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The impact of a scandal on a firm's ESG performance

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Abstract

The Corporate Social Responsibility (CSR) has grown in importance. Studies show that there is a significant relationship between a scandal and a firm's ESG performance in the subsequent year. Firms show an increase in ESG scores in the subsequent year. The goal of this paper is to discover a relationship between a scandal and a firm's ESG score in the subsequent year and to discover the relationship between a scandal and a firm's shareholders score in the subsequent year. In this paper, a scandal is perceived whenever a firm's ESG controversies score influences the firm's combined ESG score when certain criteria are met. Multiple firms of the Datastream ASSET4 dataset were used in order to obtain an understanding of these relationships. As the results show, no significant relationship between a scandal and a firm's ESG score of the subsequent year was found. In addition, no significant relationship between a scandal and a firm's shareholders score of the subsequent year was found. This concludes that the impact of the approached understanding of a scandal was not large enough in order to influence a firm's ESG performance in the subsequent year.

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1. Introduction

Corporate social responsibility (CSR) has become increasingly important in the corporate world (Yoon et al., 2016). In addition, Lemus (2016) claims this is an emerging field in the accounting and finance industry as well. But what does CSR imply? According to Mosaid & Boutti (2012), CSR is “taken to mean a balanced approach for an organization to address economic, social and environmental issues in a way that to benefit people, community and society”. CSR can also be seen as a tool to build trust between businesses and society (Mosaid & Boutti, 2012). Therefore, it can be stated that CSR became an important aspect in the degree of transparency of a firm. Where stakeholders in the first place did not have access to any non-financial information, has now changed if a firm chooses to publish this information. However, it is not mandatory to publish any CSR-related information. This could result in the fact that a certain selection of firms chooses to publish this information, while other firms choose not to publish any CSR-related information. This means there is room for strategy in this topic. Although a firm’s CSR is relevant to share with its stakeholders, the way of presenting this information is a second aspect. According to Bazillier & Vauday (2009), it is called ‘greenwashing’ if a claim about the environmental or social benefits of a product is unsubstantiated or misleading. The trustworthiness of published CSR-related information is, therefore, an important risk of sustainability reporting. Besides this risk, it is important to obtain an understanding of the overall quality of the published information. When the quality is determined, it is possible to compare a firm’s CSR with other firms’ CSR.

Thus, it can be stated that it is important to apply a measurement to provide an insight into how well a firm is performing, relative to other firms. This insight can be provided by rating a firm’s non-financial information, by rating its CSR based on environmental, social, and governance (ESG) aspects (Utz, 2019). These ESG aspects can then be rated with certain ESG scores. The CSR achievements can be included in a firm’s sustainability report or can be integrated into its financial report. Although it is not mandatory to publish its CSR-related information, there are guidelines in publishing this non-financial information. There are multiple institutions that provide ESG reporting guidelines, for example, the International Integrated Reporting Council (IIRC) and the Global Reporting Initiative (GRI). A firm is free to choose what guidelines it adopts when publishing its non-financial information.

Measuring a firm’s ESG performance is a step in the right direction, to get an insight into a firm’s non-financial information. However, there could exist any negative confidential internal information which is withheld by a firm. Whenever negative confidential internal information is leaked into the media, this can be called a scandal. According to Utz (2019), examples of scandalous behavior can be interpreted as information upon fraud, bad working conditions, large rounds of dismissals, corruption, manipulation of financial statements, and ecological disasters caused by companies are released in the form of a surprise to the public. It is interesting to know how a firm reacts to a scandalous year. This

can, for example, be measured in how well the ESG aspects are rated in the subsequent year. According to Yoon et al. (2006), companies with bad reputations want to change their negative image into a positive image, by providing insight in their CSR. Thus, this could result in higher-rated ESG aspects in the subsequent year.

An insight into the expectations of a firm after an occurred scandal will provide a better understanding of what stakeholders can expect of the specific firm. This could create a general norm of ESG scores, in the subsequent year after a caused scandal. In this study, it is the goal to provide more information about what stakeholders can expect a year after a scandal, which is caused by their firm. Because the study of Ho et al. (2020) study shows a decrease in a firm's shareholder value after a scandal, it is important to measure how a firm treats the shareholders a year after a scandal as well. For example, it can be possible that a shareholder wants more information about this scandal and more information about how the firm will react to this scandal. It is then plausible that equal treatment of shareholders is difficult for a firm to maintain. That is why in this study the change of the shareholders score in the ESG performance is included as a sub-question as well. In this way, not only the change in the general ESG score after a caused scandal will be analyzed, but specifically the related treatment of their shareholders as well.

For this study, the following research question is adopted:

“What is the impact of a firm's scandal on the firm's ESG performance in the subsequent year?”

To answer the research question, two sub-questions will be answered:

- 1. “In what matter does a caused scandal influence the change in ESG score, by comparing a scandalous year with the subsequent year?”*
- 2. “In what matter does a caused scandal influence the change in the shareholders score, by comparing a scandalous year with the subsequent year?”*

2. Theoretical framework

In this section, an elaboration on the relevant theories will be provided. As mentioned before in the sub-questions, two different types of scores will be used to create a measurement, to make it possible to answer the research question. The different types of scores will be explained, as well as how the used dataset works, how scandals can be classified as scandals, and what research gap was found.

2.1 Scandal impact

There are multiple studies on a firm's effect of ESG scandals. Wang & Yu (2014) stated that many scholars have researched the effect of corporate social responsibility, and confirmed that it will help to improve the financial performance, improve the consumption intention, enhance the brand image and resist the negative effect of a scandal. The study of Ho et al. (2020) shows that not only firms that are directly affected by a scandal are experiencing a decrease in shareholder value, but firms that belong in the same industry as the affected firm (an at-risk firm) as well. According to Ho et al. (2020), an at-risk firm is more likely to dedicate more investments to CSR after Environmental and Social (E&S) incidents, by increasing their debt. They state that at-risk firms with higher CSR investments are less likely to experience E&S scandals in the future. This is the case on one condition: the firm must not do this to manage the public perception, that would be a form of 'greenwashing'. In order to obtain a lesser chance of E&S scandals in the future, the impact of these investments can be expressed by the reaction of the firms. Ho et al. (2020) state that corporate social irresponsibility has costly implications for the stock market valuation. Thus, study shows that CSR investments after a scandal are significantly higher, even if the firm is not directly affected by this scandal.

