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Do ESG disclosure scores drive financial success? A dynamic panel analysis of Thai firms

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ABSTRACT

This study aims to explore the relationship between environmental, social, and governance (ESG) disclosure scores and financial performance among publicly listed firms in Thailand from 2014 to 2023. The study uses a methodology by designing a system GMM and difference GMM estimations. The findings provide robust insights into how ESG disclosure scores influence firm profitability and market valuation. The results reveal that environmental disclosure scores negatively affect accounting-based performance measures (ROA and ROE) but positively influence market valuation (Tobin's Q). The social disclosure score consistently enhances ROA, ROE, and Tobin's Q. The governance disclosure score presents mixed results, with system GMM showing a negative impact on all performance measures, while difference GMM indicates a positive effect on ROA and ROE but a negative influence on Tobin's Q. Firm-specific characteristics also play a significant role, as higher leverage weakens financial performance, and liquidity management has varying effects. The practical implications of the study, through its contribution to the literature, are to provide empirical evidence on environmental, social, and governance disclosures in the context of emerging markets. Finally, the study recommends the need for a well-structured policy framework that ensures that environmental, social, and governance initiatives lead to long-term financial stability, investor confidence, and sustainable economic development.

Contribution/ Originality: The authors believe that this study is distinguished from other studies by the originality of the information provided by Bloomberg to a number of Thai companies and through the use of a dynamic panel using GMM analysis. This study aims to clarify the relationship between environmental, social, and governance (ESG) disclosure scores and financial performance in this emerging environment.

1. INTRODUCTION

In recent years, Environmental, Social, and Governance (ESG) considerations have gained significant attention from investors, policymakers, and corporate stakeholders due to their potential impact on financial performance and long-term sustainability (Friede, Busch, & Bassen, 2015). ESG disclosures provide transparency regarding a firm's

commitment to sustainability, corporate ethics, and governance practices, influencing investment decisions and market valuation (Eccles, Ioannou, & Serafeim, 2014). Companies that actively engage in ESG reporting are often perceived as responsible corporate citizens, improving trust and investor confidence (Ahmad, Bin Hidthiir, Rahman, Junoh, & Yusof, 2025; Fatemi, Glaum, & Kaiser, 2018).

The relationship between ESG disclosures and financial performance has been widely debated in academic literature. While some studies suggest a positive association, where ESG initiatives enhance profitability and market valuation (Wang & Sarkis, 2017), others argue that ESG compliance imposes additional costs, potentially reducing short-term financial gains (Giese, Lee, Melas, Nagy, & Nishikawa, 2019). However, much of the existing research focuses on developed markets, leaving a gap in understanding how ESG disclosures affect financial performance in emerging economies like Thailand, where regulatory frameworks and investor perceptions may differ.

Despite the growing importance of ESG disclosures, the impact of ESG practices on financial performance remains inconclusive, particularly in emerging markets (Alareeni & Hamdan, 2020). Thailand, as a rapidly developing economy with an increasing regulatory focus on sustainability reporting, provides an interesting case study to examine this relationship. The country has witnessed a surge in ESG reporting among publicly listed firms; yet, empirical evidence on whether these disclosures translate into financial benefits remains limited (Ayman Abdalla Mohammed Abubakr et al., 2024; Charoenrook & Kouwenberg, 2019).

Previous studies have primarily analyzed the ESG-financial performance link using static panel models, which fail to address endogeneity issues and dynamic relationships (Rahman, Nguyen, & Dissanayake, 2021). Given the mixed empirical findings and methodological gaps, this study employs the system Generalized Method of Moments (GMM) and difference GMM estimations to provide more robust insights into how ESG disclosures affect financial performance in Thailand. By using Return on Assets (ROA), Return on Equity (ROE), and Tobin's Q as performance indicators, this study aims to offer a comprehensive analysis of both accounting-based and market-based financial outcomes.

The primary objective of this study is to examine the impact of ESG disclosure scores on the financial performance of publicly listed firms in Thailand from 2014 to 2023. This study contributes to the existing literature by addressing key methodological and contextual gaps in ESG research. Unlike previous studies that rely on static models, this research employs a dynamic panel approach using system GMM and difference GMM estimations to mitigate endogeneity concerns and provide more reliable insights. Additionally, it extends the ESG-financial performance literature by focusing on Thailand, an emerging market with unique institutional and regulatory dynamics.

From a policy perspective, the findings of this study offer valuable insights for regulators, investors, and corporate managers. By identifying the financial implications of ESG disclosures, this research can inform policymakers about the effectiveness of ESG reporting frameworks and encourage firms to adopt sustainability practices that align with financial performance goals. Furthermore, the study provides empirical evidence for investors to make informed decisions regarding ESG-oriented investment strategies.

The significance of this study lies in its ability to bridge the gap between sustainability reporting and financial performance in an emerging market context. Given the increasing pressure on firms to integrate ESG considerations into their corporate strategies, understanding the financial impact of ESG disclosures is crucial for both corporate decision-makers and investors. Additionally, the study's methodological rigor enhances the reliability of its findings, offering a robust foundation for future ESG research in Thailand and beyond.

