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ESG AND STOCK RETURN VOLATILITY: EVIDENCE FROM INDUSTRY ANALYSIS IN EUROPE

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Abstract. This study investigates the impact of environmental, social and governance factors on stock return volatility in different European industries. Employing a sample of European companies belonging to different industries (Basic Materials, Consumer Cyclicals, Consumer Non-Cyclicals, Energy, Financials, Healthcare, Industrials, Real Estate, Technology and Utilities), I tested if ESG performance and ESG controversies influence volatility. Additionally, the study analyses the impact of the individual Environmental, Social and Governance pillars of ESG to determine through which component ESG affects volatility. Research findings showed that ESG factors impact stock return volatility across industries. The findings of the study contribute to and enrich the academic literature in this field through an industry analysis.

1. Introduction

In the academic literature, ESG factors are used more to investigate their impact on financial performance and less on financial risk. Previous studies found a direct, inverse or insignificant influence of ESG on volatility in the context of a specific industry (Jo and Na 2012; Tasnia et al. 2020; Shakil 2021) and specific countries (Sassen et al. 2016; Meher et al. 2020). Existing multi-industry research focusses on the relationship between ESG and financial performance or stock return (Sanches Garcia et al. 2017; Diaz et al. 2021; Iazzolino et al. 2023). This study aims to answer two research questions and provide additional evidence on the impact of ESG factors on volatility through multi-industry analysis. The research questions are as follows: (1) The impact of ESG controversies on stock return volatility is different between industries? (2) Does ESG performance have a different impact on the volatility of stock returns in different industries?

In this context, this study investigates the impact of environmental, social and governance factors on stock return volatility in different European industries. Employing a sample of 1095 European companies from different industries (Basic Materials, Consumer Cyclicals, Consumer Non-Cyclicals, Energy, Financials, Healthcare, Industrials, Real Estate, Technology and Utilities), I tested if ESG performance and ESG controversies influence volatility. The reason for choosing these two ESG measures is to fully understand the phenomenon of environmental, social and governance factors from both a positive (ESG performance) and a negative perspective (ESG controversies). On the one hand, the ESG performance score reflects how well a company uses best management practices with respect to environmental, social, and governance issues in order to generate long-term shareholder value. On the other hand, the ESG controversies score is a reflection of the company's exposure to environmental, social and governance controversies and negative events reflected in media.

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Additionally, the study analyses the impact of the individual Environmental, Social and Governance pillars of ESG to determine through which component ESG affects volatility. This analysis covers the period 2019-2022. Research findings showed that ESG factors impact stock return volatility across industries. The ESG score has a direct impact on Basic Materials, Consumer Non-Cyclicals, Financials, Healthcare, Real Estate and Technology. However, the ESG scores have an opposite impact on Energy. This means strong ESG initiatives induce share price stability in the Energy industry. Since the Energy industry is very important for the world economy, companies from this industry should strengthen their ESG strategies to safeguard against share price volatility. Companies managers, especially in the Energy industry, should devise strategies for the transition to renewable energy sources, emission reduction and waste management.

Furthermore, the ESG controversies score has a significantly direct effect on Industrials and Utilities. Industrials and Utilities are highly exposed to reputational risks, since these companies provide critical infrastructure services for society. For this reason, Industrials and Utilities companies are exposed to attention and pressure from customers and communities.

Moreover, considering the findings for the Environmental, Social, and Governance pillars along with the sign of the ESG score, it can be concluded which pillar is driving the relationship for Basic Materials, Consumer Non-Cyclicals, Energy, Healthcare, Real Estate and Technology. The direct impact of ESG on Basic Materials is attributed to the direct effect of the Social pillar.

Furthermore, the direct effect of Environmental and Governance explains the direct ESG impact on Consumer Non-Cyclicals. The Energy industry is inversely affected by Environmental and Social. This is consistent with the overall inverse impact of the ESG score. Healthcare is the only industry directly affected by all the ESG pillars. The direct effect of ESG on Real Estate is attributed to the direct effect of the Social and Governance pillars. Governance is the sole driver for the ESG results of Technology.

The study findings add evidence of the impact of ESG factors on the volatility of stock returns in the European context through industry analysis, enriching the academic literature in this field. Furthermore, these results will help investors pay attention to ESG and its pillars in investment decisions, as some industries are more sensitive to ESG factors than others.

In recent years, the interest in environmental, social and governance factors has grown among investors, companies and regulators alike. As corporate and investment practices progress, investors are increasingly considering ESG performance in their investment decisions (Shakil 2021). Furthermore, the interest of companies in ESG factors had increased since the European Union issued a directive in 2014, which stipulated the importance of companies divulging information on sustainability such as social, environmental and governance issues (Liu et al. 2022). In fact, ESG factors have become an integral part of the competitive strategy of an increasing number of companies (Iazzolino et al. 2023).

The popularity of ESG factors has increased in the academic literature. Previous studies found a significant influence of ESG on financial performance (Cai et al. 2012; Di Giuli and Kostovetsky 2014; Gao and Zhang 2015; Cornett et al. 2016; Han et al. 2016; Ferrel et al. 2016; Velte 2017; Buallay 2018; Fatemi et al. 2018; Aboud and Diab 2019; Azmi et al. 2021; Wong et al. 2021; Egorova et al. 2022; Liu et al. 2022; Iazzolino et al. 2023), stock return (Hong and Kacperczyk 2009; Meher et al. 2020; Bolton and Kacperczyk 202; Diaz et al. 2021; Ferrat et al. 2022; Luo 2022) and volatility (Jo and Na 2012; Sassen et al. 2016; Meher et al. 2020; Tasnia et al. 2020; Shakil 2021). Furthermore, previous studies found significant evidence of the influence of ESG controversy on volatility (Krüger 2015; Shakil 2021), financial performance (Nirino et al. 2021), market value (Aouadi and Marsat 2018; Melinda and Wardhani 2020; Nirino et al. 2021), and cost of equity (La Rosa and Bernini 2022).

This study differs from the existing literature by analysing the impact of ESG on volatility across several industries (Basic Materials, Consumer Cyclicals, Consumer Non-Cyclicals, Energy, Financials, Healthcare, Industrials, Real Estate, Technology and Utilities). Although

the previous literature analyses the relationship between ESG and financial performance, stock return and volatility, only a few studies conduct a multi-industry analysis (Sanches Garcia et al. 2017; Diaz et al. 2021; Iazzolino et al. 2023). Some studies focus on examining the relationship in specific countries (Han et al. 2016; Sassen et al. 2016; Velte 2017; Meher et al. 2020), others on a specific industry (Jo and Na 2012; Tasnia et al. 2020; Shakil 2021). The existing literature reports that companies with higher ESG scores have better stock returns (Hong and Kacperczyk 2009; Edmans 2011; Diaz et al. 2021; Ferrat et al. 2022) and lower volatility (Jo and Na 2012; Sassen et al. 2016; Shakil 2021; Zhou and Zhou 2022).

