Academia Open

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

Academia Open

By Universitas Muhammadiyah Sidoarjo

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

Academia Open

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

Table Of Contents

Academia Open

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

Originality Statement

The author[s] declare that this article is their own work and to the best of their knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the published of any other published materials, except where due acknowledgement is made in the article. Any contribution made to the research by others, with whom author[s] have work, is explicitly acknowledged in the article.

Conflict of Interest Statement

The author[s] declare that this article was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright Statement

Academia Open

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

EDITORIAL TEAM

Complete list of editorial team (link)

Complete list of indexing services for this journal (link)

How to submit to this journal (link)

Academia Open

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

Article information

Check this article update (crossmark)

Check this article impact (*)

Save this article to Mendeley

(*) Time for indexing process is various, depends on indexing database platform

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

Academia Open

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

Do "Greener" Strategies Drive Profitability In Emerging Economies?

Ruth Samantha Hamzah, ruth_samantha@fe.unsri.ac.id (*)
Faculty of Economics, Universitas Sriwijaya, Palembang, Indonesia

Patmawati Patmawati, patmawati@fe.unsri.ac.id
Faculty of Economics, Universitas Sriwijaya, Palembang, Indonesia

Muhammad Andri Zuliansyah, mzuliansyah@fp.unsri.ac.id
Faculty of Agriculture, Universitas Sriwijaya, Palembang, Indonesia

Rizka Novelia, riska501@gmail.com
Faculty of Economics, Universitas Sriwijaya, Palembang, Indonesia

(*) Corresponding author

Abstract

General Background: Growing environmental concerns have encouraged firms to adopt green accounting practices to supportsustainable business development. **Specific Background:** Emerging economies continue to face institutional and technological challenges that may limit the financial outcomes of sustainability initiatives. **Knowledge Gap:** Comparative evidence on the financial implications of green accounting and the moderating role of green innovation across BRIC and CIVETS countries remains limited. **Aims:** This study examines the relationships between ESG performance, carbon performance, carbon emission disclosure, and financial performance while assessing the moderating role of green innovation. **Methods:** Using 952 firm-year observations from BRIC and CIVETS countries during 2018–2024, the study applies panel regression, Moderated Regression Analysis (MRA), and Seemingly Unrelated Estimation (SUEST). **Results:** Carbon performance is negatively associated with financial performance, indicating that firms with higher carbon emission intensity tend to report lower profitability. In contrast, ESG performance, carbon emission disclosure, and the moderating role of green innovation do not show significant relationships with financial performance. **Novelty:** This study provides comparative evidence from BRIC and CIVETS economies by integrating green accounting indicators and green innovation within the Natural Resource-Based View framework. **Implications:** The findings highlight carbon efficiency as a key sustainability factor associated with profitability and provide insights for managers and policymakers in strengthening environmental strategies within emerging economies.

Highlights:

- Higher carbon emission intensity is associated with lower corporate profitability.
- ESG performance and carbon disclosure show no significant financial relationship.
- Green innovation does not strengthen sustainability–profitability relationships.

Keywords: Green Accounting, Green Innovation, Financial Performance, BRIC, CIVETS

Published date: 2026-07-08

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

Introduction

Sustainability has become an increasingly important consideration in corporate decision-making as firms face growing pressure from regulators, investors, and society to address environmental challenges. While businesses have traditionally been evaluated based on their financial performance, stakeholders now expect companies to demonstrate how their operations affect the environment and contribute to sustainable development. This shift is particularly relevant in emerging economies, where rapid industrialization has accelerated economic growth but has also intensified environmental concerns, including carbon emissions, resource depletion, and ecological degradation. In response to these challenges, green accounting has gained prominence as a mechanism for incorporating environmental considerations into corporate reporting and performance evaluation. By recognizing environmental costs and benefits alongside conventional financial measures, green accounting enables firms to assess the broader consequences of their business activities and support more sustainable decision-making processes [1]. The implementation of green accounting can be observed through several sustainability indicators, including environmental, social, and governance (ESG) performance, carbon performance, and carbon emission disclosure. Together, these indicators provide insight into how firms manage environmental responsibilities and communicate sustainability-related information to stakeholders.