2. EMPIRICAL REVIEW AND HYPOTHESIS DEVELOPMENT

Empirical studies reveal varying findings regarding the influence of environmental disclosures on financial performance. Some research suggests a positive correlation, indicating that transparent environmental practices can enhance a firm's value by fostering investor trust and mitigating regulatory risks. For example, Haninun,

Lindrianasari, and Denziana (2018) discovered that environmental performance and disclosure positively impact financial outcomes, as companies with greater transparency in this area tend to experience financial improvements due to a stronger corporate reputation and increased stakeholder confidence. Likewise, Gerged (2020), in a study of firms in emerging markets, found that higher environmental disclosure scores are linked to improved financial performance, as measured by return on assets (ROA) and return on equity (ROE). On the other hand, some studies argue that environmental disclosures can impose extra costs on firms, negatively affecting short-term financial performance. Aragon-Correa, Hurtado-Torres, Sharma, and García-Morales (2016) suggest that sharing environmental information can lead to increased operational expenses and regulatory compliance burdens, ultimately weakening financial outcomes. Similarly, Wu and Li (2022) observed that while certain firms benefit from environmental transparency, others face declining financial returns due to the substantial investments required for sustainable initiatives. These conflicting findings underscore the complexity of the relationship between environmental disclosures and financial performance, suggesting that the impact may depend on factors such as industry, geographic location, and the specific environmental strategies implemented. Based on the above, the hypothesis is:

Hypothesis$_1$: Environmental disclosure scores have a significant impact on the financial performance of firms.

Research on the impact of social disclosures on financial performance presents mixed results. While some studies suggest a positive correlation, indicating that transparent social practices can enhance a company's value by fostering investor trust and minimizing regulatory risks, others report either a negative or insignificant relationship. This suggests that the costs associated with social initiatives might outweigh their immediate financial benefits. For example, a study on Saudi Arabian firms found that higher social disclosure scores positively influence Return on Equity (ROE), implying that socially responsible practices can boost profitability (Al-Marzooqi & Al-Aali, 2022). Likewise, research on Vietnamese commercial banks revealed that Environmental, Social, and Governance (ESG) disclosures contribute to improved financial performance, as measured by ROE, Return on Assets (ROA), and Net Interest Margin (NIM) (Ahmad, Hidthiir, & Rahman, 2024; Nguyen & Nguyen, 2021). On the other hand, some studies indicate no significant link between social disclosures and financial performance. A comprehensive review conducted by the NYU Stern School of Business found that only 26% of studies examining ESG disclosure alone reported a positive correlation with financial performance, whereas 53% of studies focusing on performance-based ESG measures showed a positive link (Tensie, Shivaram, & Stefan, 2021). This suggests that merely disclosing social responsibility information may not be sufficient to enhance financial performance; instead, the actual performance in social responsibility initiatives plays a more critical role. Based on this, the hypothesis is as follows:

Hypothesis$_2$: Social disclosure scores positively affect the financial performance of firms.

Empirical research investigating the correlation between governance disclosures and financial performance has shown inconclusive findings. Certain studies demonstrate a positive correlation, implying that strong governance methods can improve financial results. A study on Vietnamese commercial banks revealed that Environmental, Social, and Governance (ESG) disclosures have a beneficial effect on financial performance, as indicated by Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM) (Nguyen & Nguyen, 2021). A study examining enterprises in emerging economies indicated that governance disclosure scores have a beneficial impact on financial performance (Al-Marzooqi & Al-Aali, 2022; bin Hidthiir et al., 2024). In contrast, alternative research has identified no substantial correlation between governance disclosures and financial performance. A thorough assessment by the NYU Stern School of Business determined that merely 26% of research examining ESG disclosure alone identified a favorable link with financial performance, in contrast to 53% for performance-oriented ESG metrics (bin Hidthiir et al., 2024; Tensie et al., 2021). This indicates that simply revealing governance information may be inadequate for improving financial performance; rather, the actual execution of governance policies is more crucial. The hypothesis is formulated based on this literature as follows:

Hypothesis$_3$: Governance disclosure scores have a significant impact on the financial performance of firms.

3. METHODOLOGY

3.1. Sample and Data Collection

This study employs a sample of 67 publicly listed firms from the Thailand Stock Exchange, selected based on their relevance to the research objectives. The dataset consists of secondary data sourced from Bloomberg, covering the period from 2014 to 2023. This ten-year span was selected to capture long-term trends and patterns, enabling a thorough analysis of firms' ESG disclosure scores and financial performance. Bloomberg was chosen as the primary data source due to its reputation as a leading global provider of financial and sustainability data. Unlike many databases that merely indicate whether ESG reporting is present, Bloomberg offers detailed ESG disclosure scores on a standardized scale from 0 to 100 (Bloomberg, 2023). These scores are derived from 120 indicators across environmental, social, and governance dimensions, providing a quantitative and in-depth assessment of ESG disclosure. This rigorous data collection process strengthens the study's reliability and establishes a solid foundation for econometric analysis.