In terms of the topic of this study, previous literature found a direct or inverse influence of ESG on volatility. Jo and Na (2012) analysed the impact of corporate social responsibility (CSR) on volatility in controversial industries (alcohol, tobacco, gambling, military, firearms, cement, oil, and biotech) from US, during 1991-2010. The authors found that CSR affected inverse volatility. Similarly, Sassen et al. (2016) showed that social performance had a significantly inverse impact on volatility in Europe during 2002-2014. Consistent with the studies mentioned above are the findings of Zhou and Zhou (2022). The authors found that the volatility of companies with good ESG performance is lower than that of companies with poor performance. In contrast, Tasnia et al. (2020) found a significant and direct relationship between the ESG score and stock price volatility for US banks from 2013 to 2017.

A study by Shakil (2021) examined the impact of ESG performance and ESG controversies on financial risk for 70 oil and gas companies around the world during 2010-2018. To measure financial risk, the author used the volatility of the stock price as a proxy of total risk and the beta of the market as a proxy for systematic risk. The study findings showed a significant inverse effect of ESG performance on total risk, but an insignificant effect of ESG on systematic risk. Additionally, the study found a moderating effect of ESG controversies on the relationship between ESG performance and total risk. A previous event study by Krüger (2015) found similar results regarding the negative reaction of investors to negative CSR news, particularly for communities and environmental news. Additionally, Shackleton et al. (2022) found evidence that companies' efforts on environmental and social activities increased in response to worse stock market performance. Finally, Li et al. (2023) showed that the stock return is negatively related to ESG ratings.

Based on the prior literature, the following conclusion may be drawn. Previous studies found direct, inverse or insignificant influence of ESG on volatility in the context of specific industries and countries. The purpose of this study is to provide additional evidence to the existing literature on the impact of ESG factors on volatility through multi-industry analysis.

The remainder of the paper is structured as follows. Section 1 describes data and methodology, going into detail about data and variable selection. Section 2 presents and discusses the results. Finally, the last section concludes.

2. Data and Methodology

2.1. **Data.** The sample consists of ESG ratings and financial data from 1095 European companies during 2019-2022. Data are obtained from Thomson Reuters database. The initial sample considered for the analysis consisted of all listed European companies that were included in the Thomson Reuters database. Of the initial sample, companies from Bulgaria, Slovakia, Ukraine, Iceland, Lithuania, Estonia, Serbia, Montenegro, Macedonia, and Croatia were eliminated due to the absence of ESG ratings in the Thomson Reuters database, so the sample was reduced to 23 countries for which I have identified a reasonable level of data. The criteria for a company to be included in the sample were whether its ESG scores were available. This availability issue limits the sample number to 1095 companies. Table 1, the geographical distribution of companies shows that the sample is predominantly from Germany, France, Switzerland and Sweden, with almost 50% of the companies headquartered there. For this analysis, I considered the most recent available data from 2019 to 2022.

Table 1. Classification of companies by country

Country	Companies	
	Number	Percent
Austria	32	2.92
Belgium	45	4.11
Cyprus	2	0.18
Czech Republic	3	0.27
Denmark	42	3.84
Finland	33	3.01
France	134	12.24
Germany	157	14.34
Greece	25	2.28
Hungary	5	0.46
Ireland	45	4.11
Italy	78	7.12
Luxembourg	23	2.10
Malta	4	0.37
Netherlands	67	6.12
Norway	44	4.02
Poland	36	3.29
Portugal	13	1.19
Romania	2	0.18
Slovenia	1	0.09
Spain	65	5.94
Sweden	116	10.59
Switzerland	123	11.23
Total	1095	100.00

For industry categories, Thomson Reuters Business Classification (TRBC) was used, which covers 13 economic industries (Appendix 1). Table 2 shows the classification of companies by industry. The top three industries represented were Industrials, Financials, and Consumer Cyclicals, which together comprised almost 50% of the observations. Only one company from the database provides Academic and Educational Services, so this industry is removed from the analysis.

As can be seen in the prior literature, volatility is measured by the annual standard deviation of daily stock returns (Jo and Na 2012; Shakil 2021). To calculate volatility, I obtained a series of daily closing prices for the period from 2 January 2019 to 29 December 2022 from the Thomson Reuters database.

Independent variables of interest in this study are ESG controversies score, ESG score, ESG combined score, Environmental pillar score, Social pillar score and Governance pillar score. Additionally, other company-specific variables (dividend yield, return on assets, leverage, size and market value to book value of equity) are selected according to previous studies (Jo and Na 2012; Sassen et al. 2016; Tasnia et al. 2020; Shakil 2021). The financial data required for the calculation of company-specific variables was obtained from Thomson Reuters's company financial reports. All variables used in the study are defined in Table 3, with symbols and calculation descriptions.

Table 4 presents the descriptive statistics for the entire sample. There are 4380 company-year observations from 1095 companies during the period 2019-2022. The average volatility is 33.2%, while the minimum is 6.9%. In terms of environmental, social and governance factors,

Table 2. Classification of companies by industry

Industry	Companies	
	Number	Percent
Academic and Educational Services	1	0.09
Basic Materials	98	8.95
Consumer Cyclicals	158	14.43
Consumer Non-Cyclicals	75	6.85
Energy	48	4.38
Financials	159	14.52
Healthcare	103	9.41
Industrials	220	20.09
Real Estate	62	5.66
Technology	127	11.60
Utilities	44	4.02
Total	1095	100.00

Table 3. Variables

Variable	Symbol	Description
Volatility	VOL	Annual standard deviation of daily stock returns. Daily stock returns were calculated as the natural logarithm of the price on day t over the price on day t-1.
ESG controversies score	ESGCON	Measures a company's exposure to environmental, social, and governance controversies and negative events reflected in media (provided by Thomson Reuters).
ESG combined score	ESGCOMB	Is an overall company score based on the reported information in the environmental, social, and governance pillars (ESG Score) with an ESG Controversies overlay (provided by Thomson Reuters).
ESG score	ESG	Is an overall company score based on the self-reported information in the environmental, social, and governance pillars (provided by Thomson Reuters).
Environmental pillar score	ENV	Measures the impact of a company on living and non-living natural systems (provided by Thomson Reuters).
Social pillar score	SOC	Measures a company's capacity to generate trust and loyalty with its workforce, customers, and society (provided by Thomson Reuters).
Governance pillar score	GOV	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 (provided by Thomson Reuters).
Dividend yield	DY	Dividend per share/price per share
Return on assets	ROA	Income after taxes/total assets
Leverage	LEV	Long-term debt/total assets
Size	SIZE	Natural logarithm of total assets
Market to book value of equity	MTB	Market value of equity/book value of equity

the average ESG controversies score is 90.672 and varies between 0.439 and 100. The average ESG combined score is 56.144. The maximum ESG combined score is 94.157 and the minimum is 1.417. The average ESG score is 58.597 and varies between 1.417 and 95.422. The environmental, social and governance pillars have average values of 54.562, 63.807 and 57.717.

