

INTERNATIONAL REAL ESTATE REVIEW

2026 Vol. 29 No. 3: pp. 377 – 397

ESG Practices and the Profitability of Listed Real Estate Companies in Vietnam

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This paper evaluates the association between practicing environmental, social, and governance (ESG) standards and the profitability of listed real estate companies in Vietnam. Data are collected from real estate companies listed on the Ho Chi Minh and Hanoi Stock Exchanges during the period of 2018–2024. The research methodology utilizes panel regression models, including a pooled ordinary least squares model, and fixed and random effects models. To control for unobserved firm heterogeneity and year-specific shocks, the baseline model includes both firm and year fixed effects. The results show that ESG practices are not statistically and significantly associated with either the return on average assets or return on average equity, but are positively and significantly associated with accounting profitability. The findings suggest that ESG practices may not immediately improve accounting profitability for listed real estate companies in Vietnam, possibly due to the early stages of ESG implementation, initial compliance costs, and the long investment horizon of real estate projects.

Keywords

ESG, Profitability, Real Estate Firms, Viet Nam

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DOI: <https://doi.org/10.53383/100427>

1. Introduction

With climate change, resource depletion, and increasing more pressure for social responsibility, the shift towards adopting sustainable development models for businesses is no longer a voluntary choice but gradually becoming a mandatory market requirement. Environmental, social, and governance (ESG) standards are increasingly becoming an important element when evaluating business performance globally. Practicing ESG standards not only reflects the degree of sustainability and business responsibility towards the community and environment, but can also create a competitive advantage by enhancing brand reputation, improving risk management capabilities, and strengthening investor confidence. For listed companies, ESG standards are seen as a supplementary criterion alongside traditional financial indicators when evaluating performance and growth prospects. Therefore, studying the relationship between ESG practices and financial performance, specifically the profitability of businesses, becomes essential to provide empirical evidence for businesses, investors, and regulators in promoting the sustainable development of capital markets.

The real estate industry is one of the sectors with a significant impact on the environment and society due to its direct involvement in urbanization, land use, and energy consumption, and its impact on local communities. Therefore, the ESG practices in this industry have been increasingly adapted to meet the requirements of transparency, accountability, and sustainable development.

The literature shows that the relationship between ESG and financial performance remains inconsistent. Some studies suggest that ESG standards have a positive impact on business performance, which indicates that ESG practices can improve profitability and increase business value through enhanced governance, improved reputation, and optimized resources (Aydoğmuş et al., 2022). Conversely, other studies show that ESG practices do not have a clear impact on profitability or business value, especially in emerging markets where ESG implementation is inconsistent and the implementation costs may outweigh the short-term benefits (Dinarjito, 2024). Furthermore, some studies emphasize that ESG standards can have a two-way impact. They can increase financial stability and market attractiveness, but at the same time, generate operating and compliance costs, thus having a net impact on profitability (Shan et al., 2024). Differences in empirical results may stem from different national contexts, industry characteristics, ESG measures, and estimation methods.

In Vietnam, ESG implementation has been gradually gaining more attention as the country moves towards improving corporate governance standards and developing a sustainable capital market. The period of 2018–2024 also witnessed many significant changes in the real estate market and economy in general, including the impact of the COVID-19 pandemic, changes in the interest rate environment, capital flows, and the demand for information

transparency from investors. Therefore, studying the association between ESG practices and the profitability of listed real estate companies in Vietnam during this period of time has both theoretical and practical significance.

The study examines the relationship between ESG practices and the profitability of listed real estate companies in Vietnam during the period of 2018–2024. The study is structured as follows: after the introduction, Part 2 presents an overview of previous studies and the research hypotheses; Part 3 describes the data, variables, and research methods; Part 4 presents and analyzes the results; and Part 5 provides the conclusions and recommends directions for further research.

2. Literature Review on Association between ESG Practices and Business Profitability

ESG is a framework for assessing the sustainability of a business through three key pillars: environmental (E), social (S), and governance (G). E reflects the commitment to reducing negative environmental impacts such as controlling emissions, using energy efficiently, and managing waste; S represents social responsibility which is realized through labor policies, safety, welfare, and community relations; and G is related to the quality of corporate governance such as information transparency, shareholder rights, internal control, and business ethics (Principles for Responsible Investment, 2021; Fatemi et al., 2018).

In empirical studies, ESG is often measured in various ways, such as through ratings published by independent organizations, composite indices based on international standards (Global Reporting Initiative, Sustainability Accounting Standards Board/International Sustainability Standards Board), or self-reported data from businesses in their annual reports and sustainability reports. However, in Vietnam, ESG data lack standardization and are primarily based on voluntary disclosure, thus leading to significant discrepancies among businesses (Nguyen and Ngyuen, 2023). Therefore, this study uses a binary ESG variable to reflect whether businesses practice and disclose ESG implementation.