3.2. Description of Variables

Return on Assets (ROA) is a commonly used metric for assessing firm profitability, calculated as earnings before interest divided by total assets. It measures how efficiently a company utilizes its assets to generate profits (Delmas, Etzion, & Nairn-Birch, 2015). Similarly, Return on Equity (ROE) evaluates profitability in relation to shareholders' equity, providing insights into stock returns and overall financial health (DeGeorge, Patel, & Zeckhauser, 2013; Eugene & French, 1992). Tobin's Q, which compares a firm's market valuation to the cost of replacing its assets, serves as an indicator of investment efficiency and growth potential (Hejazi, Ghanbari, & Sarikhani, 2016; Mysaka, Adams, & Taylor, 2021; Rahman, Ahmad, Mokal, Aziz, & Khotib, 2024). Together, these three metrics—ROA, ROE, and Tobin's Q—offer a well-rounded assessment of financial performance. A detailed description of these variables is presented in Table 1.

Additionally, Environmental, Social, and Governance (ESG) disclosure scores are employed as independent variables, measured using a comprehensive system of 120 indicators, with scores ranging from 1 to 100. This metric assesses a firm's performance across three core dimensions: environmental responsibility, social impact, and governance practices (Bloomberg, 2023). As highlighted by Eccles et al. (2014), strong ESG metrics enable firms to proactively manage risks and capitalize on opportunities that contribute to long-term value creation. By offering a holistic evaluation, ESG scores serve as a reliable benchmark for investors, regulators, and stakeholders in assessing a company's commitment to sustainability and responsible business practices.

Table 1. Variable description.

Category	Variable	Measurement	Expected result
Dependent variables	ROA	Return on assets = Net profit after tax/Total assets	
	ROE	Return on equity = Net profit after tax/Equity capital	
	TBQ	Tobin's Q = Market value of assets/ Replacement cost of capital	
	ENVDS	ESG disclosure score = Calculated from a total of 120 indicators (Ranges from 1 to 100)	-/+
	SOCDS	SOC disclosure score = Calculated from a total of 120 indicators (Ranges from 1 to 100)	-/+
Independent variables	GOVDS	GOV disclosure score = Calculated from a total of 120 indicators (Ranges from 1 to 100)	-/+
Control variables	AGE	AGE = Natural log of age of firm from the date of incorporation	-/+
	TDTTA	TDTTA= Total debt to total assets	-/+
	QR	QR= Quick ratio	-/+
	LSIZE	LSIZE= Log (Total assets)	-/+

This study incorporates several control variables to account for firm-specific characteristics that may influence

financial performance and ESG disclosure scores. Firm age (AGE), calculated as the natural logarithm of years since incorporation, represents stability and operational experience, both of which can affect a company's ability to implement sustainable practices and enhance profitability (Coad, Segarra, & Teruel, 2013). Leverage (TDTTA), defined as the ratio of total debt to total assets, reflects a firm's dependence on debt financing. While higher leverage may limit financial flexibility, it can also drive efficiency by encouraging firms to meet their financial obligations (Frank & Goyal, 2009).

Liquidity (QR), measured using the quick ratio, evaluates a firm's short-term financial health. Greater liquidity allows firms to better manage risks and allocate resources toward sustainability initiatives (El Ghoul, Guedhami, Kwok, & Mishra, 2018). Firm size (LSIZE), expressed as the natural logarithm of total assets, captures the benefits associated with larger firms, such as economies of scale and heightened regulatory oversight, which can positively impact both financial performance and ESG compliance (Dang, Li, & Yang, 2018).

3.3. Model Specification and Analytical Techniques

This study investigates the relationship between Environmental, Social, and Governance (ESG) disclosure scores, profitability, and firm value for 67 publicly listed companies on the Thailand Stock Exchange from 2014 to 2023. To address potential endogeneity concerns and ensure reliable results, the study employs the Generalized Method of Moments (GMM) estimation technique. Specifically, the system GMM estimator is applied to capture within-variable variations, effectively controlling for heterogeneity, heteroscedasticity, autocorrelation, and endogeneity—limitations that traditional panel estimators such as Ordinary Least Squares (OLS), Random Effects (RE), and Fixed Effects (FE) fail to fully address (Arellano & Bond, 1991; Blundell & Bond, 1998). Additionally, to further validate the robustness of the findings, the study incorporates the difference GMM approach. Introduced by Arellano and Bond (1991, the difference GMM estimator employs first-differenced variables to eliminate unobserved time-invariant heterogeneity, reducing potential biases caused by omitted variables. By using lagged values of both dependent and independent variables as instruments, this method effectively mitigates endogeneity issues while also addressing autocorrelation and heteroscedasticity in panel data analysis (Arellano & Bond, 1991).