Regarding the control variables, the average dividend yield is 2.3%. The average ROA is 3.1% and the average leverage is 20.9%. Size and market to book value of equity mean values are approximately 5.2 billion USD and 3.142, respectively.

Table 4. Descriptive Statistics for the entire sample

Variable	Obs	Mean	Std. Dev.	Min	Max
VOL	4380	0.332	0.171	0.069	4.135
ESGCON	4380	90.672	22.81	0.439	100
ESGCOMB	4380	56.144	18.326	1.417	94.157
ESG	4380	58.597	19.378	1.417	95.422
ENV	4380	54.562	26.201	0	99.169
SOC	4380	63.807	21.301	0.432	98.294
GOV	4380	57.717	21.532	2.422	98.733
DY	4380	0.023	0.041	0	0.2
ROA	4380	0.031	0.122	-2.942	1.718
LEV	4380	0.209	0.158	0	1.125
SIZE	4380	22.372	1.963	0.007	28.743
MTB	4380	3.142	3.881	0.001	47.106

The sector-level findings, as summarised in Table 5, suggest that Energy (46.6%), Healthcare (37.6%) and Consumer Cyclicals (35.3%) were the three industries with the highest average volatility, while Consumer Non-Cyclicals (28.3%), Real Estate (29.7%) and Utilities (29.7%) were the three lowest. The ESG score ranges from 1.417 (Consumer Cyclicals) to 95.422 (Financials). Energy (62.829), Utilities (62.273) and Basic Materials (62.211) were the three industries with the highest average ESG score, whereas Real Estate (56.083), Healthcare (56.653) and Financials (56.658) were the three lowest. In terms of the ESG controversies score, the highest three industries were Real Estate (99.420), Technology (92.352) and Healthcare (92.066).

The Environmental pillar score ranges from 0 (Basic Materials, Consumer Cyclicals, Financials, Healthcare, Industrials, Real Estate, Technology) to 99.169 (Industrials). The top three industries with the highest average Environmental pillar score were Utilities (63.441), Basic Materials (61.763) and Energy (61.546). Regarding the Social pillar, Energy (67.550), Basic Materials (66.532) and Consumer Cyclicals (65.474) were the three industries with the highest average score. The average Governance pillar scores for Basic Materials (62.823), Energy (60.174) and Consumer Non-Cyclicals (60.071) were the highest score across the industries.

Table 5. Descriptive Statistics by Industry

Industry	**VOL**	**ESGCON**	**ESGCOMB**	**ESG**	**ENV**	**SOC**	**GOV**
Panel A: Mean							
Basic Materials	0.316	90.953	60.011	62.211	61.763	66.532	62.823
Consumer Cyclicals	0.353	90.667	57.410	59.915	58.105	65.474	56.461
Consumer Non-Cyclicals	0.283	91.081	58.094	60.153	59.326	62.330	60.071
Energy	0.466	83.040	58.104	62.829	61.546	67.550	60.174
Financials	0.301	86.952	52.915	56.658	49.136	59.360	59.313
Healthcare	0.376	92.066	54.335	56.653	45.167	65.609	56.236
Industrials	0.330	92.026	55.389	57.385	54.972	64.662	54.134
Real Estate	0.297	99.420	55.963	56.083	54.965	61.141	53.728
Technology	0.332	92.352	56.054	57.832	49.704	63.155	60.050
Utilities	0.297	83.708	58.017	62.273	63.441	63.571	59.182
Panel B: Standard deviation							
Basic Materials	0.110	21.515	18.616	19.251	22.606	20.059	22.109
Consumer Cyclicals	0.149	23.256	18.337	19.362	24.536	21.948	21.419
Consumer Non-Cyclicals	0.121	21.281	15.926	16.658	21.929	19.881	18.920
Energy	0.302	30.100	16.597	17.484	18.779	20.080	21.971
Financials	0.104	26.349	19.224	21.392	32.252	22.764	22.997

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Table 5 – *Continued from previous page*

Industry	VOL	ESGCON	ESGCOMB	ESG	ENV	SOC	GOV
Healthcare	0.232	22.305	18.594	19.779	29.164	22.052	20.827
Industrials	0.156	21.462	18.778	19.479	24.728	20.877	22.160
Real Estate	0.152	5.198	18.720	18.815	26.114	19.683	19.708
Technology	0.120	19.451	16.830	18.065	22.871	20.669	19.876
Utilities	0.311	28.998	18.371	18.941	24.706	21.533	20.188
Panel C: Max							
Basic Materials	1.298	100	93.338	93.338	97.501	95.713	96.809
Consumer Cyclicals	1.505	100	92.653	93.826	98.899	97.195	97.768
Consumer Non-Cyclicals	1.003	100	90.867	91.384	97.955	97.202	95.979
Energy	2.219	100	92.231	92.231	96.345	94.738	95.263
Financials	1.014	100	92.535	95.422	98.995	96.804	96.926
Healthcare	2.444	100	92.719	95.043	94.256	97.711	96.351
Industrials	2.664	100	93.713	94.300	99.169	98.294	95.046
Real Estate	1.584	100	91.015	91.015	97.503	95.550	95.118
Technology	1.214	100	94.157	94.593	94.616	97.449	98.733
Utilities	4.135	100	89.476	92.845	98.924	96.412	96.770
Panel D: Min							
Basic Materials	0.129	2.308	4.87	4.87	0	0.432	4.063
Consumer Cyclicals	0.095	1.282	1.417	1.417	0	0.700	3.842
Consumer Non-Cyclicals	0.112	2.778	15.801	15.801	1.620	11.206	11.827
Energy	0.132	4.717	16.184	16.184	7.666	12.247	9.477
Financials	0.116	0.439	1.742	1.742	0	0.589	2.688
Healthcare	0.077	0.735	3.77	3.77	0	2.040	4.933
Industrials	0.069	1.429	5.845	5.845	0	3.540	2.422
Real Estate	0.119	37.500	9.964	9.964	0	10.278	10.247
Technology	0.116	6.522	11.17	11.17	0	6.390	8.783
Utilities	0.098	4.545	9.009	9.009	2.775	3.791	9.439

