

THE IMPACT OF ESG CONTROVERSIES ON THE MARKET VALUE IN THE ENERGY SECTOR

Enerji Sektöründe ESG (ÇSY) Tartışmalarının Piyasa Değeri Üzerindeki Etkisi

Özlem SAYILIR^{*}, Muhammed Aslam CHELERY KOMATH^{**}
& İbrahim KARAASLAN^{***}

Abstract

The energy sector has relatively higher exposure to scandals and controversial publicity due to the nature of industry operations. Thus, this study focuses on the energy sector to evaluate the impact of ESG (Environmental, Social and Governance) controversy scores of LSEG database on market value of firms. We investigate the relationship between ESG controversies and the market value of 393 firms using annual data from 2013 to 2022 through Dynamic Panel Data system GMM Regression Models. The findings of the study reveal that the market value of firms in the previous period has had a statistically significant positive effect on the market value of firms in the current period. Our analysis reveals a positive and statistically significant association between Governance Controversy scores and market value. Our findings suggest governance controversies have the most direct and measurable impact on firm value in the energy sector, possibly due to their stronger influence on operational performance and investor confidence. Implications of the study may help investors and policymakers to make decisions that prioritize ESG considerations in the energy sector as firms with fewer governance controversies are rewarded by investors with higher valuations.

Öz

Enerji sektörü, faaliyetlerinin doğası gereği skandallar ve tartışmalı kamuoyu ilgisine diğer sektörlere göre daha fazla maruz kalmaktadır. Bu nedenle, bu çalışma enerji sektörüne odaklanarak LSEG veri tabanındaki ESG (Çevresel, Sosyal ve Yönetişim) tartışma puanlarının firmaların piyasa değeri üzerindeki etkisini değerlendirmeyi amaçlamaktadır. 2013-2022 dönemine ait yıllık veriler kullanılarak 393 firma üzerinde ESG tartışmaları ile piyasa değeri arasındaki ilişki, Dinamik Panel Veri (Sistem GMM) regresyon modeli aracılığıyla incelenmiştir. Çalışmanın bulguları, bir önceki dönemdeki firma piyasa değerinin mevcut dönemdeki piyasa değeri üzerinde istatistiksel olarak anlamlı ve pozitif bir etkisi olduğunu göstermektedir. Analiz sonuçları, yönetim tartışmaları puanları ile piyasa değeri arasında pozitif ve istatistiksel olarak anlamlı bir ilişki bulunduğunu ortaya koymaktadır. Bulgular, yönetim tartışmalarının enerji sektöründe firma değeri üzerinde en doğrudan ve ölçülebilir etkiye sahip olduğunu, bunun da operasyonel performans ve yatırımcı güveni üzerindeki daha güçlü etkilerinden kaynaklanabileceğini göstermektedir. Çalışmanın sonuçları, enerji sektöründe ESG unsurlarını önceliklendiren kararların alınmasına yardımcı olabilir. Zira daha az yönetim tartışmasına sahip firmalar, yatırımcılar tarafından daha yüksek değerlemelerle ödüllendirilmektedir.

Keywords:

Social
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Energy Sector.

JEL Codes:

Q56, G34, O16.

Anahtar

Kelimeler:

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* Assoc. Prof. Dr., Anadolu University, Faculty of Economics and Administrative Sciences, Türkiye, osayilir@anadolu.edu.tr