A growing body of literature suggests that sustainability-related practices may enhance firm performance. Strong ESG performance has been associated with improved corporate reputation, lower risk exposure, and greater stakeholder confidence [2]. Effective carbon management may contribute to operational efficiency by reducing energy consumption and environmental costs [3]. Similarly, transparent carbon emission disclosure can strengthen corporate legitimacy and reduce information asymmetry between firms and investors [4]. However, empirical evidence remains inconclusive. While several studies report positive relationships between sustainability practices and financial performance, others find limited or insignificant effects. These mixed findings indicate that the economic benefits of sustainability initiatives may vary across institutional and market contexts.

The issue is particularly important in emerging economies, where firms often operate under financial constraints, evolving regulatory frameworks, and varying levels of environmental awareness [5]. Under such conditions, sustainability initiatives may not always generate immediate financial returns, despite their potential long-term benefits. The Natural Resource-Based View (NRBV) provides a useful theoretical perspective for explaining this relationship. According to the NRBV, environmental capabilities can become strategic resources that support competitive advantage when firms are able to utilize them efficiently [6]. In this regard, green innovation may play an important role by helping firms transform environmental commitments into productivity improvements, cost reductions, and long-term value creation.
This study focuses on firms operating in BRIC (Brazil, Russia, India, and China) and CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa), two groups of emerging economies that exhibit different levels of sustainability development, institutional support, and innovation capacity. Although previous studies have examined the relationship between sustainability practices and financial performance, evidence comparing these emerging-market groups remains limited. Furthermore, the moderating role of green innovation in strengthening the financial impact of green accounting practices has not been fully explored. Therefore, this study investigates the effects of ESG performance, carbon performance, and carbon emission disclosure on financial performance while examining whether green innovation moderates these relationships. By focusing on BRIC and CIVETS countries, the study aims to provide a deeper understanding of the financial implications of green accounting practices and to extend the discussion on sustainability-driven value creation in emerging economies.

Review of Literature

1. Grand Theories

The theoretical foundation of this research is built upon three interrelated frameworks: Legitimacy Theory, Signaling Theory, and the Natural Resource-Based View (NRBV). These perspectives collectively explain why and how firms integrate sustainability into strategic and financial decision-making processes.Legitimacy Theory posits that companies operate within a social framework where their actions must align with societal values and expectations. When corporate behavior is perceived as inconsistent with those expectations, organizations may encounter legitimacy challenges that affect stakeholder support and long-term sustainability. As a result, firms increasingly engage in sustainability reporting and environmental disclosure to demonstrate accountability and responsiveness to societal concerns [7]. Within this perspective, green accounting serves as a tool that enables firms to communicate their environmental commitments while integrating sustainability considerations into corporate reporting and decision-making processes.

Signaling Theory offers another explanation for the growing adoption of sustainability disclosure. Since managers generally possess more information about corporate activities than external stakeholders, voluntary disclosure can help reduce information asymmetry and convey information regarding firm quality [8]. ESG reporting, carbon emission disclosure, and investments in green innovation may signal a firm's commitment to responsible management,

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

environmental responsibility, and long-term value creation. Such signals are particularly relevant in emerging economies, where transparency and information availability often vary across firms and industries.

The Natural Resource-Based View (NRBV) extends the traditional Resource-Based View (RBV) by emphasizing environmental capabilities as strategic resources. According to this perspective, firms can strengthen their competitive position by developing capabilities that improve resource efficiency and minimize environmental impacts [9]. Green innovation represents an important component of these capabilities because it enables firms to adopt cleaner technologies, improve production processes, and utilize resources more effectively. Consequently, environmental initiatives may contribute not only to environmental performance but also to operational efficiency and long-term financial outcomes through lower resource consumption, reduced waste, and productivity improvements [10].

Empirical studies have increasingly explored the relationship between green accounting practices and financial performance. Prior evidence suggests that firms adopting sustainability-oriented accounting practices may benefit from more efficient resource allocation and improved operational performance, which can support profitability [1]. However, findings remain inconclusive, particularly in emerging economies where regulatory quality, institutional development, and stakeholder awareness differ considerably. For example, the positive impact of ESG disclosure on firm value appears to be more evident in countries characterized by stronger governance systems than in environments with weaker regulatory support [2].

Carbon performance has also become an important aspect of corporate sustainability. Firms that successfully manage carbon emissions may benefit from improved operational efficiency, lower environmental costs, and stronger reputational standing [3]. In contrast, companies with high emission intensity may face greater regulatory pressure and operational inefficiencies that adversely affect financial outcomes. Green innovation has therefore been proposed as a factor that may strengthen the effectiveness of sustainability initiatives by enabling firms to transform environmental objectives into operational and economic benefits. Nevertheless, empirical evidence regarding its moderating role remains mixed, especially in emerging economies where innovation capacity and institutional support continue to develop [11].