In theory, ESG practices may be associated with business performance through a number of different ways. First, according to the stakeholder theory, practicing ESG helps businesses to meet the expectations of investors, customers, and society, thereby enhancing their reputation and creating a competitive advantage (Freeman, 1984). Secondly, according to the legitimacy theory, ESG is a tool that helps businesses to maintain legitimacy in the institutional environment and reduce the risk of negative social reactions (Suchman, 1995). Thirdly, according to the signaling theory, businesses that disclose ESG are seen as providing signals of transparency, good governance, and long-term orientation, thereby reducing information asymmetry and

increasing market confidence (Spence, 1973). ESG helps businesses to improve their risk management capabilities, increase their operational efficiency, and reduce dispute costs and information asymmetry. These facilitate increased profitability and enterprise value (Friede et al., 2015). However, ESG practices can also reduce profits in the short term due to compliance costs (information disclosure costs, green technology investments, improvements in working conditions, etc.), especially for businesses with limited resources. The cost of implementing ESG measures can reduce profits in the short term, particularly when ESG standards are superficial or when businesses lack the capacity to translate ESG measures into a real competitive advantage. Therefore, the relationship between ESG practices and accounting profitability may depend on the actual quality of the ESG implementation process, firm-specific capabilities, and the broader market context.

2.1 Studies on Association between ESG Practices and Firm Profitability

Many studies suggest that ESG practices may be positively associated with business profitability due to increased governance efficiency, reduced operational risk, enhanced market confidence, and long-term competitive advantages. According to Aydoğmuş et al. (2022), ESG measures are positively related to profitability when these measures increase investor confidence, improve business image, and optimize resource allocation efficiency. This study expects that a high ESG score will have a positive impact on both firm value and profitability. Similarly, many other studies support the view that businesses with good ESG practices generally achieve better financial performance due to improved operational capabilities and sustainable governance. In the real estate industry, the relationship between ESG practices and profitability may be particularly relevant, as it is sensitive to legal and socio-environmental risks and demands high levels of transparency, project governance, and cash flow management. Good ESG practices can help real estate businesses increase the trust of buyers, partners, credit institutions, and investors, thereby effectively supporting sales, fundraising capabilities, and improving profitability.

Aside from positive findings, some of the studies suggest that ESG may reduce profitability in the short term due to the significant implementation costs. When the benefits of ESG have yet to translate into revenue or operational efficiency, profits may decline, especially for businesses with limited financial resources or high leverage. Shan et al. (2024) emphasize that ESG practices can enhance market attractiveness and increase financial stability, but also incur additional operating costs, which result in a two-way impact on financial performance. This indicates that in some cases, ESG measures may not generate immediate profits but require time to take effect. In the real estate industry, ESG costs can be even higher because businesses must invest in green design, environmentally friendly materials, workplace safety standards, community impact control, and

transparent project management systems. Therefore, in the short term, ESG practices can put pressure on costs and reduce some of the profitability indicators (return on assets (ROA)/return on equity (ROE)) if businesses have not optimized their implementation efficiency.

Neo et al. (2024) examine 413 REITs in the United States and other developed markets over the period of 2008–2022 and find that ESG measures are negatively associated with REIT stock returns, as ESG-rated REITs tend to record lower returns and lower market risk premia, while incurring higher governance costs, particularly in terms of compensation for the board of directors and senior management.

2.2 Studies with Mixed Results or Lack of Correlation

Another research direction shows that the impact of ESG standards on profitability is inconsistent or even statistically insignificant, especially in emerging markets where ESG practices have not yet become a core factor in investment decisions or have not made a significant difference in business performance. Dinarjito (2024) shows that ESG measures do not affect profitability and firm value in an Indonesian sample, and ESG measures do not play a moderating role in the relationship between profitability and firm value.

These results suggest that ESG practices are sometimes formalistic or not effectively integrated into business strategies, thereby resulting in unclear financial benefits. Furthermore, the research emphasizes that ESG practices need to be “aligned with business objectives” rather than simply implemented to meet regulatory requirements. On the other hand, many empirical studies suggest that ESG implementation can have different impacts depending on its components (E/S/G), the size of the business, type of industry, or economic stage. For example, there may be cases where the environment (E) has a negative impact due to high costs, while governance (G) has a positive impact through improved operational efficiency. Therefore, differences in research results may stem from the way that ESG practices are measured, differences in the quality of ESG disclosure, and the quality of the ESG measures in business operations.

The existing studies show that there is still a gap in assessing the impact of ESG measures on profitability in the Vietnamese context, especially for listed real estate companies which face significant pressure from market cycles, financial leverage, and transparency requirements.