** Ph.D. Student, Anadolu University, Graduate School of Social Sciences, Türkiye, muhamedaslamck83@gmail.com

*** Assoc. Prof. Dr., Gümüşhane University, School of Applied Sciences, Türkiye, ibrahimkaraaslan@gumushane.edu.tr

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1. Introduction

Many dramatic business scandals have shaken the corporate world throughout history. Especially in recent decades, several important corporate controversies such as Enron, HealthSouth, Parmalat, Shell, Siemens AG, Tyco, and WorldCom have generated extensive consequences on various stakeholders (Mercedes, 2022). These consequences include diminished goodwill of the company, lowered market value, and escalated business risks, as controversies lead to weakened corporate reputation through negative media reporting (Kim et al., 2014). Controversies can be categorized as environmental, social, or governance (ESG) controversies as they differ in their nature. For instance, toxic waste spills are considered environmental controversies, while human-rights violations are classified as social controversies, and accounting frauds are categorized as governance-related controversies (Nugent et al., 2021). Environmental controversies have gained significant attention as climate crises induce stakeholders to prefer eco-friendly companies. Indeed, negative environmental news can harm corporate reputation, impact divestment campaigns, and lead to significant stock value declines. For example, the Italian luxury brand Moncler experienced a 6% market value drop when the exploitation of geese was exposed in the media (Capelle-Blancard and Petit, 2019). Therefore, corporate controversies and their consequences have emerged as a hot subject for investors and researchers.

There is clear evidence that controversial industries have a higher level of business risk than uncontroversial industries because of the sinful or controversial nature of their products or services, which directly or indirectly harm consumers, society, and the environment (Jo and Park, 2020). There are two types of industries that can be classified as controversial: (1) sinful industries (tobacco, gambling, and alcohol) and (2) industries involved in environmental, social, and ethical/moral issues (oil and gas, mining, wastage, and defense-related weapons) (Jo and Park, 2020). Similarly, an industry that provides controversial products or services or an industry engaging in controversial conduct in achieving business objectives can be defined as a controversial industry (Yoon et al., 2006; Hong and Kacperczyk, 2009; Cai et al., 2012). In particular, the energy sector has high exposure to controversial publicity due to the nature of industry operations. It is important to look at some historical examples. The Deepwater Horizon oil spill in April 2010 is an important case. Three months after the incident, BP (formerly The British Petroleum Company plc and BP Amoco plc) had lost fifty percent of its share value or tens of billions of dollars. Some even claimed that, due to the size of the corporation, the oil leak affected the whole British economy (Smith et al., 2011). The March 2011 nuclear tragedy at Fukushima Daiichi is an important case in the nuclear energy industry. Although the nuclear accident directly resulted from the Great East Japan Earthquake, it became more severe due to governance failures by TEPCO (Tokyo Electric Power Company). As a result of the accident, the stock price of the company plummeted (Kawashima and Takeda, 2012). To maintain the social commitment and legitimacy towards the community, substantial policies have been implemented in the energy sector, such as gas emissions reduction, investments in renewable energy alternatives, community development programs to build schools and hospitals, and youth employment projects (Frynas, 2009). The energy sector has relatively higher exposure to controversial publicity due to the nature of industry operations. For this reason, this study focuses on the energy sector and aims to evaluate the impact of ESG controversies scores (Environmental Controversies, Social Controversies, and Governance Controversies) of the LSEG (former Refinitiv EIKON) database on the market value of firms. Thus, this study focuses on the market value of firms in the energy sector.

Since ESG controversies can negatively impact a company's reputation and financial health, understanding the relationship between ESG controversies and market performance may help investors and policymakers to make decisions that prioritize ESG considerations in the energy sector. This study attempts to fill the research gap as there is no clear consensus regarding the impacts of ESG Controversies on the market value of firms, and it may contribute to the existing literature since it is one of the first studies which explore the potential impacts of different dimensions of ESG controversies (environmental, social, and governance), to the best of our knowledge. In addition, the study may provide a better comprehension of the financial impacts of ESG controversies for business managers in the energy sector to help them make effective decisions about their operations and formulate better reputation management strategies to generate value. The rest of the paper is structured as follows. Section 2 presents the theoretical background and review of empirical studies. Section 3 explains the data and methodology used in this study. Section 4 displays the findings, and Section 5 concludes the study.

2. Theoretical Background and Review of Empirical Studies

This study is built on two theories: “Signaling Theory” and “Stakeholder Theory”. These theories deliver a vigorous framework for understanding how corporate controversies may impact firm performance and stakeholder engagement, especially for the firms operating in the energy sector.