2. The Influence of ESG on Financial Performance and the Moderating Role of Green Innovation

ESG performance reflects a firm's ability to manage environmental, social, and governance issues that may influence long-term business sustainability. Companies with stronger ESG performance are generally better positioned to maintain stakeholder trust, strengthen corporate reputation, and manage business risks effectively, all of which may contribute to improved financial performance [2,8]. From the perspective of Legitimacy Theory, ESG practices help firms align their activities with societal expectations and maintain stakeholder support [7]. Signaling Theory further suggests that ESG disclosure communicates valuable information regarding a firm's commitment to responsible management, thereby reducing information asymmetry and enhancing investor confidence [7,12]. In addition, the NRBV argues that environmental and organizational capabilities developed through ESG practices can become strategic resources that support long-term value creation and competitive advantage [9].

The financial benefits associated with ESG performance may become more pronounced when firms actively pursue green innovation. Through the adoption of cleaner technologies, environmentally friendly products, and resource-efficient production methods, companies can transform sustainability commitments into tangible operational improvements and economic benefits [10,11]. Therefore, firms with stronger ESG performance and higher levels of green innovation are expected to achieve superior financial outcomes.

H1a: ESG has a positive effect on financial performance.
H1b: Green innovation moderates the relationship between ESG and financial performance.

3. The Influence of Carbon Performance on Financial Performance and the Moderating Role of Green Innovation

Carbon performance reflects a firm's ability to manage and reduce carbon emission intensity through efficient resource utilization, technological improvements, and sustainable production practices. Effective carbon management may improve financial performance by reducing energy consumption, lowering environmental compliance costs, and minimizing exposure to climate-related risks and regulations [3,13]. Moreover, firms demonstrating strong carbon performance may strengthen stakeholder confidence and enhance their corporate reputation by showing commitment to environmental responsibility. From the NRBV perspective, carbon efficiency represents an environmental capability that can contribute to sustainable competitive advantage by improving productivity while reducing environmental impacts [14]. Firms that are able to achieve lower emission intensity may therefore obtain both environmental and economic benefits.

Green innovation is expected to reinforce this relationship. Investments in low-carbon technologies, recycling systems, and cleaner production processes can help firms further reduce emissions while improving operational efficiency and

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

resource utilization [9,10]. As a result, companies that combine strong carbon performance with higher levels of green innovation may be better positioned to generate superior financial performance.
H2a: Carbon performance has a positive effect on financial performance.
H2b: Green innovation strengthens the relationship between carbon performance and financial performance.

4. The Influence of Carbon Emission Disclosure on Financial Performance and the Moderating Role of Green Innovation

Carbon emission disclosure represents corporate transparency in reporting emission levels and mitigation strategies. From the perspective of Signaling Theory, such disclosure reduces information asymmetry and signals that the firm has effective environmental governance and climate risk management [4]. From Legitimacy Theory, disclosure also helps firms gain positive perceptions from stakeholders and reduce reputational risk [15]. Previous studies show that carbon disclosure and carbon performance can be associated with better financial outcomes because transparent firms are viewed as more credible and accountable [13]. Green innovation strengthens this relationship by showing that firms are not only disclosing emissions but also taking concrete actions to reduce them through cleaner products and processes [10,11].
H3a: Carbon emission disclosure has a positive effect on financial performance.
H3b: Green innovation strengthens the relationship between carbon emission disclosure and financial performance.

Method

This study employs a quantitative research approach aimed at examining the relationship between green accounting practices and corporate financial performance, as well as exploring the moderating role of green innovation within emerging economies. The study design is explanatory in nature, intended to identify the causal influence of ESG performance, carbon performance, and carbon emission disclosure on financial performance, while also determining whether green innovation strengthens these relationships. The quantitative method is chosen because it enables statistical testing and comparison across multiple firms and time periods, thereby ensuring objectivity and generalizability of results [16].

The research population consists of publicly listed companies operating within ten emerging economies, grouped into two categories: BRIC (Brazil, Russia, India, and China) and CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey, and South Africa). The study focuses on BRIC and CIVETS countries because both groups represent emerging economies characterized by rapid growth, yet they differ in terms of institutional development, regulatory quality, and sustainability practices. Such differences offer a relevant context for investigating the financial implications of green accounting. Sample selection was conducted using purposive sampling, with observations restricted to firms that consistently disclosed annual and sustainability reports between 2018 and 2024 and provided complete data for all variables examined, including ESG performance, carbon performance, carbon emission disclosure, and green innovation. This approach ensures that the sample reflects companies with measurable environmental and financial characteristics across comparable timeframes.

