar to ours and studies analogous topics. In reality, there are different types of literature in this group. Some of the studies have to do with the effect of extreme events on the firm value. For example, the effect of severe events like product recalls, airline crashes, product tampering, corporate fraud, "unethical behavior", social movements and protests or massive layoffs. The methodology used in these studies is impeccable, and they show that firms are penalized by society beyond the direct cost of these adverse events. The problem with these cases, however, is that they analyze the effects of only these extreme cases, such as plane crashes, massive layoffs or complete biological disaster. This is a serious limitation since they don't happen that often and represent only a negligibly small part of ESG-related events. Thus, making conclusions about the effect of general ESG behavior and its coverage in the media on firms would result in sample biases. This is the critique of G. Capelle-Blancard and A. Petit (2019) [15], which we will now cover in more detail. We will not examine any other literature that deal with the somewhat extreme cases for reasons mentioned earlier. We will focus more on general research on the topic.

G. Capelle-Blancard and A. Petit use event studies to examine the effects of ESG-related news, classified as positive or negative, on the abnormal returns of companies. They

analyze news of 100 firms from the Dow Jones Sector Titans indexes between January 2002 and December 2010. The authors collect ESG publications from the Covalence EthicalQuote database and use control variables like lexical news context, firm size by asset value and firm reputation, calculated by the portion of positive ESG news in the total news pool. They find that investors react to ESG news, but mainly, although not exclusively, to negative ones. While the change in a firm's market value within a 3-day window around the publication of negative ESG news is about 0.1% on average, the impact of positive ESG news is barely significant. So we see minimal reaction of investors to ESG-related news.

Similar research was conducted in Japan by Miho Murashima (2016) [16]. It was a short-term event study and OLS regression on the 6295 news events from 879 Japanese companies in 2001–2016. The authors collected news from a Japanese database called Nikkei Telecom based on around 50 keywords in positive and negative categories. They find that, first, that there are different reactions to CSR-related news announcements depending on the type of shareholders. Second, only individual investors react to positive news, while individual, institutional and foreign investors all react to negative news. This is one of the reasons for mixed results in the CSR and financial performance linkage studies. Once again, we see research with some reaction to negative ESG news and barely any reaction at all from positive news in external sources.

Another study was conducted by Junhee Seok, Youseok Lee and Byung-Do Kim (2019) [17]. This research was designed slightly different, however, since the authors incorporated advertisement expenses into the equation. They covered 77 Korean firms over the period of 2012–2015. They used a three-step regression analysis and the Sobel test, this study reveals the roles of word-of-mouth (WOM) and advertising expenditures in the relationship between CSR news reports and firm value. They found that CSR news reports positively affect firm value, and this relationship is mediated by WOM and moderated by advertising expenditures. Notably, the positive effect of WOM on firm value is stronger for companies that spend less on advertising. This study, however, takes a different route and does not focus on the effect of positive and negative news, but, rather, analyzes the impact of publicizing news about CSR activities in the media on firm value, where they find their significance.

The last article we will cover is that of P. Krüger (2015) [18]. The author used information from a closed database KLD (which is now part of MSCI). This resource seeks to classify publicly available ESG information into 6 clusters and label them positive or negative. The sample comprises 2116 events related to 745 different firms between 2001 and 2007. He finds that investors react to negative news about CSR in a strongly negative manner. The reaction is particularly pronounced for information regarding communities and the environment. He also finds that there is a mix of significant negative effects for some windows of CAR and non-significant results. This again reinforces the idea that

investors react to negative news about ESG events, but do not react or react negatively to some of these news.

Based on real-world experience, trends in certain industries and the revised literature, the following **hypotheses** were put forward:

1) There is a strong significant relationship between negative ESG-related news and CAR in all windows.
2) There is no positive significant relationship between positive ESG-related news and positive returns.
3) There is no relationship between the publishing of ESG-related news and stock returns in emerging markets.
4) The stated hypotheses are valid in all windows of observation in the short-term.
5) A company's industry has no effect on the relationship between ESG news publishing and stock return.

As we have shown, there are some articles on the subject, even extremely specific ones in specific countries like Japan and South Korea. They are all correct in their own right. However, none of them entirely fit our goal, which is to analyze the global market, with all of its peculiarities and attitudes towards ESG and in different sectors. Thus, the main novelty of this research is that:

1) It considers a truly international sample, as will be demonstrated in the data description. It means that the results will be applicable worldwide.
2) It considers all dividends in the calculation of return. To the best of our knowledge, dividends were excluded from previous research. We understand that this effect is not life-changing, but its inclusion does make the method more refined.

Data Collection and Methodology

Data collection, description and classification. Firm choice and ESG publication specifics

The specifics of our research require it to be an event study, so we followed the general principles throughout our work. The first question that requires an answer in this research was the pool of companies. As we already mentioned, previous research focused on only one market or one country. We want to conduct truly universal research, so for that purpose we need to include companies from around the

globe. We understand that companies cannot be selected at random from each market, and one of our ideas was to select the top companies by market capitalization from every major stock exchange. However, there's also the question of which specific stock exchanges to select, and given the volatility of the market, this list of top companies is constantly changing. Thus, the best and most consistent method is to select a global index and select companies from that index.

There are 8 generally accepted global indices:

1) MSCI ACWI Index.
2) MSCI World.
3) S&P Global 100.
4) S&P Global 1200.
5) The Global Dow – Global version of the Dow Jones Industrial Average.
6) Dow Jones Global Titans 50.
7) FTSE All-World index series.
8) OTCM QX ADR 30 Index.

Out of all these 8 indices there is only one index that allows us to both have a large enough list of companies to choose from and provides the most diversity between emerging and developed markets – that is the S&P Global 1200. This index is comprised of more than 1200 companies, covers 31 countries and accounts for 70% of the global stock market capitalization [19]. But most importantly, it covers 7 diverse regional indices (Table 1).

Even though this is the most diverse index, as we can see from the table, we have a total of only 90 companies from emerging markets and over 1000 companies from developed markets. Just due to the sheer number of firms from developed countries, they always outweigh the number of firms from emerging markets. If we were to take the companies as is, our research would be subject to selection bias, since the ratio of firms from emerging and developed markets would equal approximately 1 : 11. The bias is obviously in favour of the developed markets, and we would not be able to claim that our research is universal. So the only way to overcome this bias is to balance the number of firms. We have a total of 90 firms from 2 emerging market indices. Thus, we have to gather firms from the remaining 5 developed market indices to match those 90 firms. We decided to select the top 20 firms from each of the 5 indices to approximately match the total number of firms, resulting in a total of 190 firms. A list of these firms is provided in Appendix 1.

Table 1. S&P Global 1200 constituents

Index	Region	Country
S&P 500	North America	USA
S&P/TSX 60	North America	Canada
S&P Europe 350	Europe	European countries
S&P/TOPIX 150	Asia/Pacific	Japan
S&P/ASX All Australian 50	Asia/Pacific	Australia
S&P Asia 50	Asia/Pacific	Asian countries
S&P Latin America 40	Latin America	Latin American countries

However, two more adjustments still need to be made:

- We have to exclude financial firms and banks due to the specifics of their operations and balance sheet. We shall be adding financial control variables, so firms from these sectors would alter the true result.