Signaling Theory argues that when there is an information asymmetry, one party (the sender) sends information to another party (the receiver) through signals. In the context of corporate governance, firms use different types of signals to communicate their commitment to sustainability to their stakeholders. This theory stresses the importance of engaging with stakeholders for decision-making processes, especially tackling controversial concerns. According to signaling theory, firms that actively disclose their ESG activities propagate positive signals to stakeholders, strengthening corporate reputation and reducing the negative impacts of related controversies (Eccles et al., 2014; Lins et al., 2017). Similarly, stakeholder theory emphasizes that maintaining a social license to operate is crucial, as firms that surpass ESG performance can strengthen stakeholder trust and value creation. Companies that engage productively with their stakeholders can continue a sustainable long-term legitimacy, which eventually can reduce the harm created by various corporate controversies (Curran, 2017; Hoffmann and Kristensen, 2017).

Corporate controversies come with higher penalties, which impact various stakeholders (Warner, 1977; Zavgren, 1983; Jones, 1987; Davidson III and Worrel, 1988; Zahra et al., 2005; Cole et al., 2021). In fact, Nirino et al. (2021) found that ESG controversies negatively affect financial performance, while Dogru et al. (2022) noted that the impacts of ESG controversies are increased during external shocks like the COVID-19 pandemic. Although various studies have focused on the relationship between ESG on the market value of firms (e.g., Duque-Grisales and Aguilera-Caracuel, 2021; Ademi and Klungseth, 2022; Chouaibi et al., 2022; Saygili et al., 2022; Chung et al., 2023; Korkmaz and Nur, 2023), studies examining the relationship between ESG-related controversies and market value are less in number. However, there are few attempts to explore the impacts of corruption and scandals on various measures of financial performance and market value. Most of these studies have reported negative impacts, especially for different stakeholders, including employees, business partners, investors, creditors, auditors, regulators,

capital markets, and society at large (e.g., Zahra et al., 2005; Cole et al., 2021; La Rosa and Bernini, 2022; Agnese et al., 2023; Ma and Ma, 2025). For example, La Rosa and Bernini (2022) investigated listed companies in Europe in 2009–2019 and found that ESG controversies, especially environmental controversies, heighten the cost of equity capital. Similarly, Agnese et al. (2023) examined European banks from 2005 to 2019 and found that prior instances of ESG controversies affect current levels of such controversies. Ma and Ma (2025) detected Chinese A-share firms during 2010–2020 and proposed that ESG controversies negatively influence firm value through lower levels of green innovation, total factor productivity, and financing constraints. Yet, the single-country setting restricts the generalizability of their findings. Interestingly, a few studies reported positive impacts of ESG controversies on firm value (e.g., Aouadi and Marsat, 2018; Melinda and Wardhani, 2020). Aouadi and Marsat (2018) analyzed more than 4000 firms from 58 countries during 2002–2011 and observed that ESG controversies are related to greater firm value for high-attention firms. Similarly, Melinda and Wardhani (2020) studied 1,356 companies from 22 countries in Asia during 2014 to 2018 and found that ESG controversies are positively related to company value due to the positive signal delivered about transparency and accountability inclination.

In short, previous literature shows mixed and non-conclusive evidence regarding the relationship between ESG controversies and firm value. Moreover, relatively fewer attempts were made to analyze the energy sector, which is fundamentally more exposed to ESG-related controversies due to the nature of its operations. Unlike earlier studies that either adopt a cross-industry approach or a country-specific setting, our study isolates the energy sector, which is one of the most controversy-prone industries, and applies a dynamic panel GMM estimator to capture the persistence of firm value and mitigate endogeneity concerns. Furthermore, many prior analyses are limited by shorter time spans or regional restrictions, which constrain the generalizability of their findings. Hence, this study aims to address these gaps by examining a global sample of 393 energy firms across 54 countries over the period 2013–2022. Most importantly, by analyzing the disaggregated ESG Controversy Scores obtained from LSEG (Refinitiv Eikon), which are categorized into environmental, social, and governance dimensions, our study offers new insights into the energy sector. It reveals which specific types of controversies have the most significant impact on firm value.

