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Cross-Industry ESG Performance and Exposure to ESG Controversies

Master's thesis in Economics and Business Administration
Supervisor: Thomas Leirvik
May 2023

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Preface

This thesis is written as the final part of the master's degree in economics and business administration at NTNU Business School, within the main profile of Financial Investment.

We would like to extend our heartfelt appreciation to our supervisor, Thomas Leirvik, associate professor at Nord University, for his invaluable guidance, support, and feedback during the entire writing process. Thomas' contributions have been significant in shaping and refining our work, and we are truly grateful for his assistance.

The content of this article is at the authors' expense.

NTNU Business School

Trondheim, May 2023

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Abstract

This study empirically investigates the relationship between environmental, social and governance (ESG) performance and exposure to negative media attention regarding ESG topics, as measured through ESG Controversies scores, across various industries. Building upon the framework established by Agnese et al. (2022) in the banking sector, our analysis extends to all three ESG sub-pillars and examines the drivers of ESG controversies.

Utilizing a panel dataset of 238 European-listed companies, spanning the Energy (51), Technology (61), and Financials (126) industries, we uncover significant relationships between ESG performance and exposure to ESG controversies. For instance, both the Energy and Financials industries exhibit a strong positive association between ESG performance and exposure to ESG controversies, while the Technology industry demonstrates a weaker relationship.

Our findings regarding the impact of ESG performance on ESG controversies contradict earlier research on the topic, revealing a negative relationship between overall ESG score and ESG Controversies score, albeit with cross-industry differences in significance. The observed relationship is supported by each of the three ESG sub-pillars. In contrast, our findings regarding the impact of company size corroborate earlier research. The results offer valuable insights for investors, company management, and other stakeholders on the impact of ESG performance on a company's exposure to ESG controversies.

Sammendrag

Denne studien er en empirisk undersøkelse av forholdet mellom miljø-, sosiale- og forretningsetiske (ESG) prestasjoner og eksponering mot negativ medieoppmerksomhet relatert til ESG tema, målt gjennom ESG kontroverser, på tvers av ulike bransjer. Studien bygger på rammeverket etablert av Agnese et al. (2022) i banksektoren, og utvides til alle tre ESG underpilarene og undersøker driverne til ESG kontroverser.

Ved å bruke et paneldatasett med 238 noterte selskaper i Europa, som strekker seg over energi- (51), teknologi- (61) og finanssektoren (126), avdekker vi bransjespesifikke sammenhenger mellom ESG prestasjoner og eksponering mot ESG kontroverser. Eksempelvis viser både energi- og finanssektoren en sterk positiv sammenheng mellom ESG prestasjon og eksponering mot ESG kontroverser, mens teknologisektoren viser en svakere sammenheng.

Våre funn om ESG prestasjoners påvirkning på ESG kontroverser motstrider tidligere forskning på området, da resultatene viser et negativt forhold mellom ESG score og ESG Controversies score, dog med forskjeller i signifikans på tvers av bransjene. Dette forholdet støttes av alle de tre ESG underpilarene. Vi observerer derimot at effekten av selskapsstørrelse støtter tidligere forskning. Resultatene våre gir verdifull innsikt til beslutningstakere om hvordan ESG prestasjoner påvirker selskapers eksponering mot ESG kontroverser.

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1. Introduction

Over the years, environmental, social, and governance (ESG) matters have emerged as a prominent and widely discussed topic in the public discourse, gaining significant media coverage and an increasing regulatory focus. Today, financial investors must assess the ESG strategies of the companies they are invested in. Furthermore, companies need to be mindful of the information they communicate and their actions regarding ESG, since mass media can put its spotlight on it and influence stakeholders' impressions of the company. In this study we want to investigate whether ESG scores have an impact on different types of companies' exposure to negative media attention regarding ESG topics, measured by Refinitiv Eikon's ESG Controversies score.

In Europe, large companies and publicly listed companies must regularly publish reports on their social and environmental impact (European Commission, 2022). If one compares companies listed in Europe to the world average, European companies exhibit higher average ESG scores in every industry (Figure 1, panel A), while largely having lower ESG Controversies scores (Figure 1, panel B), which might imply greater media coverage of negative ESG topics in Europe. The ESG scores from the vendor[1] used in this article are based on self-reported, publicly available, information, while the ESG Controversies scores are calculated from the amount of negative events in global media (Refinitiv, 2022). In this article, we want to investigate whether the scores based on self-reported information does affect media attention within the following industries Energy, Technology, and Financials.

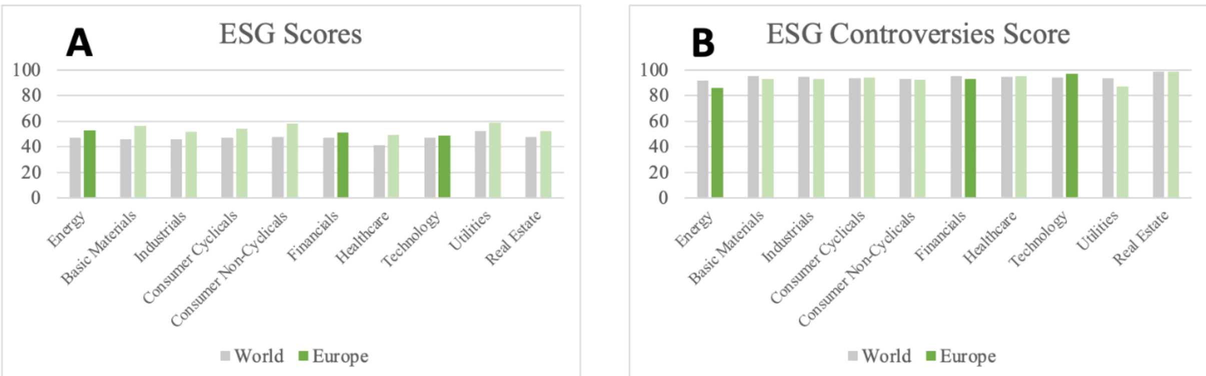

Figure 1*: Panel A shows the ESG scores comparing industries in Europe to the world average. Panel B presents ESG Controversies scores comparing industries in Europe to the world average. Dark green represents the industries we analyze in this article. Source: Refinitiv Eikon, collected: 03/30/2023.*

[1] Refinitiv Eikon is one of the world's largest providers of financial markets data and infrastructure. Refinitiv's ESG universe comprises over 85 % of the global market capitalization, across more than 630 ESG metrics (Refinitiv, 2022).

The relationship between ESG controversies and overall ESG performance is scarcely explored in the empirical literature, so this is a new field requiring more research. One notable exception is Agnese et al. (2022), who find that companies in the banking sector show a positive and statistically significant relationship between ESG Governance (and its sub-pillars) and ESG Controversies scores. These results indicate that improved Governance performance reduces exposure to disputes in the global media regarding environmental, social and corporate governance controversies.

To assess the generalizability of the model employed by Agnese et al. (2022) we extend the framework in two directions. First, we include more and broader industries, and second, we investigate the role of ESG and all sub-pillar scores for those industries. The selection of industries is based on broadening the scope from the banking sector to the industry this sub-sector is a part of, namely the Financials industry. More industries are included in order to extend the analysis, where Energy and Technology are selected due to their positioning at opposite sides of the scale for average ESG Controversies scores, as shown in Figure 1, panel B. Collecting company lists from various stock exchanges in Europe was the first step of gathering the datasets. These lists were then reduced to only containing companies registered with ESG-data for the 10-year period 2012 – 2021. Building upon Agnese et al. (2022), several company-specific variables and one macroeconomic variable were added to the panel data structure. Finally, to analyze our datasets, a dynamic panel data regression model derived by Arellano & Bond (1991), and later improved in several scientific papers, see, for instance, Arellano & Bover (1995) and Blundell & Bond (1998), was utilized.

The remainder of this article is structured as follows: Section 2 presents a review of studies on related topics and the framework our analysis builds upon, situating our research within a broader scholarly context. Section 3 describes the data and methodology used in this specific study, and Section 4 presents the empirical results and provides a discussion. In the final section key findings from the analysis are summarized along with a conclusion. Additionally, ideas for future research within this field is presented.