- To avoid sample bias, we excluded firms that had more that 60 news articles. Some firms (like Apple and Facebook, for example) had more than 200 news articles each. Including such cases would skew the results in the direction of those firms.

After all the adjustments, we arrived at a total of 65 firms from 7 regional indices from 21 different countries (9 emerging and 12 developed) (Appendix 2) and 25 industries (grouped into 11 categories depending on the similarity for the purpose of relevant regression analysis – Appendix 3). This amounts to a total of 458 news articles.

The second question we had to face was gathering the needed ESG information. We couldn't gather the information from any open resource for 3 reasons – we needed the information to be reliable, timely and related to the topic of ESG. Luckily, we were able to gain access to the S&P Global Market Intelligence Platform. This is a sub-division of S&P that gathers news, financials and other key information concerning companies around the world. The articles available can be sorted by geography, industry, company and most importantly, topic. We selected the only 3 topics that are linked to ESG – ESG, Environment and Renewables. From the 65 selected firms we were able to extract 458 separate news articles with timestamps. We then went over the articles to define the sentiment as positive or negative. There turned out to be more positive news than negative. We had 115 negative news and 343 positive ones. That concludes the collection of the news articles.

Financial information was collected from Bloomberg. To calculate the stock returns, we downloaded information about stock prices and dividends. We take dividends into account as that is a vital part of the stock value. We collected information concerning the 7 indices and 65 companies. Stock return was calculated by the standard return formula:

$$r_{i,t} = \frac{P_t - P_{t-1} + Div_t}{P_{t-1}}. \quad (1)$$

The return for the indices were calculated the same way, but without dividends since they do not yield dividends. Since we have the information about stock returns and the timestamps of every event, we are able to collect the observed returns within a time window.

An event study begins by identifying the period (event window) involved in the event. Several papers address the issue of the appropriate window length that should be used to measure the price reaction correctly. S.C. Hillmer and P.L. Yu (1979) [20] find that the event window should end within hours of the initial announcement. S.G. Chang and Son-Van Chen (1989) [21] find that event windows should last a number of days as the market keeps responding to news. D. Krivin et al. (2003) [22] point out that event win-

dow length may be related to the period of observation. We took the estimation window and analyzed the statistical properties of the 5-day [–2, +2], 3-day [–1, +1] and 2-day [0, 1] Cumulative Abnormal Returns around the event date. We kept the windows small because, as A. McWilliams et al. (1999) [23] mentioned, expansion of the event windows resulted in raising the amount of information-related noise, or in other words, increasing confounding concurrent events reduces the power of the test statistic. Also, these are the most commonly used windows in the research we covered. To mitigate the information leakage problem or to identify relevant prior events and control for their effects, however, we include time returns from days in the past, as we mentioned, –2 and –1 days.

We previously stated that we analyzed abnormal returns. They were calculated based on the observed returns, which was achieved by extracting information from Bloomberg. According to S. Brown and J.B. Warner (1985) [24], there are 3 ways to calculate an abnormal stock return: The mean adjusted return–

$$AR_{i,t} = R_{i,t} - \overline{R}_i, \quad (2)$$

where the Abnormal return (AR) is the difference between the observed return and the mean return of the estimation period (usually 250 days);

The market adjusted return –

$$AR_{i,t} = R_{i,t} - R_{m,t}, \quad (3)$$

where the AR is the difference between the observed return of the stock and the observed return of the market on the same day;

The OLS market model –

$$AR_{i,t} = R_{i,t} - \hat{\alpha}_i - \hat{\beta} \cdot R_{m,t}. \quad (4)$$

S. Brown and J.B. Warner go on to conclude that "With daily data, these two methodologies [Market adjusted returns and OLS market model] have similar power, and, as expected, the power of each is much greater with daily than with monthly data. Market Adjusted Returns and the OLS market model also outperform a simpler Mean Adjusted Returns procedure, which has low power in cases involving event-date clustering" [24]. Since we have daily data, the two best models are the OLS market model and the Market adjusted model. We started by using the OLS market model, but soon encountered the fact that some of the regressions were non-significant, so it would not be applicable for all 458 cases. In addition, the Market Adjusted model is conceptually closer to us. Looking at this from an investor's point of view, we find comparing the stock to the market would be more appropriate than comparing a stock to its previous returns. Taking all of this into consideration, we selected the Market Adjusted model and used it to calculate CAR. We selected the corresponding S&P Index (from the given 7) for every stock as a proxy for the market. By subtracting the market return from the observed return, we obtain the abnormal return for a day, and then sum up the returns for several days in the three windows we have

previously mentioned. A description and test for significance of the CARs are provided in the next chapter.

We also collected the information about the companies' ROA, ROE, Revenue, Total Assets, Profit margin and financial leverage. We used the natural logarithm of Revenue over Total assets as a proxy for the size of the firm as is done in similar research study by E. Fyodorova, R. Say-

akhov, I. Demin, D. Afanasyev (2019) [25]. We set these indicators as control variables in our regressions.

Model-based analysis with key factor significance

Before we start with the statistical checks, a brief report of the summary statistics and correlation of variables is provided in Figures 3 and 4.

Figure 3. Summary statistics of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
car22	458	.0006861	.0376465	−.153775	.2099734
car11	458	−.0009622	.0279271	−.1409184	.1215356
car01	458	−.0004621	.022793	−.1064287	.1009859
roatl	458	6.966878	6.180668	−5.06	38.15
roetl	458	19.70906	30.75732	−15.38	298.25
sizetl	458	−.5732736	.5689946	−3.117398	.9324046
profitmarg~l	458	13.91393	27.58448	−13.05	476.51
leveragetl	458	2.678581	1.507119	1.21	15.12
sentiment	458	1.251092	.4341153	1	2
markettype	458	1.427948	.4953223	1	2
industry	458	5.18559	2.258572	1	11

Figure 4. Correlation of variables

(obs=458)

	car22	car11	car01	roatl	roetl	sizetl	profit~l	levera~l	sentim~t	market~e	industry
car22	1.0000										
car11	0.7804	1.0000									
car01	0.6103	0.7414	1.0000								
roatl	−0.0416	0.0408	0.0555	1.0000							
roetl	0.0018	0.0516	0.0400	0.6989	1.0000						
sizetl	−0.0087	−0.0168	−0.0244	0.1779	0.2814	1.0000					
profitmarg~l	−0.0478	0.0167	0.0276	0.4167	0.1602	−0.4273	1.0000				
leveragetl	0.0289	0.0302	0.0250	0.1650	0.7272	0.1951	−0.0895	1.0000			
sentiment	0.0174	−0.0605	−0.0275	−0.1361	−0.1397	−0.1193	−0.0599	−0.1402	1.0000		
markettype	0.0385	−0.0276	0.0074	−0.2709	−0.2923	−0.1551	−0.0061	−0.2688	0.2828	1.0000	
industry	−0.0602	0.0309	0.0050	0.4467	0.2365	−0.1714	0.4006	0.0383	−0.2552	−0.3039	1.0000

The results of the event study are provided in Table 2. We start by checking the significance of the mean CARs in the case of positive and negative news. We use a z-test instead of a t-test, since the sample size is more than 30 in each case, even though we do not know the population's standard deviation – we assume that the sample variance equals the population variance. Since we would like to check for statistically significant positive CARs in

the case of positive news and statistically significant negative CARs in the case of negative news, we use a one-tail distribution and compare at 1%, 5% and 10% confidence intervals, which correspond to critical z-values (+−)1.28, (+−)1.64 and (+−)2.33. We test the null hypothesis, which states that for the positive (negative) events the mean is equal to 0. The alternative hypothesis is that it is greater (less) than 0.