The decision to employ the difference GMM estimator stems from its ability to complement the system GMM estimator. While system GMM enhances efficiency by combining level and difference equations, difference GMM focuses exclusively on first-differenced variables, offering a more rigorous control for unobserved heterogeneity and serving as a robustness check for instrument validity (Blundell & Bond, 1998). Previous research suggests that integrating both approaches improves result reliability, particularly in datasets where dependent variables exhibit persistence, a common characteristic of financial performance metrics (Roodman, 2009). By incorporating the difference GMM estimator, this study ensures that its findings remain robust and free from biases typically associated with dynamic panel models, thereby reinforcing the validity of the econometric analysis. The baseline model for the study is as follows:

$$ROA_{itc} = \alpha_0 + \beta_1 ROA_{itc-1} + \beta_2 ENVDS_{itc} + \beta_3 TDTTA_{itc} + \beta_4 QR_{itc} + \beta_5 LSIZE_{itc} + \beta_6 AGE_{itc} + \varepsilon_{itc} \quad (1)$$

$$ROE_{itc} = \alpha_0 + \beta_1 ROE_{itc-1} + \beta_2 SOCDS_{itc} + \beta_3 TDTTA_{itc} + \beta_4 QR_{itc} + \beta_5 LSIZE_{itc} + \beta_6 AGE_{itc} + \varepsilon_{itc} \quad (2)$$

$$TBQ_{itc} = \alpha_0 + \beta_1 TBQ_{itc-1} + \beta_2 GOVDS_{itc} + \beta_3 TDTTA_{itc} + \beta_4 QR_{itc} + \beta_5 LSIZE_{itc} + \beta_6 AGE_{itc} + \varepsilon_{itc} \quad (3)$$

In the above models, $\alpha 0$ stands for the intercept, i represents the firm, t stands for the time, c stands for the country. ROA_{itc-1} is the one-period lagged for the dependent variable. ε indicates the error term in the models. Estimation based on the proposed model may encounter three primary sources of endogeneity. When independent variables serve as both explanatory factors and as the expected values of the dependent variable, a phenomenon known as simultaneity occurs that may result in reverse causality. Unobservable heterogeneity is the biasing of estimates caused by missing variables that affect both the dependent and explanatory variables but are not directly observable. When inaccurate variable measurement skews the estimated relationships in the model, measurement error occurs. The study uses the Generalized Method of Moments (GMM) estimator to address these endogeneity issues, adhering

to the methodology described by Blundell and Bond (1998). This methodology is particularly effective in addressing biases caused by simultaneity and omitted variable issues. Furthermore, Li (2016) emphasizes that GMM provides the most robust correction effect on coefficient estimates, making it a preferred choice for dynamic panel data models.

4. RESULTS AND DISCUSSION

Table 2 shows the descriptive statistics for the principal variables in the study. The Return on Equity (ROE) has a mean of 21.869 and a standard deviation of 17.517, with a range from -49.348 to 105.867, signifying considerable variability in enterprises' profitability in relation to shareholders' equity. The Return on Assets (ROA) has an average of 7.893 and a standard deviation of 6.409, indicating moderate variability in enterprises' capacity to create earnings from their assets, with values spanning from -6.945 to 30.232. Tobin's Q (TBQ), an indicator of firm value, has a mean of 2.684 and a standard deviation of 1.928, with a low of 0 and a maximum of 11.775, illustrating variations in market valuation across firms. The Environmental Disclosure Score (ENVDS) has a mean of 2.946 and a standard deviation of 2.079, with values spanning from 0 to 7.43, reflecting disparities in enterprises' environmental transparency. The Social Disclosure Score (SOCDS) averages 3.41, with a standard deviation of 2.387, and ranges from 0 to 8.52, indicating variability in social responsibility disclosures. The Governance Disclosure Score (GOVDS) exhibits the highest mean across ESG components at 3.993, with a standard deviation of 1.63, and a range from 0 to 7.86, indicating heterogeneity in corporate governance disclosure among organizations.

Table 2. Descriptive statistics.

Variable	Obs.	Mean	Std. dev.	Min.	Max.
ROE	670	21.869	17.517	-49.348	105.867
ROA	670	7.893	6.409	-6.945	30.232
TBQ	670	2.684	1.928	0	11.775
ENVDS	670	2.946	2.079	0	7.43
SOCDS	670	3.41	2.387	0	8.52
GOVDS	670	3.993	1.63	0	7.86
TDTTA	670	27.711	17.181	0	76.316
QR	670	1.241	1.2	0	9.627
AGE	670	19.724	9.008	1	38
LSIZE	670	13.414	1.461	9.016	17.209

For financial characteristics, Total Debt to Total Assets (TDTTA) has a mean of 27.711 with a standard deviation of 17.181, ranging from 0 to 76.316, indicating varying degrees of leverage. The Quick Ratio (QR), a measure of short-term liquidity, has an average of 1.241 with a standard deviation of 1.2, showing significant dispersion from a minimum of 0 to a maximum of 9.627. Firm Age (AGE) has a mean of 19.724 years with a standard deviation of 9.008, ranging from newly established firms (1 year) to older firms (38 years), reflecting a diverse sample in terms of corporate maturity. Firm Size (LSIZE), measured as the natural logarithm of total assets, has a mean of 13.414 and a standard deviation of 1.461, with values ranging from 9.016 to 17.209, suggesting differences in firm scale within the sample.