Secondly, according to Utz, S. (2019) corporate scandals can damage reputation, and this may encourage managers to reconsider their company structure and adopt measures to improve a firm's CSR strategy. Utz, S. (2019) studied the firm's CSR performance before, during, and after a scandal. This study shows that there is a significant decline in retrospective controversy indicators. These indicators are the ESG aspects that indicate a negative impact on a firm, such as child labor, corruption, and bribery. Besides an uncovered decline in the subsequent year after these controversy indicators, Utz's study shows an increase in forward-looking indicators after a scandal. These forward-looking indicators are positively oriented indicators, such as emission reduction, product responsibility, and human rights. That means that firms are not only more likely to increase their CSR to destroy their bad image but also that firms are more likely to innovate in their CSR strategy in order to prevent any future scandal.

Besides previously mentioned studies with an uncovered relationship between scandals and a firm's CSR policy, it is shown that there is no significant relationship between a firm's ESG score

before a scandal and a firm's ESG score in the year after the scandal. The study of Del Giudice, A. & Rigamonti, S. (2020) shows that the change in the firm's ESG score before and after the scandal was not significantly affected by the scandal if the firms were part of one sample size. To elaborate on this outcome, the research sample was split into two groups to study whether an audit affects the ESG score. The firms were subsequently divided into the following groups: firms with audited, and non-audited non-financial statements. In the non-audited group, the ESG rating was significantly negatively affected by a scandal. In the audited group, the ESG rating was not significantly worsening after a scandal.

2.2 Applied methods

Thus, Utz, S. (2019) and Ho et al. (2020) show that (indirect and direct) scandals influence a firm's CSR policy, but Del Giudice, A. & Rigamonti, S. (2020) show that it is not directly influencing the firm's ESG score. Besides the different focus in these studies, important to mention is the different applied research methods. In the first place, the studies have a different understanding of occurred scandals. Ho et al. (2020) retrieved their environmental and social incidents (scandals) from the Sustainalytics database from 2010 to 2018. An incident can be defined in this study as a news report on alleged or actual misconduct with ESG implications. Examples are environmental or social misconducts and product recalls. As mentioned before, in this study the impact of a firm's incident on peer firms (in the same industry) is analyzed. This means that not directly affected firms are the central topic in this study. 5,389 news items of incidents were found in this period. However, non-financial and non-utility firms were excluded from the study. In addition, incidents that affect multiple firms in the same industry were excluded as well. Lastly, firms with negative sales were excluded as well. This results in a sample of 3,469 included incidents, with approximately 19,000 firm-year observations from 844 unique firms. Subsequently, the product responsibility, environmental innovation, workforce, human rights, resource use, and emission score of these firms were gathered to indicate their CSR investments. These were retrieved from the Thomson Reuters ASSET 4 database, three years before and three years after the scandal.

Furthermore, Utz, S. (2019) used a similar approach as Del Giudice, A. & Rigamonti, S. (2020). In that study, a list of occurred scandals was used as well. Utz, S. (2019) elaborated on the definition of a scandal: "We define a scandal as being a publicly unknown weakness in a firm which triggers a widespread debate when information about it is released to the public". In other words, leaked information about negative events related to a firm. Utz, S. (2019) uses a sample of 67 scandals, from the period of 2004 through 2014. In contrast to the study of Del Giudice, A. & Rigamonti, S. (2020), Utz, S. did not use Lexis-Nexis in order to identify the scandals. Subsequently, the scandal is combined with the firm's retrospective indicators and forward-looking indicators. Retrospective indicators are identified by the controversy score, which includes aspects like bribery, pollution, child labor, and

product recalls. The forward-looking indicators are identified by the communication, emission reduction, human rights, and product responsibility scores.

Thirdly, the study of Del Giudice, A. & Rigamonti, S. (2020) adopted a similar research question as this study, apart from their focus on the impact of an audit. What differs is the study is focusing on the effect of occurred scandals in the period of 2007-2017. According to Del Giudice, A. & Rigamonti, S. (2020), a scandal can be defined as ‘widely publicized incidents involving allegations of managerial wrongdoing or the unethical behavior of one or more members of the company’. In contrast to the study of Utz, S. (2019), the scandals were derived from Lexis-Nexis. In this study, they combined public news of corporate scandals, with the ESG scores of the Thomson Reuters ASSET4 database. This study included 54 scandals of ESG rated firms. This implicates that a scandal is combined with the ESG score of the year before the scandal and the year after the scandal.

2.3 Research gap

In this study, another approach for scandals was adopted. In contrast to other studies, in this study, a scandal is not defined by a negative event that is included in public news but is recognized on behalf of a firm’s controversies score. This score is also based on public news items, but firms with a specific controversies score are now defined as firms affected by a scandal. This results in a more broad definition of a firm that is directly affected by a scandal. In the second place, this study is relevant due to the fact that this study uses other data. This study includes 512 firms with a scandal, in one year. Relative to other studies, this is a large sample size. Also, the fact that this study is about a comparison between 2016 and 2017. This makes the study less vulnerable to changing external factors, such as a fluctuating business cycle.

Whereas other studies used the communication, emission reduction, human rights, and product responsibility scores, this study will focus on the ESG score in general, but the shareholder score as well. Due to the fact that Ho et al. (2020) stated that a firm’s shareholder value decreases after a scandal, it is therefore relevant that the change in the respective shareholders score after the scandal will be made clear. This will create a more detailed understanding of whether a firm invests more in the equal treatment of shareholders after a scandal as well. Important to emphasize is the fact that Ho et al. (2020) use another definition of a scandal. This study thus shows a change in a firm’s shareholder score which is not directly related to the decrease of shareholder value after a scandal, stated by Ho et al. (2020).

2.4 Hypotheses

As mentioned before, Ho et al. (2020) also state that a firm is likely to be responsive to E&S incidents. This raises the expectation that a scandal in one year will result in a higher ESG overall score in the next year, due to the expectation of providing resistance to any negative effect of a scandal, and as a way of improving a firm's CSR strategy. Del Giudice, A. & Rigamonti, S. (2020) stated that there is no significant decrease of a firm's ESG score before and after a scandal if the firms were not split into two groups. However, this does not exclude the possibility that the ESG score in the scandalous year was not lower than after the scandal. Therefore, the following hypotheses were adopted:

H₀: An achieved relevant ESG controversies score in 2016 does not influence the company's ESG score in 2017

H₁: An achieved relevant ESG controversies score in 2016 positively influences the company's ESG score in 2017

And:

H₀: An achieved relevant ESG controversies score in 2016 does not influence the firm's shareholders score in 2017

H₁: An achieved relevant ESG controversies score in 2016 positively influences the firm's shareholders score in 2017

The hypotheses will be tested by applying a significance level of 0.05. This implicates that an H₀ hypothesis will be rejected whenever the outcome of the regression analysis shows a significant relationship between a scandal and a firm's ESG score of 2017, or between a scandal and a firm's shareholders score of 2017.

