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The Role of Corporate Governance Mechanism and Sustainability Reporting in Firm Performance: Evidence on Resource Based Sectors

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Abstract

In this study, a firm's performance is investigated in relation to the impact of corporate governance mechanisms and sustainability reporting. Content analysis is employed to evaluate and calculate a company's sustainability reporting by utilizing the disclosure of SDGs and external assurance in its sustainability report. CEO Duality, Insider Ownership, Board Size, Remuneration Committee, and Nomination Committee are the metrics used to evaluate corporate governance. In this study, the performance of 100 firms listed in the Fortune 500 in the industrials, materials, and energy sectors is evaluated over a five-year period (2019-2023) using Tobin's Q and return on assets. The effect of corporate governance mechanisms and sustainability reporting is determined through regression analysis, and the purposive sampling method is employed in this investigation. The findings of this study indicate that ROA and Tobin's Q are significantly and positively influenced by ownership concentration. The disclosure of SDGs has a detrimental impact on ROA. Still, it does not substantially impact Tobin's Q. The use of external assurance on a sustainability report, the CEO Duality, the Nomination committee, and the Remuneration committee have no impact on Tobin's Q or ROA. This study contributes to understanding corporate governance and sustainability's nuanced effects on firm performance, highlighting ownership concentration as a key driver and revealing contrasting impacts of sustainability disclosure.

JEL classification numbers: L25, M14, Q56.
Keywords: Corporate Governance, Sustainability Reporting, SDGs, Firm Performance.

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1. Introduction

Sustainability accounting refers to the non-financial performance that affects a firm's environmental and social aspects. The concept of sustainability accounting helps a company to produce additional value and to minimize risks and liabilities. Sustainability accounting is defined as a framework for disclosing non-financial items that may interest stakeholders; hence, its nature is broad and flexible. (Anders, 2023)[6]. The rise of awareness and concerns regarding social and environmental matters causes the demand for social and environmental accountability. Firms have tried to meet said demands by willingly publishing reports covering social and environmental issues. However, skepticism on those reports still prevails, mainly on the accountability of those reports (Gray, 2014)[17]. Sìmnett et al., (2009)[33] argues that sustainability and governance reporting develop the credibility and reliability of those reports published by firms. Ever since the development of standards and agendas relating to such matters, such as the GRI standards in 2007 and SDG Agenda 2030, Firms have experienced a push to publish a general, standalone, and non-financial report, such as the sustainability report. Those reports address doubt and skepticism about the integrity of the information, aiming to demand transparency. Since the UN's development of SDG 2030, several companies have included external assurance statements in their sustainability report as a voluntary disclosure. In research conducted by PwC in 2022, 80% of companies apply the GRI standard in their sustainability report.

One of the reasons these companies use external assurance in their reports is to improve their ability to achieve sustainable development goals by combining economic, public, and environmental management outcomes in the reports that they publish. Studies have shown that firms publish those reports are made and published in a more symbolic manner rather than in an actual manner. A firm’s decision surrounding the implementation of SDGs is associated with the limits of knowledge and information, data availability, as well as other various methodological difficulties (Gutiérrez-Ponce & Wibowo, 2023)[19]. Companies often sacrifice their profits due to the internalization of costs to benefit the society and environment, to focus on their sustainability reporting on outcomes and impacts to inform stakeholders about executing the rightful duty to take care of the planet (Abeysekera, 2022)[1].

Building on the insights regarding the impact of sustainability reporting on how a firm performs, corporate governance also plays a role in shaping a firm’s performance by ensuring effective decision-making making, aligning management with shareholder interests, therefore avoiding the possibility of agency conflicts (Ngatno et al., 2021)[29]. The alignment of management and shareholder interests can be achieved through mechanisms, such as independent directors on board structures. This can also give a firm transparency in their financial reporting, which can prevent information asymmetries between the two parties (Bui & Krajcsák, 2024)[11]. Despite a firm’s attempt at good corporate governance, the issues and conflicts still prevail in the form of challenges surrounding the practices, such as

concentration of the ownership, the existence of conflict of interest, as well as the difficulties in the process of monitoring said practices (Hunjra et al., 2020)[24]. Internal corporate governance includes the mechanism that controls various parties of the firm, such as shareholders, the board, and the company's management. The internal mechanism of corporate governance aims to check the balance of the power of said parties. Various researchers used board independence, CEO Duality, as well as ownership concentration as measures of the mechanisms that affect a firm's performance (Guluma, 2021)[18]. In this study, CEO duality, board size, insider ownership, and the existence of a remuneration and nomination committee are used as a proxy of the internal corporate governance mechanism.