Table 2. Results of the event study

Market type	Window	Positive news			Negative news		
		Mean	z-statistic	Obs.	Mean	z-statistic	Obs.
Overall	(−2,+2)	0.00031	0.163	343	0.0018	0.43	115
	(−1,+1)	0.000016	0.010	343	−0.0039*	−1.33	115
	(0,+1)	−0.0001	−0.086	343	−0.0015	−0.62	115
Developed	(−2,+2)	−0.00017	−0.082	224	−0.0029	−0.888	38
	(−1,+1)	−0.00009	−0.058	224	−0.0015	−0.566	38
	(0,+1)	−0.0008	−0.675	224	0.00054	0.261	38
Emerging	(−2,+2)	0.0012	0.315	119	0.004	0.683	77
	(−1,+1)	0.0002	0.067	119	−0.005	−1.216	77
	(0,+1)	0.00122	0.494	119	−0.0026	−0.720	77

As we can see from the table, only one window of CARs, that is (−1, +1) is significant at 10% for the negative events. Some of the others come close to being significant, but they are not. Looking at the significance of the data in this table, we can say that there is no correlation between positive news and positive CARs and there is little correlation with negative news and a negative CAR, which is in line and confirms the research of previous authors mentioned in the literature review. The message is clear – investors react to negative information (in our research – only in certain windows), but show no reaction to positive information. Based on the results, we can say that two of our hypotheses (H2 and H3) have been proven and two others (H1 and H4) have been disproven.

To measure the extent of investors' reaction and the influence of other factors, we ran a number of regressions. In the case of event studies with several non-sequential events with time gaps, OLS is an appropriate model. As seen in previous research covered in the review, OLS regression is what is used as the golden standard. Also proven to be representative in itself, S. Brown and J.B. Warner (1985) writes: "Procedures other than OLS for estimating the market model in the presence of non-synchronous trading convey no clear-cut benefit in detecting abnormal performance" [24]. We use the following model for our OLS regression:

$$
\begin{aligned}
CAR\left(-n,n\right)_{t,i} &= \alpha + \beta_1 \cdot ROA_{t-1,i} + \\
&+ \beta_2 \cdot ROE_{t-1,i} + \beta_3 \cdot Asset\_size_{t-1,i} + \\
&+ \beta_4 \cdot Profit\_margin_{t-1} + \\
&+ \beta_5 \cdot Leverage_{t-1} + \beta_6 \cdot dummy_{pos_{neg}} + \\
&+ \beta_7 \cdot dummy\left(dev,emerg\right) + \\
&+ \beta_8 \cdot dummy\left(industry\right).
\end{aligned}
\tag{5}
$$

For our control variables, we selected those that are most commonly used in research literature and can have an effect on CARs in order to address probable heterogeneity. All of them are lagged by one year to avoid potential endogeneity problems due to simultaneity, also consistent with previous research.

Results of the Regression and Analysis

Running 3 robust regressions for different windows, we achieved the following result:

For CAR(−2, +2) see Figure 5.

Figure 5. OLS CAR(–2, +2) regression

```
Linear regression                              Number of obs =      458
                                               F( 16,   441) =     0.93
                                               Prob > F       =   0.5314
                                               R-squared      =   0.0316
                                               Root MSE       =   .03771
```

car22	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
roatl	-.0001015	.0007296	-0.14	0.889	-.0015354	.0013325
roetl	.0000716	.0002205	0.32	0.745	-.0003617	.000505
sizetl	-.0052731	.0040629	-1.30	0.195	-.0132582	.002712
profitmargintl	-.000112	.0000809	-1.39	0.167	-.0002709	.0000469
leveragetl	.0001434	.003922	0.04	0.971	-.0075648	.0078515
2.sentiment	.0007057	.0046981	0.15	0.881	-.0085277	.009939
2.markettype	.0074451	.0070167	1.06	0.289	-.0063451	.0212354
industry						
2	-.0438543	.0399233	-1.10	0.273	-.1223179	.0346093
3	-.0133825	.0220139	-0.61	0.544	-.0566476	.0298827
4	-.0085533	.0228915	-0.37	0.709	-.0535434	.0364367
5	-.0074637	.0233329	-0.32	0.749	-.0533212	.0383939
6	-.0301813	.0227042	-1.33	0.184	-.0748032	.0144406
7	-.0108222	.023625	-0.46	0.647	-.0572539	.0356095
8	-.0110073	.0244074	-0.45	0.652	-.0589765	.0369618
10	-.0147621	.0230978	-0.64	0.523	-.0601577	.0306334
11	-.0078679	.0285351	-0.28	0.783	-.0639496	.0482138
_cons	.0065228	.0244364	0.27	0.790	-.0415034	.054549

We obtained a non-significant model with very little predictive power. None of the variables are significant in a 5-day window.

For CAR(–1,+1) see Figure 6.

Figure 6. OLS CAR(–1, +1) regression

```
Linear regression                              Number of obs =      458
                                               F( 16,   441) =     1.24
                                               Prob > F       =   0.2363
                                               R-squared      =   0.0237
                                               Root MSE       =   .02809
```

car11	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
roatl	.0001589	.0005331	0.30	0.766	-.0008888	.0012066
roetl	.0000574	.0001529	0.38	0.708	-.0002431	.0003578
sizetl	-.0034267	.002891	-1.19	0.237	-.0091086	.0022552
profitmargintl	-.0000832	.0000467	-1.78	0.075	-.000175	8.57e-06
leveragetl	-.000304	.0027136	-0.11	0.911	-.0056372	.0050291
2.sentiment	-.0037177	.0035155	-1.06	0.291	-.010627	.0031916
2.markettype	.0003562	.0053289	0.07	0.947	-.010117	.0108294
industry						
2	-.024126	.028324	-0.85	0.395	-.0797928	.0315408
3	-.0071776	.0122982	-0.58	0.560	-.0313479	.0169928
4	-.0047021	.013176	-0.36	0.721	-.0305976	.0211935
5	-.0066132	.0137667	-0.48	0.631	-.0336697	.0204433
6	-.0162789	.013165	-1.24	0.217	-.0421528	.0095951
7	-.0099587	.0142152	-0.70	0.484	-.0378967	.0179794
8	-.0022299	.0139233	-0.16	0.873	-.0295941	.0251343
10	-.0075948	.0134885	-0.56	0.574	-.0341045	.018915
11	.0082084	.0166111	0.49	0.621	-.0244384	.0408551
_cons	.0049341	.0146405	0.34	0.736	-.0238397	.0337079

A similar result, but the sentiment parameter is much more significant in this case, although it still does not reach a tangible mark. However, we do get a significant profit margin variable.