2.2. **Methodology.** To investigate the impact of ESG factors on stock return volatility, panel regression was applied as in Jo and Na (2012), Tasnia et al. (2020), and Shakil (2021). These authors applied ordinary least squares (OLS) and fixed effects panel regression. The regression models are as follows:

$$\text{VOL}_{it} = \alpha + \beta_1 \times \text{DY}_{it} + \beta_2 \times \text{ROA}_{it} + \beta_3 \times \text{LEV}_{it} + \beta_4 \times \text{SIZE}_{it} + \beta_5 \times \text{MTB}_{it} + \epsilon_{it} \tag{1}$$

$$\text{VOL}_{it} = \alpha + \beta_1 \times \text{ESGCON}_{it} + \beta_2 \times \text{DY}_{it} + \beta_3 \times \text{ROA}_{it} + \beta_4 \times \text{LEV}_{it} + \beta_5 \times \text{SIZE}_{it} + \beta_6 \times \text{MTB}_{it} + \epsilon_{it} \tag{2}$$

$$\text{VOL}_{it} = \alpha + \beta_1 \times \text{ESGCOMB}_{it} + \beta_2 \times \text{DY}_{it} + \beta_3 \times \text{ROA}_{it} + \beta_4 \times \text{LEV}_{it} + \beta_5 \times \text{SIZE}_{it} + \beta_6 \times \text{MTB}_{it} + \epsilon_{it} \tag{3}$$

$$\text{VOL}_{it} = \alpha + \beta_1 \times \text{ESG}_{it} + \beta_2 \times \text{DY}_{it} + \beta_3 \times \text{ROA}_{it} + \beta_4 \times \text{LEV}_{it} + \beta_5 \times \text{SIZE}_{it} + \beta_6 \times \text{MTB}_{it} + \epsilon_{it} \tag{4}$$

$$\text{VOL}_{it} = \alpha + \beta_1 \times \text{ENV}_{it} + \beta_2 \times \text{DY}_{it} + \beta_3 \times \text{ROA}_{it} + \beta_4 \times \text{LEV}_{it} + \beta_5 \times \text{SIZE}_{it} + \beta_6 \times \text{MTB}_{it} + \epsilon_{it} \tag{5}$$

$$\text{VOL}_{it} = \alpha + \beta_1 \times \text{SOC}_{it} + \beta_2 \times \text{DY}_{it} + \beta_3 \times \text{ROA}_{it} + \beta_4 \times \text{LEV}_{it} + \beta_5 \times \text{SIZE}_{it} + \beta_6 \times \text{MTB}_{it} + \epsilon_{it} \tag{6}$$

$$\text{VOL}_{it} = \alpha + \beta_1 \times \text{GOV}_{it} + \beta_2 \times \text{DY}_{it} + \beta_3 \times \text{ROA}_{it} + \beta_4 \times \text{LEV}_{it} + \beta_5 \times \text{SIZE}_{it} + \beta_6 \times \text{MTB}_{it} + \epsilon_{it} \tag{7}$$

where: VOL – volatility, ESGCON – ESG controversies score, ESGCOMB – ESG combined score, ESG – ESG score, ENV – Environmental pillar score, SOC – Social pillar score, GOV – Governance pillar score, DY – dividend yield, ROA – return on assets, LEV – leverage, SIZE – size, MTB – market to book value of equity, α – the intercept, β_j – the regression coefficients (j – factor), i – the company, t – the year index, ϵ – the error term.

To select an appropriate panel regression model (fixed effect model or random effect model), the Hausman test was performed. The results of the Hausman test (Table 6) show that the probability (p-value) for each model is less than 0.05, so a fixed effects model is more suitable to show the relationship between ESG and volatility.

Table 6. Hausman specification test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Chi-square test value	300.64	346.69	339.65	337.92	305.29	316.49	312.02
P-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The matrix of correlations (Table 7), as expected, shows strong correlations between ESG factors. However, the correlation between other variables does not indicate a multicollinearity problem.

Table 7. Matrix of correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) VOL	1											
(2) ESGCON	.007	1										
(3) ESGCOMB	-.113	.072	1									
(4) ESG	-.115	-.299	.916	1								
(5) ENV	-.158	-.278	.762	.840	1							
(6) SOC	-.126	-.251	.809	.878	.731	1						
(7) GOV	-.026	-.207	.636	.696	.418	.454	1					
(8) DY	-.116	-.030	.050	.062	.058	.042	.050	1				
(9) ROA	-.325	.046	.083	.062	.105	.072	.002	.101	1			
(10) LEV	.062	-.019	.096	.094	.095	.073	.081	-.051	-.062	1		
(11) SIZE	-.189	-.425	.371	.519	.516	.442	.331	.124	.061	.015	1	
(12) MTB	-.046	.089	.002	-.030	-.064	.004	-.014	-.103	.169	-.038	-.263	1

Before performing the multi-industry analysis, multicollinearity, heteroskedasticity, and autocorrelation are verified to avoid possible problems. The following tests were used: Variance Inflation Factor (for the existence of multicollinearity), White test (for the existence of heteroskedasticity), and Runtest (for the existence of autocorrelation). First, the Variance Inflation Factor (VIF) was calculated to test for multicollinearity (Table 8). The VIF is below the level suggested by the rules of 4 or 10, indicating that multicollinearity is not a problem in regression models.

Table 8. Variance inflation factor

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VIF	VIF	VIF	VIF	VIF	VIF	VIF	
ESGCON	1.231						
ESGCOMB		1.191					
ESG			1.408				
ENV				1.396			
SOC					1.276		
GOV						1.140	
DY	1.036	1.037	1.037	1.036	1.036	1.036	1.037
ROA	1.058	1.066	1.061	1.059	1.065	1.059	1.059
LEV	1.007	1.007	1.019	1.019	1.020	1.014	1.014
SIZE	1.097	1.337	1.280	1.517	1.486	1.382	1.238
MTB	1.127	1.128	1.139	1.145	1.133	1.147	1.136
Mean VIF	1.065	1.134	1.121	1.197	1.189	1.152	1.104

Second, the White test (Table 9) shows that the probability values are less than 0.05 and indicates the presence of heteroskedasticity in the residuals. To correct heteroskedasticity, robust standard errors were used in regressions.