The data type used in this study is secondary data, collected from reliable international databases such as Refinitiv and Bloomberg. These databases provide standardized information regarding firm-level ESG performance, carbon emission metrics, innovation indicators, and financial ratios. To enhance data reliability, information obtained from commercial databases was cross-checked against annual reports and sustainability reports published by each company. This verification process helped ensure the consistency and completeness of the observations included in the analysis. The study covers the period from 2018 to 2024, a timeframe that captures the increasing adoption of sustainability reporting practices and the growing emphasis on environmental accountability among firms operating in emerging economies [17].

Data collection involves three main stages: (1) compilation of ESG, innovation, and financial performance indicators from databases, (2) verification of missing or inconsistent data by cross-checking with official company reports, and (3) transformation of raw data into standardized numerical variables for statistical analysis. The key variables of this study are defined as follows: ESG performance represents the environmental, social, and governance quality score of each firm; carbon performance measures emission efficiency, calculated as the inverse of carbon intensity (total emissions per unit of output); and carbon emission disclosure reflects the extent and quality of emission-related transparency in sustainability reporting. Green innovation is proxied by process and product innovation indices derived from sustainability disclosures, while financial performance is measured by Return on Assets (ROA), representing the efficiency of asset utilization in generating profits [11].

To enhance data reliability, information obtained from commercial databases was cross-checked with annual reports and sustainability reports published by the respective firms. This verification procedure was conducted to ensure the consistency and completeness of the observations included in the final dataset. The study covers the period from 2018 to 2024, a timeframe that reflects the growing adoption of sustainability reporting practices and increasing attention to environmental accountability among firms in emerging economies [17].

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

For data analysis, panel data regression is employed because it accommodates both cross-sectional and time-series variations across firms. The analysis begins with descriptive statistics to provide an overview of the data characteristics, followed by the Chow test and Hausman test to determine the most appropriate estimation model. Based on the test results, the Fixed Effect Model (FEM) is selected to estimate the relationships among variables. To examine the moderating role of green innovation, Moderated Regression Analysis (MRA) is conducted by incorporating interaction terms between green innovation and each green accounting indicator. This approach allows the study to assess whether green innovation influences the strength of the relationship between sustainability practices and financial performance [18].

Results and Discussion

This study examines 952 firm-year observations from 2018 to 2024 across BRIC and CIVETS countries to investigate the influence of green accounting indicators ESG performance, carbon performance (CP), and carbon emission disclosure (CED) as well as green innovation (GI) on financial performance (FP). The analysis includes descriptive statistics, panel model selection tests, classical assumption checks, fixed-effect regression estimations, and moderation tests using interaction terms, with all findings discussed in the context of relevant theory and prior studies.

The descriptive statistics presented in Table 1 provide an overview of the characteristics of the study variables. Financial Performance (FP) exhibits considerable variation across firms, with values ranging from -0.284 to 0.447 and an average of 0.053 (SD = 0.067). This suggests that profitability levels differ substantially among the sampled companies. ESG performance also displays a broad distribution, with scores ranging from 10.431 to 94.992 and a mean value of 62.586. The spread of these scores indicates that while some firms have incorporated sustainability considerations extensively into their business practices, others remain at a relatively early stage of ESG implementation. Carbon Performance (CP) records an average value of -9.978, with observations ranging between -15.680 and -5.370. Given that CP is measured using carbon emission intensity, the results reflect notable differences in carbon efficiency among firms. A similar pattern can be observed for Carbon Emission Disclosure (CED), which ranges from 0.641 to 99.829 with an average score of 67.616. This variation suggests uneven disclosure practices, where some firms provide extensive information regarding carbon emissions while others report only limited environmental information. Green Innovation (GI) has a mean value of 40.353 and a relatively high standard deviation of 34.162, with scores ranging from 0 to 99.826. These figures indicate substantial differences in the extent to which firms engage in product and process innovations aimed at improving environmental performance.