For CAR(0, +1) see Figure 7.

Figure 7. OLS CAR(0, +1) regression

```
Linear regression                                    Number of obs =        458
                                                     F( 16,   441) =       1.57
                                                     Prob > F       =     0.0735
                                                     R-squared      =     0.0409
                                                     Root MSE       =     .02272
```

car01	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf. Interval]	
roatl	.0007427	.0004516	1.64	0.101	-.0001449	.0016304
roetl	-.0000831	.0001328	-0.63	0.532	-.0003442	.000178
sizetl	-.0036795	.0021574	-1.71	0.089	-.0079195	.0005606
profitmargintl	-.0000886	.0000361	-2.45	0.015	-.0001596	-.0000176
leveragetl	.0014128	.0022898	0.62	0.538	-.0030875	.005913
2.sentiment	-.0024427	.0027261	-0.90	0.371	-.0078005	.002915
2.markettype	.0016875	.0040467	0.42	0.677	-.0062657	.0096408
industry						
2	-.0174252	.0194746	-0.89	0.371	-.0556998	.0208493
3	-.0079852	.0102677	-0.78	0.437	-.0281649	.0121945
4	-.0130423	.0108232	-1.21	0.229	-.0343138	.0082293
5	-.0091456	.0112044	-0.82	0.415	-.0311661	.012875
6	-.0213514	.011066	-1.93	0.054	-.0431001	.0003972
7	-.015843	.0113123	-1.40	0.162	-.0380757	.0063898
8	-.0026699	.0113222	-0.24	0.814	-.024922	.0195822
10	-.0113337	.0107634	-1.05	0.293	-.0324876	.0098201
11	.005098	.0143892	0.35	0.723	-.023182	.0333779
_cons	.0011494	.0120394	0.10	0.924	-.0225123	.0248111

The result for (0, +1) window is slightly different – the model itself and the variable "size" become significant at 10%, but the sentiment is still non-significant. Unfortunately, due to the insignificance of the OLS models and sentiment variables, we are unable to tell what the specific effect of the good or bad news is. This is somewhat inconsistent with previous research since we did observe some significant variables in some of the research we covered, whilst seeing insignificant in others.

One of our ideas was to remove the industry variable, since it has 11 states and could potentially be ruining the regression. Nevertheless, that assumption proved to be wrong, as can be seen in Figure 8. Removing it only makes it less sig-nificant and reduces predictive power. However, this does not completely prove or disprove our 5th hypothesis (H5). We hypothesized that the industry would be irrelevant to the CARs, but we do see that for industry 6, which is energy and oil, the variable is positive and close to being significant at 5%. It is an interesting result – this means companies that notoriously have a historically sizeable influence on ESG react more than others, and react positively. This is logical and a novelty to existing literature. Other combined effects were applied to make the model more refined and significant, but they did not reach a tangible result worth including in this research.

Figure 8. OLS CAR(0, +1) regression without the industry variable

```
Linear regression                         Number of obs =      458
                                          F(  7,   450) =     0.64
                                          Prob > F      =   0.7215
                                          R-squared     =   0.0070
                                          Root MSE      =   .02289
```

| car01	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
roat1	.0004163	.0004273	0.97	0.330	-.0004235	.0012562
roet1	-.0000443	.000128	-0.35	0.729	-.0002959	.0002073
sizet1	-.0019613	.0018754	-1.05	0.296	-.0056469	.0017243
profitmargint1	-.000022	.0000211	-1.04	0.297	-.0000635	.0000194
leveraget1	.0009545	.0022198	0.43	0.667	-.003408	.005317
2.sentiment	-.0015665	.0027343	-0.57	0.567	-.00694	.0038071
2.markettype	.0017541	.0024787	0.71	0.480	-.0031171	.0066254
_cons	-.0062215	.0065399	-0.95	0.342	-.0190741	.006631

Conclusion

We collected ESG-based data from 65 different firms in 7 different markets for 2007–2021. This resulted in 458 separate strings of news articles in the given time period. Using the CAR based on the market-adjusted model as a metric for the effect on the firm, we found that for a 3-day period, negative news has a weakly significant effect, while positive news has no effect at all. This is in line with previous research in principle. However, we demonstrate that this effect takes place only for the window (–1, +1), which is a new discovery. Given the international all-industry sample we used, we can claim with confidence that these results are universal and apply to companies from any market in any industry. Also we found a significant effect of the energy and oil industry variable on the CAR(0, 1).

However, we understand the limitations of our research. First of all, we did not take into account the severity effect. All news, including ESG, have different severity levels. Generating 2% more emissions than in the preceding year is obviously a much less severe infringement for a company than an accident that killed tens or hundreds of people and / or damaged the wildlife in a 2-km radius. So in principle, severity should be taken into account. The problem with assigning scores is that, to the best of our knowledge, there is no general scoring method that would be accepted by all / most academics and/or not be a subjective and biased metric. Secondly, having a wider range of markets, for example, the African and Oceanic SEs would make the results more robust. However, due to the lack of information, including that on ESG activity about them, it does not seem feasible at the moment. And thirdly, we hypothesize that the OLS model might not be the best model to describe the data due to the varying volatility of the stock returns through time. For that reason, we would want to turn to ARCH models to see whether they would fit the data better. We know that ARCH models fit regression models in which the volatility of a series varies through time. In the case of stock returns, periods of high and low volatility are usually grouped together. ARCH models estimate future volatility as a function of prior volatility. To accomplish this, arch fits models of autoregressive conditional heteroscedasticity (ARCH) by using conditional maximum likelihood. We also understand that there is an autoregressive pattern here, and that past variance and past volatility will contribute to future volatility.

We see that there is an apparent link of asset prices with an increase in volatility of returns (Figure 9).