3. ESG Practices and Profitability of Listed Real Estate Companies in Vietnam

3.1 Research Model

Based on the stakeholder and signaling theories and related empirical studies, this research constructs a model to examine the relationship between ESG practices and the profitability of listed real estate companies in Vietnam during the period of 2018–2024. Profitability is measured by using two common indicators, return on average assets (ROAA) or return on average equity (ROEA), to reflect the efficiency of operations on assets and equity.

To assess both immediate and lagged impacts, the study implements two models for each dependent variable, including:

- Model at time t (no lag): ESG practices in year t are examined in relation to accounting profitability in the same year.
- Model at time $t-1$ (with lag): ESG practices in the previous year are examined in relation to current accounting profitability, thus reflecting the possibility that ESG-related benefits may materialize gradually rather than immediately.

Given the potential concern that unobserved firm-specific characteristics may influence both ESG practices and profitability, the baseline specification includes firm fixed effects. Year fixed effects are also included to control for macroeconomic conditions, regulatory changes, and real estate market shocks that are common to all firms in a given year.

Specifically, the proposed regression equations are as follows:

- (1) ROAA model without lag (t):

$$ROAA_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 LIQ_{it} + \beta_5 ASINH_REV_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

- (2) Mô hình ROAA with lag ($t-1$):

$$ROAA_{it} = \beta_0 + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 LIQ_{it} + \beta_5 ASINH_REV_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

- (3) ROEA model without lag (t):

$$ROEA_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 LIQ_{it} + \beta_5 ASINH_REV_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (3)$$

- (4) ROEA model with lag ($t-1$):

$$ROEA_{it} = \beta_0 + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 LIQ_{it} + \beta_5 ASINH_REV_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (4)$$

where

- i represents the firm, t represents the year of observation.
- $ROAA_{it}$ and $ROEA_{it}$ are measures of profitability.
- ESG_{it} is a variable that reflects the ESG practices of a company.
- $SIZE_{it}$, LEV_{it} , LIQ_{it} , and $ASINH_REV_{it}$ are the control variables.
- μ_i denotes firm fixed effects, which control for time-invariant unobserved characteristics of each firm.
- λ_t denotes year fixed effects, which control for macroeconomic factors and common shocks over time
- ε_{it} is an idiosyncratic error term.

The coefficient of interest is β_1 , which captures the conditional association between ESG practices and accounting profitability after controlling for firm-level characteristics, and firm and year fixed effects. Since the study does not include an exogenous shock or a quasi-experimental research design, the estimated coefficients should be interpreted as conditional associations rather than conclusive causal effects.

3.2 Research Hypotheses

Previous studies on the relationship between ESG practices and financial performance have shown inconsistent results. Some empirical evidence suggests that ESG practices can improve profitability through enhanced governance, increased transparency, strengthened investor confidence, and reduced operational risk (Aydoğmuş et al., 2022). However, other studies indicate that ESG measures may not have a significant impact on profitability, or that the financial benefits of ESG measures are not apparent in the short term due to increased implementation and compliance costs (Dinarjito, 2024; Shan et al., 2024). Differences in results may stem from market characteristics, the type of industry, ESG measurement methods, and research methodologies. In the Vietnamese context, the real estate sector is capital-intensive, highly cyclical, and increasingly subject to pressure for transparency, responsible governance, and sustainable development. Real estate firms also face substantial financing needs, legal risks, environmental concerns, and stakeholder scrutiny. Therefore, examining the association between ESG practices and accounting profitability among listed real estate companies in Vietnam is important from both academic and practical perspectives.

Based on this, the study proposes the following general hypothesis:

H1: ESG practices are positively associated with the profitability of a real estate firm (ROAA).

H2: ESG practices are positively associated with the profitability of a real estate firm (ROEA).

H3: One -year lagged ESG practices are positively associated with the profitability of real estate firms (ROAA).

H4: One -year lagged ESG practices are positively associated with the profitability of real estate firms (ROEA).

3.3 Research Data

The study uses panel data from 41 real estate companies listed on the Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) during the period of 2018–2024 (Appendix 1). This is the period when real estate companies began to increase their compliance with sustainable development standards and disclose ESG information through annual reports, corporate governance reports, and related information disclosure documents. The data are aggregated according to a company-year structure, where each observation represents the financial situation and ESG practice status of the company in each study year. Companies are selected based on the criteria of having complete financial reporting information to calculate the variables in the model, and being able to identify ESG practices/disclosures according to the research criteria. The collected data are standardized and processed uniformly before being incorporated into the estimation model. The use of panel data allows for simultaneous assessment of differences between businesses and fluctuations over time, thereby providing a more comprehensive view of the impact of ESG implementation levels on the profitability of real estate businesses.

