The Link Between ESG Reporting Quality and Accounting Measures of Firm-Level Performance

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Abstract

Purposes: Sustainability reports and integrated information e.g. ESG reports, are utilized by stakeholders for various decision-making processes. Using Taiwan setting, this study examines the effect of ESG reporting quality, including ESG Score, ESG Rating, and ESG Ranking, on financial performance.

Methods: We employ 6,386 firm-year observations from Taiwanese non-financial listed companies to test the hypotheses. We investigate the relationship between ESG reporting quality and the financial performance of operating and market indicators at the firm level. We analyze ESG reporting components using the same pattern and perform two kinds of robustness checks, include COV-ID-19 period check and industry effect testing.

Findings: Empirical evidence demonstrates a positive effect on ESG reporting toward Tobin's Q and is robust in some testing, suggesting that ESG information has valuation implications. In addition, ESG Rating provides the greatest contribution to operating performance and market performance as measured using Tobin's Q.

Novelty: This study provides current empirical evidence on the relationship between ESG reporting quality and firm-level financial performance, going beyond conventional metrics such as Tobin's Q to incorporate a wider range of variables. This work explores various measures of ESG reporting, including ESG Score, ESG Rating, and ESG Ranking. Beyond a single metric, this comprehensive analysis of ESG reporting has numerous implications for firm performance.

Keywords: ESG, ESG Reporting, Firms Performance, Tobin's Q, Sustainability.

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INTRODUCTION

The consensus reached by 195 global leaders in the Paris Agreement has emerged as a significant catalyst for fostering global environmental consciousness within the international community. Monaco (2022) proposes that it is advisable for all stakeholders to enhance their commitment to augmenting investments in initiatives aimed at reducing greenhouse gas emissions and promoting the utilization of renewable energy sources. Initially, during the late 1990s and early 2000s, the concept of managing, monitoring, and reporting on the three components of

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an organization's social, environmental, and economic effects rose to prominence. The success of Elkington (1998) book Cannibals with Forks: The Triple Bottom Line of 21st Century Business, which was attributed to establishing a new non-financial reporting paradigm from a social and environmental standpoint, is partially to blame for this (Gray, 2006). The drawbacks of conventional financial reporting are thus addressed by a framework like triple bottom-line reporting. Companies are evaluated and positioned in accordance with their efforts and impact in promoting the three ESG pillars, namely Environmental, Social, and Governance. This evaluation is deemed trustworthy by multiple stakeholders due to the companies' active involvement in ongoing initiatives and their provision of pertinent and up-to-date information.

The acronym ESG, which stands for "environmental, social, and governance," defines as a framework that is utilized to assess a company's operations and performance in terms of environmental impact, social responsibility, and governance practices. The term "ESG" was first developed by the United Nations Environment Programme (UNEP) in 2004. Subsequently, the concept has been widely adopted by socially responsible investing communities (Fulton et al., 2012). ESG has gained prominence among researchers as a term encompassing diverse company activities. Furthermore, Saini et al. (2022a) argue that the performance of companies in terms of ESG factors, as well as their disclosure of non-financial information, play a critical role in enabling them to achieve a competitive edge. While ESG reporting, as defined by Arvidsson and Dumay (2022), refers to the process of firms disclosing their environmental, social, and governance practices and performance to stakeholders. The purpose of this reporting is to provide transparency and accountability in company activities related to sustainability and ethical governance. The act of disclosure has been found to yield advantages for stakeholders and contribute to the enhancement of firm value, as supported by the research conducted by Solikhah and Maulina (2021), Lee et al. (2013), and Okafor et al. (2021).

The development of ESG adoption in Taiwan began in 2015 (Hsiao and Kelly, 2017), starting with the use of Integrated Reporting (IR) techniques. Before the formal introduction of the Taiwanese IR Framework in December 2015 (IIRC, 2015), FarEasTone and Cathay Financial Holdings were the first Taiwanese enterprises to implement this IR methodology. These two pioneer companies published their integrated report before 2015. In addition, Taiwan has become the initial Asia-Pacific market to implement the G4 principles established by the Global Reporting Initiative. In 2015, the Taiwan Stock Exchange (TWSE) implemented a requirement for listed companies operating in the food processing, financial services, and chemical sectors and having a share capital over NT\$10bn (equivalent to US\$310m), to provide sustainability reports based on the G4 guidelines. Compliance with the G4 may not be the same as compliance with the Framework, but the G4 promotes the link between sustainability reporting methods and the preparation of integrated reports (GRI, 2015). The Framework and G4 share several fundamental concepts. G4 prioritizes the impact of an organization on economic, social, and environmental concerns, while the Framework highlights the generating of financial value, the communication of the business model, and the six capitals (Hsiao and Kelly, 2017). The study of ESG reporting in the context of the Taiwan market is very interesting for several reasons. First, Taiwan became the first Asia-Pacific market to implement the G4 principles established by the Global Reporting Initiative. Second, in 2015, the Taiwan Stock Exchange (TWSE) started requiring specific companies to provide social responsibility reports.