Regarding the control variables, firm Size records an average value of 22.493, while Growth averages 0.259. These values are generally consistent with the characteristics of firms operating in emerging economies. The industry variable (IND) also shows considerable variation, suggesting that the sample comprises firms from a diverse range of industrial sectors. Overall, these descriptive statistics highlight substantial cross-firm differences in sustainability practices, innovation capacity, carbon emissions behavior, and financial outcomes

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FP	952	.053	.067	-.284	.447
ESG	952	62.586	16.561	10.431	94.992
CP	952	-9.978	1.97	-15.68	-5.37
CED	952	67.616	23.699	.641	99.829
GI	952	40.353	34.162	0	99.826
IND	952	51.023	18.894	11.111	90.476
Size	952	22.493	1.524	18.963	26.985
Growth	952	.259	5.971	-38.207	121.896

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

Academia Open

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

Table 2. Descriptive Statistics - BRIC

Variable	Obs	Mean	Std. Dev.	Min	Max
FP	196	.061	.056	-.105	.405
ESG	196	65.013	14.668	27.208	91.259
CP	196	-9.439	2.167	-14.738	-5.37
CED	196	71.293	17.896	15.042	99.123
GI	196	52.214	29.789	0	99.826
IND	196	42.871	14.755	14.286	90
Size	196	23.43	1.315	21.514	26.985
Growth	196	.132	2.535	-12.947	27.156

Table 3. Descriptive Statistics - CIVETS

Variable	Obs	Mean	Std. Dev.	Min	Max
FP	756	.051	.07	-.284	.447
ESG	756	61.957	16.97	10.431	94.992
CP	756	-10.118	1.892	-15.68	-5.4
CED	756	66.663	24.905	.641	99.829
GI	756	37.278	34.566	0	98.611
IND	756	53.136	19.279	11.111	90.476
Size	756	22.251	1.481	18.963	25.739
Growth	756	.292	6.576	-38.207	121.896

These comparative findings imply that the BRIC countries may possess more developed institutional and corporate infrastructure for sustainability and innovation, which helps their firms achieve somewhat better performance in those areas. By comparison, firms in CIVETS countries often operate under more uneven institutional and regulatory conditions, which may limit the effective implementation of sustainability initiatives. Differences in policy support, technological capability, and access to sustainability-related resources can contribute to greater variation in environmental practices across firms. This pattern reflects the diverse sustainability landscape among emerging economies. Several BRIC countries, particularly Brazil and China, have made substantial progress in renewable energy development and environmental innovation, while many CIVETS economies continue to face challenges related to regulatory capacity, infrastructure development, and the adoption of sustainability-oriented policies. Such contextual differences help explain why, in our overall results, only carbon efficiency showed a robust financial impact a factor closely tied to immediate cost savings while broader ESG and innovation initiatives (which require strong external support and long-term vision) did not yield short-term benefits in the less mature sustainability ecosystems of these markets.

Before estimating the regression model, panel model selection tests and assumption checks were performed. The choice of estimation model was determined through the Chow and Hausman tests. A significant Chow test result ($p < 0.05$) indicated that the Fixed Effects Model (FEM) was preferable to the pooled OLS approach. Consistent with this finding, the Hausman test produced a chi-square statistic of 28.654 with a p-value of 0.000, supporting the use of fixed effects rather than random effects. Accordingly, the FEM was adopted for all subsequent analyses, allowing the model to

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

control for firm-specific characteristics that remain constant over time. In addition, diagnostic checks show that multicollinearity is not a concern: the Variance Inflation Factors range from 1.005 to 2.38 with an average VIF of 1.525 (far below the critical threshold of 10). We did detect heteroskedasticity (Breusch-Pagan test $p < 0.05$), so the regressions were estimated using robust standard errors (heteroskedasticity-consistent) to ensure unbiased inference.

The regression results presented in Table 6 indicate that carbon performance (CP) is negatively associated with financial performance and remains statistically significant at the 5% level (coefficient = -0.015; p = 0.015). This finding suggests that firms with higher carbon emission intensity tend to report lower profitability, providing support for Hypothesis H2a. Economically, a one-unit increase in carbon intensity is associated with an approximately 0.015 decrease in the financial performance ratio. By contrast, ESG performance (ESG) and carbon emission disclosure (CED) exhibit relatively small coefficients and fail to reach statistical significance ($p > 0.05$). The evidence therefore does not support the expectation that ESG performance or carbon disclosure directly influences short-term financial performance. Accordingly, Hypotheses H1a and H3a are not supported. The control variables, including industry classification, firm size, and growth, also show no statistically significant relationship with profitability. The estimated model explains approximately 4.6% of the variation in financial performance, indicating that profitability is likely influenced by a range of additional firm-specific and external factors beyond those included in the model.