3.4 Variables in the Model

Table 1 lists the variables in the research model.

3.4.1 Dependent Variables

There are two dependent variables: ROAA and ROEA. The former measures the efficiency of generating returns from average total assets, thus reflecting the efficiency of asset utilization by the enterprise (Ross et al., 2016). The latter measures the efficiency of generating returns from average equity, thus reflecting the level of return on shareholders (Ross et al., 2016).

3.4.2 Independent Variable

The independent variable is the ESG, which is a dummy variable that reflects the state of ESG practices/disclosures of an enterprise. Theoretically, ESG is considered to be a factor that can impact financial performance through improved governance, reduced risk, and enhanced credibility with investors (Eccles et al., 2014; Friede et al., 2015).

In this study, + ESG=1 if the company practices/discloses ESG measures according to the research criteria, and + ESG = 0 if the company does not practice/disclose ESG measures.

Table 1 Measurement of Variables in Research Model

Variable	Abbreviation	Measure	Sources
ESG practices	ESG	Dummy variables: 1 = the company practices/discloses ESG measures; 0 = the company does not practice/disclose ESG measures.	Eccles et al. (2014); Friede et al. (2015); Dinarjito (2024)
Profitability (of assets)	ROAA	$ROAA = (\text{Net profit after tax} / \text{Average total assets}) \times 100\%$	Ross et al. (2016)
Profitability (equity)	ROEA	$ROEA = (\text{Net Profit} / \text{Average Equity}) \times 100\%$	Ross et al. (2016)
Firm size	SIZE	$SIZE = \ln(\text{total asset})$	Rajan and Zingales (1995)
Leverage	LEV	$LEV = \text{Total debt} / \text{Total asset}$	Rajan and Zingales (1995)
Liquidity	LIQ	$LIQ = \text{Current assets} / \text{Current liabilities}$	Ross et al. (2016)
Variable revenue	ASINH_REV	$ASINH_REV = \text{asinh}(\text{Revenue})$	Burbidge et al. (1988); Bellemare & Wichman (2020)

3.4.3 Control Variables

The four control variables are financial size (SIZE), financial leverage (LEV), liquidity q (LIQ), and variable revenue (ASINH_REV). SIZE is measured by the natural logarithm of the total assets, thereby reflecting stable size and reducing distribution bias (Rajan and Zingales, 1995). LEV reflects the amount of debt used in the capital structure and is usually measured by the ratio of total debt to total assets (Rajan and Zingales, 1995). LIQ is measured by the current ratio, which reflects the ability to meet short-term obligations. Finally, in cases where the data may show negative or zero revenue, the natural logarithm variation is unsuitable. Therefore, the study uses ASINH_REV for revenue to maintain the observation and reduce the impact of distribution bias (Burbidge et al., 1988).

3.5 Research Methodology

This study uses panel regression models to examine the association between ESG practices and the accounting profitability of listed real estate companies in

Vietnam during 2018–2024, measured by the ROAA and ROEA. Panel data allow the analysis to control for firm-level heterogeneity and time variation, thereby improving the reliability of the estimates (Baltagi, 2005; Wooldridge, 2010).

The study estimates pooled ordinary least square (OLS), fixed-effects model (FEM), and random-effects model (REM) specifications. The F-test, Breusch-Pagan Lagrange multiplier (LM) test, and Hausman test are used to assess the appropriateness of different panel-data models. Although the Hausman test does not reject the random effects specification in all of the models, a two-way FEM is used as the baseline specification to address concerns about unobserved firm heterogeneity. Firm fixed effects control for time-invariant firm characteristics, while year fixed effects control for macroeconomic shocks, regulatory changes, and common real estate market conditions. Pooled OLS and REM results are reported as robustness checks. Standard errors are clustered at the firm level. The results are interpreted as conditional associations rather than definitive causal effects.

4. **Research Results and Discussion**

4.1 **Variable Descriptions**

Table 2 lists the descriptive statistics of the variables in the model.

Table 2 Descriptive Statistics of Variables in Model

Variable	Mean	Standard deviation	Min	Max
ESG	0.47	0.50	0.00	1.00
ROAA	4.68	4.71	-22.44	22.67
ROEA	12.21	14.06	-76.73	97.00
Size	15.82	1.36	12.75	20.15
LEV	0.54	0.18	0.00	0.87
LIQ	3.02	7.26	0.23	92.92
ASINH REV	14.31	3.22	-12.76	19.15

Source: Author's calculations

As shown in Table 2, the average of the ROAA and ROEA is 4.68% and 12.22%, respectively, but vary significantly (ROAA from -22.44% to 22.67%; ROEA from -76.73% to 97%). This reflects considerable differences in the business performance among the companies in the real estate industry.