2. Literature review

In recent years, the incorporation of environmental, social, and governance (ESG) information into investment decisions has emerged as a significant development within financial markets (Christensen et al., 2022). Nevertheless, considerable skepticism surrounds ESG ratings, stemming from the substantial discrepancies among rating agencies in their ESG outcome metrics, which consequently yield divergent ESG scores. The absence of an integrated reporting framework, especially outside of Europe and prior to the introduction of the European Union (EU) Corporate Sustainability Reporting Directive (CSRD) (European Commission, 2022), has resulted in significant differences in the information reported by companies. Furthermore, this is a source of mistrust on whether disclosure of information regarding responsible conduct of business has been done out of the motivation of signaling or greenwashing (Mahoney et al., 2013). In summary, there is mistrust and skepticism surrounding ESG scores, meaning that investigating these ESG scores' impact on ESG controversies could bring forth valuable insight for investors and regulators among others.

Even though there is limited research on the relationship between the ESG Controversies score and overall ESG performance, several studies focusing on ESG controversies have been conducted. For instance, numerous articles have investigated the impact of ESG controversies on firm value, whereas a consistent finding have been that ESG controversies erode profitability (Dorfleitner et al., 2020; Treepongkaruna et al., 2022; Galletta & Mazzù, 2023). However, Aouadi and Marsat (2018) observe the opposite, as they find ESG Controversies not to have a direct effect on firm value, but that it might be an indirect effect which, surprisingly, enhance firm value – because an ESG controversy drives attention to the corporate social performance, which in turn increases firm value.

Other articles examining ESG controversies reach conclusions that indicate, for instance, that prior strong E-pillar score enhances firm resilience. This, in turn, allows share prices to bounce back to pre-shock levels faster when a firm is confronted with an environmental controversy (Marsat et al., 2022). Furthermore, firms are more likely to engage in symbolic – rather than substantive – corporate social responsibility (CSR), and engagement in CSR following a controversy is positively looked upon by investors following a controversy in countries with higher levels of trust between stakeholders and firms (Li et al., 2019). An event that has been observed to lead to a significant drop in ESG controversies is an exogenous decline in shareholder litigation risk (Treepongkaruna et al., 2022). Moreover, the social and governance dimensions of ESG controversies have been found to exert the most influence on ESG controversies for EU firms (Passas et al., 2022). Additionally, Passas et al. (2022) found that ESG controversies are more likely to occur in countries with a high level of democracy.

All the mentioned articles, except Passas et al. (2022) who do not use the variable, find that firm size is an important factor regarding ESG controversies.

Agnese et al. (2022) investigate whether the Governance pillar of ESG and its sub-pillars (ESG Management, ESG Shareholders, and ESG CSR Strategy) have an impact on ESG controversies. The authors analyze 567 listed banks: 433 in the United States (U.S.) and 134 in Europe, with annual observations over the period 2016 – 2021. They use a System Generalized Method of Moments (GMM) estimator, an augmented version of the Arellano-Bond estimator. They find a positive and statistically significant relationship between the Governance pillar of ESG and the ESG Controversies score, which is supported by all the three sub-pillars of the Governance pillar. Firm size is found to have a negative and statistically significant relationship with ESG controversies, indicating that larger companies are more exposed to controversies.

3. Data and Methodology

3.1 Data

The focus of this article is on publicly listed companies in Europe within the following industries: Energy, Technology, and Financials, within the timeframe of 2012 – 2021 (latest available data). Firm data is collected from Refinitiv Eikon, based on lists of ordinary shares from each industry limited to Europe. At first, a total of 7,019 firms within the Energy industry, 20,895 within the Technology industry, and 23,409 within the Financials industry were extracted. The raw dataset contained a significant share of duplicate firms, which was deleted. The remaining sets of companies were further quality-checked for ESG data: Only companies registered with ESG Controversies score, ESG score, and each ESG sub-pillar score for every year during 2012 – 2021 were included. Ultimately, a total sample containing 238 firms was left, made up of three balanced datasets. Specifically, these datasets consist of 51 firms within the Energy industry, 61 within Technology, and 126 within Financials.

Our dependent variable is the ESG Controversies score, which is calculated based on 23 ESG controversy topics and reflects negative events in global media (Refinitiv, 2022). This means that if news regarding ESG negatively impact a given company occurs, the company is punished with a lower score. The scoring of ESG Controversies is fully automated and thereby objective. All controversy measures have a default value of 0, while the ESG Controversies score itself ranges between 1 and 100, where 100 is the score a company will get if it is not involved in any controversies during a year. The scoring system is based on a relative ranking within each industry, and it handles the market capitalization bias by dividing companies into different classes. First, the companies are divided into the classes “large” (≥ 10 billion), “mid” (≥ 2 billion), and “small” (< 2 billion), based on market capitalization. Then different severity rates are applied to calculate the score, respectively 0.33 for “large”, 0.67 for “mid” and 1.0 for “small”. The methodology behind the score calculation is based on four steps: 1) Count the number of controversies per company for the specific fiscal year, 2) multiply the number of controversies for the specific year with the severity rate based on market capitalization, 3) sort the companies within the same industry group, based on The Refinitiv Business Classification (TRBC) (Refinitiv, 2020), in descending order considering the values from step 2), and 4) apply the percentile rank formula to calculate the ESG Controversies score.

Equation 1 illustrates the percentile rank formula for calculating the ESG Controversies score for company X (Refinitiv, 2022):

$$Score\ for\ X = \frac{\#\ companies\ with\ a\ worse\ value + \frac{\#\ companies\ with\ the\ same\ value}{2}}{\#\ companies\ with\ a\ value} \tag{1}$$

This methodology means that companies defined as large are not as severely punished by a controversy as smaller companies, because the difference in media attraction is considered. Figure 2 presents the time series of the ESG Controversies score for the three industries:

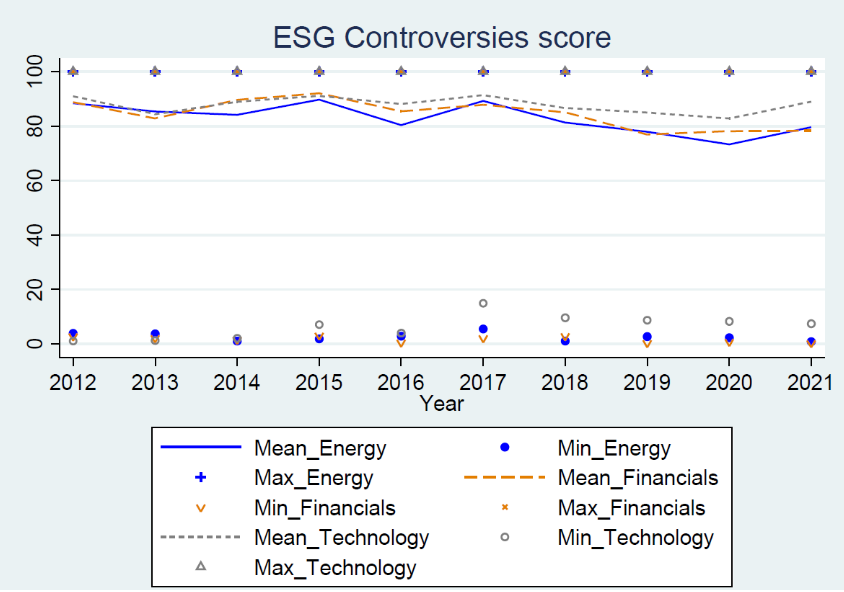

Figure 2: Time series plot of the mean, minimum, and maximum values of the ESG Controversies scores in the three datasets.