Table 3 shows that a strong positive correlation exists between the environmental disclosure score (ENVDS) and the social disclosure score (SOCDS) (0.599), as well as between ENVDS and the governance disclosure score (GOVDS) (0.554), suggesting that firms with strong environmental commitments also tend to engage in social and governance disclosures. Similarly, SOCDS and GOVDS exhibit a strong positive correlation (0.544), indicating that firms with higher social disclosures also demonstrate stronger governance practices. Firm age (AGE) shows a moderate positive correlation with SOCDS (0.278) and GOVDS (0.190), implying that older firms tend to have better social and governance disclosures. Meanwhile, the quick ratio (QR) has a weak negative correlation with SOCDS (-0.210), suggesting that firms with higher liquidity may engage less in social disclosures. Other financial variables,

such as total debt to total assets (TDTTA) and firm size (LSIZE), exhibit weak or negligible correlations with ESG disclosures, indicating that financial constraints may not significantly influence ESG reporting practices.

Table 3. Matrix of correlations.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ENVDS	1.000						
SOCDS	0.599	1.000					
GOVDS	0.554	0.544	1.000				
TDTTA	0.114	0.076	-0.083	1.000			
QR	-0.003	-0.210	0.009	-0.547	1.000		
AGE	0.086	0.278	0.190	0.066	-0.154	1.000	
LSIZE	0.053	-0.055	0.069	0.024	-0.056	0.091	1.000

The findings in Table 4 indicate that the environmental disclosure score (ENVDS) negatively impacts ROA and ROE but positively influences Tobin's Q (TBQ). Studies have found that higher environmental disclosures often lead to increased compliance costs, operational adjustments, and potential short-term financial burdens, which can reduce accounting-based profitability measures like ROA and ROE (Clarkson, Li, Richardson, & Vasvari, 2011; Dhaliwal, Li, Tsang, & Yang, 2011). Companies that invest in sustainability initiatives often incur higher capital expenditures, regulatory compliance costs, and resource reallocation, which may initially reduce profitability. However, the positive correlation between ENVDS and TBQ indicates that the market views strong environmental disclosure as a signal of long-term sustainability and corporate responsibility. Previous studies by Eccles et al. (2014) and López, Garcia, and Rodriguez (2007) suggest that investors place significant value on transparency in environmental practices, contributing to higher market valuations reflected in Tobin's Q. This implies that while sustainability efforts may lead to short-term financial burdens, they can ultimately strengthen a firm's reputation, boost investor confidence, and support long-term growth, thereby enhancing overall firm value.

The findings indicating that the social disclosure score (SOCDS) positively influences ROA, ROE, and Tobin's Q (TBQ) align with previous research suggesting that firms with strong social responsibility initiatives tend to achieve higher profitability and greater market valuation. Studies have shown that corporate social responsibility (CSR) and social disclosures enhance financial performance by strengthening stakeholder relationships, increasing customer loyalty, and attracting socially responsible investors (Orlitzky, Schmidt, & Rynes, 2003; Waddock & Graves, 1997). Socially responsible firms often benefit from higher employee satisfaction, improved brand reputation, and reduced operational risks, all of which contribute to stronger financial outcomes (Cheng, Ioannou, & Serafeim, 2014). These advantages can drive higher ROA and ROE by enhancing efficiency, fostering innovation, and creating a competitive edge (Margolis & Walsh, 2003). Furthermore, the positive correlation between SOCDS and Tobin's Q suggests that investors perceive social disclosures as indicators of long-term sustainability and lower financial risk. Previous studies indicate that firms engaging in social responsibility initiatives experience lower capital costs and greater investor confidence, leading to higher market valuations as reflected in Tobin's Q (Eccles et al., 2014; Fatemi et al., 2018). These findings support the notion that social disclosures are not just ethical obligations but also strategic investments that contribute to long-term firm value.

The finding that the Governance Disclosure Score (GOVDS) negatively affects ROA, ROE, and Tobin's Q (TBQ) suggests that increased governance disclosures may introduce short-term financial costs or indicate governance inefficiencies, aligning with certain prior studies in the literature. While governance disclosures are generally linked to greater transparency, stronger regulatory compliance, and improved investor protection, some research suggests that extensive disclosures can negatively impact financial performance in the short term due to higher compliance costs, administrative burdens, and potential agency conflicts (Cheng, Evans, & Nagarajan, 2006; Ntim & Soobaroyen, 2013). One possible reason for the negative effect on ROA and ROE is that firms with higher governance disclosures

may face stricter regulatory requirements, increased board oversight, and heightened public scrutiny, leading to higher operational costs and reduced managerial flexibility (Bhagat & Bolton, 2008).

Table 4. GMM result.