Table 9. White test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Chi-square test value	63.21	66.39	67.68	69.10	73.93	78.39	79.22
P-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Finally, Runtest was used to check for possible autocorrelation problems (Table 10). The probability value does not indicate a serial correlation. All of the above-mentioned tests have

been applied to each regression model and industry and obtained similar results. Consequently, the estimation method used was fixed effects and robust standard error.

Table 10. Runtest

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
z	.4	.61	.61	.64	.4	.4	.61
Prob > |z|	.69	.54	.64	.64	.69	.4	.54

3. Results

Table 11 presents the regression results of Equation (1). This model tests the impact of control variables on volatility. Dividend yield has a significantly direct impact on Basic Materials, Consumer Cyclicals, Financials and Industrials. This result is contrary to Shakil (2021) for oil and gas firms and Tasnia et al. (2021) for banks.

Return on assets has an inverse effect on Basic Materials, Energy, Financials, Healthcare and Utilities. This result is similar to the findings of (Jo and Na 2012) for controversial industries; the authors explain this result in terms of the fact that a higher return on assets means a profitable company which is associated with lower volatility. However, it has a direct impact on Industrials.

Leverage has an inverse effect on Consumer Cyclicals, Industrials, Real Estate, Technology and Utilities, as in Tasnia et al. (2021) and a direct effect on Healthcare. Size affects direct Consumer Non-Cyclicals, Energy, Industrials, Real Estate and Technology, contrary to Jo and Na (2012). Market to book value of equity has a direct effect on Energy. However, it has an opposite impact on Basic Materials, Consumer Cyclicals and Financials, as in Shakil (2021) and Tasnia et al. (2021).

Table 11. Impact of control variables on volatility

Industry	**DY**	**ROA**	**LEV**	**SIZE**	**MTB**	**cons**	**Obs.**	**R-sq.**
Basic Materials	.425*	-.208***	0.055	-0.003	-.008**	.397***	392	0.07
	(.217)	(.064)	(.089)	(.005)	(.004)	(.12)		
Consumer Cyclicals	.429**	-0.132	-.223***	0.004	-.017***	0.356	632	0.086
	(.182)	(.096)	(.059)	(.025)	(.005)	(.559)		
Consumer Non-Cyclicals	0.067	0.062	0.06	.084***	-0.001	-1.612**	300	0.062
	(.438)	(.152)	(.103)	(.03)	(.006)	(.671)		
Energy	0.645	-.241***	-0.11	.024*	.028**	-0.122	192	0.123
	(.703)	(.083)	(.179)	(.014)	(.011)	(.342)		
Financials	.693***	-.109*	0.029	-0.005	-.012***	0.416	636	0.072
	(.136)	(.058)	(.084)	(.014)	(.005)	(.333)		
Healthcare	-0.302	-.597***	.298***	-0.012	-0.005	0.599	412	0.225
	(2.188)	(.078)	(.102)	(.032)	(.003)	(.696)		
Industrials	.553***	.21***	-.239***	.012**	-0.002	0.111	880	0.11
	(.132)	(.036)	(.066)	(.005)	(.003)	(.12)		
Real Estate	0.304	-0.307	-.587***	.201***	0.029	-4.026***	248	0.221
	(.26)	(.199)	(.157)	(.049)	(.03)	(1.122)		
Technology	0.054	-0.128	-.235***	.128***	0.003	-2.418***	508	0.186
	(.046)	(.08)	(.06)	(.016)	(.002)	(.353)		
Utilities	-1.034	-1.581**	-3.753***	-0.048	0.005	2.498	176	0.613
	(.897)	(.721)	(.292)	(.07)	(.031)	(1.695)		

Robust standard errors are in parentheses.
*** p < .01, ** p < .05, * p < .1.

As shown in Table 12, the ESG controversies score has a significantly direct effect on Industrials and Utilities. Industrials (composed of Aerospace and Defence Machinery, Tools, Heavy Vehicles, Trains and Ships, Construction and Engineering, Freight and Logistics Services, Passenger Transportation Services, Transport Infrastructure) and Utilities (composed of Electric Utilities and Independent Power Producers, Natural Gas Utilities, Water and Related Utilities) industries are sensitive to ESG controversies and negative events reflected in media. Thus, a

high ESG controversies score may indicate a low capacity of a company to mitigate shareholder risks (Diaz et al. 2021). Investors can perceive ESG controversies as a sign of poor management, leading to a decline in investor confidence, which can negatively impact stock prices. Industrials and Utilities are highly exposed to reputational risks, since these companies provide critical infrastructure services for society. For this reason, Industrials and Utilities companies are exposed to attention and pressure from customers and communities.

TABLE 12. Impact of ESG controversies score on volatility

Industry	**DY**	**ROA**	**LEV**	**SIZE**	**MTB**	**ESG CON**	**cons**	**R-sq.**
Basic Materials	.433**	-.218***	.052	-.003	-.007*	.0	.354***	.078
	(.216)	(.064)	(.088)	(.005)	(.004)	(.0)	(.122)	
Consumer Cyclicals	.431**	-.136	-.222***	.005	-.017***	.0	.332	.087
	(.182)	(.096)	(.059)	(.025)	(.005)	(.0)	(.56)	
Consumer Non-Cyclicals	.067	.062	.06	.084***	-.001	.0	-1.613**	.062
	(.44)	(.153)	(.103)	(.03)	(.006)	(.0)	(.675)	
Energy	.643	-.24***	-.111	.024	.028**	.0	-.096	.123
	(.705)	(.083)	(.18)	(.014)	(.012)	(.001)	(.353)	
Financials	.695***	-.11*	.028	-.004	-.012***	.0	.368	.076
	(.136)	(.058)	(.084)	(.014)	(.005)	(.0)	(.335)	
Healthcare	-.395	-.597***	.303***	-.011	-.005	.001	.521	.227
	(2.193)	(.078)	(.102)	(.032)	(.003)	(.001)	(.705)	
Industrials	.552***	.209***	-.234***	.012**	-.002	.001**	.052	.117
	(.132)	(.036)	(.065)	(.005)	(.003)	(.0)	(.123)	
Real Estate	.305	-.307	-.592***	.199***	.029	-.001	-3.882***	.222
	(.261)	(.199)	(.158)	(.049)	(.03)	(.002)	(1.155)	
Technology	.054	-.128	-.235***	.128***	.003	.0	-2.415***	.186
	(.046)	(.08)	(.06)	(.017)	(.002)	(.0)	(.371)	
Utilities	-1.13	-1.711**	-3.693***	-.048	-.003	.002*	2.366	.625
	(.888)	(.716)	(.291)	(.07)	(.031)	(.001)	(1.677)	

Robust standard errors are in parentheses.
*** p < .01, ** p < .05, * p < .1.