This study chose the industrial, materials, and energy sectors due to their significant influence on global sustainability and corporate governance practices. These sectors are inherently resource-intensive, contributing to environmental challenges such as carbon emissions, resource depletion, and supply chain sustainability. Their operations and outputs impact various stakeholders, including governments, investors, and communities, making them key players in the global transition toward sustainable practices. Sustainability reporting in these sectors is critical, allowing firms to address risks, showcase transparency, and demonstrate progress toward long-term environmental and social goals. For instance, according to EY, companies in the energy sector are often at the forefront of addressing climate change, managing water resources, and ensuring ethical sourcing of materials. Robust sustainability reporting in these areas supports not only compliance with regulations but also enhances stakeholder trust and investor confidence. Corporate governance is equally significant in these sectors, as it provides the framework for strategic decision-making and accountability. Firms in industrials, materials, and energy must navigate complex regulatory landscapes and stakeholder expectations, making governance mechanisms essential for aligning sustainability goals with firm performance. Effective governance ensures that resources are managed efficiently, risks are mitigated, and the interests of various stakeholders are balanced. Additionally, Fortune 500 companies within these sectors are often seen as leaders in setting industry benchmarks for sustainability practices. Their large-scale operations and significant influence mean that their strategies have the potential to drive systemic change across global supply chains.

2. Review of Literature and Hypotheses Development

Many researchers have analyzed the association between corporate governance and a firm's performance. Various studies have shown that internal corporate governance mechanisms such as board size and ownership structure, have a positive effect on a firm performance measured by ROA (Coleman & Wu, 202; Bunget et al., 2020) [14, 12]. However, Ngatno et al., (2021) [29] analyzed the moderating effects of corporate governance mechanism on the relationship between a firm's capital structure and its performance, which shows the results that the size of board commissioners strengthens the relationship between capital structure and firm

performance and that board size and ownership concentration can't moderate the relationship. Another study has also shown that ownership concentration positively affects firm performance (Guluma, 2021)[18]. A study conducted by Puni & Anlesinya, (2020) [31] concluded that Board size, shareholder concentration, and the frequency of board meetings positively affect financial performance. However, this study also concluded that the presence of board committees (such as remuneration committees and nomination committees) negatively affects financial performance, while CEO Duality harbors no impact on firm performance. However, a study conducted by (Huynh et al., 2022)[25] stated that the presence of a board committee and board size are positively associated with firm performance. Another study has also shown that CGVS (Corporate Governance Score) that uses measures of corporate governance mechanisms positively affects firm performance (Affes & Jarboui, 2023)[3]. An earlier study showed that stock ownership by board members, and CEO Duality are positively correlated with better firm performance (Bhagat & Bolton, 2008)[8]. A study that uses the firms in Pakistan as a subject also found that board size, size of board committees, and the ownership concentration of a firm positively affect firm performance measured by Tobin's Q, while CEO Duality and board independence affect firm performance negatively (S. Singh et al., 2018a)[35]. Ownership concentration, the separation of CEO and Chairman (CEO Duality), and board size may affect firm performance by aligning the interests of a firm's stakeholders, superintending management, managing agency cost, and reducing information asymmetry between agent and principal. This process ensures that management acts in the shareholders' best interest, increasing firm performance. From this, we can conclude that internal corporate governance mechanisms have significant influence; therefore, the following hypothesis is made:

H1a. Ownership Concentration has a positive influence on firm performance
H1b. Board Size has a positive influence on firm performance.
H1c. CEO Duality has a positive influence on firm performance.

Evidence from previous studies that analyze the effect of board committees still needs to be more conclusive. According to the Corporate Governance Institute, the remuneration committee of a board is responsible for reviewing the Terms and Conditions of employment along with the compensation given to senior directors and managers, as well as reassuring shareholders that the amount of remuneration has been decided reasonably and transparently with no conflicts of interest present. Meanwhile, nomination committee members are responsible for the overall corporate governance of the organization by selecting candidates for each seat on the board. A soundly structured board of committees can affect firm performance through the development of the architectural mechanism of corporate governance; therefore, the following hypothesis is made:

H1d. The remuneration committee has a positive influence on firm performance.
H1e. The nomination committee has a positive influence on firm performance.

Various studies have also been conducted regarding the effect of sustainability reporting. Some of those studies showed that corporate sustainability reporting positively affects a firm's performance (Oncioiu et al., 2020; Laskar, 2019)[30; 27]. Buallay (2019)[9], argues that there are two perspectives on sustainability in its research. The first is the perspective from cost-of-capital reduction, where the study argues that investing in matters regarding ESG increases cost and harbors economic consequences, which might affect the firm's performance negatively. The second one is the value creation perspective, where ESG plays the role of a tool to increase competitive advantage and, therefore, enables the growth of firm performance. However, studies regarding the effect of sustainability reporting are still inconclusive between sectors and countries, even by measures of firm performance. Buallay (2020)[10] analyzed the role of sustainability reporting in firm performance in two different sectors, manufacturing and banking. In the banking sector, it is shown that sustainability reporting affects firm performance negatively, while the manufacturing sector is affected positively by sustainability reporting. The same author, Buallay, (2019)[9], have also analyzed the effect of sustainability reporting on firm performance by using a different subject, which is 342 financial institutions across 20 countries. It is shown that sustainability reporting has a negative effect on financial and operational performance, measured by ROA, therefore supporting value creation theory.