3. Methodology

The research methodology will be discussed in this chapter. This section will provide an understanding of how the used sample selection was determined. As mentioned before, the Thomson Reuters ESG scores were used as the main dataset. The Thomson Reuters ESG scores were gathered from Refinitiv's Datastream, ASSET4 platform. There are multiple reasons why the Thomson Reuters dataset was used. According to Utz (2019), there are three reasons. In the first place, it provides ESG ratings for a large amount of different international firms. Secondly, ASSET4 reports more types as scores next to the overall rating, such as the shareholder score. Thirdly, it provides a continuous data type, with scores from 0 to 100. This can provide more precise results, to obtain a more detailed answer to our research question. In this study, the results were gathered by regression analysis. Therefore: the statistics program 'SPSS' was used. Datastream contains 8700 companies that have achieved a single or multiple Thomson Reuters ESG scores in the years 2000 until 2019. For every company, Datastream contains the respective geographical location, Standard Industrial Classification (SIC) codes, relevant scores, and Market Capitalization (MC). How this information was used in this study, will be explained in this section.

3.1 Thomson Reuters ESG scores

As mentioned before, CSR can be measured by scoring the Environmental, Social and Governmental (ESG) topics. There are multiple different institutions that provide an ESG scoring method. The used ESG data in this study is the Thomson Reuters ESG scores database. A different, much used, database is the MSCI KLD 400 Social Index. The reason that the Thomson Reuters ESG score database was used, is because of the fact that there is more recent data available. According to Thomson Reuters (2018), the ESG score is an overall company score based on the self-reported information in the environmental, social, and corporate governance pillars. This is a relative ESG score, which is determined by comparing each firm's ESG performance. The method Thomson Reuters wields is to measure the ESG scores in percentile ranks. The formula to compute the ESG score (figure 1) can be found in the appendix.

As can be seen in table 1 of the appendix, the ESG scores can be converted into a rank system with letter grades. According to Thomson Reuters (2018), the database uses the TRBC Industry Group as the benchmark for the Environmental and Social category scores. Next to that, to calculate the Governance categories, Thomson Reuters has used the country as the benchmark, as the governance practices tend to be more consistent within countries. Each percentile score range receives its respective grade. The ESG grade ranges can also be found in table 1 of the appendix. Each percentile will be then be multiplied by 100 to generate its final ESG score.

Important to mention is the date on which the scores were added to the database. In the Thomson Reuters ESG scores database, a firm's scores are added to the database when a firm's ESG assessment was published. This means that the scores in the database do not have the same date of origin.

To calculate the ESG score, Thomson Reuters (2018) uses over 400 company-level ESG measures. These ESG measures are categorized in 178 subsets. Subsequently, these 178 subsets are categorized into 10 categories. Finally, these 10 categories are categorized into three categories: Environmental, Governance, and Social. Each category has a number of measurements into scoring, as some categories have more measurements than other categories. As Thomson Reuters (2018) claims, the count of measures per category determines the weight of each respective category. How each category is weighted to be included in the ESG score, can be found in table 2 of the appendix.

According to Thomson Reuters (2018), the Shareholders Score measures a company's effectiveness towards equal treatment of shareholders and the use of anti-takeover devices. In order to answer the second sub-question, this category will be relevant in order to measure whether the firm maintains an equal treatment of its shareholders with its ESG assessment after a scandal occurred.

3.2 Scandals explained

Besides the overall ESG score, Thomson Reuters (2018) provides the 'ESG combined score'. According to Thomson Reuters (2018), ESG Combined Score is an overall company score based on the reported information in the environmental, social, and corporate governance pillars (ESG Score) with an ESG Controversies overlay. The ESG combined score provides an insight in which companies have any ESG controversies included in their ESG score, and it discounts the ESG score which is based on negative media stories. To measure these discounts due to controversies based on negative media stories, Thomson Reuters (2018) have the 'ESG controversies score'. According to Thomson Reuters (2018), the ESG controversies score measures a company's exposure to environmental, social, and governance controversies and negative events reflected in global media. This score is calculated based on 23 ESG controversy topics. If a negative event was reflected in global media, the company gets penalized in its ESG controversies score. This gives the company with a controversy a lower ESG score than companies without a controversy. A controversy occurs in a specific category, this means that not all the categories should have a controversy included in order to achieve a penalty in its ESG controversies score.

The ESG combined score is the average of the ESG score and the ESG controversies score. However, the ESG controversies score must meet certain criteria in order to affect the ESG combined score. The ESG controversies score must have a maximal score of 50, and the ESG controversies score

must be lower than the ESG overall score. If a controversies score does not meet these criteria, the ESG combined score is the same score as the ESG score. In this study, it is only perceived as a scandal, when these criteria are met. Thus, in this study, it is possible for a firm to have controversies, without being considered as a firm with an occurred scandal.

3.3 Dependent variable

In this study, the outcome of the ESG overall scores of 2017 will be used as the dependent variable for the first sub-question, to find out whether there is a relationship between ESG overall scores when controversy was detected. In order to include a companies' ESG overall score of 2017 in this study, it must have an ESG overall score above 0. The dependent variable for the second sub-question is the shareholders score of 2017. This variable must have a shareholders higher than 0, in order to be included in the regression model.