To improve internal decision-making and foster a shared understanding of how value is created by avoiding internal silos, sustainability reports present a comprehensive picture of the combination, interrelatedness, and dependencies between the factors that affect the organization's capacity to create value over time (IIRC, 2013). There is still a lot of uncertainty surrounding the creation of sustainability reports in practice (Bradford et al., 2017). According to Smith et al. (2007), stakeholders use sustainability reports and integrated information, including ESG reports to inform a variety of decisions.

The relationship between ESG disclosures and the financial outcomes of corporations

has garnered increased interest among scholars, academics, and policymakers (Xie et al., 2019, Bhaskaran et al., 2020, Saini et al., 2022a). There has been a notable rise in the adoption of sustainability strategies and the disclosure of environmental, social, and governance information by firms (Friede, 2019). This trend has brought about significant transformations in business models and management theory. The existing literature has thoroughly examined the relationship in question, as evidenced by the works of Li et al. (2018), Xie et al. (2019), Bhaskaran et al. (2020), Saini et al. (2022a), and Shaikh (2022)). In their recent study, Saini et al. (2022a) have made the noteworthy finding that ESG disclosures offer investors a means of evaluating their investment decisions beyond the confines of traditional financial metrics. According to Costa and Agostini (2016) there is an increasing importance of ESG disclosures in relation to corporate value. According to Bhaskaran et al. (2020), there exists a positive correlation between ESG investment practices and financial performance.

Against the background explained previously, this study aims to examine the association between ESG reporting quality and financial performance at the firm level. We also include several control variables in our regression models, including ROA, Leverage, Liquidity, Cash Flow, Firm's Growth, Size, and Age. We draw 6,386 firm-year observations from non-financial listed companies in Taiwan. This study finds that ESG reporting positively correlates with financial performance on three reporting quality measures used in this paper (i.e., ESG Score, ESG Rating, and ESG Ranking). The findings of this study remain robust and consistent with the main finding after undergoing investigation for potential impacts of the COVID-19 event and industry effects checking. Additionally, ESG Rating provides the greatest contribution to operating performance and market performance as measured using Tobin's Q.

This study makes significant contributions to the existing literature in various ways. First, this study presents empirical findings on the relationship between the quality of ESG reporting and the firm-level financial performance of both operating and market indicators, specifically Tobin's Q. Not only operating performance indicators such as return on assets (ROA) or return on equity (ROE) (see Sandberg et al. (2022), and market performance indicators such as stock price or return (see Diaz et al. (2021), which are commonly employed alone in the model. This extensive examination of the firm performance entails a wider range of potential implications for ESG reporting, going beyond the limitations of a singular metric. Second, we employed the same pattern to analyze the various components of ESG reporting concerns. This study presents empirical evidence on multiple aspects of ESG reporting quality, such as ESG Score, ESG Rating, and ESG Ranking. This study applied a comparative analysis of the three primary dimensions of ESG disclosure quality and determined that ESG Rating exhibits the most robust positive impact on firm performance. It can be inferred that ESG ratings offer considerable significance within the market. ESG ratings provided by some agencies play a pivotal role in facilitating relations between companies and their stakeholders. Third, this study employs two kinds of robustness test to capture the implications of COVID-19 and industry effect. Our results make a valuable contribution to the current academic and practical discourse on the importance of sustainability in enhancing corporate resilience to unanticipated disturbances.

Literature Review and Hypothesis Development

The stakeholder theory and legitimacy theory are both relevant frameworks for examining and assessing ESG disclosure. Ofoegbu et al. (2018) posit that legitimacy theory and stakeholder theory are the primary theoretical frameworks employed to explain the emergence of ESG reporting impacts. According to stakeholder theory and legitimacy theory, organizations will make efforts to legitimize their actions in order to meet the demands of various stakeholders.

According to legitimacy theory, if the public believes that an organization has violated its social contract with the community, the organization's ability to continue operations will be at risk (Deegan, 2002). Firms strive to align their behavior with societal norms and boundaries as they operate in an external environment that is constantly changing (Brown and Deegan, 1998).