On the other hand, the same research concluded that sustainability reporting positively affects market performance, which is measured by Tobin's Q. Another study has shown that sustainability reporting differently affects firm performance between two countries, India and South Korea. Firms in India were negatively affected by sustainability reporting, while South Korean firm performance was positively affected by sustainability reporting. The research conducted by Girón et al. (2021)[16], which measures sustainability reporting by the disclosure of SDGs in a firm's sustainability report, the use of external assurance on said report, as well as Tobin's Q.

From this, we assume that sustainability reporting has a significant effect on firm performance; therefore, the following hypothesis is developed:

H2a. The disclosure of the alignment with SDGs in a sustainability report positively influences firm performance.

H2b. The use of external assurance in a sustainability report positively influences firm performance.

3. Data and Methodology

In this section, information regarding the research method, as well as the research model, data set, and statistical methods used in the analysis are discussed.

3.1 Data Source, Study Period, and Sample

This research focuses on companies that operate in the industrials, materials, and energy sectors, which are listed in the Fortune 500 Index for the period 2019 to 2023. The sample screening was carried out using the purposive sampling method, an approach of samplings based on specific pre-determined criteria. The number of companies that are selected as research samples is adjusted according to the pre-determined criteria, thus providing a framework that is adequate for an in-depth analysis of the characteristics of companies in the industrials, materials, and energy sectors. To select the samples of these companies, this research developed a few criteria:

1. Companies that are listed in the Fortune 500 Index.
2. Companies that fall under the industrials, materials, and energy sectors.
3. Companies that regularly publish annual reports during the 2019-2023 period.
4. Companies that at least published one sustainability report during the 2019-2023 period

This research uses the quantitative data analysis method, where the data are used as numbers that will later illustrate the size and relationships between the variables tested in the study to determine whether the hypothesis is supported or rejected. The results of the research will be presented in the form of tables with explanations in the form of paragraphs regarding the analysis based on the evidence found in this study. Therefore, the results are expected to determine the conclusion, which will compare the formulated hypotheses. This study will use the 17th version of STATA Statistical Data Analysis Software for quantitative data processing.

3.2 Measurement of Variables

This research uses Tobin's Q and return on asset to measure market and operational performance, respectively. Tobin's Q is a ratio of asset value and its replacement value. Market value from a company is calculated using total shares outstanding, while replacement value is measured using book value (S. Singh et al., 2018b)[36] Return on asset (ROA) measures the efficiency of a company's operational process in generating profit from its assets, and it is calculated by dividing net income by the total asset of a company (R. Singh et al., 2024)[34].

3.2.1 Independent Variables

Corporate governance mechanisms will be quantified using board size, ownership concentration, CEO Duality, and the presence of a nomination committee and remuneration committee. Board size is measured using the number of active board

members at the end of the year (Ngatno et al., 2021)[29]. Ownership concentration is measured using the percentage of shares held by insiders compared to the total shares outstanding (Guluma, 2021)[18]. CEO Duality is measured using a dummy variable, where CEO Duality is measured by giving the value of 1 if the chairperson also holds the title of CEO, and 0 if it states otherwise (Huynh et al., 2022)[25]. Both nomination committee and remuneration committee are measured using a dummy variable, where the existence of respective committees is measured as 1 if said committees are present, 0 if said committees are not present in a company (Puni & Anlesinya, 2020)[31].

3.2.2 Control Variables

This research includes a set of firm-specific determinants to control for the relationships under investigation. The selected variables are firm size and leverage (Gerged et al., 2023)[15], firm age (Coleman & Wu, 2021)[14], and capital expenditures (Laskar, 2019)[27]. Table 1 presents the operationalization of variables used in this research, outlining the indicators and measurements used to assess key constructs.

Table 1: Variable Measures

Variables	
Dependent Variables	
Return on Asset	Net Income divided by book value of total assets at the end of the year
Tobin's Q	(Total Market Value + Total Liabilities)/Total Assets
Independent Variables	
Corporate Governance Mechanism	
Board Size	Number of board members at the end of the year
CEO Duality	1 = if the Chairperson is also CEO, 0 if otherwise
Ownership Concentration	Shares held by insiders/Total number of shares outstanding
Remuneration Committee	1 = Remuneration committee is present, 0 = when it is not present
Nomination Committee	1 = Nomination committee is present, 0 = when it is not present
Sustainability Reporting	
SDGs	1 = If the company discloses its alignment with SDGs in its sustainability report, 0 = if a company does not disclose its alignment with SDGs.
External Assurance	1 = If the company has external assurance statements in its sustainability report, 0 = if there is no external assurance statement.
Control Variables	
Age	Natural logarithm of a firm's age.
Size	Natural logarithm of a firm's total assets.
Leverage	Total debt/total equity
Capital Expenditures	Natural logarithm of capital expenditures

The tests to be conducted in this research include descriptive statistics, correlation analysis, classical assumption tests, coefficient of determination analysis, F-test for significance, and individual parameter significance test (t-test), with the main analysis being conducted using panel data regression.