3.4 Independent variable

In order to research whether a perceived relevant controversies score has a significant effect on the ESG overall score of 2017 and the shareholders score of 2017, a dummy variable will be used. The following dummy was used in the Ordinary Least Squares (OLS) regression:

1, when a relevant ESG controversies score was achieved

0, when no relevant ESG controversies score was achieved

During this paper, the companies with an achieved relevant ESG controversies score, will be announced as 'controversy companies', whereas the companies without an achieved relevant ESG controversies score will be announced as 'non-controversy companies'. As mentioned before, according to Thomson Reuters (2017), a company's controversies score must have a maximum score of 50, and the ESG controversies score must be lower than the company's ESG overall score in order to affect the company's ESG combined score. If these criteria are not met, the company will be approached as a company with a non-relevant ESG controversies score, and thus will be considered as a 'non-controversy firm'. A non-controversy firm will be considered as a firm with no occurred scandal in that year. In addition, whenever a firm with an achieved relevant controversies score in 2016 also has achieved a relevant controversies score in 2017, the firm was excluded from the study.

3.5 Control variables

Apart from a relevant ESG controversies score in 2016, there are more variables that influence the ESG overall score of 2017 and the shareholders score of 2017. The regression analysis will include three general control variables, and one control variable specifically for each sub-question.

In the first place for the first sub-question, the respective firm's ESG score of 2016 will be included as a control variable. This is included in the model to gain an insight into how much of the ESG overall score of 2017 is explained by the ESG overall score of the previous year. According to Utz, S. (2019), the autocorrelation of ESG assessments is very high. That means it is expected that there is a relationship between the ESG overall scores of two subsequent years. Besides Utz, S. (2019), also Del Giudice, A. & Rigamonti, S. (2020) found a strong positive relationship between the year's ESG score and the ESG score of its subsequent year. Thus, when a company has achieved a certain ESG overall score in 2016, it can be assumed that this affects the company's ESG overall score in 2017. As for the second sub-question, the firm's Shareholders score of 2016 will be included as a control variable as a replacement for the respective firm's ESG score of 2016. Likewise, as the dependent variable, only the firms with an ESG score of 2016 and shareholders score of 2016 higher than 0 will be included in the regression model.

Secondly, the market capitalization (MC) will be a control variable for both sub-questions as well. According to Dremptic et al. (2019), there is a significant relationship between a firm's size and the company's sustainability performance. Dremptic et al. (2019) used the company's market capitalization to express the firm's size and used the Thomson Reuters ASSET4 ESG ratings to express the company's sustainability performance. Therefore, market capitalization is included in the OLS model. Market capitalization is considered as the total value of all the outstanding shares of the concerned company. In order to maintain a consistent data source, the market capitalization of each company was used as of December 31, 2016. This data is retrieved from Datastream, and the currencies were converted to US dollars. Any company with a non-valid Market capitalization in 2016 and 2017, were excluded from the data selection.

Thirdly, the industry sector of the company is also included as a control variable in both models. According to Wanderley et al. (2008), a company's industry has a significant effect on overall provided CSR-related information. However, Wanderley et al. (2008) state that the company's country of origin has a stronger influence over CSR than the industry sector. In this study, the companies' industry sectors are divided into ten different industry sectors. This is done by sorting the companies by their SIC code. The SIC codes, which were extracted from Datastream, were sorted in their relevant industry sector. The applied industry sectors and the respective numbers of observations can be found in table 3 of the appendix. Any company with no SIC code or with an invalid SIC code were excluded from the data selection.

Lastly, as mentioned before, according to Wanderley et al. (2008), the company's geographical location has a significant effect on the overall provided CSR-related information. Therefore, the

geographical location was included as a control variable in both models as well. The national geographical locations of the relevant companies were categorized in their continental geographical location, so there would remain six continents as dummy variables. These geographical locations and the respective numbers of observations can be found in table 4 of the appendix. Worth mentioning are the countries which are part of two continents. All of the companies' headquarters were used to determine the respective geographical location. Any company with no valid geographical location was excluded from the data selection.

3.6 Regression models

As mentioned before, a regression model will be used to answer the stated sub-questions. To include the previously mentioned variables, two regression models were adopted to answer the sub-questions. The first model was used to find out whether there is a relationship between a scandal and the ESG score of 2017. The dummy variables 'North America', and 'Agriculture, Forestry, and Fishing' were excluded from the model, functioning as reference dummy variables.

$$\text{Model 1: } ESG17 = \alpha + \beta1CONT + \beta2ESG16 + \beta3MC + \beta15SA + \beta16EUR + \beta17ASIA + \beta18AFR + \beta19OCEA + \beta5MINE + \beta6CONS + \beta7MANU + \beta8TRANS + \beta9WHOLE + \beta10RET + \beta11FINAN + \beta12SERV + \beta13PUBL + u$$

The next model was used to answer the second sub-question. This model was used to find out whether there is a relationship between a scandal and the shareholders score of 2017. The dummy variables 'North America' and 'Agriculture, Forestry, and Fishing' were excluded from the model, functioning as reference dummy variables.

$$\text{Model 3: } SHR17 = \alpha + \beta1CONT + \beta2SHR16 + \beta3MC + \beta15SA + \beta16EUR + \beta17ASIA + \beta18AFR + \beta19OCEA + \beta5MINE + \beta6CONS + \beta7MANU + \beta8TRANS + \beta9WHOLE + \beta10RET + \beta11FINAN + \beta12SERV + \beta13PUBL + u$$

The following list provides the description of the used variables:

ESG17 = a company's ESG overall score of 2017

ESG16 = a company's ESG overall score of 2016

SHR17 = a company's Shareholders score of 2017

SHR16 = a company's Shareholders score of 2016

CONT = dummy variable for an achieved relevant ESG controversies score

ESG16 = a company's ESG overall score of 2016

MC = a company's market capitalization as of December 31, 2016

AGR = dummy variable for the agriculture, forestry, and fishing industry

MINE = dummy variable for the mining industry

CONS = dummy variable for the construction industry

MANU = dummy variable for the manufacturing industry

TRANS = dummy variable for the transportation, communications, electric, gas, and sanitary services industry

WHOLE = dummy variable for the wholesale trade industry

RET = dummy variable for the retail trade industry

FINAN = dummy variable for the finance, insurance, and real estate industry

SERV = dummy variable for the services industry

PUBL = dummy variable for the public administration industry

NA = dummy variable for the North America geographical location

SA = dummy variable for the South America geographical location

EUR = dummy variable for the European geographical location

ASIA = dummy variable for the Asia geographical location

AFR = dummy variable for the Africa geographical location

OCEA = dummy variable for the Oceania geographical location

4. Results

In this section, the outcomes of the regression analysis will be discussed. The outcomes will be interpreted, which thereafter can be used to obtain a conclusion. The two stated models will be interpreted by means of analyzing the outcomes of each stated model. the R squared, the variables' correlations, the relevant coefficients, the ANOVA and test whether the outcomes are significant or not. A description of each analysis will be provided in this section. Important to mention is the fact that the Market Capitalization is included as millions of USD.