The introduction of green innovation (GI) as a moderating variable does not materially alter the main findings. Carbon performance remains negatively related to financial performance and continues to be statistically significant (coefficient = -0.017; p = 0.012), suggesting that lower carbon efficiency is consistently associated with reduced profitability. Green innovation itself does not exhibit a significant direct effect on financial performance (coefficient ≈ 0; p = 0.622). Likewise, none of the interaction variables representing the moderating effect of green innovation (ESG*GI, CP*GI, CED*GI) show statistical significance (all $p > 0.10$). These results indicate that green innovation does not significantly influence the relationship between green accounting indicators and financial performance, leading to the rejection of Hypotheses H1b, H2b, and H3b. The inclusion of the moderating variable produces only a marginal increase in explanatory power, with the coefficient of determination rising slightly from the baseline model to 0.048. Taken together, the findings highlight carbon performance as the only sustainability-related factor that demonstrates a consistent relationship with profitability, whereas ESG performance, carbon disclosure, and green innovation do not appear to generate measurable short-term financial benefits within the sampled emerging-market firms.

Table 4. Regression Test

VARIABLES	(1) FEM Without Moderation - Robust	(2) FEM With Moderation GI - Robust
ESG	0.000	0.000
	(0.000)	(0.001)
CP	-0.015**	-0.017**
	(0.006)	(0.007)
CED	-0.000	-0.000
	(0.000)	(0.000)
GI		0.000
		(0.001)
ESG_GI		0.000
		(0.000)

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

CP_GI		0.000
		(0.000)
CED_GI		-0.000
		(0.000)
IND	0.000	0.000
	(0.000)	(0.000)
Size	0.013	0.012
	(0.011)	(0.011)
Growth	0.001	0.001
	(0.001)	(0.001)
Constant	-0.403*	-0.401*
	(0.232)	(0.239)
Observations	952	952
R-squared	0.046	0.048
Number of id	136	136

The negative effect of carbon performance on profitability is both economically and statistically significant, carrying important implications for firms in emerging economies. Companies with higher carbon intensity, which reflects lower environmental efficiency, tend to experience reduced financial performance. Lower carbon performance may reflect higher energy consumption, inefficient use of resources, and greater exposure to environmental compliance costs. Such conditions can place additional pressure on operating expenses and reduce overall profitability. The findings suggest that firms with higher carbon emission intensity face greater challenges in maintaining financial performance. This result is consistent with earlier studies reporting that inadequate environmental performance is associated with increased business risk and weaker financial outcomes, particularly in emerging economies where sustainability-related incentives remain limited and compliance burdens can be substantial [3,13,19]. The negative and significant coefficient of carbon performance therefore reinforces the importance of effective carbon management as a factor associated with firm profitability, providing support for Hypothesis H2a.

The insignificant coefficients of ESG performance and carbon emission disclosure indicate that these variables are not associated with financial performance in the observed sample. This finding may reflect the limited integration of sustainability considerations into investment evaluation and corporate valuation within emerging economies. While ESG initiatives and disclosure practices can contribute to transparency and stakeholder engagement, their financial benefits may require a longer period to materialize. Consequently, investors may continue to rely primarily on traditional financial indicators when assessing firm performance, reducing the immediate financial impact of sustainability-related activities. Implementing strong ESG frameworks typically incurs substantial short-term costs related to system restructuring, certification, monitoring, and reporting, while the potential long-term benefits, such as efficiency gains, stakeholder trust, and improved reputation, may not be immediately reflected in financial metrics. This finding supports previous evidence that the ESG-financial performance relationship is highly dependent on institutional strength, stakeholder pressure, and market maturity [2,8,20].

The findings may reflect the institutional characteristics of many emerging economies, where sustainability practices are still evolving and market responses to environmental initiatives remain limited [5,7]. Under such conditions, ESG activities and emission disclosure may not yet generate tangible financial benefits that are immediately recognized by investors. Consistent with the regression results, Hypotheses H1a and H3a are not supported, indicating that ESG performance and carbon emission disclosure do not exhibit a significant relationship with short-term financial

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

performance in the sampled firms. Only a limited number of firms engage significantly in sustainability-focused research and development, while most remain at the early adoption stage. Second, green innovation projects typically involve high upfront costs, long development timelines, and uncertain payoffs. Many environmentally friendly technologies and processes do not yield immediate profitability, making it difficult for firms to realize short-term financial gains.