3.3 Empirical Model

The following equations represent the panel data regression analysis approach that is used in this study:

Model 1:

$$ROA_{it} = \alpha + \beta_1 OWNCON_{it} + \beta_2 BSIZE_{it} + \beta_3 NOMCOM_{it} + \beta_4 REMCOM_{it} + \beta_5 CEODUAL_{it} + \beta_6 SDG_{it} + \beta_7 EXTASSR_{it} + \beta_8 SIZE_{it} + \beta_9 AGE_{it} + \beta_{10} LEV_{it} + \beta_{11} CAPEX_{it} + \mu_i + \lambda_t + \epsilon_{it} \quad \ldots\ldots(1)$$

Model 2:

$$TOBINSQ_{it} = \alpha + \beta_1 OWNCON_{it} + \beta_2 BSIZE_{it} + \beta_3 NOMCOM_{it} + \beta_4 REMCOM_{it} + \beta_5 CEODUAL_{it} + \beta_6 SDG_{it} + \beta_7 EXTASSR_{it} + \beta_8 SIZE_{it} + \beta_9 AGE_{it} + \beta_{10} LEV_{it} + \beta_{11} CAPEX_{it} + \mu_i + \lambda_t + \epsilon_{it} \quad \ldots\ldots(2)$$

Description**:** ROA = return on assets, TOBINSQ = Tobin's Q, α = Constant, OWNCON = Ownership Concentration, BSIZE = Board size, NOMCOM = Nomination Committee, REMCOM = Remuneration Committee, CEODUAL = CEO Duality, SDG = Disclosure of SDG in a sustainability report, EXTASSR = the use of external assurance in a sustainability report, SIZE = Company Size, AGE = Company Age, LEV = Leverage, CAPEX = Capital Expenditure, ϵ = error term.

This research has undertaken three of the most widely used tests, the Chow test, the Hausman test, and the Bresuch-Pagan test, to determine the appropriate panel data regression model. For both model 1 and model 2, all tests result in a prob>chibar2 value less than 0.05; therefore, this research will use a random effect model for both models.

4. Results and Discussion

Table 2 describes the descriptive statistics of the variables used in this study. ROA, which measures firm operational performance in this research, shows that the subjects have values ranging from -0.27 to 0.285, with an average value of 0.068. As for Tobin's Q, which measures market performance in this research, it ranges from 0.627 to 10.895.

Table 2: Statistic Descriptive Results

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	500	0.068	.07	-0.270	0.285
TOBINSQ	500	2.339	1.478	0.627	10.895
BSIZE	500	11.162	1.598	6	16
CEODUAL	500	0.556	.497	0	1
REMCOM	500	0.99	0.1	0	1
NOMCOM	500	0.97	.171	0	1
OWNCON	500	1.732	3.904	0.014	20.86
SDG	500	0.572	0.495	0	1
EXTASSR	500	0.404	0.491	0	1
SIZE	500	10.029	0.982	7.464	12.838
AGE	500	4.286	0.794	1.099	5.226
CAPEX	500	6.502	0.144	0.244	10.101
LEV	500	0.614	0.145	0.228	1.126

The smallest board size a company has in a period is 6, while the largest board size is 16, averaging 11.16 in size. 55.6% of the companies observed in this research have a CEO serving as chairperson. 99% and 97% of the observable companies in this research have a remuneration committee and nomination committee present, respectively. The smallest value of ownership concentration is 0.014%, while the largest is 20.86%, averaging 1.73%. The proportion of companies disclosing their alignment with SDGs is 0.572 or 57.2%. At the same time, the % of companies using external assurance in their sustainability report is 40.4%.