Legitimacy theory provides a more comprehensive perspective on the disclosure of economic, social, and corporate governance. The theory posits that business operations are subject to a social agreement, in which corporations commit to fulfilling various corporate social responsibilities in order to gain public approving for their objectives, thus guaranteeing the company's sustainability (Brown and Deegan, 1998).

Communities play a crucial role in the establishment and functioning of organizations, as suggested by Freeman and Reed (1983). Hence, the stakeholder theory serves as a guiding principle for the organization's initiatives to ensure adequate disclosure practices. The interaction between a corporation and its stakeholders has created a pressure to fulfil the interests and needs of their stakeholders. To ensure continued access to critical resources that may potentially come under control, it is imperative for executives to engage in disclosure practices with stakeholders (Tanaka and Tanaka, 2022).

The Association Between ESG Quality and Firm-Level Financial Performance

A comprehensive cross-national study conducted by Xie et al. (2019) presents empirical evidence supporting the notion that engaging in environmental, social, and governance (ESG) activities has a favorable influence on the financial performance of firms. In a study conducted by Bhaskaran et al. (2020), it was found that the utilization of the three pillars of ESG, namely environment, social, and governance, has proven to be beneficial in enhancing the market value of firms. The study involved an extensive sample of over 4500 firms. According to De Lucia et al. (2020), from a European standpoint, the incorporation of ESG factors has been found to have a favorable influence on the financial performance of firms. Diaz et al. (2021), Zhao et al. (2018) consistently observed a positive association between strong ESG performance and enhanced financial performance. The conclusion was derived from an analysis of China's publicly traded power generation companies.

Additionally, according to a systematic review of the literature, the majority of studies discovered a favorable correlation between ESG performance (based on ESG score, ESG ranking, or ESG rating) and firm-level performance. More than 2,200 individual studies on the relationship between ESG criteria and financial performance were compiled in a study by Friede et al. (2015). The results showed that 90% of the studies confirmed that ESG had a positive impact on firm-level performance. Moreover The systematic review conducted by Khan (2022), subsequently Identifying the relationship between ESG disclosure and firm-level financial performance, used 199 papers from Scopus databased. The first cluster, which contained the most papers, contained 34 studies that looked at the connection between ESG disclosure and financial performance.

The correlation between ESG reporting and financial performance relies on the notion that organizations that provide greater transparency regarding ESG matters are more likely to embrace sustainable business practices, leading to potential enhancements in company performance, competitive advantages, and bolstered reputation (Bui et al. (2021), Sandberg et al. (2022), Alfalih (2022), Arvidsson and Dumay (2022). Considering arguments that ESG reporting has an impact on the firm's performance, this study proposes the following main hypothesis:

Ha: ESG reporting quality is positively associated with firm-level financial performance

METHOD

Data and Sample Selection

The time frame from 2015 to 2020 has been selected as the designated period for observation. The year of 2015 was chosen as the starting year because it is the first year of the development of ESG adoption in Taiwan. The sample includes the nonfinancial firms listed on the Taiwan Stock Exchange (TWSE) and over-the-counter (OTC). The empirical data retrieved from the Taiwan Economic Journal Database (TEJ), the biggest accounting and finance databased provider in Taiwan. The sample size was truncated due to 60 missing values of different variables. Finally, this paper considers the unbalanced panel data analysis of 6,386 firm-level observations. Then,

we conduct winsorized method to mitigate the influence of outliers or anomalous extreme values for dependent variable (Tobin's Q) and all control variables (ROA, LEV, LIQ, CFLOW, GROWTH, SIZE, LNAGE). This is accomplished by substituting the smallest (outlying 1%) and largest values (outlying 99%) with the values that are nearest to them.

Variable measurement

The Dependent variables employed in this study is Tobin's Q. Tobin's Q indicates long-term financial performance (Saini et al., 2022b) and can measure both operating performance and market performance (Sandberg et al., 2022). The independent variables examined in this study involve three indicators that measure the quality of ESG reporting, specifically the ESG score, ESG rating, and ESG ranking. For the purpose of convenience interpretation, the ESG rating and ESG ranking original value multiplied by -1 (minus 1), then a higher value of ESG rating and ESG ranking mean the better quality of ESG reporting. In addition, the regression model incorporates several control variables, namely Return on Assets (ROA), Leverage (LEV), Liquidity (LIQ), Cash Flow (CFLOW), Growth (GROWTH), Size (SIZE), and Natural Logarithm of Age (LNAGE). The measurement each variables show in Table 1.