Going further, the ESG combined score (as can be seen in Table 13) has a significantly direct impact on Basic Materials, Consumer Non-Cyclicals, Financials, Healthcare, Industrials and Real Estate.

TABLE 13. Impact of ESG combined score on volatility

Industry	**DY**	**ROA**	**LEV**	**SIZE**	**MTB**	**ESG COMB**	**cons**	**R-sq.**
Basic Materials	.454**	-.227***	.06	-.002	-.006	.001***	.298**	.094
	(.214)	(.064)	(.088)	(.005)	(.004)	(.0)	(.123)	
Consumer Cyclicals	.431**	-.135	-.224***	.002	-.016***	.00	.404	.086
	(.182)	(.096)	(.059)	(.026)	(.005)	(.001)	(.571)	
Consumer Non-Cyclicals	.117	.072	.067	.066**	-.002	.001*	-1.28*	.078
	(.436)	(.151)	(.102)	(.032)	(.006)	(.001)	(.689)	
Energy	.598	-.231***	-.114	.021	.026**	-.003	.095	.142
	(.698)	(.082)	(.178)	(.014)	(.011)	(.002)	(.362)	
Financials	.699***	-.111*	.013	-.009	-.011**	.001***	.473	.086
	(.135)	(.057)	(.083)	(.014)	(.005)	(.0)	(.331)	
Healthcare	-.342	-.585***	.295***	-.039	-.004	.003***	.973	.25
	(2.156)	(.077)	(.1)	(.033)	(.003)	(.001)	(.696)	
Industrials	.573***	.212***	-.248***	.012**	-.001	.001**	.052	.117
	(.132)	(.036)	(.065)	(.005)	(.003)	(.0)	(.123)	
Real Estate	.356	-.214	-.637***	.149***	.036	.003***	-3.064***	.262
	(.254)	(.196)	(.154)	(.051)	(.029)	(.001)	(1.137)	
Technology	.053	-.131	-.232***	.125***	.003	.00	-2.38***	.189
	(.046)	(.08)	(.06)	(.016)	(.002)	(.0)	(.354)	
Utilities	-1.015	-1.603**	-3.758***	-.054	.007	.00	2.578	.613
	(.901)	(.726)	(.294)	(.072)	(.032)	(.002)	(1.714)	

Robust standard errors are in parentheses.
*** p < .01, ** p < .05, * p < .1.

The results for the ESG scores (Table 14), as expected, are very similar to those of the ESG combined scores ones. The ESG score has a direct impact on Basic Materials, Consumer Non-Cyclicals, Financials, Healthcare, Real Estate and Technology. However, the ESG scores

have an opposite impact on Energy. A high ESG score can indicate a company's capacity to mitigate shareholder-related risks in the Energy industry (composed by Coal, Oil and Gas, Renewable Energy and Uranium). This means strong ESG initiatives induce share price stability in the Energy industry. Since the Energy industry is very important for the world economy, companies from this industry should strengthen their ESG strategies to safeguard against share price volatility.

TABLE 14. Impact of ESG score on volatility

Industry	DY	ROA	LEV	SIZE	MTB	ESG	cons	R-sq.
Basic Materials	.432**	-.209***	.058	-.003	-.007*	.001**	.302**	.082
	(.216)	(.064)	(.088)	(.005)	(.004)	(.001)	(.128)	
Consumer Cyclicals	.428**	-.133	-.225***	.002	-.016***	.00	.405	.086
	(.182)	(.096)	(.059)	(.027)	(.005)	(.001)	(.577)	
Consumer Non-Cyclicals	.16	.069	.058	.044	-.002	.002***	-.852	.098
	(.431)	(.15)	(.101)	(.033)	(.006)	(.001)	(.708)	
Energy	.581	-.233***	-.096	.021	.026**	-.006**	.302	.162
	(.69)	(.081)	(.176)	(.014)	(.011)	(.002)	(.374)	
Financials	.7***	-.11*	.011	-.012	-.01**	.001***	.523	.088
	(.135)	(.057)	(.083)	(.014)	(.005)	(.0)	(.333)	
Healthcare	-.324	-.583***	.278***	-.05	-.004	.004***	1.149	.256
	(2.148)	(.076)	(.1)	(.034)	(.003)	(.001)	(.701)	
Industrials	.569***	.211***	-.248***	.012**	-.001	.001	.065	.113
	(.132)	(.036)	(.066)	(.005)	(.003)	(.001)	(.124)	
Real Estate	.358	-.208	-.642***	.146***	.036	.004***	-2.999***	.263
	(.254)	(.196)	(.154)	(.051)	(.029)	(.001)	(1.14)	
Technology	.053	-.129	-.234***	.118***	.004	.001**	-2.266***	.198
	(.045)	(.08)	(.06)	(.017)	(.002)	(.001)	(.356)	
Utilities	-1.104	-1.524**	-3.727***	-.033	-.003	-.002	2.26	.615
	(.904)	(.727)	(.295)	(.074)	(.033)	(.003)	(1.73)	

Robust standard errors are in parentheses.
*** p < .01, ** p < .05, * p < .1.

Going further to investigate each of the Environmental, Social, and Governance pillars, Table 15 shows that the Environmental pillar has a direct impact on Consumer Non-Cyclicals and Healthcare. However, it has an opposite impact on Consumer Cyclicals and Energy. As expected, the Energy industry is influenced by ESG factors from an environmental point of view due to the nature of its activities. In addition, Consumer Cyclicals (composed by Automobiles and Auto Parts, Textiles and Apparel, Homebuilding and Construction Supplies, Household Goods, Leisure Products, Hotels and Entertainment Services, Media and Publishing) is influenced by the environmental pillar. Companies managers, especially in the Energy industry, should devise strategies for the transition to renewable energy sources, emission reduction and waste management.