Figure 9. Visual comparison of stock and index prices to their respective volatility
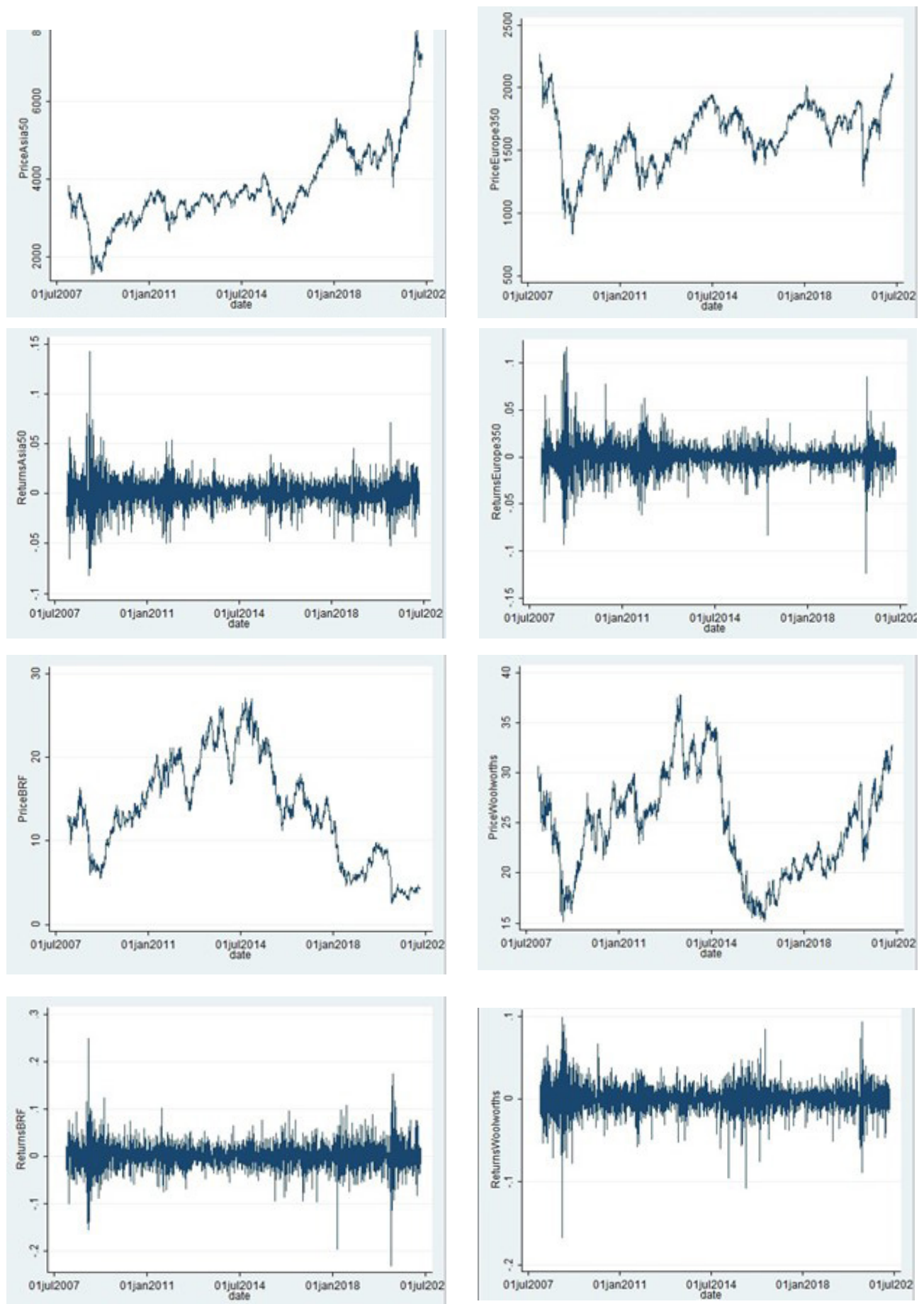
We selected one index and one stock from both markets (developed and emerging) to demonstrate the correlation in the fall in prices and increased volatility in returns. Apparently, every sharp fall is accompanied by a cluster of higher than average volatility, which stays at that level for a time. And once it falls back, it stays at that clustered level. Thus, this visually displays the autoregressive characteristic of the data and the visual evidence seems to indicate the expected form of asymmetry.

There is the question, however, of which specific ARCH model to choose. It is proven in R. Engle and V.K. Ng (1991) [1] that the ARCH and EGARCH models. This would perfectly describe the relationship between the given information. However, the lack of ESG information is holding us back for now. Unfortunately, ESG is a tendency that has just recently started developing and gaining popularity. This means that increasingly more news articles about firms are coming out every year. But for the ARCH model to work, we need ESG event points every day with no intervals. As ESG develops further, this will become a possibility in the future, but for now it is impossible. My hypothesis is that this is the reason why no other authors have employed or even mentioned ARCH models in their ESG research and use OLS as a standard regression. So, this point in particular is what we bring as a research goal for the years to come.

We find the results achieved in this research to be logical and fit for the reality we live in today. Evidently, investors do pay attention to the ESG-component of firms as of now, but it is not a deal-breaker. It is more like a "nice-to-have" than a "must". When investors witness negative news, they sell in the short-term to avoid potential loss. However, they do not see the added value in positive ESG news, which is why there is no effect. From what we see in reality, the world is not at a point where ESG would play a decisive role in investment, which is why we find the results of this study unbiased and sound.

References

1. Engle R.E., Ng V.K. Measuring and testing the impact of news on volatility. *The Journal of Finance*. 1993;48(5):1749-1778. https://doi.org/10.1111/j.1540-6261.1993.tb05127.x

2. As Boohoo prepares to announce its full-year results, investors are still focused on response to sweatshop slavery scandal. This is Money. Apr. 30, 2021. URL: https://www.thisismoney.co.uk/money/investing/article-9530731/Boohoo-investors-focus-response-sweatshop-slavery-scandal.html

3. Fedorova E., Afanasev D., Nersesyan R., Ledyaeva, S. Impact of non-financial information on key financial indicators of Russian companies. *Zhurnal Novoi ekonomicheskoi assotsiatsii = Journal of the New Economic Association*. 2020;(2):73-96. (In Russ.). https://doi.org/10.31737/2221-2264-2020-46-2-4

4. De Silva Lokuwaduge C., Heenetigala K. Integrating environmental, social and governance (ESG) disclosure for a sustainable development: An Australian study. *Business Strategy and the Environment*. 2017;26(4):438-450. https://doi.org/10.1002/bse.1927

5. Weber O. Environmental, social and governance reporting in China. *Business Strategy and the Environment*. 2014;23(5):303-317. https://doi.org/10.1002/bse.1785

6. Lanis R., Richardson G. A reply to corporate social responsibility and tax aggressiveness: A test of legitimacy theory. *Social and Environmental Accountability Journal*. 2016;36(1):92-93. https://doi.org/10.1080/0969160X.2016.1148975

7. Arayssi M. Jizi M., Tabaja H.H. The impact of board composition on the level of ESG disclosures in GCC countries. *Sustainability Accounting, Management and Policy Journal*. 2020;11(1):137-161. https://doi.org/10.1108/SAMPJ-05-2018-0136

8. Sharma P., Panday P., Dangwal R.C. Determinants of environmental, social and corporate governance (ESG) disclosure: A study of Indian companies. *International Journal of Disclosure and Governance*. 2020;17(4):208-217. https://doi.org/10.1057/s41310-020-00085-y

9. Conca L., Manta F., Morrone D., Toma P. The impact of direct environmental, social, and governance reporting: Empirical evidence in European-listed companies in the agri-food sector. *Business Strategy and the Environment*. 2021;30(2):1080-1093. https://doi.org/10.1002/bse.2672

10. Xiang Y., Birt J.L. Internet reporting, social media strategy and firm characteristics – an Australian study. *Accounting Research Journal*. 2021;34(1):43-75. https://doi.org/10.1108/ARJ-09-2018-0154