The independent variable of greatest interest in this study is the ESG score. This score measures ESG performance based on self-reported, publicly available, data (Refinitiv, 2022). More specifically, a subset of the 186 most relevant and comparable measures per industry is selected from a total of over 630 ESG metrics, and is then divided into 10 different sub-categories that form the basis for the three ESG sub-pillar scores. Figure 3 presents the time series of the ESG score for the three industries:

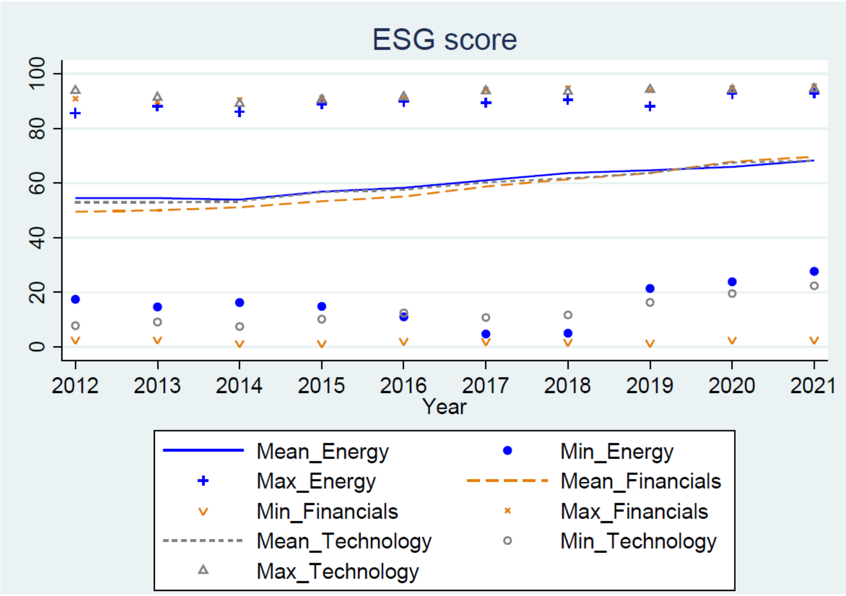

Figure 3*: Time series plot of the mean, minimum, and maximum values of the ESG scores in the three datasets.*

For robustness tests we utilize the three sub-pillars of the ESG score, namely the Environmental pillar score, the Social pillar score and the Governance pillar score. The ESG sub-pillar scores are defined as a relative sum of the category weights, which for the environmental and social categories varies per industry (Refinitiv, 2022). For the governance category, the weights are normalized to percentages ranging between 0 and 100.

To address company-specific information, we include the variables Age, Size, Debt to Equity, Return on Equity and Price to Book Value. Furthermore, we include the variable Gross Domestic Product (GDP) Growth, to account for macroeconomic conditions, and dummy variables for each year. Company-specific data is all gathered from Refinitiv database, while the macroeconomic variable GDP growth is collected from the World Bank database[2]. Company-specific data is collected as annual data based on fiscal years. For the small share of the companies that operate with deviating fiscal years, the data is adjusted to calendar years. Appendix A summarizes the definitions of all the variables taken into consideration, while

[2] World Bank Open Data website: data.worldbank.org

Table 1 presents descriptive statistics. From Figure 2 and 3, we observe that the ESG score and its sub-pillar scores range from a minimum of 0 to a maximum of nearly 100, with ESG score means over the whole time period between 58.05 – 60.18 for the different industries. The dependent variable, ESG Controversies score, has a mean of 83.95 for Energy, 87.84 for Technology and 84.51 for Financials.

3.2 Methodology

To capture whether ESG scores have an impact on different types of companies' exposure to negative media attention, we use a dynamic panel estimation. Specifically, we use the augmented version of the Arellano-Bond estimator, the orthogonal version of the System GMM estimator, which is "designed for dynamic "small-T, large-N" panels that may contain fixed effects and idiosyncratic errors that are heteroskedastic and correlated within, but not across, individuals" (Roodman, 2009a).

The Arellano-Bond estimator, also known as the first-difference GMM estimator, is a widely used dynamic panel data estimator in econometrics. It addresses the endogeneity issue arising from the inclusion of lagged dependent variables in dynamic panel data models by using the lagged values of the dependent variable as instruments (Arellano & Bond, 1991). The estimator was first developed to remove fixed effects by first-differencing the equation of a model

$$Y_{i,t} = b_1 \cdot X_{i,t} + b_2 \cdot W_{i,t} + u_{i,t} \tag{2}$$

where

$$u_{i,t} = v_i + \varepsilon_{i,t} \tag{3}$$

However, it is well known that the Arellano-Bond estimator can lead to unwanted challenges, such as weak instrument problems, overfitting, and finite sample bias. For cases where the residual has serial correlation, Arellano and Bover (1995) and Blundell and Bond (1998) improved the estimator by incorporating higher-order lags as instruments, naming it System GMM, and proposed forward orthogonal deviations transformations. In addition to removing fixed effects, orthogonal deviations have the advantage of preserving sample size in panels with gaps whenever panels are balanced, and within System GMM the levels are still instrumented with differences (Roodman, 2009a). To sum it up, Difference GMM first-differences data to eliminate fixed effects, while the System GMM estimates simultaneously both in differences and in levels.

The System GMM estimator requires the variables used in the model to be specified as strictly exogenous, predetermined, or endogenous. For this analysis, we specified the lagged dependent variable (lagged ESG Controversies score) as endogenous, and the rest of the explanatory variables as strictly exogenous. In addition to the variables mentioned in Appendix A, we also defined time dummies as strictly exogenous variables.

To improve our model, further specifications are included. If there are too many instruments compared to the sample size, instruments can overfit endogenous variables leading to invalid results. Therefore, to limit the instrument count, the command "collapse" for the endogenous variable is specified, in this way it is only one instrument for each lag distance. For proper handling of the exogenous variables, the option "equation(levels)" is included, which specifies that only the levels equation should use the instruments. Note that the two separate equations are one model, and that the first-differenced equation is just a transformation of the level equation. Furthermore, the commands "robust" and "two-step" are used as these trigger Windmeijer's finite-sample correction for the covariance matrix, which adjusts the standard errors to be consistent in the presence of heteroskedasticity and any pattern of autocorrelation within panels (Roodman, 2009b). See Appendix C for the specific Stata command syntaxes.

When employing the system GMM estimator, there are several diagnostic tests that need to be conducted and verified in order to validate the results. The first one to be reported is the Arellano-Bond test for autocorrelation, which is applied to the differenced residuals to remove the unobserved and perfectly autocorrelated v_i (Roodman, 2009b). Autocorrelation is expected in first differences (AR(1)), but not in levels which is indicated by the AR(2) test for differences. In other words, it is expected to have low ρ values for AR(1) tests, and large ρ values for AR(2) tests. If autocorrelation is present, some lags can become invalid as instruments.

Other assessments are the Sargan and Hansen tests, who report over-identifying restrictions of whether the instruments, as a group, appear exogenous – validating the instrument sets and thereby says something about whether the model is dynamically complete (Roodman, 2009b). The Sargan test is the minimized value of the one-step GMM criterion function, while the Hansen test (also named "J test") is the minimized value of the two-step GMM. Note that the Sargan test is not robust to heteroskedasticity or autocorrelation, but the Hansen test is. The reason the Sargan test is run in two-step system GMM estimations, is because the Hansen test can be greatly weakened by instrument proliferation. However, when employing a two-step system GMM the Sargan test results should not be interpreted since it does not use an optimal weighting matrix. The Hansen test does use an optimal weighting matrix; therefore, we focus on the Hansen test results regarding the validity of the instrument sets. For the Hansen test, ρ values above 0.25 might be viewed as potential signs of trouble. Also, note that the Hansen test becomes unreliable if the instrument count is too large compared to the number of groups.

The difference-in-Hansen test can be used to test the validity of additional instruments, because it explains the needed mean stationarity for the level instruments to be valid (Roodman, 2009b). This test can be interpreted if the Hansen test excluding a group of instruments does not reject the null hypothesis ($\rho \leq 0.05$). However, this test is only necessary for instruments if their inclusion requires justification (e.g. AR(2) has a ρ value < 0.1).

To check for multicollinearity, we have set up correlation matrixes with all variables for each industry, see Appendix B. The overall result is that there are, not surprisingly, high levels of correlation between ESG and the sub-pillars (> 0.7) for all the industries except Energy, where the correlation for the Governance pillar is less than 0.7.