The average financial leverage reaches 0.545 (equivalent to 54.49%), which indicates that real estate companies tend to use a lot of debt, consistent with the industry characteristics of large capital requirements and long project cycles.

At the same time, the LEV ranges from 0.003 to 0.873, which shows uneven levels of debt utilization among companies.

The level of ESG practice also varies. The average ESG value is 0.470, and ranges from 0 to 1, thus indicating a significant difference between businesses that had disclosed/implemented ESG and those that did not during the study period.

As for the revenue after the ASINH transformation, ASINH_REV is on average 14.31 and ranges from -12.76 to 19.15, thus reflecting the difference in revenue size between businesses. Using the ASINH transformation helps to reduce the impact of outliers while retaining information from observations with very large or very small revenues in the regression model.

4.2 Correlation Analysis

The results of the correlation analysis (Table 3) show that the correlation between the variables in the model is less than 0.8. The variance inflation factor (VIF) test shows that there is no severe multicollinearity in the research model. Specifically, the VIF values of each variable are relatively low, which range from 1.17 to 1.93, and the mean VIF is 1.58 (less than the threshold of 10). Therefore, the explanatory and control variables are reliable and can be used to perform panel data regression estimates in the subsequent analysis steps.

Table 3 Correlation Matrix between Variables

	ROAA	ESG	SIZE	LEV	LIQ	ASINH_REV
ROAA	1.000					
ESG	0.0450	1.000				
SIZE	-0.0120	0.3210	1.000			
LEV	-0.0624	0.0030	0.2443	1.000		
LIQ	-0.0191	-0.0772	-0.1663	-0.3573	1.000	
ASINH_REV	0.3895	0.1840	0.4483	0.1173	-0.1255	1.000

Source: Author's calculations

4.3 Results of Model Selection with ROAA Variables

To select a model that is suitable for the panel data, this study uses three estimation methods: pooled OLS, fixed effects, and random effects modeling. The F-test is used to compare the FEM with the pooled OLS model results, while the Breusch–Pagan LM test is used to compare the REM with the pooled OLS model results, and finally, the Hausman test is used to compare the FEM with REM. In addition, multicollinearity, heteroskedasticity, and autocorrelation tests are conducted to determine if there are any potential model defects. The study estimates both the contemporaneous model at time t and the

one-year lagged model at time $t-1$ to examine the immediate and lagged associations between ESG practices and accounting profitability.

4.3.1 **Model t**

Table 4 is the summary of the model selection and diagnostic tests.

Table 4 Summary of Model Selection and Diagnostic Tests– ROAA (t)

Test	Statistic	P-value	Conclusion
VIF (Multicollinearity)	Mean VIF = 1.58		No multicollinearity
F-test (Fixed effects and pooled OLS modeling)	$F(40,235) = 3.48$	0.0000	FEM is more suitable than pooled OLS.
Breusch-Pagan LM (Random effects and pooled OLS modeling)	$\text{chibar}2(01) = 46.73$	0.0000	REM is more suitable than pooled OLS.
Hausman (Fixed and random effects modeling)	$\text{chi}2(5) = 10.32$	0.0668	REM is suitable ($p>0.05$)
Modified Wald (heteroskedasticity)	$\text{chi}2(41) = 53064.79$	0.0000	There is heteroskedasticity.
Breusch-Godfrey (autocorrelation)	$F(1,40) = 2.6$	0.1145	No autocorrelation

Source: Author's calculations

The results in Table 4 show that both FEM and REM are preferred to pooled OLS, as indicated by the F-test and Breusch–Pagan LM test. The Hausman test has a p-value of 0.0668, which means that the null hypothesis in favor of REM is not rejected at the 5% significance level. However, the result is marginal at the 10% level, thereby suggesting that unobserved firm-specific effects may still be relevant. Therefore, although REM is not rejected by the Hausman test in this contemporaneous model, FEM remains important as a conservative specification, especially given the concern that unobserved firm characteristics may be related to ESG practices and accounting profitability.

The diagnostic tests also indicate that the model does not suffer from serious multicollinearity, with a mean VIF of 1.58. The Wooldridge test does not indicate autocorrelation. However, the modified Wald test rejects the null of homoskedasticity, thereby indicating heteroskedasticity. Therefore, robust standard errors clustered at the firm level should be used in the final regression estimation.

4.3.2 $t-1$ Lag Model

To assess the relationship between the lag of ESG practices and profitability, this study constructs a regression model with a one-period lagged ESG (ESG (-1)) as the primary independent variable and the ROAA as the dependent variable. For the lagged ROAA model, the F-test and Breusch – Pagan LM test again show that panel-data estimators are preferred to pooled OLS (see Table 5).