3. Data and Methodology

The sample of the study consists of 393 firms operating in the energy sector, collected from the LSEG (formerly Refinitiv EIKON) database. Firm selection was based on the operating industry. If a firm operated in one or more of the industries of Coal, Oil & Gas, Oil & Gas Related Equipment and Services, Renewable Energy, and Uranium, it was added to the sample. The sample covers 54 countries during the period of 2013–2022. These years were selected based on data availability and consistency in ESG controversies reporting. Prior to 2013, data for ESG controversies were less and inconsistent across firms and regions. The ESG controversies scores used in this study are Environmental Controversies (CE), Social Controversies (CS), and Governance Controversies (CG) Scores. These scores are based on 23 ESG controversy topics and reflect the controversies report available in various media. Each score ranges from 0 to 100, where a score of 100 indicates no reported controversies, while a score of 0 reflects a higher number or severity of incidents, which implies the media reported various violations and

allegations regarding bad corporate practices on ESG. The scores are interval-scaled and benchmarked by industry groups to ensure comparability.

In the study, the logarithm of the Market Capitalization of Companies (LogMCap) operating in the energy sector was used as the dependent variable to represent market value. As independent variables: logarithm of the lag of one period of the dependent variable (LogMCap(-1)), as well as the dimensions of ESG controversies CE, CS, and CG were used. Several financial performance ratios i.e. Return on Asset (ROA) as a proxy of profitability, Current Ratio (CR) as a proxy of liquidity, Total Asset to Total Equity (TATE) as a proxy of financial leverage, Asset Turnover (AT) as a proxy of efficiency as well as logarithm of Revenue from Business Activities (LogTR) as a proxy of size were used as control variables. The list of the variables used in the study is given in Table 1 below.

Table 1. Variable Definitions

Variable	Abbreviation	Definition
Logarithm of the Market Capitalization	LogMCap	Total market value of all applicable types of shares issued by a company.
Environmental Controversies	CE	Environmental score, which is an overall company score based on negative media coverage linked to environmental controversies.
Social Controversies	CS	Social controversies score, which includes negative media attention regarding a company's ability to establish and maintain trust and loyalty among its employees, customers, and broader society.
Governance Controversies	CG	Governance controversies score reflects the negative media publicity regarding board members/ executives' actions, and about the function of the board that affects the interest & wealth of the shareholders.
Return on Asset	ROA	Pre-tax return on assets highlights the efficiency of operations in generating profit.
Current Ratio	CR	Current asset/current liabilities
Total Asset to Total Equity	TATE	Total Assets / Total Equity
Logarithm of Revenue from Business Activities	LogTR	Total revenues represent revenues from all of a company's operating activities.
Asset Turnover	AT	Net Sales (or Revenue) / Average Total Assets

The Stata 15 program was used in the analysis of the study. Descriptive statistics for the variables are given in Table 2.

Table 2. Descriptive Statistics

Variable	Obs.	Mean	Std.Dev.	Min.	Max.
LogMCap	4,131	9.263	.866	4.125	12.363
CE	3,053	50.515	13.645	0	55.71
CS	3,053	54.605	4.436	0	58.14
CG	3,053	52.068	5.377	30.906	60.262
ROA	2,963	.0324	.126	-4.764	.995
CR	4,336	2.494	34.917	0	2291.02
TATE	4,199	3.167	11.753	1	616.75
LogTR	4,280	9.215	.933	4.41	11.78
AT	4,226	.786	.942	0	12.05

In econometric analysis, to avoid the problem of multicollinearity between independent variables, first, a correlation matrix is created, and if there are independent variables that are highly correlated (0.80 or above), some of them should be excluded from the model. Correlation analysis is often performed to examine whether there is a high level of relationship between independent variables, yet occasionally the dependent variable may also be included to see the relationships between independent variables and the dependent variable. Correlation analysis results are given in Table 3.