Our models are as follows (for the syntax used in Stata see Appendix C):

Model 1:

$$ESGC_t = \alpha_i + \rho ESGC_{t-1} + \beta_1 Age_{it} + \beta_2 Size_{it} + \beta_3 Debt/Equity_{it} + \beta_4 ROE_{it} + \beta_5 Price/(Book\ value)_{it} + \beta_6 GDP\ growth_{it} + \delta_t + \varepsilon_{it} \quad (4)$$

Model 2:

$$ESGC_t = \alpha_i + \rho ESGC_{t-1} + \beta_1 ESG_{it} + \beta_2 Age_{it} + \beta_3 Size_{it} + \beta_4 Debt/Equity_{it} + \beta_5 ROE_{it} + \beta_6 Price/(Book\ value)_{it} + \beta_7 GDP\ growth_{it} + \delta_t + \varepsilon_{it} \quad (5)$$

Model 3:

$$ESGC_t = \alpha_i + \rho ESGC_{t-1} + \beta_1 Environmental\ Pillar_{it} + \beta_2 Age_{it} + \beta_3 Size_{it} + \beta_4 Debt/Equity_{it} + \beta_5 ROE_{it} + \beta_6 Price/(Book\ value)_{it} + \beta_7 GDP\ growth_{it} + \delta_t + \varepsilon_{it} \quad (6)$$

Model 4:

$$ESGC_t = \alpha_i + \rho ESGC_{t-1} + \beta_1 Social\ Pillar + \beta_2 Age_{it} + \beta_3 Size_{it} + \beta_4 Debt/Equity_{it} + \beta_5 ROE_{it} + \beta_6 Price/(Book\ value)_{it} + \beta_7 GDP\ growth_{it} + \delta_t + \varepsilon_{it} \quad (7)$$

Model 5:

$$ESGC_t = \alpha_i + \rho ESGC_{t-1} + \beta_1 Governance\ Pillar_{it} + \beta_2 Age_{it} + \beta_3 Size_{it} + \beta_4 Debt/Equity_{it} + \beta_5 ROE_{it} + \beta_6 Price/(Book\ value)_{it} + \beta_7 GDP\ growth_{it} + \delta_t + \varepsilon_{it} \quad (8)$$

Table 1:
Descriptive statistics of the datasets for the following industries: Energy, Technology and Financials.
For the definition of the variables, see Appendix A.

	ESG Controversies	**ESG**	**Environmental Pillar**	**Social Pillar**	**Governance Pillar**	**Size**	**Age**	**Debt to Equity**	**Return on Equity**	**Price to Book**	**Price to Cash Flow (only Appendix D)**	**GDP growth rate**
Energy												
Mean	82.95	60.18	57.91	63.14	58.60	23.40	34.01	217.86	11.93	10.65	15.15	1.41
St.dev	30.34	17.75	21.26	21.71	23.43	2.16	25.87	2611.17	84.37	217.53	127.95	3.38
Min	0.88	4.78	0.00	4.50	7.04	20.02	2	0	-268.88	-376.62	0.16	-11.33
Max	100	92.96	96.21	95.57	98.56	30.43	132	58245.83	1695.35	4848.96	2758.82	11.35
Obs	510	510	510	510	510	510	510	498	485	500	471	510
Technology												
Mean	87.84	59.50	54.36	63.49	57.45	22.65	34.80	95.90	37.50	0.38	13.65	1.46
St.dev	25.03	19.67	24.67	23.43	21.52	2.03	29.42	132.09	191.69	182.17	15.90	3.22
Min	1.09	7.52	0	2.16	5.18	17.47	2	0	-64.35	-4365.54	0.73	-11.33
Max	100	94.59	96.45	98.2	98.25	27.97	156	1245.45	2604.97	705.85	134.09	11.35
Obs	610	610	610	610	610	610	610	588	561	610	582	610
Financials												
Mean	84.51	58.05	60.83	59.34	58.77	25.30	53.70	184.17	9.05	1.43	16.97	1.70
St.dev	28.93	20.66	28.01	22.97	22.44	2.16	48.04	269.91	38.65	1.86	46.17	3.79
Min	0.42	1.53	0	0.12	2.41	17.71	1	-0.58	-1047.25	-0.52	0.04	-11.33
Max	100	95.43	99.15	98.5	97	30.95	238	5291.24	127.98	30.12	810.98	24.37
Obs	1260	1260	1260	1260	1260	1260	1260	1255	1093	1220	934	1260

4. Results – Empirical Analysis and Discussion

4.1 Results

Our results demonstrate that, despite cross-industry differences, common ground is found where an increase in overall sustainability performance increases the exposure to negative attention regarding ESG controversies in global media, ceteris paribus. The robustness tests from the three sub-pillars of ESG support the negative and statistically significant relationship by two out of three sub-pillars within the Energy (E- and S-pillar) and Financials industry (S- and G-pillar).

4.1.1 Results for ESG Score

Model 1 is our benchmark model and explains the ESG Controversies score, hereby ESGC, using the previous years' ESGC, as well as the firm-specific variables Age, Size, Debt-to-Equity, Return on Equity, Price-to-Book value, and the macroeconomic variable GDP growth (GDPg). Model 2 extends Model 1 by including the ESG score, hence it tests the impact of general ESG performance on exposure to ESG controversies.

Overall, the estimation outputs indicate that there is a negative relationship between a company's overall sustainability performance and its exposure to adverse media coverage. Revealing that an increase in ESG performance leads to an increase in exposure to ESG controversies. This relationship is statistically significant for two out of the three industries, namely Energy and Financials. As expected, the Arellano-Bond test for AR(1) in first differences reveals significant autocorrelation in the first order differenced residuals for all models, while the AR(2) tests does not show significant autocorrelation. This is the desired results regarding autocorrelation. The Hansen test results show a satisfying ρ value, despite returning above 0.25 for Energy and Technology, as the instrument count is significantly lower than the number of groups. We do not interpret the Sargan statistics because we employ a two-step system GMM estimator. The estimation outputs from these two models are presented in Table 2, and the coefficient estimates with corresponding confidence intervals are plotted in Figure 4, 5, and 6.

For companies within the *Energy industry*, we find a negative and statistically significant relationship between the ESG score and the ESG Controversies score (at 5 % significance level). This indicates that an increase in an energy company's ESG score increases its exposure to negative attention in global media. We also find that the lagged ESG Controversies score has a positive and statistically significant (at 5% significance level) coefficient, indicating that an increase in exposure to ESGC in the previous year tends to lead to an increase in exposure in the current year.

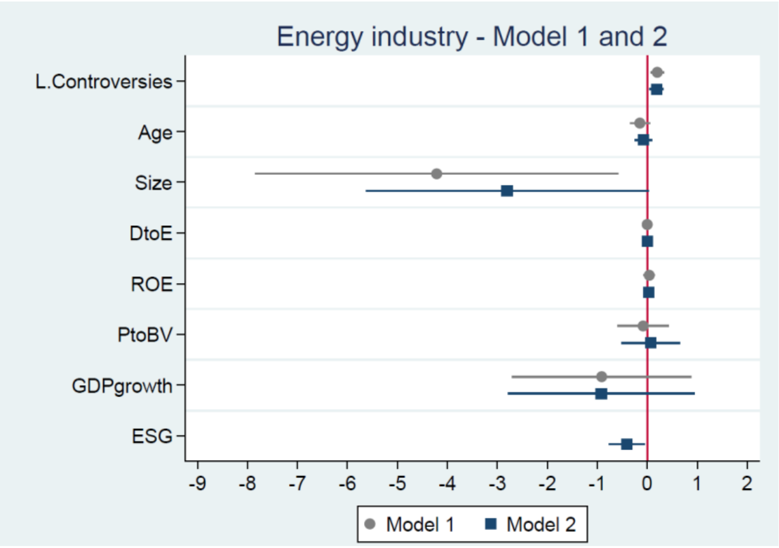

Figure 4*: Plot of the coefficient estimates with corresponding 95 % confidence intervals for the explanatory variables in model 1 and 2 for the Energy industry.*

The relationship between the ESG score and the ESGC score for companies in the *Technology industry* found in Model 2 is also negative, but not statistically significant (ρ value = 0.101). We do, however, find a positive and statistically significant relationship between the lagged ESGC score and the ESGC score, albeit at the 10% level of significance (ρ value = 0.078 for Model 1 and 0.069 for Model 2).