Table 5 Summary of Model Selection Testing with ROAA ($t-1$)

Test	Statistic	P-value	Conclusion
VIF (Multicollinearity)	Mean VIF = 1.53		No multicollinearity
F-test (Fixed effects and pooled OLS modeling)	$F(40,195) = 3.31$	0.0000	FEM is more suitable than pooled OLS.
Breusch-Pagan LM (Random effects and pooled OLS modeling)	$\text{chibar}2(01) = 35.99$	0.0000	REM is more suitable than pooled OLS.
Hausman (Fixed and random effects modeling)	$\text{chi}2(5) = 11.28$	0.0461	FEM is preferred ($p > 0.05$)
Modified Wald (heteroskedasticity)	$\text{chi}2(41) = 99453.08$	0.0000	There is heteroskedasticity.
Wooldridge test / Autocorrelation	$F(1,40) = 1.2$	0.2791	No autocorrelation

Source: Author's calculations

In contrast, the Hausman test for the lagged ROAA model rejects the REM specification and supports the use of FEM. Considering these results, together with the concern that unobserved firm-specific characteristics may be related to both ESG practices and accounting profitability, the study uses fixed effects as the baseline specification and reports random effects results for comparison.

The diagnostic tests indicate that both ROAA models do not exhibit serious multicollinearity or autocorrelation. However, heteroskedasticity is detected in both specifications. Therefore, the final regression models are estimated by using robust standard errors clustered at the firm level.

4.4 Results of Model Selection and Defect Testing of the ROEA Model

Similar to the ROAA, this study uses panel data regression to examine the association between ESG measures and profitability, which is measured by using the ROEA during the period of 2018–2024; see Table 6. Before the

regression, model selection and econometric defect tests are done to ensure model fit and reliable estimation results

Table 6 Summary of Model Selection and Defect Validation – ROEA (*t*)

Test	Statistic	P-value	Conclusion
VIF (multicollinearity)	Mean VIF = 1.58		No multicollinearity
F-test (Fixed effects and pooled OLS modeling)	F (40,235) = 4.44	0.0000	FEM is more suitable than pooled OLS.
Breusch-Pagan LM (Random effects and pooled OLS modeling)	chibar2(01) = 78.58	0.0000	REM is more suitable than pooled OLS.
Hausman (Fixed and random effects modeling)	chi2(5) = 10.96	0.0521	REM is selected (p>0.05)
Modified Wald (heteroskedasticity)	chi2(41) = 6268.84	0.0000	Heteroskedasticity exists.
Wooldridge test (Autocorrelation)	F (1,40) = 4.22	0.0466	There is autocorrelation.

Source: Author's calculations

The F-test and Breusch–Pagan LM test indicate that panel-data models are more appropriate than a pooled OLS model. The Hausman test produces a p-value of 0.0521. Although this result does not reject the REM at the 5% significance level, the p-value is very close to the conventional threshold. Therefore, the model selection result is considered marginal. Given the concern that unobserved firm-specific characteristics may be associated with ESG practices and accounting profitability, the study reports the FEM as a conservative specification and presents the REM for comparison. Robust standard errors clustered at the firm level are applied due to the presence of heteroskedasticity and autocorrelation.

4.5 *t*-1 Lag Model

The *t*-1 lag modeling results are found in Table 7.

For the lagged ROEA model, the F-test and Breusch–Pagan LM test are statistically significant, which confirm that panel-data models are preferred to a pooled OLS model. The Hausman test has a p-value of 0.1121, thus indicating that the REM is not rejected. However, because unobserved firm characteristics may still be related to ESG practices and accounting profitability, the FEM remains a useful conservative baseline specification.

The diagnostic tests show that the model does not suffer from serious multicollinearity or autocorrelation. However, heteroskedasticity is detected. Therefore, robust standard errors clustered at the firm level should also be used for the lagged ROEA specification.

Table 7 Summary of Model Selection Testing with ROEA ($t-1$)

Test	Statistic	P-value	Conclusion
VIF (multicollinearity)	Mean VIF = 1.53	0.0000	No multicollinearity
F-test (Fixed effects and pooled OLS modeling)	F (40,195) = 3.75	0.0000	FEM is more suitable than pooled OLS.
Breusch-Pagan LM (Random effects and pooled OLS modeling)	chibar2(01) = 51.83	0.0000	REM is more suitable than pooled OLS.
Hausman (Fixed and random effects modeling)	chi2(5) = 8.92	0.1121	REM is not rejected.
Modified Wald (Heteroskedasticity)	chi2(41) = 4614.57	0.0000	Heteroskedasticity exists.
Wooldridge test (Autocorrelation)	F (1,40) = 1.5	0.2278	No autocorrelation.