Table 3. Correlation Analysis Results

	LogMCap	CE	CS	CG	ROA	CR	TATE	LogTR	AT
LogMCap	1.000								
CE	-0.321 [0.000]	1.000							
CS	-0.275 [0.000]	0.313 [0.000]	1.000						
CG	-0.179 [0.000]	0.105 [0.000]	0.333 [0.000]	1.000					
ROA	0.232 [0.000]	-0.051 [0.012]	-0.029 [0.152]	-0.043 [0.036]	1.000				
CR	-0.004 [0.079]	0.060 [0.000]	0.041 [0.021]	0.057 [0.001]	0.000 [0.096]	1.000			
TATE	-0.059 [0.000]	0.006 [0.073]	-0.040 [0.027]	-0.028 [0.011]	-0.048 [0.008]	0.079 [0.000]	1.000		
LogTR	0.752 [0.000]	-0.324 [0.000]	-0.319 [0.000]	-0.239 [0.000]	0.179 [0.000]	-0.204 [0.000]	-0.013 [0.000]	1.000	
AT	0.048 [0.002]	-0.019 [0.028]	-0.022 [0.022]	0.018 [0.030]	0.148 [0.000]	-0.068 [0.000]	-0.000 [0.097]	0.345 [0.000]	1.000

Note: Values in parentheses show the significance level of the correlation relationship between variables.

When the correlation coefficients between the independent variables are examined, it is seen that there will be no multicollinearity problem in the model with these independent variables, since the correlation coefficients between the independent variables are below 0.80. In addition to correlation analysis, another analysis that can be used to identify independent variables that may cause multicollinearity among independent variables is VIF (Variance Inflation Factor) analysis. VIF analysis is performed solely on the independent variables, indicating that any independent variable with a central VIF value greater than 5 should be excluded from the analysis to avoid multicollinearity issues. The VIF analysis results for the independent variables used in the study are presented in Table 4.

Table 4. VIF Analysis Results

Variables	VIF	1/VIF
LogTR	1.65	0.606
CS	1.34	0.746
AT	1.23	0.810
CE	1.21	0.826
CG	1.20	0.834
CR	1.09	0.920
ROA	1.06	0.945
TATE	1.01	0.988
Mean VIF	1.22	

As seen in the table above, the central VIF values of the independent variables are less than 5. Therefore, there seems to be no multicollinearity problem in the model created by using the independent variables listed in Table 4.

To analyze the impact of ESG controversies on the market value of companies, the two-stage system GMM (Generalized Method of Moments) estimator was used. The two-stage system GMM is a dynamic panel data method developed by Arellano and Bover (1995) and Blundell and Bond (1998). The two-stage system GMM estimator considers the level equation as well as the difference equation and combines them within a “system”. There are two main GMM estimators: the GMM-difference estimator proposed by Arellano and Bond (1991) and the GMM-system estimator, which includes the Arellano and Bover (1995) method that uses differenced values of the dependent variable in the instrument matrix and the Blundell and Bond (1998) method (two-stage system GMM) that uses the original and differenced observations in the instrument matrix. This method provides consistent results that are resistant to autocorrelation, heteroscedasticity, and endogeneity problems in the analysis. System GMM estimator tends to perform better than the difference GMM estimator regarding finite sample bias and mean squared error, and coefficient estimator standard errors (Hacıoğlu, 2017). Although the two-stage system GMM and the difference GMM approaches are widely used in literature, the two-stage system GMM is usually preferred as it gives more reliable results when working with random variables (Roodman, 2009).

There are three basic conditions for the reliability of the system GMM estimator: Firstly, the GMM estimator must satisfy the condition of absence of the second-order autocorrelation of the error term. Since null hypotheses are defined as the absence of the first-order/second-order autocorrelation, the condition that the null hypothesis cannot be rejected or rejected in AR (1) and that the null hypothesis cannot be rejected in AR (2) depends on the validity of the appropriate diagnostic statistics. Secondly, in the system GMM, the number of instrumental variables should not exceed the number of observations, as it creates a large number of "weak" instrumental variables that may lead to biased predictions. In addition, if the probability value of the Hansen test statistic is greater than 0.05 or 0.10 (meaning the acceptance of the null hypothesis in terms of the validity of the overidentification constraints, indicating the suitability of the instrumental variables), it means that the instrumental variables are valid. In other words, the model is defined correctly. Under valid moment conditions, the Hansen test statistic asymptotically approaches the chi-square distribution. The last condition for the validity of System GMM is a requirement that the lagged value of the dependent variable, which is considered as the convergence indicator, should be less than one (Roodman, 2006)

The structure of the dynamic panel model based on the study is as follows:

$$y_{it} = \alpha y_{it-1} + \beta x_{it} + \varepsilon_{it} \quad (1)$$

In this equation, y_{it} defines the dependent variable, y_{it-1} defines a lag of the dependent variable, and x_{it} defines the other independent variables used in the study. ε_{it} represents the error term of the model.