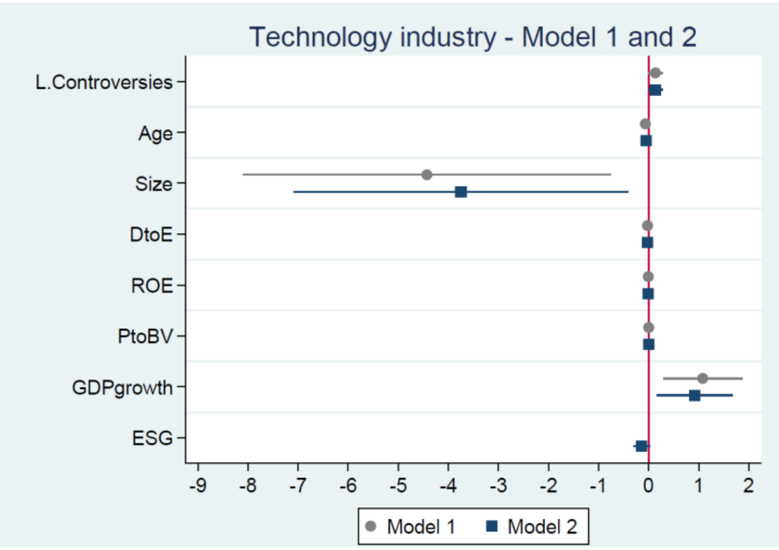

Figure 5*: Plot of the coefficient estimates with corresponding 95 % confidence intervals for the explanatory variables in model 1 and 2 for the Technology industry.*

From our selection of companies from the *Financials industry* we find a similar and statistically significant relationship between the ESG score and the ESGC score at the same level as for the Energy industry (5 %). Unlike the Energy industry we do not find a statistically significant relationship between the dependent variable and the lagged dependent variable for Financials in Model 2 (ρ value = 0,111), although the observed relationship is positive.

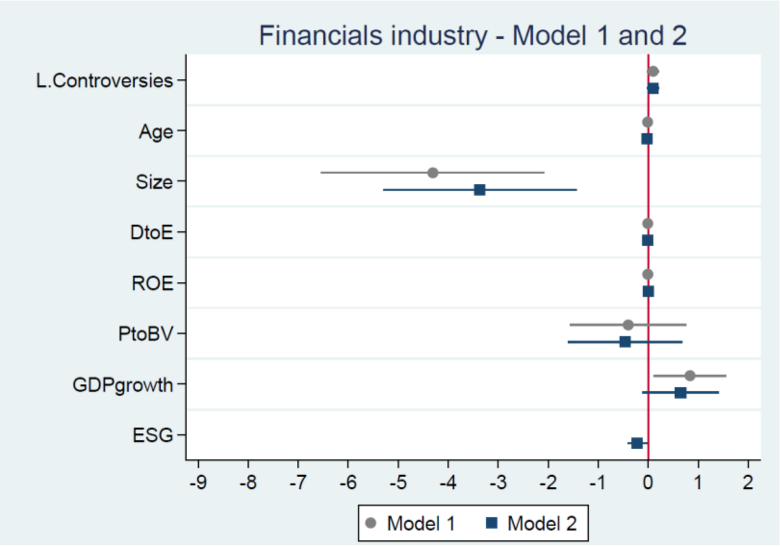

Figure 6*: Plot of the coefficient estimates with corresponding 95 % confidence intervals for the explanatory variables in model 1 and 2 for the Financials industry.*

4.1.2 Results for ESG Sub-Pillar Scores

To amplify our results, we run additional estimations with Models 3, 4, and 5, where we replace the overall ESG score with each sub-pillar score as explanatory variables: In Model 3 the ESG score is replaced by the Environmental pillar score, for Model 3 and 4 it is replaced by the Social- and Governance pillar scores respectively.

Overall, we observe that the negative relationship between the ESG score and the ESGC score is supported by a negative relationship between all ESG sub-pillars and the ESGC score for all three industries. However, our results do not show statistically significant relationships for every sub-pillar in all industries. The results also reinforce the observed influence of size from Model 1 and 2, as the relationship between size and the dependent variable is negative and statistically significant at minimum 5% significance level for all models, even at 1% for the Financials industry. With regards to the diagnostic tests AR(1), AR(2), and Hansen, the results for Models 3, 4, and 5 are interpreted like for Models 1 and 2, and yield satisfying ρ values here as well. Table 3 presents the estimation outputs from these models, while the coefficient estimates with corresponding confidence intervals are plotted in Figure 7, 8, and 9.

In the *Energy industry* the relationship between the ESG sub-pillars and the ESGC score is negative for all three sub-pillars, and statistically significant for the Environmental pillar and the Social pillar, at respectively 10% (ρ value = 0,051) and 5% significance level. Our results do not show a statistically significant ρ value for the Governance pillar (ρ value = 0.111). The lagged ESGC score has a positive coefficient and is statistically significant at 1% level for these models.

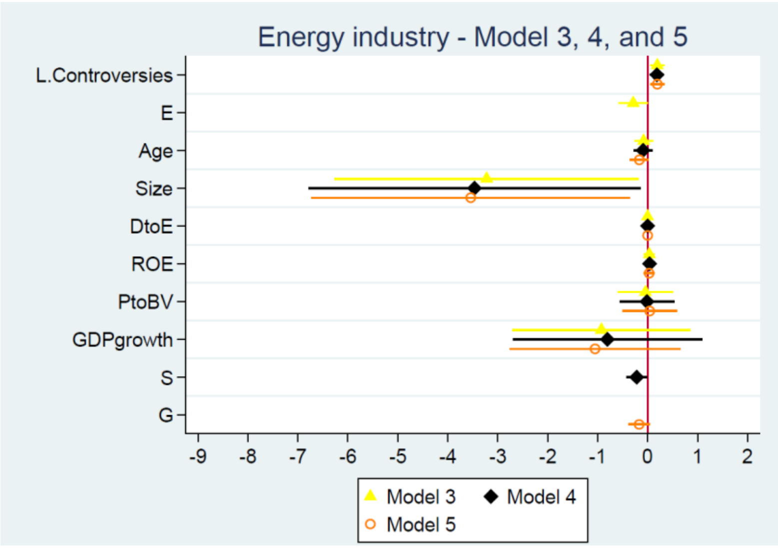

Figure 7: *Plot of the coefficient estimates with corresponding 95 % confidence intervals for the explanatory variables in model 3, 4, and 5 for the Energy industry.*

The estimation outputs for the *Technology industry*, show that none of the models with the ESG sub-pillars as explanatory variables are statistically significant between one or more of the sub-pillar scores and the ESGC score, supporting the result from Model 2. The coefficients for each sub-pillar are also negative, like the one for the overall ESG score in Model 2. For this industry the lagged ESGC score is statistically significant at 10% level for all the three models as seen in Table 3, with the following ρ values: 0.069 for the Environmental-, 0.083 for the Social-, and 0.059 for the Governance pillar.

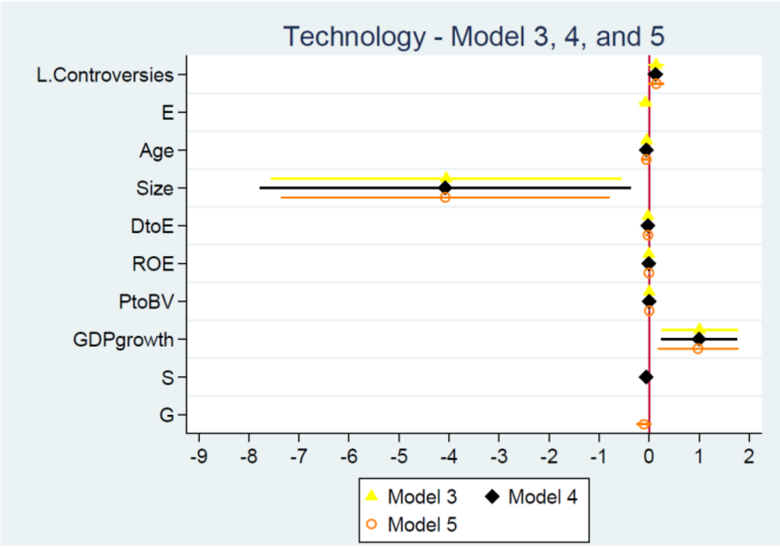

Figure 8: *Plot of the coefficient estimates with corresponding 95 % confidence intervals for the explanatory variables in model 3, 4, and 5 for the Technology industry.*

For the *Financials industry*, these results show no statistically significant relationships between the ESGC score and the lagged ESGC score for Model 3 (ρ value = 0.124) and Model 4 (ρ value = 0.113), while Model 5 is statistically significant at 10 % level (ρ value = 0.083). From the output of Model 3 we observe that the coefficient for the Environmental pillar is negative, although not statistically significant (ρ value = 0.120). On the contrary, the Social- and Governance pillars are statistically significant at 10 % level (ρ value = 0.054 for Social and 0.076 for Governance), both with negative coefficients which support the estimation results from Model 2 for financials.