Variables	ROA	ROE	TBQ
L.	0.540***	0.660***	0.609***
	(0.00442)	(0.00366)	(0.00280)
ENVDS	-0.821***	-0.603***	0.0195***
	(0.0325)	(0.0567)	(0.00134)
SOCDS	0.955***	1.744***	0.115***
	(0.0179)	(0.0529)	(0.00311)
GOVDS	-0.102***	-0.113	-0.126***
	(0.0297)	(0.150)	(0.00451)
TDTTA	-0.202***	-0.212***	-0.0255***
	(0.00256)	(0.00512)	(0.000613)
QR	0.157***	-1.287***	-0.117***
	(0.0168)	(0.106)	(0.00268)
AGE	-0.140***	-0.626***	-0.0346***
	(0.00857)	(0.0195)	(0.00149)
LSIZE	0.810***	1.995***	0.169***
	(0.0170)	(0.0627)	(0.00299)
Hansan/Sargan	0.0145	0.0163	0.0180
AR (1)	0.0001	0.0007	0.0656
AR (2)	0.1062	0.1504	0.1771
Observations	670	670	670
Number of companies	67	67	67

Note: Standard errors in parentheses.
*** p<0.01.

Additionally, excessive governance-related disclosures could signal weak governance structures, internal conflicts of interest, or overly cautious decision-making, all of which may hinder firm efficiency and profitability (Bebchuk & Weisbach, 2010). The negative relationship with Tobin's Q suggests that investors may interpret extensive governance disclosures as reactive measures driven by external pressures rather than proactive improvements. Prior research indicates that while strong governance can enhance firm value, excessive or forced disclosures may create uncertainty, erode investor confidence, and ultimately lead to lower market valuations (Gillan, 2006; López-Iturriaga, García-Meca, & Tejerina-Gaite, 2010; Rahman & Ahmad, 2024).

Furthermore, the findings indicate that Total Debt to Total Assets (TDTTA) negatively influences ROA, ROE, and Tobin's Q (TBQ), aligning with prior research suggesting that excessive debt levels can adversely affect firm profitability and market valuation. High debt ratios reflect greater financial leverage, which can lead to increased interest obligations, heightened financial distress, and reduced profitability. Previous studies have shown that high leverage negatively impacts ROA and ROE, as excessive debt raises interest expenses, limits cash flow for operational investments, and increases default risk, ultimately diminishing net income and shareholder returns (Fama & French, 2002; Rajan & Zingales, 1995). The negative effect on Tobin's Q suggests that investors perceive highly leveraged firms as riskier and less appealing. High debt levels often result in greater financial distress costs, restricted investment flexibility, and lower future growth prospects, all of which can reduce market valuation (Frank & Goyal, 2009; Myers, 1977). Additionally, excessive debt may signal weak financial health, poor governance, or an overdependence on external financing, further discouraging investors (Titman & Wessels, 1988). These findings are consistent with the trade-off theory of capital structure, which posits that while moderate leverage can enhance firm value through tax advantages, excessive debt leads to increased financial distress costs, ultimately harming firm performance (Jensen, 1986; Modigliani & Miller, 1958).

The findings indicate that the Quick Ratio (QR) positively influences ROA but negatively affects ROE and Tobin's Q (TBQ), suggesting that liquidity management plays a nuanced role in shaping firm performance. A higher quick ratio signifies that a company has sufficient liquid assets to cover short-term liabilities, which can enhance operational efficiency and short-term profitability. Prior research suggests that firms with strong liquidity management face fewer financial constraints, a lower risk of cash shortages, and smoother operational activities, leading to better asset utilization and improved profitability (Deloof, 2003; García-Teruel & Martínez-Solano, 2007). Since ROA measures a firm's ability to generate profits from its total assets, maintaining adequate liquidity ensures that operational expenses can be met without relying on costly external financing, ultimately boosting ROA (Baños-Caballero, García-Teruel, & Martínez-Solano, 2014). However, the negative correlation between QR and ROE implies that while liquidity enhances operational stability, it may dilute shareholder returns. High liquidity levels suggest that firms are holding excess cash and short-term assets instead of investing in high-yield projects or distributing profits to shareholders. This can reduce financial leverage and, consequently, lower ROE (Gill & Shah, 2012; Opler, Pinkowitz, Stulz, & Williamson, 1999). This observation aligns with the trade-off theory of liquidity, which suggests that excessive liquidity may signal inefficient cash management, resulting in lower returns on equity (Ozkan & Ozkan, 2004). The negative impact on Tobin's Q suggests that investors may view high liquidity as a sign of underutilized resources or overly conservative financial management. Firms that hold excessive liquid assets might be perceived as lacking growth opportunities, innovation, or aggressive investment strategies, leading to a lower market valuation (Ferreira & Vilela, 2004; Pinkowitz, Stulz, & Williamson, 2006). Investors generally prefer firms that allocate resources efficiently toward value-generating investments rather than stockpiling liquid assets, which explains the decline in Tobin's Q.