The equation of the model is given below.

$$\begin{aligned} \text{LogMCapit} = & \beta_1 \text{LogMCapit}(-1) + \beta_2 \text{CEit} + \beta_3 \text{CSit} + \beta_4 \text{CGit} + \beta_5 \text{ROAit} \\ & + \beta_6 \text{CRit} + \beta_7 \text{TATE} + \beta_8 \text{LogTRit} + \beta_9 \text{ATit} + \varepsilon_{it} \end{aligned} \quad (2)$$

where, LogMCap: Logarithm of the Market Capitalization (firm value), CE: Environmental Controversies, CS: Social Controversies, CG: Governance Controversies, ROA: Return on Asset (profitability), CR: Current Ratio (liquidity), TATE: Total Asset to Total Equity (financial leverage), LogTR : Logarithm of Revenue from Business Activities (firm size), AT: Asset Turnover (efficiency).

This study utilized market capitalization as a measure of firm value as the primary dependent variable since it reflects investors’ perceptions of a company’s financial performance and future directions. There are also a few control variables that are constantly used in the literature. We employed return on assets, current ratio, total assets to total equity, revenue from business activities, and asset turnover as control variables. Return on Assets (ROA) provides essential information about the quality of management and operational efficiency of the company and is one of the key variables to consider, which may influence market value. The current ratio (CR) is an essential indicator of financial stability and risk level for investors, and it can indirectly affect market value through liquidity problems. The total assets to total equity (TATE) ratio was included as it reflects the company’s financial leverage level. Financial leverage has a direct impact on the market value of firms because if the debt is not used effectively, it can adversely affect the market performance of the company. Revenue from business activities (LogTR) has been included in the model as a control variable because it reflects the growth of revenue generation from business operations. Finally, the asset turnover ratio (AT) has been included in the analysis as a control variable because it reflects the degree to which a company effectively utilizes its current assets to generate income. A high asset turnover ratio indicates strong operational efficiency and may have a positive impact on market value. In short, we included financial performance measures in different domains (liquidity, profitability, efficiency, and financial leverage) as control variables and included only one measure in each domain to avoid multicollinearity problems.

4. Findings

The two-stage system GMM model estimation results are shown in Table 5 below. AR (1) and AR (2) are the probability values of the first and second order autocorrelation. The Hansen test shows the probabilities of the null hypothesis that asserts the validity of the instrumental variables. Wald test probability values give the significance of the model. The probability value of the Wald- χ^2 statistic (2.66e+06), which shows the significance of the model as a whole, is statistically significant at the 1% level. When the estimation results of the lagged dependent variable LogMCap (-1), which provides information about the validity of the dynamic features in the model, are examined, it is seen that the coefficient is statistically significant and positively correlated with the dependent variable. This result can be considered as a finding that the dynamic model should be preferred.

When the model results are examined, the null hypothesis that there is no AR (1) first-order autocorrelation in the model is rejected. Thus, the null hypothesis that quadratic autocorrelation is not AR (2) is accepted. Since System GMM introduces a large number of “weak” instrumental variables that can lead to biased estimates, the number of instrumental variables should not exceed the number of observations. When the table is examined, the number of instrument variables (10) does not exceed the number of observations (2044). The fact that the probability (prob.=0.445)

value of the Hansen test statistic is greater than 0.05 or 0.10 indicates that the instrumental variables are valid.

Table 5. GMM Model Estimation Results

Dependent Variable: LogMCap		
Variables	Coefficient	Probability
LogMCap ₍₋₁₎	0.718***	0.000
CE	-0.000	0.563
CS	0.000	0.582
CG	0.002**	0.011
ROA	0.80***	0.000
CR	0.010**	0.014
TATE	-0.001***	0.000
LogTR	0.266***	0.000
AT	-0.088***	0.000
Wald- χ^2 (chi2) (probability)	2.66e+06 (0.000)	
Number of groups	393	
AR1(probability)	0.000	
AR2(probability)	0.186	
Sargan (probability)	0,32	
Hansen(probability)	0.445	
Number of instruments	10	
Number of observations	2044	

Note: ***, **, * indicate significance at 1%, 5% and 10% significance level, respectively.