Table 3: Pairwise Correlation Results

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
(1) ROA	1					
(2) TOBINSQ	0.471***	1				
(3) BSIZE	-0.101**	-0.194***	1			
(4) CEODUAL	-0.026	0	-0.008	1		
(5) REMCOM	0.045	0.019	-0.04	-0.009	1	
(6) NOMCOM	0.058	0.051	-0.004	-0.157***	-0.018	1
(7) OWNCON	0.181***	0.387***	-0.074*	-0.102**	0.028	0.074*
(8) SDG	-0.234***	-0.247***	0.106**	-0.025	-0.046	-0.01
(9) EXTASSR	-0.147***	-0.225***	0.126***	-0.044	-0.081*	-0.07
(10) SIZE	-0.286***	-0.531***	0.279***	0.165***	0.019	-0.169***
(11) AGE	0.049	0.028	0.146***	0.292***	-0.084*	0.128***
(12) LEV	-0.233***	-0.036	0.156***	0.114**	-0.140***	0.049
(13) LN_CAPEX	-0.152***	-0.425***	0.210***	0.067	-0.039	-0.130***
Variables	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
(7) OWNCON	1					
(8) SDG	-0.176***	1				
(9) EXTASSR	-0.108**	0.424***	1			
(10) SIZE	-0.294***	0.255***	0.260***	1		
(11) AGE	-0.157***	-0.002	0.006	0.134***	1	
(12) LEV	-0.086*	-0.045	-0.083*	0.189***	0.129***	1
(13) LN_CAPEX	-0.088**	0.199***	0.196***	0.779***	0.066	0.017

*** p<0.01, ** p<0.05, * p<0.1

Table 3 presents the correlation matrix amongst the variables used in this research as an essential measure of checking multicollinearity problems; this research assumes a value of 0.8 or higher in absolute value indicates a multicollinearity problem. As seen in Table 3, this research does not have multicollinearity problems amongst the variables that are used. This research also uses the variance inflation factor (VIF) test in Table 4 to show that the explanatory variables are below the value of 10, further indicating no multicollinearity problems in this research. (Hair et al., 2019)[20]

Table 4: VIF Test Results

	VIF	1/VIF
SIZE	3.55	0.28
CAPEX	2.90	0.35
EXTASSR	1.30	0.77
SDG	1.28	0.78
OWNCON	1.20	0.84
AGE	1.20	0.84
CEODUAL	1.18	0.85
LEV	1.18	0.85
BSIZE	1.13	0.89
NOMCOM	1.11	0.90
REMCOM	1.06	0.94
Mean VIF	1.55	.

The results of the Shapiro-Wilk normality test, presented in Table 5, indicate that the dependent variables ROA and Tobin's Q deviate significantly from a normal distribution. For ROA, the Shapiro-Wilk W-statistic is 0.930 with a p-value of 0.000, suggesting a significant departure from normality. Similarly, for Tobin's Q, the W-statistic is 0.728 with a p-value of 0.000, further confirming non-normality. However, given that the sample size exceeds 200 observations, the Central Limit Theorem suggests that the data can be treated as approximately normal, minimizing concerns about normality violations in the analysis.
The results of the Shapiro-Wilk normality test, presented in Table 5, indicate that the dependent variables ROA and Tobin's Q deviate significantly from a normal distribution. For ROA, the Shapiro-Wilk W-statistic is 0.930 with a p-value of 0.000, suggesting a significant departure from normality. Similarly, for Tobin's Q, the W-statistic is 0.728 with a p-value of 0.000, further confirming non-normality. However, given that the sample size exceeds 200 observations, the Central Limit Theorem suggests that the data can be treated as approximately normal, minimizing concerns about normality violations in the analysis.

Table 5: Shapiro-Wilk Normality Test Results

Shapiro-Wilk W Test for Normal Data					
Variable	**Obs**	**W**	**V**	**z**	**Prob>z**
ROA	500	0.930	23.412	7.580	0.000
TOBINSQ	500	0.728	91.484	10.856	0.000

This study employs the Breusch-Pagan test to assess the presence of heteroskedasticity in the models. The results presented in Table 6 show no indication of heteroskedasticity in Model 1, as the p-value obtained (0.2496) is greater than the significance level of 0.05. This implies that the assumption of

homoskedasticity is met for Model 1, and the variance of the residuals is consistent across observations.

Table 6: Heteroskedasticity test results for Model 1

Breusch–Pagan/Cook–Weisberg test	
Chi-square (01)	1.33
Prob > Chi-square	0.2496

Conversely, the results in Table 7 reveal potential heteroskedasticity issues in Model 2, with the p-value being significantly lower than 0.05 (0.0000). This finding suggests that the variance of the residuals in Model 2 may not be constant, violating the assumption of homoskedasticity and indicating the need for further investigation or remedial measures to address this issue.

Table 7: Heteroskedasticity test results for Model 2

Breusch–Pagan/Cook–Weisberg test	
Chi-square (01)	276.77
Prob > Chi-square	0.0000

The Wooldridge test for autocorrelation was utilized in this study to assess whether autocorrelation exists within the models. As shown in the results presented in Table 8, there is a clear indication of autocorrelation in Model 1, as the Prob > F value is 0.0017, which is less than the significance level of 0.05. This suggests that the residuals in Model 1 are correlated, violating the assumption of no autocorrelation in the model. Similarly, the results for Model 2, displayed in Table 9, show a Prob > F value of 0.000, also below the 0.05 threshold, further confirming the presence of autocorrelation in this model as well.