Third, the limited market recognition of green innovation may help explain its insignificant role in influencing financial performance. In many emerging economies, sustainability-oriented innovation has not yet become a major consideration for investors or consumers, reducing the potential economic benefits that firms can obtain from such initiatives. As a result, efforts to develop green products or environmentally friendly processes do not necessarily translate into higher profitability. This finding is consistent with previous studies suggesting that the positive effects of green innovation are more likely to emerge when supported by strong institutional frameworks, sufficient technological capabilities, and greater market demand for sustainable products and services [10–12]. These conditions explain why Hypotheses H1b, H2b, and H3b, which predicted a strengthening effect of green innovation, are rejected. Green innovation has not yet functioned as a mechanism to reinforce the link between sustainability practices and profits, supporting the view that eco-innovation in emerging economies remains at an early developmental stage, with financial benefits that are more likely to emerge in the long term rather than immediately.

A comparison between BRIC and CIVETS firms provides additional insight into the observed findings. Firms operating in BRIC economies generally report slightly higher and more stable profitability than those in CIVETS countries, suggesting a stronger financial position. They also tend to achieve higher ESG scores and lower carbon intensity, indicating more established environmental and governance practices. In addition, BRIC firms appear to disclose carbon-related information more extensively and demonstrate a greater level of engagement in green innovation activities. By contrast, firms in CIVETS economies show greater variation in both sustainability indicators and financial performance. The relatively larger firm size and more stable growth observed among BRIC companies may reflect better access to financial resources, technological capabilities, and institutional support, which can facilitate the implementation of sustainability-related initiatives. These observations are consistent with previous studies suggesting that several BRIC economies possess stronger institutional capacity, deeper economic integration, and more developed sustainability financing systems, although important differences remain across countries [17,21].

The findings may be interpreted through the Natural Resource-Based View (NRBV), which emphasizes that environmental capabilities, pollution prevention, and innovation can become sources of competitive advantage when supported by adequate resources and favorable institutional conditions [6,9,14]. The results indicate that carbon performance is the only sustainability-related variable that shows a significant association with financial performance. This suggests that improvements in carbon efficiency may contribute to profitability through lower operating costs and more efficient use of resources. In contrast, ESG performance and carbon emission disclosure do not exhibit significant effects, implying that broader sustainability activities have not yet translated into measurable financial benefits within the sampled emerging economies. Likewise, the insignificant interaction effects suggest that green innovation has not strengthened the relationship between green accounting indicators and firm profitability during the period of observation.

From a theoretical perspective, these findings provide additional evidence for the application of NRBV in emerging-market settings. The results indicate that environmental efficiency appears to have a more direct relationship with profitability than sustainability disclosure practices. From a managerial perspective, the findings highlight the importance of energy efficiency, carbon management, and operational improvements as practical approaches for enhancing financial performance. At the policy level, stronger regulatory support, clearer sustainability guidelines, and incentives for innovation may help firms derive greater economic benefits from environmental initiatives. Previous studies on green accounting and environmental management accounting similarly suggest that institutional support, managerial capability, and regulatory clarity play an important role in determining whether sustainability practices can generate measurable performance outcomes [22–24].

The results further indicate that, within BRIC and CIVETS economies, the financial benefits of green accounting and green innovation remain limited in the short term, with the exception of carbon efficiency. This finding highlights the importance of internal efficiency improvements in supporting both sustainability objectives and financial performance. The relatively weak effects of ESG performance and carbon emission disclosure, together with the insignificant moderating role of green innovation, suggest that the economic value of sustainability initiatives may depend on broader institutional and market conditions. These findings contribute to the literature on sustainable finance in developing markets by demonstrating that the link between sustainability and profitability is highly contingent on context, specifically the maturity of regulatory frameworks, market perceptions, and the availability of organizational capabilities and resources.

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

Vol. 11 No. 2 (2026): December
DOI: 10.21070/acopen.11.2026.14693

Conclusion

This study provides comprehensive empirical evidence on the relationship between green accounting practices and financial performance in emerging economies, specifically within BRIC and CIVETS countries. The findings reveal that carbon performance significantly and negatively affects financial performance, indicating that higher emission intensity leads to reduced profitability. This result highlights that environmental inefficiency directly increases operational costs and risk exposure, making carbon management a key determinant of financial outcomes in developing markets. ESG performance and carbon emission disclosure, however, do not exhibit a significant relationship with profitability. This finding indicates that sustainability-related initiatives and disclosure practices have not yet produced measurable financial benefits among firms operating in the sampled emerging economies. Green innovation is also not found to significantly moderate the relationship between green accounting indicators and financial performance. This result suggests that the financial benefits associated with innovation may require stronger institutional support, greater market acceptance, and more developed organizational capabilities before becoming evident in firm performance.