Source: Author's calculations

5. Model Estimation Results

This study estimates the impact of ESG practices on the profitability of listed real estate companies in Vietnam during the period of 2018–2024 by using a panel data regression model. Two representative profitability indicators are used: the ROAA and ROEA. Based on the model selection tests in the previous section (F-, LM, and Hausman tests), an REM and clustered standard errors by company ID are used to ensure the reliability of the estimates.

5.1 Model Estimation Results with Dependent Variable ROAA

Table 8 lists the model estimation results with the use of the ROAA.

The results show that ESG practices are not statistically and significantly associated with ROAA in either the contemporaneous or one-year lagged specification. In Model 1, the ESG coefficient is positive but insignificant with $\beta = 0.561$ and p -value = 0.664.

In Model 2, the coefficient of lagged ESG is negative but also statistically insignificant ($\beta = -0.864$, p -value = 0.316). These results suggest that ESG

practices are not significantly associated with the ROAA among the listed real estate companies in Vietnam during the study period.

In the control group, SIZE has a negative coefficient in both models, but is only marginally significant in Model 1 at the 10% level ($\beta = -3.010$, p -value = 0.093) and insignificant in Model 2. Leverage and liquidity are not statistically significant in either ROAA specification. The ASINH_REV variable is positive and marginally significant in both models, with $p = 0.074$ in Model 1 and $p = 0.099$ in Model 2. This suggests that revenue-generating capacity may be positively associated with the ROAA, although the evidence is only weakly significant after controlling for firm- and year-fixed effects, and ESG practices are significantly associated with accounting profitability in the short term or with a one-year lag.

Table 8 Model Estimation Results with ROAA

Variable	Model 1 (no lag)		Model 2 (lag)	
	β coefficient	P_value	β coefficient	P_value
ESG	0.561	0.664		
ESG (-1)			-0.864	0.316
SIZE	-3.010	0.093	-0.785	0.705
LEV	-3.777	0.418	-6.532	0.223
LIQ	0.024	0.347	0.030	0.146
ASINH REV	0.512	0.074	0.447	0.099

Source: Author's calculations

5.2 Model Estimation Results with Dependent Variable ROEA

Table 9 lists the model estimation results with the use of the ROEA.

Table 9 Model Estimation Results with ROEA

Variable	Model 3 (no lag)		Model 4 (lag)	
	β coefficient	P_value	β coefficient	P_value
ESG	1.650	0.624		
ESG (-1)			-0.694	0.749
SIZE	-6.547	0.202	1.898	0.723
LEV	4.239	0.744	-4.404	0.772
LIQ	0.093	0.026	0.092	0.055
ASINH REV	1.458	0.070	1.289	0.091

Source: Author's calculations

The two-way fixed effects estimation results show that ESG practices are not statistically and significantly associated with the ROEA. In Model 3, the ESG coefficient is positive but insignificant ($\beta = 1.650$, $p = 0.624$). In Model 4, the coefficient of lagged ESG is negative but also statistically insignificant ($\beta = -$

0.694, $p = 0.749$). Therefore, the results do not provide evidence that ESG practices are significantly associated with ROEA in either the contemporaneous or one-year lagged model.

For the control variables, LIQ shows a positive and statistically significant association with the ROEA in Model 3 ($\beta = 0.093$, $p = 0.026$). In the lagged model, LIQ remains positive and is marginally significant at the 10% level ($\beta = 0.092$, $p = 0.055$). This suggests that firms with stronger liquidity positions tend to achieve higher returns on equity. ASINH_REV is also positive and marginally significant in both models, with $p = 0.07$ in Model 3 and $p = 0.091$ in Model 4, thus indicating that revenue-generating capacity may contribute to higher ROEA. SIZE and LEV are not statistically significant in either ROEA specification.

Overall, the ROEA results indicate that liquidity and revenue are more consistently associated with accounting profitability than ESG practices during the sample period.

Table 10 provides a summary of the hypothesis testing results.

Table 10 Summary of Hypothesis Testing Results

Hypothesis		Empirical result	Conclusion
H1	ESG practices are positively associated with the profitability of a real estate firm (ROAA).	ESG is not statistically significant	Not supported
H2	ESG practices are positively associated with the profitability of a real estate firm (ROEA).	ESG is not statistically significant	Not supported
H3	One-year lagged ESG practices are positively associated with the profitability of real estate firms (ROAA)	ESG (-1) is not statistically significant	Not supported
H4	One-year lagged ESG practices are positively associated with the profitability of real estate firms (ROEA)	ESG (-1) is not statistically significant	Not supported

The empirical results do not support the four proposed hypotheses. ESG practices are not statistically and significantly associated with either the ROAA or ROEA in both contemporaneous and one-year lagged specifications. Therefore, the findings do not provide evidence that ESG practices are

associated with immediate or short-term improvements in profitability among listed real estate companies in Vietnam from 2018 to 2024.