No	Variable	Description	Measurement
Dependent Variabl	e		
1	Tobin's Q	Adjusted Tobin's Q	The ratio of the market value of assets divided by the book value of total assets minus the industry average ratio
Independent Varial	ble		
2	ESG Score	Total score of ESG report	The weighted score of ESG reporting provide by TEJ, the score range is 1-100
3	ESG Rating	ESG rating conversion	ESG ratings are converted as follows: A+=1, A=2, B+=3, B=4, B-=5, C=6, C-=7, then the value multiplied by (-1)
4	ESG Ranking	ESG ranking each year	The ESG ranking program developed by TEJ, each company's obtained ranking divide by the total number of participants in a given year, then the value multiplied by (-1)
Control Variables			
5	ROA	Return on assets	Net (comprehensive) return scaled by total assets
6	LEV	Leverage	The total debt to asset ratio
7	LIQ	Liquidity	The current to total debt ratio
8	CFLOW	Cash flow	Total cash flow scaled by the lagged total assets
9	GROWTH	Firm growth	Net income in year t minus net income in year (t-1) scaled by net income in year t-1
10	SIZE	Firm size	The natural logarithm of total assets
11	LNAGE	Firm listing age	The natural logarithm of listing age, which is determined by subtracting the year of research (t) from the year of listing

Table 1. Variables Definition and Measurement

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Empirical Model

The application of Panel Least Squares Regression is employed to examine the effect of ESG reporting quality toward firm-level financial performance. For the linear regression analysis, three regression models, first for ESG Score, second for ESG rating, and third for ESG ranking, are developed. The processing of regression statistics is implemented using the EViews program. We also include firms fixed effect and year fixed effect in the model. The regression equations employed in this paper are as follows:

Model 1

$$\begin{split} TOBINSQ_{i,t} &= \alpha_0 + \beta_1 ESG_Score_{i,t} + \beta_2 ROA_{i,t} + \beta_3 LEV_{i,t} + \beta_4 LIQ_{i,t} + \beta_5 CFLOW_{i,t} + \\ & \beta_6 GROWTH_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 LNAGE_{i,t} + Year\ Effect + \\ & Firm\ Effect + \varepsilon_{i,t} \end{split}$$

Model 2

$$\begin{split} TOBINSQ_{i,t} &= \alpha_0 + \beta_1 ESG_Rating_{i,t} + \beta_2 ROA_{i,t} + \beta_3 LEV_{i,t} + \beta_4 LIQ_{i,t} + \beta_5 CFLOW_{i,t} + \\ & \beta_6 GROWTH_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 LNAGE_{i,t} + Year\ Effect + \\ & Firm\ Effect + \varepsilon_{i,t} \end{split}$$

Model 3

$$\begin{split} TOBINSQ_{i,t} &= \alpha_0 + \beta_1 ESG_Ranking_{i,t} + \beta_2 ROA_{i,t} + \beta_3 LEV_{i,t} + \beta_4 LIQ_{i,t} + \beta_5 CFLOW_{i,t} + \\ & \beta_6 GROWTH_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 LNAGE_{i,t} + Year\ Effect + \\ & Firm\ Effect + \varepsilon_{i,t} \end{split}$$

RESULT AND DISCUSSIONS

The sample utilized in this study comprises non-financial companies listed on the Taiwan Stock Exchange (TWSE). The dataset consists of 6,386 observations, categorized into 18 industry groups, as presented in Table 2.

Code	Industry	Number	Freq. %
11	Cement	59	0.92%
12	Food	131	2.05%
13	Plastics	150	2.35%
14	Textile and Fiber	207	3.24%
15	Motor Machinery	517	8.10%
16	Electric Appliance	50	0.78%
17	Chemical Industry	608	9.52%
18	Glass & Ceramic	20	0.31%
19	Paper Pulp	18	0.28%
20	Iron and Steel	235	3.68%
21	Rubber	60	0.94%
22	Automotive	53	0.83%
23	Electronics	3,407	53.35%
25	Construction	257	4.02%
26	Shipping	118	1.85%
27	Tourism	111	1.74%
29	Trade	69	1.08%
99	Others	316	4.95%
	Total	6,386	100%

Table 2. Sample Distribution

	Mean	Median	Maximum	Minimum
TOBINSQ	1.200	0.950	4.988	0.35
ESG SCORE	55.578	54.970	83.730	34.2
ESG RATING	3.9	4	7	1
ESG RANKING	901	801	2,284	1
ROA	0.087	0.073	0.342	-0.017
LEV	0.407	0.275	2.239	0
LIQ	2.446	1.922	10.954	-0.12
CFLOW	0.900	0.849	5.823	-1.964
GROWTH	0.889	0.128	23.138	-0.989
SIZE	0.155	0.153	0.199	0.129
LNAGE	2.037	2.303	3.892	0
AGE	11.629	10	60	0