Table 16 indicates that the Social pillar has a direct impact on Basic Materials, Healthcare and Real Estate and an inverse impact on Energy. As can be seen, the Energy industry is also influenced by the social pillar, which measures a company's ability to generate trust and loyalty with its workforce, customers and society. Promoting labor rights and safety in the Energy industry can induce share price stability.

TABLE 15. Impact of Environmental pillar score on volatility

Industry	DY	ROA	LEV	SIZE	MTB	ENV	cons	R-sq.
Basic Materials	.426*	-.209***	.054	-.003	-.008**	.000	.386***	.07
	(.217)	(.064)	(.089)	(.005)	(.004)	(.001)	(.127)	
Consumer Cyclicals	.442**	-.111	-.213***	.018	-.017***	-.001*	.113	.093
	(.181)	(.096)	(.059)	(.026)	(.005)	(.001)	(.572)	
Consumer Non-Cyclicals	.152	.088	.061	.045	-.002	.002**	-.828	.079
	(.437)	(.152)	(.102)	(.036)	(.006)	(.001)	(.772)	
Energy	.625	-.263***	-.069	.016	.026**	-.004**	.294	.151
	(.694)	(.082)	(.178)	(.015)	(.011)	(.002)	(.39)	
Financials	.694***	-.108*	.027	-.006	-.012**	.000	.427	.073
	(.136)	(.058)	(.084)	(.014)	(.005)	(.0)	(.334)	
Healthcare	-.299	-.591***	.276***	-.03	-.005	.002**	.881	.238

Continued on next page

Table 15 – *Continued from previous page*

Industry	DY	ROA	LEV	SIZE	MTB	ENV	cons	R-sq.
	(2.174)	(.077)	(.102)	(.033)	(.003)	(.001)	(.704)	
Industrials	.559***	.21***	-.239***	.012**	-.002	.000	.097	.111
	(.133)	(.037)	(.066)	(.005)	(.003)	(.0)	(.123)	
Real Estate	.337	-.292	-.607***	.191***	.029	.001	-3.824***	.223
	(.264)	(.2)	(.159)	(.051)	(.03)	(.001)	(1.154)	
Technology	.055	-.126	-.241***	.124***	.003	.001	-2.35***	.188
	(.046)	(.08)	(.06)	(.017)	(.002)	(.001)	(.359)	
Utilities	-1.06	-1.573**	-3.738***	-.043	.000	-.001	2.426	.613
	(.903)	(.724)	(.296)	(.072)	(.035)	(.002)	(1.712)	

Robust standard errors are in parentheses.
*** p < .01, ** p < .05, * p < .1.

Table 16. Impact of Social pillar score on volatility

Industry	DY	ROA	LEV	SIZE	MTB	SOC	cons	R-sq.
Basic Materials	.453**	-.208***	.056	-.003	-.008*	.001*	.308**	.082
	(.216)	(.064)	(.088)	(.005)	(.004)	(.001)	(.128)	
Consumer Cyclicals	.428**	-.133	-.223***	.002	-.017***	.000	.398	.086
	(.182)	(.096)	(.059)	(.027)	(.005)	(.001)	(.576)	
Consumer Non-Cyclicals	.117	.058	.067	.065**	-.002	.001	-1.25*	.073
	(.437)	(.152)	(.103)	(.033)	(.006)	(.001)	(.707)	
Energy	.743	-.215***	-.171	.028**	.03***	-.007***	.25	.211
	(.67)	(.079)	(.171)	(.014)	(.011)	(.002)	(.339)	
Financials	.693***	-.109*	.029	-.005	-.012***	.000	.416	.072
	(.136)	(.058)	(.084)	(.014)	(.005)	(.0)	(.333)	
Healthcare	-.102	-.587***	.282***	-.039	-.005	.003**	.964	.242
	(2.17)	(.077)	(.101)	(.034)	(.003)	(.001)	(.705)	
Industrials	.565***	.211***	-.244***	.011**	-.002	.001	.075	.112
	(.133)	(.036)	(.066)	(.005)	(.003)	(.0)	(.124)	
Real Estate	.302	-.233	-.619***	.168***	.033	.002*	-3.397***	.235
	(.258)	(.202)	(.157)	(.052)	(.03)	(.001)	(1.168)	
Technology	.055	-.127	-.234***	.13***	.003	.000	-2.421***	.187
	(.046)	(.08)	(.06)	(.016)	(.002)	(.001)	(.353)	
Utilities	-1.005	-1.608**	-3.755***	-.059	.012	.002	2.631	.614
	(.9)	(.724)	(.293)	(.072)	(.033)	(.002)	(1.711)	

Robust standard errors are in parentheses.
*** p < .01, ** p < .05, * p < .1.

Table 17 shows that the Governance pillar has a significantly direct impact on Consumer Non-Cyclicals, Healthcare, Real Estate and Technology.

Table 17. Impact of Governance pillar score on volatility

Industry	DY	ROA	LEV	SIZE	MTB	GOV	cons	R-sq.
Basic Materials	.39*	-.208***	.047	-.002	-.007*	.001	.343***	.076
	(.218)	(.064)	(.089)	(.005)	(.004)	(.0)	(.126)	
Consumer Cyclicals	.429**	-.132	-.222***	.005	-.017***	.0	.347	.086
	(.182)	(.096)	(.059)	(.026)	(.005)	(.0)	(.563)	
Consumer Non-Cyclicals	.055	.073	.059	.07**	-.001	.001*	-1.338*	.074
	(.436)	(.152)	(.103)	(.031)	(.006)	(.001)	(.687)	
Energy	.553	-.238***	-.087	.024*	.026**	-.002	-.029	.133
	(.705)	(.083)	(.179)	(.014)	(.012)	(.001)	(.349)	
Financials	.694***	-.111*	.022	-.007	-.011**	.0	.444	.076
	(.136)	(.058)	(.084)	(.014)	(.005)	(.0)	(.333)	
Healthcare	-.333	-.589***	.276***	-.03	-.004	.003***	.822	.248
	(2.159)	(.077)	(.101)	(.032)	(.003)	(.001)	(.691)	
Industrials	.556***	.211***	-.247***	.012**	-.002	.0	.091	.111
	(.132)	(.036)	(.066)	(.005)	(.003)	(.0)	(.122)	
Real Estate	.31	-.177	-.591***	.18***	.033	.002***	-3.673***	.252
	(.255)	(.201)	(.154)	(.049)	(.029)	(.001)	(1.11)	
Technology	.052	-.126	-.242***	.122***	.003	.001*	-2.31***	.193
	(.045)	(.08)	(.06)	(.017)	(.002)	(.0)	(.357)	
Utilities	-1.034	-1.582**	-3.752***	-.048	.005	.0	2.485	.613
	(.9)	(.724)	(.293)	(.072)	(.032)	(.002)	(1.709)	

Robust standard errors are in parentheses.
*** p < .01, ** p < .05, * p < .1.