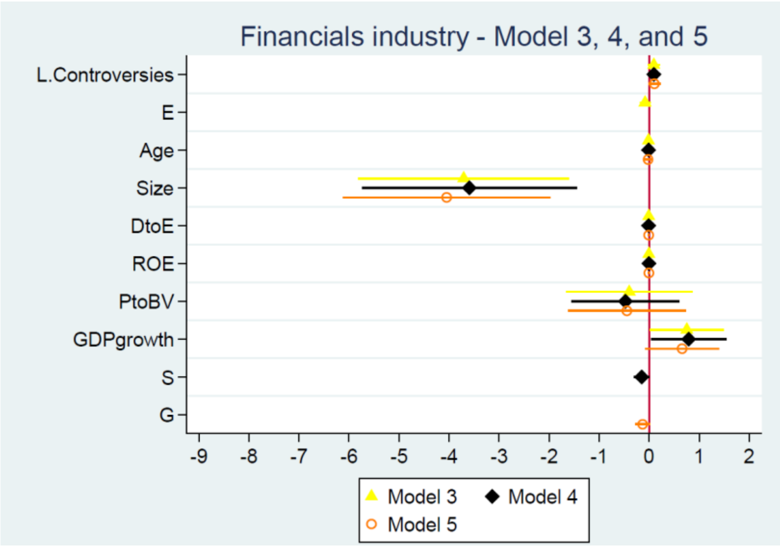

Figure 9: *Plot of the coefficient estimates with corresponding 95 % confidence intervals for the explanatory variables in model 3, 4, and 5 for the Financials industry.*

***Table 2**:*
Results for model 1 and 2 for each industry. This table lists all coefficient estimates, with standard errors in parentheses below, and level of ρ value for all independent variables. ρ values are listed for the diagnostic tests. Level of statistical significance indicated by "", where: "*" = ρ < 0,1, "**" = 0,01 < ρ < 0,05, and "***" = 0,05 < ρ < 0,10.*
For the definition of the variables, see Appendix A.

	Energy (Model 1)	**Energy (Model 2)**	**Technology (Model 1)**	**Technology (Model 2)**	**Financials (Model 1)**	**Financials (Model 2)**
Lagged ESG Controversies score	0,199 (0,067)***	0,184 (0,074)**	0,135 (0,077)*	0,135 (0,074)*	0,099 (0,059)*	0,097 (0,061)
ESG score		-0,411 (0,182)**		-0,138 (0,084)		-0,219 (0,097)**
Age	-0,149 (0,101)	-0,074 (0,089)	-0,066 (0,043)	-0,048 (0,043)	-0,011 (0,033)	-0,020 (0,031)
Size	-4,214 (1,853)**	-2,805 (1,443)*	-4,429 (1,875)**	-3,747 (1,703)**	-4,307 (1,139)***	-3,367 (0,986)***
Debt to Equity	-0,0005 (0,0001)***	-0,0004 (0,0001)***	-0,023 (0,018)	-0,026 (0,019)	-0,009 (0,009)	-0,009 (0,009)
Return on Equity	0,039 (0,058)	0,032 (0,053)	-0,008 (0,004)*	-0,006 (0,004)*	-0,009 (0,010)	-0,001 (0,012)
Price to Book Value	-0,083 (0,262)	0,065 (0,297)	0,001 (0,0006)*	0,001 (0,0007)**	-0,399 (0,593)	-0,463 (0,582)
GDP Growth	-0,912 (0,913)	-0,921 (0,954)	1,080 (0,403)***	0,921 (0,387)**	0,836 (0,368)**	0,646 (0,389)*
Constant	155,289 (45,811)***	148,563 (37,228)***	187,533 (42,819)***	179,883 (39,422)***	189,731 (31,273)***	180,222 (28,803)***
Time dummies	YES	YES	YES	YES	YES	YES
AR(1)	0,000***	0,000***	0,001***	0,001***	0,000***	0,000***
AR(2)	0,351	0,483	0,615	0,605	0,864	0,910
Sargan test	0,316	0,241	0,065*	0,084*	0,002***	0,001***
Hansen test	0,359	0,377	0,331	0,358	0,157	0,123
Number of observations	416	416	484	484	958	958
Number of groups	50	50	56	56	117	117
Number of instruments	24	25	24	25	24	25

Table 3:
Results for model 3, 4 and 5 for each industry. This table lists all coefficient estimates, with standard errors in parentheses below, and level of ρ value for all independent variables. ρ values are listed for the diagnostic tests. Level of statistical significance indicated by "", where: "*" = ρ < 0,1, "**" = 0,01 < ρ < 0,05, and "***" = 0,05 < ρ < 0,10.*
For the definition of the variables, see Appendix A.

	Energy (Model 3)	**Energy (Model 4)**	**Energy (Model 5)**	**Technology (Model 3)**	**Technology (Model 4)**	**Technology (Model 5)**	**Financials (Model 3)**	**Financials (Model 4)**	**Financials (Model 5)**
Lagged ESG Controversies score	0,192 (0,072)***	0,187 (0,071)***	0,193 (0,070)***	0,139 (0,077)*	0,129 (0,075)*	0,142 (0,076)*	0,093 (0,060)	0,095 (0,059)	0,104 (0,060)*
Environmental Pillar score	-0,289 (0,148)*			-0,071 (0,060)			-0,083 (0,053)		
Social Pillar score		-0,219 (0,106)**			-0,058 (0,053)			-0,148 (0,077)*	
Governance Pillar score			-0,169 (0,106)			-0,104 (0,073)			-0,129 (0,073)*
Age	-0,080 (0,095)	-0,091 (0,094)	-0,167 (0,094)*	-0,049 (0,047)	-0,057 (0,044)	-0,058 (0,039)	-0,013 (0,033)	-0,012 (0,031)	-0,021 (0,032)
Size	-3,221 (1,549)**	-3,467 (1,694)**	-3,540 (1,625)**	-4,057 (1,787)**	-4,077 (1,889)**	-4,075 (1,675)**	-3,707 (1,074)***	-3,595 (1,094)***	-4,048 (1,056)***
Debt on Equity	-0,0005 (0,0001)***	-0,0004 (0,0001)***	-0,0005 (0,0001)***	-0,023 (0,019)	-0,025 (0,019)	-0,024 (0,018)	-0,009 (0,009)	-0,009 (0,009)	-0,009 (0,009)
Return to Equity	0,035 (0,056)	0,039 (0,053)	0,030 (0,056)	-0,007 (0,004)*	-0,008 (0,004)**	-0,006 (0,004)*	-0,006 (0,009)	-0,003 (0,011)	-0,006 (0,012)
Price to Book Value	-0,044 (0,279)	-0,012 (0,277)	0,041 (0,276)	0,001 (0,0006)*	0,001 (0,0006)*	0,002 (0,0009)**	-0,396 (0,645)	-0,474 (0,546)	-0,445 (0,599)
GDP Growth	-0,927 (0,909)	-0,803 (0,966)	-1,052 (0,867)	1,008 (0,386)***	0,999 (0,386)***	0,976 (0,412)**	0,753 (0,377)**	0,789 (0,385)**	0,659 (0,379)*
Constant	148,481 (38,947)***	153,066 (41,927)***	151,570 (43,549)***	181,868 (40,829)***	183,549 (42,508)***	184,849 (39,651)***	179,851 (29,631)***	181,896 (29,717)***	191,167 (31,372)***
Time dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES
AR(1)	0,000***	0,000***	0,000***	0,001***	0,001***	0,001***	0,000***	0,000***	0,000***
AR(2)	0,456	0,391	0,437	0,579	0,623	0,611	0,909	0,878	0,900
Sargan test	0,297	0,298	0,224	0,070*	0,074*	0,082*	0,002***	0,002***	0,002***
Hansen test	0,351	0,408	0,364	0,366	0,337	0,352	0,139	0,158	0,141
Number of observations	416	416	416	484	484	484	958	958	958
Number of groups	50	50	50	56	56	56	117	117	117
Number of instruments	25	25	25	25	25	25	25	25	25