Table 3. Descriptive Statistics

Correlation Analysis

Table 4.	Correlation	Analysis
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	TOBINSQ	ESG SCORE	ESG RATING	ESG RANKING	ROA	LEV
TOBINSQ	1					
ESG SCORE	0.0064	1				
ESG RATING	-0.0096	-0.9723	1			
ESG RANKING	-0.0093	-0.9599	0.9664	1		
ROA	0.4914	0.0588	-0.0602	-0.0514	1	
LEV	-0.2185	-0.0230	0.0220	0.0220	-0.2735	1
LIQ	0.2392	0.0186	-0.0192	-0.0168	0.1588	-0.4281
CFLOW	0.0368	0.0088	-0.0106	-0.0101	0.0845	-0.2857
GROWTH	-0.0008	0.0057	-0.0030	-0.0060	0.1057	0.0210
SIZE	-0.1052	-0.0286	0.0322	0.0331	-0.0555	0.2607
LNAGE	-0.1871	-0.0531	0.0521	0.0529	-0.2863	0.1077
		LIQ	CFLOW	GROWTH	SIZE	LNAGE
LIQ		1				
CFLOW		0.1195	1			
GROWTH		-0.0060	-0.0335	1		
SIZE		-0.2490	-0.0123	-0.0265	1	
LNAGE		-0.0828	0.0220	0.0341	0.4729	1

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Descriptive Statistics

Table 3. Presents the descriptive statistics for all variables utilized in the study. The provided example demonstrates Tobin's Q has an average score of 1.2, which indicates that the market value of a company is approximately 1.2 times greater than its book value. The ESG score indicates an average value of 55,578, suggesting that there is an opportunity for improvement of ESG reporting in Taiwan. The average score for ESG ratings is 4, indicating a grade of B for ESG rating. Nevertheless, the ESG reporting quality of listed companies in Taiwan exhibits a favourable trend, as evidenced by the increasing number of participants engaging in the ESG ranking program annually. ROA show an average value of 8.7%, it implies that, on average, the observed companies exhibit favourable levels of profitability. Additionally, other control variables such as LEV, LIQ, CFLOW, GROWTH, and SIZE demonstrate positive performance on average. The last control variable, AGE, measures the average number of years that a company has been listed on either the Taiwan Stock Exchange (TWSE) or the Over-the-Counter (OTC) market.

Correlation analysis is a crucial step in the analytical process, involving the estimation of a correlation matrix to mitigate potential biases in the model. Table 4. Presents the correlation coefficients, which were computed to examine the statistical association between the dependent and independent variables, as well as to ascertain the presence of collinearity. The result indicate a range from low to moderate correlation, with no strong associations observed. Consequently, no further variables were considered necessary to be excluded from the regression models. The findings indicate a positive correlation between TOBINSQ and various indicators of ESG Reporting Quality, namely ESG Score, ESG Rating and ESG Ranking.

employed in the regression.								
	Model 1:		Mode	Model 2:		3:		
	ESG Sc	ore	ESG Ra	ting	ESG Ran	king		
	Coefficient	t-Stat	Coefficient	t-Stat	Coefficient	t-Stat		
Coefficient	0.1585	0.58	0.7948***	4.91	0.7588***	5.33		
ESG	0.0089 *	2.41	0.0367*	2.23	0.0001**	3.11		
ROA	6.3670***	22.39	6.3585***	22.17	6.3652***	22.35		
LEVERAGE	0.0705***	4.27	0.0695***	4.21	0.0704^{***}	4.35		
LIQUIDITY	0.0687^{***}	11.27	0.0687***	11.26	0.0689***	11.37		
CFLOW	-0.0213*	-2.01	-0.0213*	-2.03	-0.0213*	-1.99		
GROWTH	-0.0147***	-4.24	-0.0146***	-4.16	-0.0146***	-4.21		
SIZE	-0.5864	-0.64	-0.5642	-0.62	-0.5727	-0.63		
LNAGE	-0.0418^{*}	-2.45	-0.0417^{*}	-2.46	-0.0418^{*}	-2.45		
Firm Effect	Yes		Yes		Yes			
Year Effect	Yes		Yes		Yes			
Ν	6,386		6,386		6,386			
R ²	54.22%		54.21%		54.24%			
Adjusted R ²	39.85%		39.83%		39.87%			
F Statistic	3.7716***		3.7692***		3.7747***			

Table 5. Empirical Result

Table 5 reports regression results examining the effects of the ESG reporting quality on Tobin's Q. The model includes industry fixed effect and year fixed effect. Each model indicates the different independent variables employed in the regression.