Regarding the core variables of interest, the Governance Controversies score (CG) is positively and significantly associated with market value ($\beta = 0.002$, $p < 0.05$). This suggests that firms with fewer governance controversies, reflected in higher CG scores, are rewarded by investors with higher valuations. This finding aligns with the findings of various studies (e.g., Wu et al., 2023; Brinette et al., 2023. Yet, Environmental (CE) and Social (CS) controversy scores were not found to have a statistically significant effect on market value. Strong governance practices are often linked to better long-term performance. Thus, higher CG scores positively impact stock prices and firm value.

Our findings are in line with the findings of the studies which assert that ESG controversies have a negative impact on firm value implying higher ESG Controversies scores are positively associated with higher ESG Controversies scores. The positive and statistically significant relationship between Governance Controversy Scores and firm value can be attributed to the direct impact of governance on operational performance, investor perceptions, and the unique dynamics of the energy sector. The lack of a similar association for Environmental and Social Controversies may stem from sector-specific characteristics, stakeholder priorities, and the complexity of measuring and reporting these issues. There is a positive and statistically significant relationship between market value and the control variables of ROA, CR, LogTR and LogMCap, while there is a negative and statistically significant relationship between market value and control variables of TATE and AT.

5. Conclusion

Industries with fundamental environmental and social risks, such as energy, oil, gas, mining, and nuclear, face higher exposure to controversies in the public. These industries must

secure and maintain a "social license to operate" (SLO), an unwritten contract with stakeholders that legitimizes their operations (Curran, 2017; Hoffmann and Kristensen, 2017). Although a few recent studies have explored ESG controversies arising from various causes, such as corruption and scandals, this study is one of the first studies that explores the potential impacts of different dimensions of ESG controversies (environmental, social, and governance) on the market value of firms in the energy sector, to the best of our knowledge.

We employ a dataset of 393 firms in the energy sector to propose a new perspective in evaluating the impact of ESG controversies on market value in the Energy sector by using ESG Controversies Scores. The findings of our study reveal that the market value of firms in the previous period has had a statistically significant positive effect on the market value of firms in the current period. Our analysis reveals a positive and statistically significant association between Governance Controversy scores and market value. Our findings suggest governance controversies have the most direct and measurable impact on firm value in the energy sector, possibly due to their stronger influence on operational performance and investor confidence. On the other hand, environmental and social controversies do not exhibit a significant impact. Implications of the study may help investors and policymakers to make decisions that prioritize ESG considerations in the energy sector, as firms with fewer governance controversies are rewarded by investors with higher valuations. In this study, the findings emphasize the importance of stronger corporate governance, which implies that companies should reduce their involvement in governance-related controversies, which are related to executive compensation, insider trading, anti-competition, bribery, and corruption, to strengthen market value. Negative media publicity regarding board members' or executives' actions, and about the function of the board, would have adverse effects on the interests and wealth of the shareholders and ultimately would deteriorate the market value of firms. Therefore, the board of directors should be more involved in the implementation of strong corporate governance mechanisms to avoid such governance-related controversies in the energy sector.

This research is not without limitations. The number of firms examined has been limited to 393 due to data availability constraints. As ESG reporting becomes increasingly standardized and mandatory under various regulations, ESG controversy scores are expected to become more widely available, which will allow future studies to utilize larger and more comprehensive datasets. Also, to better capture delayed market responses, future research may explore the long-term effects of ESG controversies using multi-year lag structures or event-study methods. While this study focuses on the energy sector, it treats the sector as a single homogeneous group. Sectoral comparisons may help to determine whether the asymmetric importance of corporate governance controversies in our study is unique to the energy sector or can be considered in other sectors.

Declaration of Research and Publication Ethics

This study, which does not require ethics committee approval and/or legal/specific permission, complies with the research and publication ethics.

Researcher's Contribution Rate Statement

The authors declare that they have contributed equally to the article.

Declaration of Researcher's Conflict of Interest

There is no potential conflict of interest in this study.

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