Table 8: Autocorrelation test results for Model 1

Woolridge test for Autocorrelation	
F(1,99)	10.392
Prob > F	0.0017

Table 9: Autocorrelation test results for Model 1

Woolridge test for Autocorrelation	
F(1,99)	56.850
Prob > F	0.0000

Due to the violation of classical regression assumptions in this research, which may undermine the reliability of results, this study employs the Driscoll-Kraay regression with standard errors to address this issue. This method is designed to handle such violations by providing robust standard error estimates, ensuring that the findings remain consistent and reliable despite these statistical challenges. The use of this approach reinforces the methodological rigor of the study and enhances the validity of its conclusions (Hoechle, 2007)[23].

Table 10: Model Specification test for Model 1

Regression with Driscoll-Kray standard errors		**Number of obs**	500
Method	Random Effects GLS regression	**Number of groups**	100
Group variable	Id	**Wald chi2(10)**	251.52
Maximum lag	2	**Prob>chi2**	0.000
Corr(u_i, Xb)	0 (assumed)	**overall R-Squared**	0.1407

In Table 10, the results of the F-test for Model 1, with return on assets (ROA) as the dependent variable, show a probability value (Prob > chi2) of 0.000. This study applies a significance level of 0.05, and based on this, it can be concluded that all independent variables in Model 1 jointly have a significant effect on the dependent variable in the model. The same table shows that the overall coefficient of determination (R-squared) for Model 1 is 0.1407, which can be interpreted as follows: the independent variables measuring Corporate Governance Mechanisms and Sustainability Reporting explain 14.07% of the variation in the firm performance, as measured by the return on assets (ROA) ratio. The remaining 85.93% of the variation is attributable to other external factors not captured by the independent variables in this study.

Table 11: Model Specification test for Model 1

Regression with Driscoll-Kray standard errors		**Number of obs**	500
Method	Random Effects GLS regression	**Number of groups**	100
Group variable	Id	**Wald chi2(10)**	589.99
Maximum lag	2	**Prob>chi2**	0
Corr(u_i, Xb)	0 (assumed)	**overall R-Squared**	0.3599

In Table 11, the results of the F-test for Model 2, with Tobin's Q as the dependent variable, show a probability value (Prob > Chi2) of 0.000. This study applies a significance level of 0.05, and based on this, it can be concluded that all independent variables in Model 2 simultaneously significantly affect the dependent variable in

the model. The same table shows that the overall coefficient of determination (R-squared) for Model 2 is 0.3599. This indicates that the independent variables measuring Corporate Governance Mechanisms and Sustainability Reporting explain 35.99% of the variation in financial performance, as measured by Tobin's Q. The remaining 64.01% of the variation is explained by other external factors not captured by the independent variables in this study.

Table 12: t-test results for Model 1

Dependent Variable: ROA						
Period: 2019-2023						
ROA	**Coefficient**	**std. err.**	**T**	**P>|t|**	**[95% conf. interval]**	
BSIZE	0.002	0.001	1.89	0.132	-0.001	0.005
CEODUAL	-0.002	0.009	-0.2	0.850	-0.026	0.023
REMCOM	-0.001	0.013	-0.1	0.924	-0.036	0.034
NOMCOM	0.097	0.033	0.33	0.757	-0.072	0.092
OWNCON	0.002	0.000	5.31	0.006	0.001	0.003
SDG	-0.015	0.001	-13.7	0.000	-0.018	-0.012
EXTASSR	-0.003	0.004	-0.66	0.547	-0.015	0.095
SIZE	-0.009	0.008	-1.12	0.327	-0.032	0.014
AGE	0.013	0.003	3.95	0.017	0.004	0.022
CAPEX	0.005	0.005	-5.57	0.000	-0.004	0.015
LEV	-0.159	0.059	-2.68	0.055	-0.323	0.006
_cons	0.182	0.014	12.89	0.000	0.143	0.222

Table 12 shows that Ownership Concentration (OWNCON) shows a probability value of 0.006 or 0.6%, which is then divided by two because the hypothesis is one-tailed (testing for a specific direction, either positive or negative effect). This results in a value of 0.003 or 0.3%. The study applies a significance level of 5%, and produces a coefficient value of 0.002, thus indicating that Ownership Concentration influences firm performance when measured using Return on Assets (ROA).

This finding is aligned with previous research conducted by Puni & Anlesinya (2020)[31], which stated that Ownership Concentration positively affects a firm's performance. This finding is also aligned with Machek & Kubíček, (2018)[28], which states that more concentrated ownership supports a firm's performance by reducing the principal-agency problem, but only to a certain extent; therefore, in the presence of a controlling owner, performance is maximized.