Note: ***, **, * Represents 1% significance, 5% significance, or 10% significance, respectively. This test applies the adjustment of standard errors proposed by White (1980) using two-way cluster standard errors and covariance. All variables are defined in Table 1.

REGRESSION RESULT

To test the hypothesis, the panel least square estimation with firm fixed effect and year fixed effect was employed. Table 5. Reports the results of the various model specifications. Model 1 reveals the output of a regression within ESG score and firm performance, including all control variables. In the model 2, the independent variable of ESG rating is employed with the same control variables. Model 3 displays the ESG ranking test results using the same methodology as models 1 and 2.

Consistent with our initial hypothesis, the coefficient associated with ESG reporting demonstrates a positive and statistically significant relationship across all three models. This implies that enhancing the quality of ESG reports has the potential to enhance company performance, including both internal and market performance.

Table 6. Robustness Test Based on COVID-19 Period

Panel A. Panel Least Squares Regression

Panel A reports robustness regression results consider for COVID-19 period. The model includes firm fixed effect and year fixed effect. Each model indicates the different independent variables employed in the regression.

	Model 1:		Mode	1 2:	Mode	Model 3:	
	ESG So	core	ESG Ra	ating	ESG Rar	nking	
	Coefficient	t-Stat	Coefficient	t-Stat	Coefficient	t-Stat	
Coefficient	0.0512	0.12	0.7897^{*}	2.23	0.7508^{*}	2.13	
ESG	0.0111**	3.18	0.0380*	2.35	0.0001**	3.37	
DCOVID19	0.1273	0.14	0.0090	0.01	0.0184	0.02	
ESG*DCOVID19	-0.0033	-2.25	-0.0047	-0.64	0.0000	-0.91	
ROA	6.3660***	22.35	6.3578***	22.18	6.3642***	22.35	
LEVERAGE	0.0702***	4.29	0.0694***	4.21	0.0704^{***}	4.36	
LIQUIDITY	0.0686***	11.28	0.0687^{***}	11.27	0.0689***	11.37	
CFLOW	-0.0211*	-1.99	-0.0212*	-2.03	-0.0212*	-1.99	
GROWTH	-0.0147***	-4.21	-0.0146***	-4.15	-0.0146***	-4.20	
SIZE	-0.5712	-0.63	-0.5584	-0.61	-0.5655	-0.62	
LNAGE	-0.0414^{*}	-2.41	-0.0416*	-2.45	-0.0416*	-2.43	
Firm Effect	Yes		Yes		Yes		
Year Effect	Yes		Yes		Yes		
Ν	6,386		6,386		6,386		
R ²	54.24%		54.21%		54.25%		
Adjusted R ²	39.85%		39.80%		39.85%		
F Statistic	3.7681***		3.7629***		3.7686***		
Panel B. Wald Chi-Sq	uared Test						
	Coefficient	t-Stat	Coefficient	t-Stat	Coefficient	t-Stat	
ESG + ESG*DCOVID19	0.0079**	2.18	0.0333*	1.81	0.0001**	2.52	
F-statistic	4.7377**		3.2821*		6.339**		
Chi-square	4.7377**		3.2821*		6.339**		

Note: ***, **, * Represents 1% significance, 5% significance, or 10% significance, respectively. This test applies the adjustment of standard errors proposed by White (1980) using two-way cluster standard errors and covariance. All variables are defined in Table 1.

Robustness Test

In order to evaluate the confidence of the regression results, this study performed two kinds of robustness checks. First, we check for the COVID-19 effect, and second, we consider the industry effect in our model. Engelhardt et al. (2021) examined how ESG scores affected 1,452 European companies' financial performance during the COVID-19 crisis. The authors argue that firms with strong ESG performance had higher cumulative abnormal returns and lower idiosyncratic volatility during the COVID-19 pandemic. Similar to those papers, Cardillo et al. (2023) discovered that investors view ESG performance as a valuable aspect of a company, as these firms exhibit stronger stock market performance during the COVID-19 pandemic. Considering that COVID-19 affects company performance, this paper then investigates how ESG reporting quality performs during the COVID-19 event. The years 2019 and 2020 have been designated as the Covid-19 crisis period, denoted as DCOVID19. During this period, a score of 1 was assigned, while other years received a score of 0. In the subsequent panel least squares regression, we include an interaction effect between the ESG report and the COVID-19 year dummy toward firm performance. The robustness check consider for COVID-19 period is reported in Table 6. Panel A provides the results of the Panel Least Squares Regression, while Panel B reports the findings of the Wald Chi-Squared Test.