5.3 Robustness Check: Dynamic Panel GM Estimation

To further examine the robustness of the baseline results and partially address dynamic endogeneity concerns, this study uses a dynamic panel generalized method of moments (GMM) model. The model includes a lagged dependent variable to capture the persistence of accounting profitability and uses internal lagged instruments for potentially endogenous variables (see Table 11). The number of instruments is restricted to reduce the risk of instrument proliferation.

Table 11 Dynamic Panel GMM Results

Dependent variable	Model	ESG coefficient	P value	Hausman p-value	AR(2) p-value	Conclusion
ROAA	ESG	-5.694	0.161	0.259	0.237	ESG not significant
ROAA	ESG (-1)	-3.601	0.347	0.029	0.400	ESG not significant
ROEA	ESG	-16.189	0.246	0.326	0.474	ESG not significant
ROEA	ESG (-1)	-12.106	0.384	0.058	0.460	ESG not significant

Source: Author's calculations

The GMM results are broadly consistent with the baseline two-way fixed effects estimates. ESG practices are not statistically and significantly associated with either the ROAA or ROEA in both contemporaneous and one-year lagged specifications. The AR(2) tests are insignificant across all models, thus suggesting that there is no evidence of second-order serial correlation in the differenced residuals. However, the Hausman test is weak in the lagged ROAA model and borderline in the lagged ROEA model. Therefore, the GMM results should be interpreted as supplementary robustness evidence rather than as the primary basis for causal inference.

Overall, the dynamic GMM estimation confirms that ESG practices are not statistically and significantly associated with accounting profitability among listed real estate companies in Vietnam during the study period.

6. Conclusion

This study examines the association between ESG practices and profitability of listed real estate companies in Vietnam from 2018 to 2024 by using two representative measures: the ROAA and ROEA. Empirical results from a two-

way FEM, including firm and year fixed effects with clustered standard errors by company, show that ESG practices are not statistically and significantly associated with either the ROAA or ROEA. Considering the lag factor, the model with a one-period lag ESG (ESG (-1)) also yields similar results, thereby indicating that lagged ESG practices are not statistically and significantly associated with the ROAA or ROEA. These findings suggest that, during 2018–2024, ESG practices by listed Vietnamese real estate companies had not yet translated into profits in the short term. The financial benefits of ESG, if any, may require a longer time horizon or depend on the actual quality and depth of ESG implementation.

Besides the ESG variable, the results suggest that revenue-generating capacity and liquidity are more relevant to accounting profitability than ESG practices during the study period. Several control variables play a significant role in explaining profitability. *ASINH_REV* has a positive influence in both the ROAA and ROEA models, thus reflecting that businesses with better revenue generation capabilities tend to achieve higher profitability. By contrast, *SIZE* and *LEV* are not statistically significant in most of the two-way fixed effects specifications. Year fixed effects are included in the model to control for common macroeconomic shocks, regulatory changes, and real estate market conditions during the sample period.

Based on these results, the study suggests several key policy and governance implications. First, real estate businesses need to view ESG implementation as a long-term strategy rather than a short-term goal by focusing on improving implementation quality and information transparency to increase investor confidence. Secondly, in a context where ESG benefits are not yet clearly reflected in short-term profits, businesses need to simultaneously focus on fundamental factors with a more direct impact on profitability, such as revenue-generating capacity and liquidity management. Thirdly, regulatory bodies and the market need to promote the standardization of ESG reporting to improve comparability, reduce formality, and make ESG measures a higher-quality information signal in business valuation.

Although the study provides empirical evidence on the ESG-profitability relationship in the context of listed real estate companies in Vietnam, it still has some limitations. First, the ESG measure used in this study is a dummy variable that mainly reflects whether firms practice or disclose ESG-related activities, so it may not fully capture the quality, intensity, or credibility of ESG implementation. Secondly, the study sample and observation period are limited, while the impact of ESG may be more long-term. Third, although the study uses firm and year fixed effects, lagged ESG specifications, and dynamic GMM as robustness checks, potential endogeneity concerns, such as reverse causality and time-varying omitted variables, may still remain. Therefore, future studies could construct quantitative ESG scores, separate the ESG dimensions, consider longer lag structures, expand the observation period, and examine

additional performance indicators, such as firm value, cost of capital, and other market-based measures.

Acknowledgments

The authors gratefully acknowledge partial financial support from the Banking Academy of Vietnam.

Disclosure Statement

The author(s) confirm that there is no potential conflict of interest.

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