As can be found in the appendix, the mean ESG score of 2016 is 1.77 points lower than the mean ESG score of 2017, whereas the shareholders score of 2016 is equal to the shareholders score of 2017. A summary of the mean, maximum and minimum scores can be found in table 5 of the appendix.

4.1 Pearson Correlations

The correlation matrixes can be found in appendix 7.1. The correlations show a relationship between the included variables. In other words, it shows how much a change in the value of a specific variable influences the value of another variable. A perfect relationship can be indicated by a value of 1, whereas a perfect negative relationship can be indicated by a value of -1. As can be found in table 11 of the appendix, the correlation between an achieved relevant controversies score and the ESG score of 2017 is 0.148. This correlation has a significance of 0.000, which is significant at a 0.01 percentage significance level. Thus, whenever one of these two variables increases, the other variable slightly increases as well. With this outcome, it shows almost no linear relationship between an achieved relevant controversies score and a firm's ESG score of 2017. Furthermore, table 11 of the appendix shows a high correlation of 0,938 between a firm's ESG score of 2016 and a firm's ESG score of 2017. This is significant at a 0,01 significance level. This is thus in line with the theory of Utz, S. (2019). Lastly, the market capitalization and the geographical location 'Europe', both correlate significantly (at a 0,01 significance level) with a firm's ESG score in 2017 and 2016. Interesting to mention is the correlation between the 'finance, insurance, and real estate' industry and the 'manufacturing' industry. It shows a correlation of -0,371 which is significant at a 0,01 significance level.

As can be found in table 17 of the appendix, the correlation between an achieved relevant controversies score, and a firm's shareholders score of 2017 is 0,015. However, this correlation has a significance of 0,147, which is not significant at a 0.05 significance level. Therefore, it cannot be stated that there is a significant relationship between an achieved relevant controversies score and a firm's shareholders score of 2017. Similar to the findings of the first model, a firm's shareholders score of 2016 does correlate with a firm's shareholders score of 2017, which is again in line with the findings

of Utz, S. (2019). Interesting to mention is the fact that the market capitalization shows no significant correlation with a firm's shareholders score of 2017.

4.2 ANOVA and Coefficients

The first model can be found in Appendix 7.1. This model includes an R-squared value of 0,881, and the adjusted R-squared has a value of 0,881 as well. This means that the variables of these models explain 88,1% of the outcome of the dependent variable 'ESG score of 2017'. An adjusted R-squared value is an R-squared value, adjusted by the amount of included independent variables. For the second model, the R-squared value is 0,680, and the adjusted R-squared value is 0,679. This means that the variables of this model explain 68% of the dependent variable 'shareholders score of 2017'. The ANOVA of the first model shows that the model produces a significant output at a 0,05 significance level. This means that the variables significantly influence a firm's ESG score of 2017. Furthermore, a one-way ANOVA was conducted to show how an achieved relevant controversies score would affect a firm's ESG score of 2017, and its shareholders score of 2017 with no other variables included. As can be found in table 10 of the appendix, an achieved relevant controversies score significantly (at a 0,01 significance level) increased the firm's ESG score of 2017 with 8,343 points, whereas in the first model the controversy had a significance of 0,985. Thus, the variables of the first model made a crucial impact. However, in table 16 can be seen that an achieved relevant controversies score has a significance of 0,294, whereas in the second model the controversy had a significance of 0,449. Thus, the controversy in the second model never was significant, with or without the other variables.

In appendix 7.1 the analysis of the coefficients can be found as well. This model was adopted to gain an insight into whether there is a relationship between the ESG score of 2017 and a scandal in 2016. As the results of this model show, an achieved relevant controversies score has a coefficient of -0,006. Thus in this model, the ESG score of 2017 decreases by 0,006 ESG points whenever a firm has achieved a relevant controversies score. However, the model outcome of the model displays a significance of 0,985, which is far from significant at a 0,05 significance level. This means for model 1, an achieved relevant controversies score does not have a significant relationship with the firm's ESG score. As can be found in the first appendix section, there are multiple variables that do have a significant effect on the ESG score of 2017. The market capitalization, the ESG score of 2016, the geographical location 'Europe', and the geographical location 'Asia' are the control variables that influence the ESG score of 2017 significantly at a significance level of 0,05. Thus, a selection of geographical location has a significant effect on the ESG score of 2017. The coefficients of each variable can be found in the appendix section.

In appendix 7.2, the regression analysis of the second model can be found. This model was adopted to gain an insight into whether there is a relationship between the shareholders score of 2017, and a scandal in 2016. The second regression model shows a significant output at a 0,05 significance level as well. The outcome of the model displays a coefficient of an achieved relevant controversies score of 0,590. However, this variable has a significance of 0,449, which is also far from significant at a significance level of 0,05. As for the other control variables, only the shareholders score of 2016 has a significant effect on the shareholders score of 2017. Interesting to uncover is the fact that none of the other control variables significantly influence the shareholders score of 2017. The coefficients of each variable can be found in the appendix section.

4.3 Hypotheses and research question

In order to be able to answer the research question, the sub-questions must be answered. The first sub-question can be found below.

1. *“What is the relationship between the ESG score in 2016 when a scandal occurred, and a firm’s ESG score in 2017, when no scandal occurred?”*

To answer this sub-question, the following hypotheses were adopted:

H₀: An achieved relevant ESG controversies score in 2016 does not influence the company’s ESG score in 2017

H_a: An achieved relevant ESG controversies score in 2016 positively influences the company’s ESG score in 2017

As the results concluded, the ESG score in 2016 when a scandal occurred, and a firm’s ESG score in 2017, when no scandal occurred, have no significant relationship. This implicates that the H₀ cannot be rejected. Therefore, an achieved relevant controversies score does not significantly influence a firm’s ESG score of 2017.

2. *“What is the relationship between the shareholders score in 2016 when a scandal occurred, and a firm’s shareholders score in 2017, when no scandal occurred?”*

To answer the second sub-question, the following hypotheses were adopted:

H₀: An achieved relevant ESG controversies score in 2016 does not influence the company’s shareholders score in 2017

H_a: An achieved relevant ESG controversies score in 2016 positively influences the company's shareholders score in 2017

As the results concluded, the shareholders score in 2016 when a scandal occurred, and a firm's shareholders score in 2017, when no scandal occurred, have no significant relationship as well. This also implicates that the H₀ cannot be rejected. Therefore, an achieved relevant controversies score does not significantly influences a firm's shareholders score of 2017.