The results indicate that there is a positive relationship between the quality of ESG reporting and the firms performance across three models. This findings remain unchanged the main output. Further analyses using Wald Chi-Squared Test reveals that collectively ESG reporting quality and COVID-19 event have a positive on firm performance and statistically significant effect. Indicating the consistency of results across multiple tests. According to Cardillo et al. (2023), the COVID-19 outbreak necessitates that firms prioritize sustainability as a crucial element for ensuring their survival and growth.

As shown in Table 2. The electronic industry dominated 53% of the observations. Considering the monetization of ESG efforts within the industry collectively, we employ industry fixed effect for the second robustness test. Patel et al. (2021) found that value creation through ESG heavily depends on how industry-level ESG moves in line with industry sales lead to Tobin's Q. Therefore, the sample was divided into two groups: electronic industry and non-electronic industry. Next, we re-run the three main regressions to determine whether the influence of ESG on firm performance differs between the two industry groups. We perform industry fixed effect model in Table 7.

By dividing subsamples into electronic and non-electronic industries, the results demonstrate consistent with the main findings. Even ESG reporting quality has a significant influence on firm performance only in ESG ranking measurement, but ESG score and ESG rating still show a positive effect in the electronics industry group. Meanwhile, the results for non-electronic industry group indicate that ESG reporting on all three measures positively impacts firm performance.

The robustness test results in Tables 6 and Tables 7 indicate that the quality of ESG reporting on three measures, namely ESG score, ESG rating, and ESG ranking, has a significant positive influence on Tobin's Q. These outputs are consistent with the main regression test. All methodologies produce nearly indistinguishable outcomes. Hence, it can be inferred that the results obtained from this study exhibit a significant level of robustness.

Table 7. Robustness Test Based on Sub-Sample Electronic Industry

Panel A. Electronic Industry Sub-Sample

Panel A reports robustness regression results use **Electronic Industry Sub-Sample**. The model includes firm fixed effect and year fixed effect. Each model indicates the different independent variables employed in the regression.

	Model 1:		Model	Model 2:		Model 3:	
	ESG Sc	ore	ESG Rating		ESG Ranking		
	Coefficient	t-Stat	Coefficient	t-Stat	Coefficient	t-Stat	
Coefficient	0.4443	1.10	0.9596***	4.36	0.9162***	4.77	
ESG	0.0067	1.09	0.0356	1.52	0.0001*	2.06	
ROA	6.3952***	14.38	6.3900***	17.62	6.3920***	17.55	
LEVERAGE	0.0515	1.23	0.0508	1.84	0.0525	1.95	
LIQUIDITY	0.0776***	5.48	0.0776***	8.45	0.0779***	8.52	
CFLOW	-0.0243	-1.29	-0.0243	-1.80	-0.0240	-1.75	
GROWTH	-0.0155***	-2.50	-0.0154***	-3.91	-0.0155***	-3.94	
SIZE	-0.5582	-0.44	-0.5610	-0.44	-0.5740	-0.45	
LNAGE	-0.0742**	-2.39	-0.0747^{**}	-3.43	-0.0742^{**}	-3.38	
Firm Effect	Yes		Yes		Yes		
Year Effect	Yes		Yes		Yes		
Ν	3,407		3,407		3,407		
R ²	53.55%		53.56%		53.58%		
Adjusted R ²	38.34%		38.36%		38.39%		
F Statistic	3.5216***		3.5236***		3.5265***		

Panel B. Non-Electronic Industry Sub-Sample

Panel A reports robustness regression results use **Non-Electronic Industry Sub-Sample**. The model includes firm fixed effect and year fixed effect. Each model indicates the different independent variables employed in the regression.

	Model 1: ESG Score		Model ESG Ra	Model 2: ESG Rating		Model 3: ESG Ranking	
	Coefficient	t-Stat	Coefficient	t-Stat	Coefficient	t-Stat	
Coefficient	-0.1649	-0.44	0.5920**	2.90	0.5583**	2.50	
ESG	0.0111**	2.03	0.0387	2.00 [*]	0.0001*	2.22	
ROA	6.3851***	16.50	6.3747***	16.32	6.3866***	16.44	
LEVERAGE	0.0939***	2.56	0.0937***	4.75	0.0930***	4.58	
LIQUIDITY	0.0603***	3.93	0.0605***	4.67	0.0606***	4.62	
CFLOW	-0.0197	-1.02	-0.0195	-1.14	-0.0199	-1.17	
GROWTH	-0.0122**	-2.03	-0.0121	-1.75	-0.0120	-1.76	
SIZE	-0.5365	-0.39	-0.4852	-0.39	-0.4809	-0.39	
LNAGE	-0.0038	-0.14	-0.0025	-0.12	-0.0033	-0.16	
Firm Effect	Yes		Yes		Yes		
Year Effect	Yes		Yes		Yes		
Ν	2,979		2,979		2,979		
R ²	55.36%		55.30%		55.35%		
Adjusted R ²	41.12%		41.04%		41.11%		
F Statistic	3.8885***		3.8792***		3.8871***		

Note: ***, **, * Represents 1% significance, 5% significance, or 10% significance, respectively. This test applies the adjustment of standard errors proposed by White (1980) using two-way cluster standard errors and covariance. All variables are defined in Table 1.