The findings that firm age negatively affects ROA, ROE, and Tobin's Q (TBQ), while firm size has a positive impact on all three performance measures, suggest that maturity and scale influence firm performance in distinct ways. The negative relationship between firm age and financial metrics indicates that older firms may face organizational inefficiencies, structural rigidities, and declining adaptability over time. Several studies suggest that as firms age, they often become more bureaucratic, less innovative, and increasingly risk-averse, which can contribute to lower profitability and market valuation (Coad et al., 2013; Loderer & Waelchli, 2010). Older firms may also struggle with outdated operational structures, resistance to change, and higher administrative costs, all of which can limit their ability to generate strong returns on assets and equity (Davidsson, Steffens, & Fitzsimmons, 2005). Additionally, investors may view aging firms as having limited growth potential, leading to lower Tobin's Q valuations (Henderson, 1999). This supports the liability of aging hypothesis, which argues that firms experience diminishing returns to experience, slower decision-making, and greater difficulty adapting to market shifts, ultimately weakening financial performance (Dechow & Sloan, 1991; Stinchcombe, 1965).

On the other hand, the positive influence of firm size on financial performance is well-established in corporate finance literature. Larger firms benefit from economies of scale, stronger market presence, and improved access to financial resources, all of which contribute to higher profitability and enhanced shareholder returns (Demsetz & Lehn, 1985; Goddard, Tavakoli, & Wilson, 2005). With greater scale, firms can distribute fixed costs across a larger revenue base, secure more favorable terms from suppliers, and access lower-cost financing options, ultimately leading to improved ROA and ROE (Berger & Di Patti, 2006). Additionally, size often correlates with stronger brand recognition, diversified revenue streams, and competitive advantages, making these firms more attractive to investors, thereby increasing Tobin's Q (Hall & Weiss, 1967). From an investor perspective, larger firms are perceived as more stable and resilient, reducing their risk premium and enhancing their market valuation (Majumdar, 1997). This supports the growth-resource theory, which argues that firm expansion leads to greater financial and strategic benefits, ultimately boosting performance (Penrose, 1959).

Table 5. Robustness result of difference GMM.

VARIABLES	ROA	ROE	TBQ
L.	0.493***	0.591***	0.410***
	(0.00310)	(0.00346)	(0.00197)
ENVDS	-0.647***	-0.815***	0.0447***
	(0.0238)	(0.0567)	(0.00192)
SOCDS	1.094***	1.135***	0.141***
	(0.0126)	(0.0670)	(0.00289)
GOVDS	0.0441***	0.249	-0.0322***
	(0.0122)	(0.156)	(0.00672)
TDTTA	-0.177***	-0.350***	-0.0164***
	(0.00217)	(0.00551)	(0.000540)
QR	0.367***	-1.179***	-0.160***
	(0.0249)	(0.101)	(0.00423)
AGE	-0.239***	-0.438***	-0.0122***
	(0.00570)	(0.0471)	(0.00158)
LSIZE	-0.138**	-1.180	-0.0905***
	(0.0636)	(0.994)	(0.0154)
Hansan/Sargan	0.0012	0.0015	0.0014
AR (1)	0.0001	0.0006	0.0675
AR (2)	0.1185	0.1559	0.1801
Constant	12.83***	41.68***	3.462***
	(0.691)	(12.96)	(0.195)
Observations	670	670	670
Number of companies	67	67	67

Note: Standard errors in parentheses.
*** p<0.01.

Table 5 shows the results of the robustness analysis using the difference GMM estimation, which largely confirms the findings from the system GMM estimation, demonstrating the reliability of the results. The consistency of most variables across both estimation techniques suggests that the relationships between ESG disclosures, firm characteristics, and financial performance remain stable. However, there are some discrepancies, particularly in governance disclosure (GOVDS) and firm size (LSIZE), which warrant further discussion. The environmental disclosure score (ENVDS) continues to exhibit a negative impact on ROA and ROE but a positive impact on Tobin's Q (TBQ) across both system and difference GMM estimations. Similarly, the social disclosure score (SOCDS) maintains a positive impact on ROA, ROE, and TBQ across both estimation methods, confirming that socially responsible activities improve both financial and market performance.

However, the governance disclosure score (GOVDS) yields contradictory results across the two estimation methods. In the system GMM estimation, governance disclosure negatively impacts ROA, ROE, and TBQ, whereas in the difference GMM estimation, it positively affects ROA and ROE but remains negative for TBQ. This inconsistency may stem from endogeneity concerns and the varying sensitivity of governance-related factors to different estimation techniques. Some studies suggest that governance disclosures can introduce compliance costs and bureaucratic constraints in the short term, thereby reducing profitability (Bhagat & Bolton, 2008; Gompers, Ishii, & Metrick, 2003). However, stronger governance practices can also foster investor confidence and financial stability, ultimately improving profitability over time (Shleifer & Vishny, 1997). The persistent negative impact on Tobin's Q across both estimations suggests that investors may perceive extensive governance disclosures as more of a regulatory burden than a driver of value creation, particularly in emerging markets.