5. Conclusion and discussion

The outcome of the results shows no relationship between an achieved relevant controversies score and a firm's ESG score and shareholders score of 2017. The following research question was adopted:

“What is the impact of a firm's scandal in the firm's ESG performance in the subsequent year?”

It can be stated that a scandal does not significantly impact the ESG performance of a firm in the subsequent year. The outcome of this study shows that a scandal does not influence a firm's treatment of its shareholders and in general neither a firm's ESG score. As the other studies showed a relationship between a firm's CSR policy and negative large news items, this outcome is not in line with the expectations. As the study of Ho et al. (2020) showed, a firm is more likely to dedicate more investments in its CSR strategy, which could imply a higher expected ESG score in the subsequent year. Secondly, the study of Utz, S. (2019) showed an increase in forward-looking indicators after a scandal, which implicates a higher ESG score in the subsequent year. However, the outcome of this study was in line with the study of Del Giudice, A. & Rigamonti, S. (2020), which stated that a change in the ESG score of non-audited and audited firms before and after a scandal was not significantly affected by a scandal.

The different outcomes of the other studies are caused by a different understanding of a scandal. Whereas the other studies perceived a scandal as a negative news item, this study approached a scandal on a more detailed level. It can be concluded that whenever a firm's controversies score affects the firm's combined ESG score, it does not have to imply that a firm is experiencing a scandal as the previously mentioned studies have shown. This implicates that a controversies score that influences the combined ESG score has to meet other criteria in order to affect a firm's CSR policy. The results of this study can state that after a firm's controversies score affected the firm's combined ESG score, the stakeholders can expect a comparable ESG score in the subsequent year.

In order to significantly influence a firm's ESG score in the subsequent year after a scandal, this study shows that a scandal must be of a greater impact than a controversies score which influences a firm's combined ESG score. This outcome shows that a firm does not react to low controversies scores (relative to the firm's ESG score). In order to improve a firm's ESG performance, it can be implied that a firm must feel the 'need' to do so. As the study of Yoon et al. (2006) stated, companies with bad reputations want to change their negative image into a positive image. Clearly, the impact of the media which publishes any scandals of involved firms is relevant to influence a firm's behavior. It can be concluded that firms do not achieve a bad reputation when the controversies score influences a firm's combined ESG score.

5.1 Limitations

It can be possible that a comparison of 2016 and 2017 provides a distorted result. To gain an even more trustful outcome, more years could be included to gain a larger sample size. This could exclude any external factors which influence a firm's ESG score. For example, it can be possible that in 2015 other GRI guidelines were relevant than in 2016. Due to the fact that the ESG score is compiled by multiple aspects, this study only shows the change in a firm's shareholders score and ESG score after a scandal. Therefore, other aspects which influence the ESG score are excluded, and no insight into the impact of a scandal on these other aspects was provided. This implicates that it can be possible that, for example, a scandal could possibly significantly influence a firm's human rights score. In this study, only the general impact of a scandal on a firm's ESG score of 2017 and shareholders score of 2017 is studied, which provides a better understanding of a scandal's impact, but it is also a less detailed outcome than possible. For any future studies, it can be recommended to include the other aspects which are included in the ESG score as well. Also, more information about the scandals is needed for any future studies. This study shows that the controversies scores are not entirely accurate in order to identify a scandal that makes an impact on a firm. It is therefore recommended for future studies that a scandal is approached as a public media item. In that way, it is more likely to discover a significant relationship between a scandal and a firm's ESG score in the subsequent year.

Besides the fact that the Thomson Reuters ASSET4 database is a good fit for this study, it has some limitations as well. It is a commonly recognized downside of this database that the data is provided on a yearly basis. Because Ho et al. (2020) state that a scandal can affect a firm's peer firms, the publication date of a CSR report could influence the ESG score of a peer firm as well. Another database, such as the MSCI KLD index provides a more continuous dataset. However, this dataset applies a binary valuation method and is only providing data of firms in the US. Furthermore, this dataset excludes firms that may provide a negative social or environmental impact. This makes this dataset not suitable for this study.

6. Bibliography

Del Giudice, A., Rigamonti, S. (2020). *Does Audit Improve the Quality of ESG Scores? Evidence from Corporate Misconduct*. Sustainability 12(14), 5670. Retrieved from <https://doi.org/10.3390/su12145670>

Ho, C. CY, Nguyen, T.H., & Vu, V.H. (2020). *Do environmental and social risks affect corporate financial policies?*. SSRN. Retrieved from <http://dx.doi.org/10.2139/ssrn.3601616>

Lemus, E. (2016). *The Importance of CSR in Financial Reporting Standards*. Global Journal Of Management And Business Research. Retrieved from <https://journalofbusiness.org/index.php/GJMBR/article/view/2132>

Mosaid, E.F. and Boutti, R. (2012). *Relationshipship between corporate social responsibility and financial performance in Islamic banking*. Research Journal of Finance and Accounting, 3(10), 93-103. Retrieved from <https://ap.lc/0exOd>

Thomson Reuters. (2018). *Thomson Reuters ESG scores*. Retrieved from <http://zeeroverly.nl/blogfiles/esg-scores-methodology.pdf>

United States department of labor. (1987). *Standard Industrial Classification (SIC) Manual*. Retrieved from <https://www.osha.gov/data/sic-manual>

Utz, S. (2019). *Corporate scandals and the reliability of ESG assessments: evidence from an international sample*. Review of Managerial Science 13, 483–511. Retrieved from <https://doi.org/10.1007/s11846-017-0256-x>

Wanderley, L.S.O., Lucian, R., Farache, F., De Sousa Filho, J.M. (2008). *CSR Information Disclosure on the Web: A Context-Based Approach Analysing the Influence of Country of Origin and Industry Sector*. Journal of Business Ethics, 82, 369–378. Retrieved from <https://doi.org/10.1007/s10551-008-9892-z>

Wang, C. & Yu, W. (2014). *Study on Corporate Social Responsibility (CSR) Affect on Brand Trust and Purchase Intention After Brand Scandal*. Proceedings of the Seventh International Conference on Management Science and Engineering Management, 283-290. Retrieved from https://doi.org/10.1007/978-3-642-40078-0_24