DISCUSSION

This study demonstrates that ESG reporting has a significant positive impact on firm-level financial performance. The link between ESG disclosure and financial performance is grounded in the idea that companies that provide greater transparency regarding ESG matters are more likely to implement sustainable business strategies, thereby potentially leading to enhanced corporate performance, increased competitive advantages, and bolstered reputation (Branco and Rodrigues (2006) and Bui et al. (2021). According to Sandberg et al. (2022), the communication of ESG disclosure to investors through integrated and sustainability reports, as well as press releases, has the potential to enhance financial performance by mitigating avoidable expenses and consequently yielding increased profits. The study conducted by Fatemi et al. (2018) provides evidence supporting the positive relationship between strengths in ESG factors and firm value appreciation, while weaknesses in these areas are found to be associated with a decrease in firm value. Consistent with them, the earlier study by Alareeni and Hamdan (2020) found a favorable correlation between ESG disclosure and the financial performance of companies in the S&P 500 index.

This empirical study demonstrates an improvement in the quality of ESG reporting. In response to mounting investor demands for comprehensive disclosure of financial and nonfinancial information, companies have adopted various means to fulfill these requirements. Specifically, companies have chosen to incorporate such information within their annual reports, sustainability reports, and integrated reporting. This aligns with the theoretical framework of stakeholder theory, positing that organizations bear a responsibility towards all their stakeholders (Deegan, 2002). The findings of this study assert that the judicious and deliberate dissemination of both financial and non-financial information positively impacts financial performance. According to Sandberg et al. (2022), companies that exhibit stronger ESG performance are experiencing more favorable financial outcomes. Our results are also similar to those of research conducted in developing countries, such as Indonesia. For instance, Armadani and Zarefar (2023) found that quality sustainability disclosure enhances firm performance (Tobin's Q). Our findings are consistent for several additional tests, such as excluding COVID-19 even and differentiating between electronic versus non-electronic industries. This result supports prior relevant literature, for example, Engelhardt et al. (2021) demonstrating a positive correlation between ESG ratings and the performance of stock prices amidst the COVID-19 pandemic. The second robustness test also confirms our main test. Note that electronic industries in Taiwan dominate the sample, then dividing those two groups mitigates the industry-type effect. In line with Patel et al. (2021) argumentation, value creation through ESG is significantly influenced by the alignment of industry-level ESG practice.

CONCLUSIONS

This study examines how ESG reporting quality affects firm-level financial performance. This study indicates that various metrics used to assess the quality of ESG reporting, such as ESG Score, ESG Rating, and ESG Ranking, have demonstrated their efficacy in enhancing financial performance. The empirical evidence supports a positive relationship between the extent of ESG reporting and Tobin's Q, suggesting that value creation is influenced by ESG-related information from the companies. This result is robust for several additional examinations, including considering the COVID-19 pandemic and dividing into the electronic versus non-electronic industries. Our result is consistent with the notion that businesses that offer enhanced transparency on environmental, social, and governance (ESG) issues in their sustainability reports are more likely to enhance sustainable business practices. Implementing sustainable practices improves firm performance, competitive advantages, and reputation.

The study's findings have significant practical implications, particularly for industries are faced with challenges and concerns to the ESG investment as ESG activities requires large expenditure for research and development. Companies, on the other hand, face challenges in

determining how the report should be created, given the variety of frameworks available. Increasing collaboration between industry, government, and non-governmental organizations through training courses, workshops, and seminars would help address ESG reporting issues.

Future studies should reconsider the measurement and comparison of ESG reporting across entities. This offers a challenge for academicians since the lack of qualitative ESG reporting measures compared to quantitative data. The potential value and significance of ESG ratings could be enhanced through the adoption of a more open approach, which incorporates consistent criteria and internationally recognized standards. Further research is also recommended to differentiate between types of industries because different types of industries face different challenges in terms of ESG activities and ESG reporting and thus are anticipated to have different impacts.

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