11. Bhattacharya S., Sharma D. Do environment, social and governance performance impact credit ratings: A study from India. *International Journal of Ethics and Systems*. 2019;35(3):466-484. https://doi.org/10.1108/IJOES-09-2018-0130

12. Mervelskemper L., Streit D. Enhancing market valuation of ESG performance: Is integrated reporting keeping its promise? *Business Strategy and the Environment*. 2017;26(4):536-549. https://doi.org/10.1002/bse.1935

13. Maniora J. Is integrated reporting really the superior mechanism for the integration of ethics into the core business model? An empirical analysis. *Journal of Business Ethics*. 2017;140(4):755-786. https://doi.org/10.1007/s10551-015-2874-z

14. Landau A., Rochell J., Klein C., Zwergel B. Integrated reporting of environmental, social, and governance and financial data: Does the market value integrated

reports? *Business Strategy and the Environment*. 2020;29(4):1750-1763. https://doi.org/10.1002/bse.2467

15. Espahbodi L., Espahbodi R., Juma N., Westbrook A. Sustainability priorities, corporate strategy, and investor behavior. *Review of Financial Economics*. 2019;37(1):149-167. https://doi.org/10.1002/rfe.1052

16. Capelle-Blancard G., Petit A. Every little helps? ESG news and stock market reaction. *Journal of Business Ethics*. 2019;157(2):543-565. https://doi.org/10.1007/s10551-017-3667-3

17. Murashima M. Do investors' reactions to CSR-related news communication differ by shareholder? An empirical analysis from Japan. *Corporate Governance*. 2016;20(5):781-796. https://doi.org/10.1108/CG-11-2019-0346

18. Seok J., Lee Y., Kim B.-D. Impact of CSR news reports on firm value. *Asia Pacific Journal of Marketing and Logistics*. 2020;32(3):644-663. https://doi.org/10.1108/APJML-06-2019-0352

19. Krüger P. Corporate goodness and shareholder wealth. *Journal of Financial Economics*. 2015;115(2):304-329. https://doi.org/10.1016/j.jfineco.2014.09.008

20. S&P Global 1200. S&P Dow Jones Indices. URL: https://www.spglobal.com/spdji/en/indices/equity/sp-global-1200/#overview

21. Hillmer S.C., Yu P.L. The market speed of adjustment to new information. *Journal of Financial Economics*. 1979;7(4):321-345. https://doi.org/10.1016/0304-405X(79)90002-3

22. Chang S.J., Chen S.-N. A study of call price behavior under a stationary return generating process. *The Financial Review*. 1989;24(3):335-354. https://doi.org/10.1111/j.1540-6288.1989.tb00346.x

23. Krivin, Dmitry & Patton, Robert & Rose, Erica & Tabak, David. Determination of the appropriate event window length in individual stock event studies. *SSRN Electronic Journal*. 2003. https://doi.org/10.2139/ssrn.466161

24. McWilliams A., Siegel D., Teoh S.H. Issues in the use of the event study methodology: A critical analysis of corporate social responsibility studies. *Organizational Research Methods*. 1999;2(4):340-365. https://doi.org/10.1177/109442819924

25. Brown S.J., Warner J.B. Using daily stock returns: The case of event studies. *Journal of Financial Economics*. 1985;14(1):3-31. https://doi.org/10.1016/0304-405X(85)90042-X

26. Fyodorova E., Sayakhov R., Demin I., Afanasyev D. The influence of conference calls' semantic characteristics on the company market performance: Text analysis. *Russian Journal of Economics*. 2019;5(3):297-320. https://doi.org/10.32609/j.ruje.5.47422

Appendix

Appendix 1. List of initial S&P companies

Company	Ticker	Country	Industry
Tencent Holdings	SEHK: 700	China	Communication
Samsung Electronics	KRX: 005930	South Korea	Information Technology
Taiwan Semiconductor Manufacturing	TWSE: 2330	Taiwan	Information Technology
AIA Group	SEHK: 1299	Hong Kong	Financial
China Construction Bank	SEHK: 939	China	Financial
Ping An Insurance	SEHK: 2318	China	Financial
Industrial and Commercial Bank of China	SEHK: 1398	China	Financial
China Mobile	SEHK: 941	China	Communication
SK Hynix	KRX: 000660	South Korea	Information Technology
Meituan-Dianping	SEHK: 3690	China	Consumer Discretionary
Hong Kong Exchanges and Clearing	SEHK: 388	Hong Kong	Financial
DBS Group	SGX: D05	Singapore	Financial
Oversea-Chinese Banking	SGX: O39	Singapore	Financial
Bank of China	SEHK: 3988	China	Financial
Hon Hai Precision Industry	TWSE: 2317	Taiwan	Information Technology
United Overseas Bank	SGX: U11	Singapore	Financial
CNOOC Limited	SEHK: 883	China	Energy
CK Hutchison Holdings	SEHK: 1	Hong Kong	Industrials
Link Real Estate Investment Trust	SEHK: 823	Hong Kong	Real Estate
Sun Hung Kai Properties	SEHK: 16	Hong Kong	Real Estate
Hong Kong and China Gas	SEHK: 3	Hong Kong	Utilities
MediaTek	TWSE: 2454	Taiwan	Information Technology
Singapore Telecommunications	SGX: Z74	Singapore	Communication
Naver	KRX: 035420	South Korea	Communication
CK Asset Holdings	SEHK: 1113	Hong Kong	Real Estate
CLP Holdings	SEHK: 2	Hong Kong	Utilities
China Life Insurance Company	SEHK: 2628	China	Financial
China Merchants Bank	SEHK: 3968	China	Financial
Shinhan Financial Group	KRX: 055550	South Korea	Financial
Galaxy Entertainment Group	SEHK: 27	Hong Kong	Consumer Discretionary
Hang Seng Bank	SEHK: 11	Hong Kong	Financial
China Petroleum & Chemical	SEHK: 386	China	Energy
POSCO	KRX: 005490	South Korea	Materials
Xiaomi	SEHK: 1810	China	Information Technology