Yoon, Y., Gürhan-Canli, Z., & Schwarz, N. (2006). *The Effect of Corporate Social Responsibility (CSR) Activities on Companies with Bad Reputations*. *Journal of Consumer Psychology*, 16(4), 377-390. Retrieved from <http://www.jstor.org/stable/27609615>

7. Appendix

$$\text{Score} = \frac{\text{n. of companies with a worse value} + \frac{\text{n. of companies with the same value included in the current one}}{2}}{\text{n. of companies with a value}} \quad (1)$$

Table 1

ESG grade ranges

Score range	Grade
0.0 <= score <= 0.083333	D-
0.083333 < score <= 0.166666	D-
0.166666 < score <= 0.250000	D+
0.250000 < score <= 0.333333	C-
0.333333 < score <= 0.416666	C
0.416666 < score <= 0.500000	C+
0.500000 < score <= 0.583333	B-
0.583333 < score <= 0.666666	B
0.666666 < score <= 0.750000	B+
0.750000 < score <= 0.833333	A-
0.833333 < score <= 0.916666	A
0.916666 < score <= 1	A+

Source: Thomson Reuters ASSET4

Table 2

Categories' weights

Pillar	Category	Indicators in Scoring	Weights (%)
Environmental	Resource use	20	11
	Emissions	22	12
	Innovation	19	11
Social	Workforce	29	16
	Human Rights	8	4,5
	Community	14	8
	Product Responsibility	12	7
Governance	Management	34	19
	Shareholders	12	7
	CSR Strategy	8	4,5
Total		178	100

Source: Thomson Reuters ASSET4

Table 3

Numbers of observations: industry sectors

Industry sector	Number of observations of controversy companies	Number of observations of non-controversy companies
Agriculture, Forestry, And Fishing	3	19
Mining	64	323
Construction	23	166
Manufacturing	156	1396
Transportation, Communications, Electric, Gas, And Sanitary Services	92	498
Wholesale Trade	7	120
Retail Trade	26	249
Finance, Insurance, And Real Estate Services	87	1074
Public Administration	0	0
Total	512	4466

Source: Thomson Reuters ASSET4

Table 4

Numbers of observations: geographical locations

Geographical location	Number of observations of controversy companies	Number of observations of non-controversy companies
North America	185	2084
South America	14	195
Europe	122	736
Asia	139	1013
Africa	8	105
Oceania	44	333
Total	512	4466

Source: Thomson Reuters ASSET4

Table 5

Score descriptives

Year	Mean score	Max score	Min score
ESG 2016	48.30	93.66	7.39
ESG 2017	50.07	94.13	8.46
SHR 2016	50.03	99.98	0.06
SHR 2017	50.03	99.98	0.09

Source: Thomson Reuters ASSET4

7.1 Model 1 output

Table 6
Descriptive statistics of the second model

	Mean	Std. Deviation
ESG2017	50,0692	17,17122
ESG2016	48,3028	17,13316
Controversy	0,1	0,304
MarketCap.	5,379,828.94	9,319,246.775
SouthAmerica	0,042	0,20057
Europe	0,1726	0,3779
Asia	0,2312	0,42165
Africa	0,0227	0,14896
Oceania	0,0757	0,2646
MINE	0,0777	0,26779
CONS	0,038	0,19114
MANU	0,3118	0,46326
TRANS	0,1185	0,32326
WHOLE	0,0255	0,15769
RET	0,0552	0,22848
FINAN	0,2332	0,42293
SERV	0,1356	0,34239
PUBL	0	0

Source: Thomson Reuters ASSET4

Table 7
Summary of the first model

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin Watson
,939	0,881	0,881	5,92204	2,004

Source: Thomson Reuters ASSET4

Table 8
ANOVA of the first model

	Sum of Squares	df	Mean Square	F	Sig.
Regression	1293487,919	16	80842,995	2305,157	,000
Residual	173984,757	4961	35,071		
Total	1467472,676	4977			

Source: Thomson Reuters ASSET4

Table 9
Coefficients of the first model

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	5,482	1,287		4,26	0
ESGOoverall2016	0,921	0,006	0,919	167,235	0
Controversy	-0,006	0,285	0	-0,019	0,985
MarketCapitalization	4,78E-08	0	0,026	4,79	0
SouthAmerica	0,765	0,433	0,009	1,768	0,077
Europe	1,609	0,247	0,035	6,516	0
Asia	0,9	0,221	0,022	4,07	0
Africa	-0,867	0,576	-0,008	-1,505	0,132
Oceania	0,383	0,337	0,006	1,136	0,256
MINE	-0,975	1,301	-0,015	-0,75	0,454
CONS	-0,491	1,338	-0,005	-0,367	0,714
MANU	-0,204	1,277	-0,005	-0,16	0,873
TRANS	-1,517	1,29	-0,029	-1,175	0,24
WHOLE	-0,555	1,371	-0,005	-0,405	0,686
RET	-1,028	1,316	-0,014	-0,781	0,435
FINAN	-0,94	1,28	-0,023	-0,734	0,463
SERV	-0,409	1,288	-0,008	-0,317	0,751

Source: Thomson Reuters ASSET4

Table 10
Coefficients controversy on ESG score of 2017

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	49,211	0,254		193,625	0,000
Controversy	8,343	0,792	0,148	10,528	0,000