For total debt to total assets (TDTTA), the negative impact on ROA, ROE, and TBQ remains consistent across both system and difference GMM estimations. Similarly, the quick ratio (QR) produces stable results across both methods, showing a positive effect on ROA but a negative impact on ROE and TBQ. Regarding firm age (AGE), the negative influence on ROA, ROE, and TBQ remains robust across both estimation techniques, reinforcing the liability

of aging hypothesis. However, firm size (LSIZE) presents a notable discrepancy between the two estimation methods. While system GMM results indicate a positive impact on ROA, ROE, and TBQ, the difference GMM results reveal a negative effect across all three measures. This inconsistency may stem from estimation sensitivity to unobserved firm-specific factors or the presence of nonlinear effects in the size-performance relationship (Goddard et al., 2005; Majumdar, 1997). Some studies suggest that larger firms benefit from economies of scale and stronger market positioning, which enhance profitability (Demsetz & Lehn, 1985). However, excessive expansion, bureaucratic inefficiencies, and increased operational complexity can sometimes outweigh these advantages, leading to weaker financial performance (Hall & Weiss, 1967). The conflicting results between estimation methods indicate that the impact of firm size on financial performance may be contingent on industry dynamics and firm-specific strategic decisions.

5. CONCLUSION

This study examined the relationship between ESG disclosure scores and financial performance among publicly listed firms in Thailand, using a dataset covering the period from 2014 to 2023. By employing both system GMM and difference GMM estimations, the findings offer robust insights into how environmental, social, and governance (ESG) disclosures influence firm profitability and market valuation. The robustness analysis confirms the consistency of most variables, reinforcing the reliability of the results. However, variations in governance disclosure scores and firm size highlight the complexity of these relationships and the sensitivity of different estimation techniques. The results indicate that the environmental disclosure score (ENVDS) negatively impacts accounting-based financial performance (ROA and ROE) but positively affects market valuation (Tobin's Q). This suggests that while environmental initiatives may impose short-term costs, investors acknowledge their long-term benefits. Meanwhile, the social disclosure score (SOCDS) consistently demonstrates a positive effect on ROA, ROE, and TBQ, supporting the argument that socially responsible activities contribute to both financial stability and market confidence. However, the governance disclosure score (GOVDS) presents mixed results. In system GMM, it negatively impacts all three performance measures, whereas in difference GMM, it positively influences ROA and ROE but remains negative for TBQ. Firm-specific characteristics also exhibit notable impacts. Total debt to total assets (TDTTA) consistently shows a negative influence on ROA, ROE, and TBQ, reinforcing the view that excessive leverage weakens financial performance. Similarly, the quick ratio (QR) has a positive impact on ROA but a negative effect on ROE and TBQ, suggesting that while liquidity enhances operational efficiency, an excessive focus on liquidity management might limit returns to shareholders. Firm age (AGE) negatively affects all performance measures, aligning with the liability of aging hypothesis, which suggests that older firms may struggle with innovation and adaptability. A key divergence emerges in firm size (LSIZE). System GMM results indicate a positive effect on all financial performance measures, whereas difference GMM results suggest a negative impact.

6. POLICY IMPLICATIONS

The findings of this study provide important policy implications for regulators, investors, and corporate decision-makers regarding the role of ESG disclosures in financial performance. Given the negative short-term impact of the environmental disclosure score (ENVDS) on profitability but its positive influence on market valuation, policymakers should offer tax incentives, subsidies, and standardized ESG reporting frameworks to encourage sustainable practices while minimizing financial burdens. The positive impact of the social disclosure score (SOCDS) across all financial indicators underscores the importance of promoting corporate social responsibility (CSR) initiatives, such as employee welfare programs and sustainability-linked investments. However, the mixed effects of the governance disclosure score (GOVDS) highlight the need for a balanced regulatory approach that enhances governance transparency while minimizing excessive compliance costs. The consistent negative impact of total debt to total assets (TDTTA) on financial performance emphasizes the significance of sound debt management policies, encouraging firms to maintain

optimal debt levels through financial oversight and sustainability-linked financing. Similarly, while higher liquidity (QR) supports operational efficiency, its negative effect on shareholder returns suggests that firms should refine their liquidity management strategies to strike a balance between financial stability and profitability. The contrasting results for firm size (LSIZE) indicate that while larger firms benefit from economies of scale, overregulation and operational inefficiencies can offset these advantages. Therefore, policymakers should adopt a flexible, incentive-driven, and sector-specific approach to ESG regulation, harmonizing reporting frameworks, optimizing debt management, balancing governance requirements, and promoting efficient liquidity and growth strategies. A well-structured policy framework will ensure that ESG initiatives drive long-term financial stability, investor confidence, and sustainable economic development (Abubakr et al., 2024).

7. LIMITATIONS AND FUTURE RECOMMENDATIONS

This study has several limitations that should be acknowledged. The sensitivity of estimation methods, particularly the differences between system GMM and difference GMM results, suggests that findings may be influenced by model specification. Additionally, the dataset is limited to publicly listed firms in Thailand from 2014 to 2023, restricting the generalizability of results to other markets. ESG disclosure scores, while useful proxies, may suffer from measurement inconsistencies due to variations in reporting standards. Furthermore, the study primarily captures short-term financial effects, leaving the long-term impact of ESG initiatives unexplored. Despite using GMM to address endogeneity, potential biases such as omitted variable bias or measurement errors in ESG scores may still persist. Future research should consider cross-country comparisons to examine institutional and regulatory influences, explore alternative financial performance measures like earnings per share or free cash flow, and conduct sector-specific analyses to identify industry-level ESG impacts.

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