Board Size (BSIZE) shows a probability value of 0.132 or 13.2%, which is then divided by two because the hypothesis is one-tailed (testing for a specific direction). This results in a value of 0.066 or 6.6%, meaning it is not significant at the 5% significance level, but considered necessary at the 10% level. Since this study uses a 5% significance level, we conclude that board size does not significantly affect ROA. This finding contradicts previous research by Coleman & Wu (2021)[14],

which stated that Board size positively and significantly affects a firm's performance. But it is aligned with the research done by (Ngatno et al., 2021)[29], which also stated that board size does not significantly affect a firm's performance. The disclosure of SDGs in the Sustainability Report (SDG) shows a probability value of 0.000, or 0%, which is then divided by two, resulting in 0.000 or 0%. Since this study uses a 5% significance level, we conclude that the disclosure of SDGs in the Sustainability Report (SDG) negatively affects the firm's operational performance, measured using the Return on Assets (ROA) ratio, with a coefficient value of -0.015. The result of this finding aligns with the research previously conducted (Buallay, 2019)[9], where it was shown that sustainability report performance negatively impacts ROA. Resource-based theory (RBT) suggests that firms achieve competitive advantage through the effective allocation of resources. (Acedo et al., 2006)[2]. If those resources are allocated towards SDG initiatives without immediate returns, operational efficiency and profitability may be reduced in the short term, thus lowering ROA.

Based on Table 12, we conclude that the other independent variables—CEO Duality (CEODUAL), Remuneration Committee (REMCOM), Nomination Committee (NOMCOM), and the use of external assurance on the company's sustainability report (EXTASSR)—do not have a significant impact on a firm's operational performance, as measured by ROA, due to their p-values (after being halved) being greater than 0.05.

Table 13: t-test results for Model 2

Dependent Variable: Tobin's Q						
Period: 2019-2023						
TOBINSQ	**Coefficient**	**std. err.**	**T**	**P>t**	**[95% conf. interval]**	
BSIZE	-0.01	0.007	-1.37	0.244	-0.029	0.01
CEODUAL	0.033	0.141	0.23	0.828	-0.358	0.423
REMCOM	0.322	0.843	0.38	0.722	-2.017	2.662
NOMCOM	-0.393	0.569	-0.69	0.527	-1.972	1.186
OWNCON	0.088	0.017	5.03	0.007	0.039	0.136
SDG	0.019	0.053	0.36	0.739	-0.128	0.166
EXTASSR	-0.081	0.133	-0.61	0.573	-0.45	0.287
SIZE	-0.563	0.167	-3.37	0.028	-1.027	-0.1
AGE	0.266	0.158	1.68	0.169	-0.174	0.706
CAPEX	0.137	0.760	0.18	0.857	-0.135	0.162
LEV	-0.239	0.768	-0.31	0.771	-2.372	1.893
_cons	7.052	2.344	3.01	0.04	0.544	13.559

The data presented in Table 13 shows that ownership concentration affects Tobin's Q with a probability value of 0.007 and a coefficient value of 0.008, suggesting a statistically significant relationship. This result indicates that higher ownership

concentration may positively influence market valuation, as reflected in Tobin's Q. This finding is aligned with the result of previous research done by Larrain et al. (2023)[26], which stated that insider ownership positively affects Tobin's Q. This finding relates to agency theory, which addresses conflict of interest between principals and agents, which in this case is shareholders and management, respectively (Hill & Jonfs, 1992)[22]. In the context of this study, ownership concentration mitigates the agency problem by empowering large shareholders to monitor managerial actions, ensuring alignment with shareholder interests closely. As reflected in Tobin's Q, concentrating on ownership positively influences firm performance by reducing managerial opportunism and enhancing accountability.

This finding suggests that other variables in the study, such as Board Size, had a significant impact on firm performance, both operational and market performance. This research is inconsistent with previous studies (Puni & Anlesinya, 2020; Huynh et al., 2022)[31; 25]. It is consistent with previous studies conducted by Vaidya (2019)[38] and Topak (2011)[37]. CEO Duality also has no correlation in both operational and market performance, which aligns with the research conducted by Puni & Anlesinya (2020)[31], and Shrivastav, (2016)[32]. A previous study stated that CEO Duality can positively affect firm performance under certain conditions, such as high complexity or resource scarcity. (Chen et al., 2008)[13]. Certain board committees may have a positive significant effect on firm performance. In this case, both the remuneration and nomination committee have no significant impact on both measures of firm performance, which does not align with the study previously conducted by Al-Absy & AlMahari (2023)[4], and Aldegis et al., (2023)[5].

The disclosure of SDGs in a sustainability report, on the other hand, affects a firm's operational performance, but it does not affect a firm's market performance. This result may indicate that sustainability reporting may be less relevant if market-based performance is used, or that their effects are context-dependent and influenced by other factors, such as industry characteristics, regulatory environments, and/or investor priorities (Beretta et al., 2024)[7]. The use of external assurance also did not affect both measures of firm performance; this may be due to several factors, such as the varying quality and scope of assurance services, the level of stakeholder trust in the assurance provider, and the specific contexts in which firms operate. Additionally, the perceived value of external assurance might differ among investors and other stakeholders, leading to inconsistent impacts on market performance. A previous study by Harymawan et al., (2020)[21] stated that external assurance in a sustainability report has a positive effect on firm performance, which does not align with the findings in this research.