Considering the findings for the Environmental, Social, and Governance pillars along with the sign of the ESG score, it can be concluded which pillar is driving the relationship for Basic Materials, Consumer Non-Cyclicals, Energy, Healthcare, Real Estate and Technology. The direct impact of ESG on Basic Materials is attributed to the direct effect of the Social pillar. Companies from these industries should promote safety and employees rights to protect against share price volatility.

Furthermore, the direct effect of Environmental and Governance explains the direct ESG impact on Consumer Non-Cyclicals. From the environmental point of view, the focus of this industry should be on reducing waste and emissions. Governance concerns of Consumer Non-Cyclicals companies revolve around regulatory compliance.

The Energy industry is inversely affected by Environmental and Social. This is consistent with the overall inverse impact of the ESG score. The environmental factor of ESG is crucial to the Energy industry since this industry is a significant contributor to global carbon emissions. The social factors in the Energy industry include employees rights and safety. These companies should promote strategies for the transition to renewable energy sources, emission reduction, waste management, labor rights and safety to induce share price stability.

Healthcare is the only industry directly affected by all the ESG pillars. The Healthcare industry faces a variety of ESG challenges. The environmental concerns are related to product quality and waste. Social factors include safety, labor rights and community implications. Governance issues revolve around the management regulatory risks in this highly regulated industry.

The direct effect of ESG on Real Estate is attributed to the direct effect of the Social and Governance pillars. Social factors in Real Estate include safety, employees rights and community impact. Governance concerns are related to regulatory compliance and business ethics. Finally, Governance is the sole driver for the ESG results of Technology. Governance concerns of

Technology companies revolve around ethical use of data, as well as data privacy and security. By addressing these concerns, Technology companies can build trust with investors, customers and community.

4. Conclusions

This study analysed the impact of environmental, social and governance factors on stock return volatility in different European industries. For this purpose, I considered a sample of 1095 European companies from different industries (Basic Materials, Consumer Cyclicals, Consumer Non-Cyclicals, Energy, Financials, Healthcare, Industrials, Real Estate, Technology and Utilities).

Research findings showed that ESG factors impact stock return volatility across industries. For instance, the ESG controversies score has a significantly direct effect on Industrials and Utilities. The ESG score has a direct impact on Basic Materials, Consumer Non-Cyclicals, Financials, Healthcare, Real Estate and Technology. However, it has an opposite impact on Energy. Moreover, considering the findings for the Environmental, Social, and Governance pillars along with the sign of the ESG score, it can be concluded which pillar is driving the relationship for Basic Materials, Consumer Non-Cyclicals, Energy, Healthcare, Real Estate and Technology. The direct impact of ESG on Basic Materials is attributed to the direct effect of the Social pillar. Furthermore, the direct effect of Environmental and Governance explains the direct ESG impact on Consumer Non-Cyclicals. The Energy industry is inversely affected by Environmental and Social. This is consistent with the overall inverse impact of the ESG score. Healthcare is the only industry directly affected by all the ESG pillars. The direct effect of ESG on Real Estate is attributed to the direct effect of the Social and Governance pillars. Governance is the sole driver for the ESG results of Technology.

The findings of the study enrich the academic literature in this field through an industrial analysis of European companies. These findings also contribute to the literature by adding further evidence on the influence of ESG factors on stock return volatility in the European

context. In addition to the impact on researchers, the results have significant implications for companies, investors and regulators. For companies, the results highlight industry differences in terms of ESG performance and controversy and its impact on volatility. Regarding investors, these results help them in the investment decisions to pay attention to ESG and its pillars. Regarding policy implications, regulators could solve the issue of ESG differences between industries by harmonising the ESG reporting framework. Matching indicators between industries, as is currently the case, is not a solution because some ESG indicators may not be relevant to a particular industry. However, some forms of indicator classification are essential to understand why and where the ESG rating differs from industry to industry.

As in other studies, my present research exhibits a number of limitations with reference to a short time horizon. A limitation that could be subject to further research is related to the difficulty of drawing conclusions on the impact of ESG on volatility, since the industries are made up of several groups of businesses. Another limitation of the study is the use of ESG ratings from a single rating provider. The ESG rating can vary from one rating provider to another and it will be useful to examine the impact of these differences between industries on volatility. These topics will be the subject of future research.

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Appendix

Appendix 1. Thomson Reuters Business Classification

Economic sector/industry	Business sector	Industry group
Academic and Educational Services	Academic and Educational Services	
Basic Materials	Chemicals	
	Mineral Resources	Metals and Mining
	Applied Resources	Paper and Forest Products
		Containers and Packaging
Consumer Cyclicals	Automobiles and Auto Parts	
	Cyclical Consumer Products	Textiles and Apparel
		Homebuilding and Construction Supplies
		Household Goods
		Leisure Products
	Cyclical Consumer Services	Hotels and Entertainment Services
		Media and Publishing
	Retailers	
Consumer Non-Cyclicals	Food and Beverages	Beverages
		Food and Tobacco
	Personal and Household Products and Services	
	Food and Drug Retailing	
	Consumer Goods Conglomerates	
Energy	Energy – Fossil Fuels	Coal
		Oil and Gas
		Oil and Gas Related Equipment and Services
	Renewable Energy	
	Uranium	
Financials	Banking and Investment Services	
	Insurance	
	Collective Investments	
	Investment Holding Companies	
Government Activity	Government Activity	
Healthcare	Healthcare Services and Equipment	
	Pharmaceuticals and Medical Research	
Industrials	Industrial Goods	Aerospace and Defence
		Machinery, Tools, Heavy Vehicles, Trains and Ships
	Industrial and Commercial Services	Construction and Engineering
		Diversified Industrial Goods Wholesale
		Professional and Commercial Services
	Transportation	Freight and Logistics Services
		Passenger Transportation Services
		Transport Infrastructure
Institutions, Associations and Organizations	Institutions, Associations and Organizations	
Real Estate	Real Estate	Real Estate Operations
		Residential and Commercial REITs
Technology	Technology Equipment	
	Software and IT Services	
	Financial Technology and Infrastructure	
	Telecommunications Services	
Utilities	Utilities	Electric Utilities and Independent Power Producers
		Natural Gas Utilities
		Water and Related Utilities
		Multiline Utilities