Company	Ticker	Country	Industry
Hyundai Motor Company	KRX: 005380	South Korea	Consumer Discretionary
Celltrion	KRX: 068270	South Korea	Health Care
KB Financial Group Inc	KRX: 105560	South Korea	Financial
CTBC Financial Holding	TWSE: 2891	Taiwan	Financial
Hyundai Mobis	KRX: 012330	South Korea	Consumer Discretionary
Formosa Plastics Corporation	TWSE: 1301	Taiwan	Materials
Chunghwa Telecommunications	TWSE: 2412	Taiwan	Communication
LG Chem	KRX: 051910	South Korea	Materials
Nan Ya Plastics Corporation	TWSE: 1303	Taiwan	Materials
Formosa Chemicals & Fibre Corporation	TWSE: 1326	Taiwan	Materials
Largan Precision	TWSE: 3008	Taiwan	Information Technology
Cathay Financial Holding	TWSE: 2882	Taiwan	Financial
China Overseas Land and Investment	SEHK: 688	China	Real Estate
Sands China	SEHK: 1928	Hong Kong	Consumer Discretionary
PetroChina	SEHK: 857	China	Energy
KT&G	KRX: 033780	South Korea	Consumer Staples
ALFA	BMV: ALFA A	Mexico	Conglomerate
América Móvil	BMV: AMX L	Mexico	Telecommunications
Banco Bradesco	NYSE: BBD	Brazil	Banking
Banco Santander Chile	NYSE: BSAC	Chile	Banking
Banco de Chile	BCS: CHILE	Chile	Banking
Banco do Brasil	B3: BBAS3	Brazil	Banking
Bancolombia	NYSE: CIB	Colombia	Banking
B3	B3: B3SA3	Brazil	Stock Exchange
BRF S.A.	NYSE: BRFS	Brazil	Food processing
CCR S.A.	B3: CCRO3	Brazil	Transportation
Cemex	BMV: CEMEX CPO	Mexico	Cement
Cencosud	BCS: CENCOSUD	Chile	Retail
Cielo S.A.	B3: CIEL3	Brazil	Financial services
Compañía de Minas Buenaventura	NYSE: BVN	Peru	Mining
Companhia Energetica de Minas Gerais (CEMIG)	NYSE: CIG	Brazil	Energy
Companhia Siderúrgica Nacional	NYSE: SID	Brazil	Steel
Companhia de Bebidas das Americas (AmBev)	NYSE: ABEV	Brazil	Beverages
CPFL Energia	NYSE: CPL	Brazil	Energy
Credicorp	NYSE: BAP	Peru	Banking
Ecopetrol	NYSE: EC	Colombia	Oil

Company	Ticker	Country	Industry
Grupo Elektra	BMV: ELEKTRA *	Mexico	Retail
Empresa Brasileira de Aeronáutica (Embraer)	NYSE: ERJ	Brazil	Aerospace/Defense
Empresas CMPC	BCS: CMPC	Chile	Paper/Pulp
Empresas Copec	BCS: COPEC	Chile	Energy
Enel Américas	NYSE: ENIA	Chile	Energy
Enel Generación Chile	NYSE: EOCC	Chile	Energy
Fomento Económico Mexicano (FEMSA)	BMV: FEMSA UBD	Mexico	Beverages
Gerdau	NYSE: GGB	Brazil	Steel
Grupo Financiero Banorte	BMV: GFNORTE O	Mexico	Banking
Grupo Televisa	BMV: TLEVISA CPO	Mexico	Media
Itaú Unibanco	NYSE: ITUB	Brazil	Banking
Itaúsa Investimentos Itau	B3: ITSA4	Brazil	Banking
LATAM Airlines Group	NYSE: LFL	Chile / Brazil	Airline
Petrobras	NYSE: PBR.A	Brazil	Oil
S.A.C.I. Falabella	BCS: FALABELLA	Chile	Retail
Sociedad Química y Minera de Chile	NYSE: SQM	Chile	Agricultural Chemicals
Southern Copper Corp.	NYSE: SCCO	Peru	Mining
Ultrapar Participacoes S.A.	B3: UGPA3	Brazil	Energy
Vale	NYSE: VALE.P	Brazil	Mining
Wal-Mart de México	BMV: WALMEX V	Mexico	Retail
Amcor	AMC	Australia	Materials
ANZ Bank	ANZ	Australia	Financials
BHP	BHP	Australia/UK	Materials
Brambles	BXB	Australia	Industrials
Commonwealth Bank	CBA	Australia	Financials
CSL	CSL	Australia	Health Care
Goodman Group	GMG	Australia	Real Estate
Insurance Australia Group	IAG	Australia	Financials
Macquarie Group	MQG	Australia	Financials
National Australia Bank	NAB	Australia	Financials
Rio Tinto	RIO	Australia/UK	Materials
Scentre Group	SCG	Australia	Financials
South32	S32	Australia	Materials
Suncorp	SUN	Australia	Financials
Telstra	TLS	Australia	Telecommunication Services
Transurban	TCL	Australia	Industrials

Company	Ticker	Country	Industry
Wesfarmers	WES	Australia	Consumer Staples
Westpac	WBC	Australia	Financials
Woodside Petroleum	WPL	Australia	Energy
Woolworths	WOW	Australia	Consumer Staples
TOYOTA MOTOR CORP		Japan	Consumer Durables
SOFTBANK GROUP CORP		Japan	Communications
SONY GROUP CORPORATION		Japan	Consumer Durables
KEYENCE CORP		Japan	Electronic Technology
NIPPON TEL & TEL CORP		Japan	Communications
FAST RETAILING CO LTD		Japan	Retail Trade
RECRUIT HOLDINGS CO LTD		Japan	Technology services
NIDEC CORPORATION		Japan	Producer manufacturing
KDDI CORPORATION		Japan	Communications
SHIN-ETSU CHEMICAL CO		Japan	Process Industries
NINTENDO CO LTD		Japan	Consumer Durables
TOKYO ELECTRON		Japan	Electronic Technology
MITSUBISHI UFJ FINANCIAL GROUP INC		Japan	Finance
CHUGAI PHARMACEUTICAL CO		Japan	Health Technology
SOFTBANK CORP.		Japan	Communications
DAIKIN INDUSTRIES		Japan	Producer manufacturing
TAKEDA PHARMACEUTICAL CO LTD		Japan	Health technology
MURATA MANUFACTURING CO		Japan	Electronic technology
HONDA MOTOR CO		Japan	Consumer Durables
DENSO CORP		Japan	Producer Manufacturing
Nestle SA Reg		Switzerland	Consumer Staples
ASML Holding NV			Information Technlogy
Roche Hldgs AG Ptg Genus		Switzerland	Healthcare
Novartis AG Reg		Switzerland	Healthcare
LVMH-Moet Vuitton		France	Consumer Durables
Unilever		UK	Consumer Staples
SAP SE		Germany	Information technology
Siemens AG		Germany	Industrials
AstraZeneca Plc		UK	Healthcare
HSBC Holdings Plc		UK	Financials
Royal Dutch Shell		Netherlands	Oil and gas
L'Oreal		France	Consumer Durables