However, this study to certain limitations that should be acknowledged. The sample of this study initially aimed to include 128 companies from the industrial, materials, and energy sectors in the Fortune 500 index, 28 companies did not meet the criteria due to incomplete financial reporting or lack of comprehensive sustainability report, as well as having outlier values from 2019 to 2023. As a result, only 100 companies were included in the final analysis. Lastly, while this study focused on certain variables, it is important to note that other factors not included in the analysis may

still influence firm performance. Future research should consider incorporating additional variables to provide a more comprehensive view of the factors affecting corporate performance, especially in relation to sustainability disclosures and governance structures.

5. Conclusion

Both past empirical and theoretical literature lack consistency on how corporate governance mechanisms and sustainability reporting affect a firm's performance. This study examined the effect of five corporate governance mechanism measures as well as two sustainability reporting measures on two different firm performance indicators (ROA and Tobin's Q) using data from 100 companies that are listed in the Fortune 500 Index that fall under the industrials, materials, and energy sector. The study found that ownership concentration positively affects both operational and market-based firm performance measures, while the disclosure of SDGs negatively affects the operational measure of firm performance. Other corporate governance mechanism measures do not significantly affect market-based firm performance measures. These findings carry important implications: our study offers new perspectives to address gaps in the literature of corporate governance and sustainability reporting, particularly the ongoing debate about the financial effects of corporate governance mechanisms and sustainability reporting. The results add to the body of knowledge by presenting novel evidence that some governance practices and sustainability initiatives may need to be revised to effectively drive firm performance in resource-based sectors.

Secondly, the positive impact of ownership concentration, measured by the percentage of insider ownership, suggests that a higher concentration of ownership among insiders can significantly enhance firm performance. Insider ownership aligns the interests of management with those of shareholders, reducing agency conflicts and fostering better decision-making. As stakeholders with a vested interest in the company's success, insiders are more likely to act in the organization's best interest, leveraging their intimate knowledge and commitment to drive financial performance. The findings indicate that a higher percentage of insider ownership creates a sense of accountability and motivation to achieve sustainable growth. Consequently, firms are encouraged to maintain a balanced ownership structure that ensures a meaningful level of insider ownership, enabling them to benefit from the alignment of incentives and the strategic contributions of insiders to overall performance.

Thirdly, the disclosure of Sustainable Development Goals (SDGs) in Sustainability Reports negatively impacts Return on Assets (ROA). This result aligns with the Resource-Based Theory, which suggests that dedicating resources to SDG-related initiatives may strain operational efficiency and profitability in the short term, as these activities often require significant investment without yielding immediate financial returns. However, the absence of a significant relationship between SDG disclosures and Tobin's Q indicates that market participants may not yet fully

recognize or incorporate the strategic value and long-term benefits of sustainability initiatives into their assessment of firm valuation. This highlights a potential disconnect between operational performance and market perception regarding the role of sustainability in driving firm value.

Fourthly, the remuneration and nomination committees show no significant effect on firm performance. This finding can be attributed to the fact that over 95% of the observable data from companies within the industrials, materials, and energy sectors already have these committees in place. The widespread adoption of these governance structures reduces variability in their presence, making it difficult to detect a distinct impact on performance. Essentially, the near-universal establishment of remuneration and nomination committees in these sectors may have normalized their influence, suggesting that their existence alone is not a differentiating factor for firm performance. Instead, the effectiveness of these committees may depend on other factors, such as their composition, processes, or alignment with organizational goals.

6. Limitations

Limitations that are present in this research are stated in respective of future research directions: firstly, the findings in this research align with both positive and negative outcomes reported in prior literature, which suggests that the relationship between certain corporate governance mechanisms and sustainability reporting measures, as well as firm performance, may not be direct, as there might be an influence by mediating or moderating factors. Future research should focus on identifying and analyzing these underlying variables to better understand how corporate governance mechanisms and sustainability reporting measures impact financial outcomes. Secondly, our study focused solely on corporate governance and sustainability reporting measures did not incorporate any other potential determinants of financial performance. This decision was made due to the relatively high number of primary predictors and the potential risk of multicollinearity, which could interfere with the analysis of our variables of interest. Nevertheless, future research is strongly encouraged to include additional control variables, such as sector-based variables, capital structure, market conditions, dividend policy, as well as geographic diversification, if there is no evident risk of multicollinearity.

This study highlights the nuanced and context-dependent nature of governance mechanisms and sustainability practices in influencing firm performance. It underscores the importance of ownership concentration as a key driver of both operational and market-based performance metrics while providing insights into the limited short-term effects of governance and sustainability disclosures.

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