Source: Thomson Reuters ASSET4

Table 11
Correlation Matrix of the first model

	ESG2017	ESG2016	Contr.	Market Cap.	South America	Europe	Asia	Africa	Oceania	MINE	CONS	MANU	TRANS	WHOLE	RET	FINAN	SERV	PUBL
ESG2017	1																	
ESG2016	,938**	1																
Contr.	,148**	,153**	1															
Market Cap.	,369**	,371**	,204**	1														
SouthAmerica	-,036*	-,039**	-,025	-,036*	1													
Europe	,236**	,226**	,061**	,033*	-,096**	1												
Asia	,065**	,054**	,031*	,082**	-,115**	-,250**	1											
Africa	0,021	,039**	-,016	-,050**	-,032*	-,070**	-,084**	1										
Oceania	-,046**	-,043**	0,013	-,109**	-,060**	-,131**	-,157**	-,044**	1									
MINE	-,027	-,020	,060**	-,043**	-,020	-,041**	-,099**	,036*	,172**	1								
CONS	0,008	0,004	0,012	-,011	0,016	0,001	,118**	0,019	-,017	-,058**	1							
MANU	,090**	,075**	-,005	0,020	-,031*	-,004	,112**	-,030*	-,103**	-,195**	-,134**	1						
TRANS	-,008	0,007	,064**	,040**	,100**	0,017	,038**	-,014	-,013	-,106**	-,073**	-,247**	1					
WHOLE	-,036*	-,039**	-,025	-,021	-,021	-,013	-,001	-,008	0,021	-,047**	-,032*	-,109**	-,059**	1				
RET	-,009	-,005	-,007	0,006	0,024	0,013	0,001	,034*	-,003	-,070**	-,048**	-,163**	-,089**	-,039**	1			
FINAN	-,022	-,016	-,051**	,040**	-,007	,042**	-,066**	0,015	-,047**	-,160**	-,110**	-,371**	-,202**	-,089**	-,133**	1		
SERV	-,040**	-,046**	-,030*	-,063**	-,048**	-,027	-,099**	-,025	,064**	-,115**	-,079**	-,267**	-,145**	-,064**	-,096**	-,218**	1	
PUBL	.c	.c	.c	.c	.c	.c	.c	.c	.c	.c	.c	.c	.c	.c	.c	.c	.c	.c

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

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

c . Cannot be computed because at least one of the variables is constant.

Source: Thomson Reuters ASSET4

7.2 Model 2 output

Table 12
Descriptive statistics of the second model

	Mean	Std. Deviation
SHR17	50,2726	28,60023
Controversy	0,1	0,304
MarketCapitalization	5,379,828.94	9,319,246.775
SouthAmerica	0,042	0,20057
Europe	0,1726	0,3779
Asia	0,2312	0,42165
Africa	0,0227	0,14896
Oceania	0,0757	0,2646
MINE	0,0777	0,26779
CONS	0,038	0,19114
MANU	0,3118	0,46326
TRANS	0,1185	0,32326
WHOLE	0,0255	0,15769
RET	0,0552	0,22848
FINAN	0,2332	0,42293
SERV	0,1356	0,34239
PUBL	0	0
SHR16	50,0261	28,65823

Source: Thomson Reuters ASSET4

Table 13
Model Summary of the second model

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
,825	0,68	0,679	16,2075	2,02

Source: Thomson Reuters ASSET4

Table 14
ANOVA of the second model

	Sum of Squares	df	Mean Square	F	Sig.
Regression	2767882,319	16	172992,645	658,56	,000
Residual	1303170,407	4961	262,683		
Total	4071052,726	4977			

Source: Thomson Reuters ASSET4

Table 15

Coefficients of the second model

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	8,096	3,508		2,308	0,021
Controversy	0,59	0,779	0,006	0,757	0,449
MarketCapitalization	1,46E-08	0	0,005	0,572	0,567
SouthAmerica	1,578	1,184	0,011	1,334	0,182
Europe	0,838	0,654	0,011	1,281	0,2
Asia	-0,817	0,602	-0,012	-1,357	0,175
Africa	-1,341	1,568	-0,007	-0,855	0,393
Oceania	-0,134	0,921	-0,001	-0,146	0,884
MINE	2,288	3,559	0,021	0,643	0,52
CONS	2,835	3,661	0,019	0,774	0,439
MANU	0,904	3,493	0,015	0,259	0,796
TRANS	0,462	3,53	0,005	0,131	0,896
WHOLE	2,187	3,752	0,012	0,583	0,56
RET	0,238	3,602	0,002	0,066	0,947
FINAN	1,257	3,503	0,019	0,359	0,72
SERV	-0,02	3,523	0	-0,006	0,995
SHR16	0,821	0,008	0,823	102,235	0

Source: Thomson Reuters ASSET4

Table 16

Coefficients controversy on shareholders score of 2017

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	50,128	0,428		117,133	0,000
Controversy	1,402	1,334	0,015	1,050	0,294

Source: Thomson Reuters ASSET4

Table 17

Correlation Matrix of the second model

	SHR17	Contr.	Market Cap.	South America	Europe	Asia	Africa	Oceania	MINE	CONS	MANU	TRANS	WHOLE	RET	FINAN	SERV	PUBL	SHR16
SHR17	1																	
Contr.	0,015	1																
Market Cap.	0,003	,204**	1															
SouthAmerica	0,007	-0,025	-,036*	1														
Europe	,042**	,061**	,033*	-,096**	1													
Asia	-0,026	,031*	,082**	-,115**	-,250**	1												
Africa	-0,005	-0,016	-,050**	-,032*	-,070**	-,084**	1											
Oceania	-0,002	0,013	-,109**	-,060**	-,131**	-,157**	-,044**	1										
MINE	,043**	,060**	-,043**	-0,020	-,041**	-,099**	,036*	,172**	1									
CONS	0,008	0,012	-0,011	0,016	0,001	,118**	0,019	-0,017	-,058**	1								
MANU	-0,013	-0,005	0,020	-,031*	-0,004	,112**	-,030*	-,103**	-,195**	-,134**	1							
TRANS	0,015	,064**	,040**	,100**	0,017	,038**	-0,014	-0,013	-,106**	-,073**	-,247**	1						
WHOLE	0,011	-0,025	-0,021	-0,021	-0,013	-0,001	-0,008	0,021	-,047**	-,032*	-,109**	-,059**	1					
RET	-0,013	-0,007	0,006	0,024	0,013	0,001	,034*	-0,003	-,070**	-,048**	-,163**	-,089**	-,039**	1				
FINAN	0,001	-,051**	,040**	-0,007	,042**	-,066**	0,015	-,047**	-,160**	-,110**	-,371**	-,202**	-,089**	-,133**	1			
SERV	-,031*	-,030*	-,063**	-,048**	-0,027	-,099**	-0,025	,064**	-,115**	-,079**	-,267**	-,145**	-,064**	-,096**	-,218**	1		
PUBL	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c	. ^c
SHR16	,824**	0,009	-0,003	-0,004	,034*	-0,015	0,002	-0,002	,036*	-0,004	-0,012	0,025	0,005	-0,009	-0,007	-0,020	. ^c	1

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

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

c. Cannot be computed because at least one of the variables is constant.

Source: Thomson Reuters ASSET4