4.2 Discussion

Our results are consistent with earlier research on the relationship between firm size and the ESG Controversies score, by being negative and statistically significant (Agnese et al., 2022; Dorfleitner et al., 2020; Treepongkaruna et al., 2022; Galletta & Mazzù, 2023). I.e., even though the calculation of the ESG Controversies (ESGC) score addresses the market capitalization bias our results show that larger companies, although in our case measured by total assets and not market capitalization, are more exposed to negative coverage in global media.

Based on Agnese et al. (2022) we expected that an increase in sustainability performance, measured by the ESG score, decreases exposure to negative media attention. However, this expectation was not supported in our results. In fact, our results state the opposite: An increase in ESG score increases exposure to negative media attention, ceteris paribus. A possible reason for this might be the tendency that European companies have higher ESG scores and lower ESGC scores than the world average (see Figure 1). Since the majority of the dataset used by Agnese et al. (2022) is made up of U.S. listed banks (76.4 % to be exact), they have less fluctuations in their data. Furthermore, their dataset is significantly larger than our dataset. However, at best the share of ESG observations is 55.4 %[3] of total observations in their dataset. Another reason for different results might be that they had three more, bank-specific, variables in their analysis. In our analysis we did not include industry-specific variables, only company-specific, in order to see if the model could be generalized. We did, however, run estimations for all models within the Energy industry where "Price to Cash Flow per share" was included as an explanatory variable. The inclusion of this ratio is due to its frequent adoption in valuations among analysts for energy companies. Moreover, a significant share of the earnings of companies in this industry often relies on raw materials, whose market price normally fluctuate cyclically. This inclusion did not change the existing results to any great extent, and neither was the multiple statistically significant itself. See Appendix D for estimation outputs. Nevertheless, this does not mean that other industry-/sector-specific variables will not improve the model.

The goal of this study is not to seek causality, merely to set focus on the correlation: An increase in ESG score causes a decrease in ESGC score (indicating more controversies). One could, however, wonder if the positive correlation in Agnese et al. (2022) could be due to the U.S.

[3] Calculation is based on descriptive statistics from Agnese et al. (2022): $\frac{Greatest\ \#\ of\ ESG\ observations}{Greatest\ \#\ of\ observations} = \frac{1886}{3402}$

market seeing an increase in ESG scores as signaling, and that our results indicate that the European market see it as a sign of greenwashing. Anyhow, discussions related to that is beyond the scope of this study.

There are some limitations to this study. One is that we aimed for balanced datasets, because it reduces the noise introduced by heterogeneity. By strictly limiting the dataset to companies who was registered with ESG-related scores (ESGC, ESG + sub-pillars) for every year between 2012 – 2021, several companies were excluded, and the datasets got significantly smaller. However, generally it is not a problem for GMM estimation to have random missing values in between data, especially if one use forward-orthogonal deviations instead of first differences since it retains more information when the panel data has gaps (Kripfganz, 2019). As mentioned in the methodology chapter the system GMM model is designed for "small T and large N" panels, and in this case the amount of N might be a concern for our panels. In total, this may limit the strength of our results.

Another limitation is that our dependent variable, the ESG Controversies score, is set to 100 if a company is not involved in any ESG controversies during a year. A rating like this leads to it, by its own scoring method, being less exposed to fluctuations. Trying to explain the variations over time in a variable like this may cause a "no variation bias", in which no explanatory variables will turn out as statistically significant because the dependent variable itself does not fluctuate. However, published articles, for instance Agnese et al. (2022) and Treepongkaruna et al. (2022), also use the ESG Controversies score as dependent variable. From the descriptive statistics of our dataset, shown in Table 1, we observe that the mean of the ESGC score in our data is in the region 83.95 – 87.51, with a standard deviation of 25.03 – 30.34.

Furthermore, the system GMM estimator is complex, which leads to the risk of misspecification. There are several options one can choose to include in the syntax, and the model can easily generate invalid estimates if "wrong" options are used (Roodman, 2009b). In Section 3.2 we explained why we specified the syntax model as we did, and in Appendix C we present it.

At last, as earlier discussed, it is a potential limitation of this study that we do not include other industry-specific control variables in our models.

5. Conclusion

In this article we examine whether ESG scores have an impact on different type of companies' exposure to negative media attention regarding ESG topics. We extend the framework introduced by Agnese et al. (2022) in two directions to assess the generalizability of it. First, we include more and broader industries, namely Energy, Technology, and Financials. Second, we investigate the role of ESG and its sub-pillar scores for those industries.

Our results indicate that although there are some cross-industry differences in significance levels, an increase in ESG score increases exposure to negative media attention, measured through ESG Controversies, regarding ESG topics, ceteris paribus. This is confirmed by the sub-pillars of ESG. However, only the E- and S- pillar is statistically significant within Energy, and S- and G- pillar within Financials. Within Technology, the same negative relationship is observed but the effect is not strong enough to be assertive about. These results contradict Agnese et al. (2022), who find a positive relationship stating that an increase in Governance pillar score leads to less ESG Controversies. Regarding firm size and ESG Controversies, our results are consistent with earlier research.

For further research on topics regarding ESG Controversies we suggest adapting the set of control variables to each specific industry or sector, and perhaps allow an unbalanced panel dataset to receive a larger sample size. Furthermore, including geographical areas to investigate whether that plays a role in if an increase in ESG score is interpreted as signaling or greenwashing by the media could be an idea. Also, adding an ESG score uncertainty measure, based on scoring disagreement between different rating agencies, could highlight differences between companies with high and low uncertainty.

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Appendix

Appendix A – Variables included in the econometric analysis

Variables		Source
Dependent variable		
ESG Controversies Score	Measures a company's exposure to environmental, social and governance controversies and negative events reflected in global media.	Refinitiv Eikon
Variables of interest		
ESG Score	Measures the company's ESG performance based on verifiable reported data in the public domain.	Refinitiv Eikon
Environmental Pillar Score	Measures a company's impact on living and non-living natural systems, including the air, land, and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities to generate long term shareholder value.	Refinitiv Eikon
Social Pillar Score	Measures a company's capacity to generate trust and loyalty with its workforce, customers, and society, through its best use of management practices. It reflects the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value.	Refinitiv Eikon
Governance Pillar Score	Measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long-term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances to generate long term shareholder value.	Refinitiv Eikon
Company specific variables		
Company Market Cap	Represents the sum of market value for all relevant issue level share types. The issue level market value is calculated by multiplying the requested shares type by latest closing price. This item supports Default, Free Float and Outstanding share types. The default shares type is the most widely reported outstanding of shares for a market and it is most issued, Outstanding, or Listed shares.	Refinitiv Eikon
Size	Is measured as the natural logarithm of total assets.	Refinitiv Eikon
Age	Is the referenced year minus the year in the collected data for Date of Incorporation.	Refinitiv Eikon
Debt to Equity	Is the ratio of Total Debt as the end of the fiscal period to Total Equity for the same period and is expressed as percentage.	Refinitiv Eikon
Return on Equity	Is the company's actual value normalized to reflect the I/B/E/S default currency and corporate actions (e.g., stock splits). ROE is a profitability ratio calculated by dividing a company's net income by total equity of common shares.	Refinitiv Eikon
Price to Book ratio	Is calculated by dividing the company's latest closing Price by its Book Value per share. Book Value per share is calculated by dividing Total Equity from latest fiscal period by Current Total Shares Outstanding	Refinitiv Eikon
Price to Cash Flow ratio	Is calculated by dividing the company's LTM Cash Flow from Operating activities by its Current shares Outstanding. Price to Cash Flow Per Share is not calculated when LTM Cash Flow from Operating activities is less than or equal to zero.	Refinitiv Eikon
Country variables		
GDP growth rates	Reflects the annual percentage growth rate of GDP at market prices based on constant local currency.	World Bank Database