Company	Ticker	Country	Industry
Anheuser-Busch Inbev		Belgium	Consumer Durables
Medtronic		Ireland	Health Technology
Total S.A.		France	Oil and gas
Prosus		Netherlands	Communication
Novo Nordisk		Denmark	Healthcare
Accenture		Ireland	Information technology
BP		UK	Oil and gas
Sanofi		France	Healthcare
Shopify Inc	SHOP-T	Canada	Information Technology
Royal Bank of Canada	RY-T	Canada	Financials
Toronto-Dominion Bank	TD-T	Canada	Financials
Canadian National Railway Co.	CNR-T	Canada	Railroads
Enbridge Inc	ENB-T	Canada	Oil & gas
Bank of Nova Scotia	BNS-T	Canada	Banking
Brookfield Asset Management Inc Cl.A Lv	BAM-A-T	Canada	Financials
Bank of Montreal	BMO-T	Canada	Financials
Canadian Pacific Railway Limited	CP-T	Canada	Railroads
Tc Energy Corp	TRP-T	Canada	Oil & gas
Thomson Reuters Corp	TRI-T	Canada	Consulting
Canadian Imperial Bank of Commerce	CM-T	Canada	Financials
BCE Inc	BCE-T	Canada	Communication
Manulife Fin	MFC-T	Canada	Financials
Barrick Gold Corp	ABX-T	Canada	Mining
CDN Natural Res	CNQ-T	Canada	Oil & gas
Alimentation Couche-Tard Inc Cl B Sv	ATD-B-T	Canada	Consumer Staples
Constellation Software Inc	CSU-T	Canada	Information Technology
Nutrien Ltd	NTR-T	Canada	Basic Materials
Suncor Energy Inc	SU-T	Canada	Oil & gas
Apple Inc.	AAPL	USA	Information Technology
Microsoft Corporation	MSFT	USA	Information Technology
Amazon.com Inc.	AMZN	USA	Consumer discretionary
Facebook Inc. Class A	FB	USA	Communication
Alphabet Inc. Class A	GOOGL	USA	Communication
Alphabet Inc. Class C	GOOG	USA	Communication
Tesla Inc	TSLA	USA	Consumer discretionary
Berkshire Hathaway Inc. Class B	BRK.B	USA	Financials
JPMorgan Chase & Co.	JPM	USA	Financials

Company	Ticker	Country	Industry
Johnson & Johnson	JNJ	USA	Healthcare
NVIDIA Corporation	NVDA	USA	Information Technology
Visa Inc. Class A	V	USA	Information Technology
UnitedHealth Group Incorporated	UNH	USA	Healthcare
Home Depot Inc.	HD	USA	Consumer discretionary
Mastercard Incorporated Class A	MA	USA	Information Technology
Procter & Gamble Company	PG	USA	Consumer staples
Walt Disney Company	DIS	USA	Communication
PayPal Holdings Inc	PYPL	USA	Information Technology
Bank of America Corp	BAC	USA	Financials
Intel Corporation	INTC	USA	Information Technology

Colour code – highlighted yelow – excluded.

Appendix 2. Final list of S&P companies used in research

Company	Country	Industry	Index
Accenture	Ireland	Information Technology	Europe350
Anheuser-Busch Inbev	Belgium	Consumer Durables	Europe350
ASML Holding NV	Netherlands	Information Technlogy	Europe350
AstraZeneca Plc	UK	Healthcare	Europe350
BRF S.A.	Brazil	Food processing	LATAM40
Canadian National Railway Co.	Canada	Railroads	TSX60
CEMEX, S.A.B. de C.V.	Mexico	Cement	LATAM40
China Mobile	China	Communication	Asia50
China Overseas Land & Investment Limited	China	Real Estate	Asia50
CK Asset Holdings	Hong Kong	Real Estate	Asia50
CK Hutchison Holdings	Hong Kong	Industrials	Asia50
CLP Holdings	Hong Kong	Utilities	Asia50
CNOOC Limited	China	Energy	Asia50
Companhia Energética de Minas Gerais	Brazil	Energy	LATAM40
Companhia Siderúrgica Nacional	Brazil	Steel	LATAM40
Ecopetrol S.A.	Colombia	Oil	LATAM40
Enel Américas S.A.	Chile	Energy	LATAM40
Enel Generación Chile S.A.	Chile	Energy	LATAM40
Falabella S.A.	Chile	Retail	LATAM40
FAST RETAILING CO LTD	Japan	Retail Trade	TOPIX150
Formosa Plastics Corporation	Taiwan	Materials	Asia50
Gerdau S.A.	Brazil	Steel	LATAM40
Goodman Group	Australia	Real Estate	ASX50
Home Depot Inc.	USA	Consumer discretionary	S&P500
Hon Hai Precision Industry	Taiwan	Information Technology	Asia50
HONDA MOTOR CO	Japan	Consumer Durables	TOPIX150
Hyundai Motor Company	South Korea	Consumer Discretionary	Asia50
Intel Corporation	USA	Information Technology	S&P500
L'Oreal	France	Consumer Durables	Europe350
LATAM Airlines Group S.A.	Chile	Airline	LATAM40
LG Chem, Ltd.	South Korea	Materials	Asia50
Link Real Estate Investment Trust	Hong Kong	Real Estate	Asia50
LVMH-Moet Vuitton	France	Consumer Durables	Europe350
Mastercard Incorporated Class A	USA	Information Technology	S&P500
Medtronic	Ireland	Health Technology	Europe350
NIPPON TEL & TEL CORP	Japan	Communications	TOPIX150
Novartis AG Reg	Switzerland	Healthcare	Europe350

Company	Country	Industry	Index
Novo Nordisk	Denmark	Healthcare	Europe350
Nutrien Ltd	Canada	Basic Materials	TSX60
PetroChina Company Limited	China	Energy	Asia50
Petróleo Brasileiro S.A. - Petrobras	Brazil	Oil	LATAM40
POSCO	South Korea	Materials	Asia50
Procter & Gamble Company	USA	Consumer staples	S&P500
Roche Hldgs AG Ptg Genus	Switzerland	Healthcare	Europe350
Samsung Elelctronics	South Korea	Information Technology	Asia50
Sands China Ltd.	Hong Kong	Consumer Discretionary	Asia50
SAP SE	Germany	Information technology	Europe350
Siemens AG	Germany	Industrials	Europe350
Sociedad Química y Minera de Chile S.A.	Chile	Agricultural Chemicals	LATAM40
Sony Group Corporation	Japan	Consumer Durables	TOPIX150
South32 Limited	Australia	Materials	ASX50
Southern Copper Corporation	Peru	Mining	LATAM40
Sun Hung Kai Properties	Hong Kong	Real Estate	Asia50
Taiwan Semiconductor Manufacturing	Taiwan	Information Technology	Asia50
TAKEDA PHARMACEUTICAL CO LTD	Japan	Health technology	TOPIX150
Telstra Corporation Limited	Australia	Telecommunication Services	ASX50
Tencent Holdings	China	Communication	Asia50
Toyota Motor Corporation	Japan	Consumer Durables	TOPIX150
Unilever	UK	Consumer Staples	Europe350
Vale S.A.	Brazil	Mining	LATAM40
Visa Inc. Class A	USA	Information Technology	S&P500
Walt Disney Company	USA	Communication	S&P500
Wesfarmers Limited	Australia	Consumer Staples	ASX50
Woodside Petroleum Ltd	Australia	Energy	ASX50
Woolworths Group Limited	Australia	Consumer Staples	ASX50

Appendix 3. Industry grouping into categories

Industry	Group / category
Agricultural Chemicals	1
Airline	2
Basic Materials	3
Cement	3
Communication	4
Communications	4
Consumer discretionary	5
Consumer Durables	5
Consumer staples	5
Energy	6
Food processing	5
Health Technology	7
Healthcare	7
Industrials	8
Information Technlogy	10
Information technology	10
Materials	3
Mining	3
Oil	6
Railroads	2
Real Estate	11
Retail	5
Retail Trade	5
Steel	3
Telecommunication Services	4
Utilities	5