Appendix B – Correlation matrix for all the variables used in the econometric analysis

Industry	Variables	ESG Controversies	ESG	E	S	G	Age	Size	Debt to Equity	ROE	Price to Book Value	GDP growth
Energy	ESG Controversies	1.0000										
	ESG	-0.4205	1.0000									
	E	-0.3420	0.8817	1.0000								
	S	-0.3600	0.8945	0.7566	1.0000							
	G	-0.3053	0.5885	0.2978	0.2715	1.0000						
	Age	-0.2178	0.3801	0.3191	0.4037	0.1454	1.0000					
	Size	-0.3485	0.3720	0.3523	0.3117	0.2156	-0.0413	1.0000				
	Debt to Equity	-0.0304	0.0127	-0.0005	0.0402	-0.0177	-0.0126	-0.0603	1.0000			
	ROE	0.0267	-0.0438	-0.0691	-0.0201	-0.0213	-0.1056	0.0645	-0.0745	1.0000		
	Price to Book Value	0.0908	-0.0483	-0.0949	-0.0434	0.0324	-0.0699	-0.1755	-0.0035	0.5453	1.0000	
	GDP growth	0.0684	-0.0904	-0.0780	-0.0774	-0.0615	-0.1110	0.0509	-0.0167	0.1752	0.0035	1.0000
Technology	ESG Controversies	1.0000										
	ESG	-0.3555	1.0000									
	E	-0.3370	0.8471	1.0000								
	S	-0.3050	0.9012	0.7663	1.0000							
	G	-0.2379	0.7588	0.4886	0.4641	1.0000						
	Age	-0.1130	0.2056	0.2274	0.2004	0.1378	1.0000					
	Size	-0.4469	0.5104	0.4996	0.5060	0.2674	0.0063	1.0000				
	Debt to Equity	-0.2195	0.1285	0.2092	0.0931	0.0533	-0.0287	0.3142	1.0000			
	ROE	0.0618	-0.0850	-0.1124	-0.1690	0.0334	-0.1028	-0.2737	-0.0388	1.0000		
	Price to Book Value	-0.0060	0.0497	0.0252	0.0331	0.0592	0.0167	0.0451	0.0241	-0.1553	1.0000	
	GDP growth	0.0986	-0.0882	-0.0821	-0.0741	-0.0783	-0.0458	0.0379	-0.0513	0.0321	-0.0196	1.0000
Financials	ESG Controversies	1.0000										
	ESG	-0.3658	1.0000									
	E	-0.3050	0.7407	1.0000								
	S	-0.3218	0.8895	0.6976	1.0000							
	G	-0.2536	0.7597	0.3291	0.4325	1.0000						
	Age	-0.0620	-0.0244	-0.0099	0.0683	-0.1248	1.0000					
	Size	-0.3864	0.5054	0.5994	0.5119	0.2315	0.0267	1.0000				
	Debt to Equity	-0.1939	0.1440	0.2066	0.1006	0.0805	0.0555	0.3068	1.0000			
	ROE	0.0129	0.0255	0.0092	0.0114	0.0209	-0.0533	-0.0604	-0.0078	1.0000		
	Price to Book Value	0.1025	-0.1739	-0.1982	-0.2037	-0.0641	-0.1125	-0.3427	-0.0293	0.2493	1.0000	
	GDP growth	0.0739	-0.0774	-0.0334	-0.0192	-0.1194	0.0401	0.0268	-0.0250	0.0412	0.0219	1.0000

Appendix C – Syntax used in the Stata commands

Model 1:

xtabond2 Controversies L.Controversies Age Size DtoE ROE PtoBV GDPgrowth i.Year, twostep robust orthogonal gmm(L.Controversies, split collapse) iv(Age Size DtoE ROE PtoBV GDPgrowth i.Year, eq(level))

Model 2:

xtabond2 Controversies L.Controversies ESG Age Size DtoE ROE PtoBV GDPgrowth i.Year, twostep robust orthogonal gmm(L.Controversies, split collapse) iv(ESG Age Size DtoE ROE PtoBV GDPgrowth i.Year, eq(level))

Model 3:

xtabond2 Controversies L.Controversies E Age Size DtoE ROE PtoBV GDPgrowth i.Year, twostep robust orthogonal gmm(L.Controversies, split collapse) iv(ESG Age Size DtoE ROE PtoBV GDPgrowth i.Year, eq(level))

Model 4:

xtabond2 Controversies L.Controversies S Age Size DtoE ROE PtoBV GDPgrowth i.Year, twostep robust orthogonal gmm(L.Controversies, split collapse) iv(ESG Age Size DtoE ROE PtoBV GDPgrowth i.Year, eq(level))

Model 5:

xtabond2 Controversies L.Controversies G Age Size DtoE ROE PtoBV GDPgrowth i.Year, twostep robust orthogonal gmm(L.Controversies, split collapse) iv(ESG Age Size DtoE ROE PtoBV GDPgrowth i.Year, eq(level))

Appendix D – "Price to Cash flow" included in the models for the Energy industry

Results for model 1, 2, 3, 4, and 5 for the energy industry when "Price to Cash flow ratio" is included as an explanatory variable. This table lists all coefficient estimates, with standard errors in parentheses below, and level of ρ value for all independent variables. Level of statistical significance indicated by "", where: "*" = ρ < 0,1, "**" = 0,01 < ρ < 0,05, and "***" = 0,05 < ρ < 0,10.*

For the definition of the variables, see Appendix A.

	Energy (Model 1)	**Energy (Model 2)**	**Energy (Model 3)**	**Energy (Model 4)**	**Energy (Model 5)**
Lagged ESG Controversies score	0,256 (0,068)***	0,237 (0,074)***	0,248 (0,073)***	0,235 (0,071)***	0,257 (0,071)***
ESG score		-0,396 (0,184)**			
Environmental Pillar score			-0,256 (0,145)*		
Social Pillar score				-0,234 (0,107)**	
Governance Pillar score					-0,165 (0,118)
Age	-0,140 (0,079)*	-0,098 (0,074)	-0,106 (0,079)	-0,104 (0,078)	-0,154 (0,077)**
Size	-4,255 (2,079)**	-2,713 (1,549)*	-3,084 (1,701)*	-3,368 (1,816)*	-3,623 (1,843)**
Debt to Equity	-0,001 (0,0001)***	-0,0005 (0,0001)***	-0,0005 (0,0001)***	-0,0004 (0,0001)***	-0,0006 (0,0001)***
Return on Equity	0,036 (0,066)	0,039 (0,0602)	0,029 (0,063)	0,046 (0,063)	0,035 (0,062)
Price to Book Value	-0,149 (0,273)	-0,039 (0,278)	-0,125 (0,275)	-0,092 (0,277)	-0,049 (0,270)
Price to Cash Flow	-0,0001 (0,002)	0,003 (0,003)	0,003 (0,003)	0,002 (0,002)	0,001 (0,003)
GDP Growth	-0,641 (1,037)	-0,867 (1,024)	-0,799 (1,014)	-0,703 (1,061)	-0,824 (0,962)
Constant	173,675 (44,635)***	164,756 (35,806)***	162,244 (37,050)***	169,042 (39,421)***	171,787 (43,329)***
Time dummies	YES	YES	YES	YES	YES
AR(1)	0,000***	0,000***	0,000***	0,000***	0,000***
AR(2)	0,376	0,457	0,460	0,435	0,365
Sargan test	0,340	0,209	0,220	0,300	0,265
Hansen test	0,247	0,283	0,209	0,328	0,271
Number of observations	390	390	390	390	390
Number of groups	50	50	50	50	50
Number of instruments	25	26	26	26	26

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