These findings also provide additional support for the Natural Resource-Based View (NRBV). While environmental efficiency appears to contribute to profitability, the financial outcomes of broader sustainability strategies seem to depend on contextual factors such as institutional maturity, market awareness, and organizational capability. The results further suggest that companies may achieve greater financial benefits by prioritizing carbon management, resource efficiency, and the integration of sustainability considerations into their core business activities as part of a long-term competitive strategy. Policymakers are also encouraged to design supportive regulatory frameworks and incentive mechanisms that foster green innovation and enhance investor confidence in sustainable enterprises. For future research, extending the observation period and exploring sector-specific analyses are recommended to capture delayed financial impacts and identify industries where sustainability initiatives yield stronger financial advantages.

References

1. M. M. Rounaghi, “Economic analysis of using green accounting and environmental accounting to identify environmental costs and sustainability indicators,” *International Journal of Ethics and Systems*, vol. 35, no. 4, pp. 504–512, 2019, doi: 10.1108/IJOES-03-2019-0056.
2. S. Chen, Y. Song, and P. Gao, “Environmental, social, and governance (ESG) performance and financial outcomes: Analyzing the impact of ESG on financial performance,” *Journal of Environmental Management*, vol. 345, p. 118829, 2023, doi: 10.1016/j.jenvman.2023.118829.
3. J. He, Z. Huang, X. Fan, H. Zhang, M. Song, Y. Zhao, *et al.*, “Research on the relationship between carbon performance and financial performance of electric power enterprises under the background of ‘dual carbon,’” *Frontiers in Environmental Science*, vol. 12, 2024, doi: 10.3389/fenvs.2024.1362450.
4. J. R. Al-Mari and G. H. Mardini, “Financial performance and carbon emission disclosure,” *Journal of Business and Socio-Economic Development*, vol. 4, no. 3, pp. 293–307, 2024, doi: 10.1108/JBSED-03-2024-0023.
5. W. Qian, C. Tilt, and A. Belal, “Social and environmental accounting in developing countries: Contextual challenges and insights,” *Accounting, Auditing & Accountability Journal*, vol. 34, no. 5, pp. 1021–1050, 2021, doi: 10.1108/AAAJ-03-2021-5172.
6. S. L. Hart, “A Natural-Resource-Based View of the Firm,” *Academy of Management Review*, vol. 20, no. 4, pp. 986–1014, 1995, doi: 10.5465/amr.1995.9512280033.
7. W. Ng, “From sustainability accounting to a green financing system: Institutional legitimacy and market heterogeneity in a global financial centre,” *Journal of Cleaner Production*, vol. 195, pp. 585–592, 2018, doi: 10.1016/j.jclepro.2018.05.250.
8. de S. Barbosa, M. C. B. C. da Silva, L. B. da Silva, S. N. Morioka, and V. F. de Souza, “Integration of Environmental, Social, and Governance (ESG) criteria: Their impacts on corporate sustainability performance,” *Humanities and Social Sciences Communications*, vol. 10, p. 410, 2023, doi: 10.1057/s41599-023-01919-0.
9. W. Ng, “Environmental Proactivity on Environmental Performance: An Extension of Natural Resource-Based View Theory (NRBV),” *International Journal of Industrial Management*, vol. 5, pp. 56–65, 2020, doi: 10.15282/ijim.5.0.2020.5622.
10. Q. Cheng, A.-P. Lin, and M. Yang, “Green innovation and firms’ financial and environmental performance: The roles of pollution prevention versus control,” *Journal of Accounting and Economics*, vol. 79, p. 101706, 2025, doi: 10.1016/j.jacceco.2024.101706.
11. X. Xie, J. Huo, and H. Zou, “Green process innovation, green product innovation, and corporate financial performance: A content analysis method,” *Journal of Business Research*, vol. 101, pp. 697–706, 2019, doi: 10.1016/j.jbusres.2019.01.010.
12. S. Chouaibi, J. Chouaibi, and M. Rossi, “ESG and corporate financial performance: The mediating role of green innovation: UK common law versus Germany civil law,” *EuroMed Journal of Business*, vol. 17, no. 1, pp. 46–71, 2022, doi: 10.1108/EMJB-09-2020-0101.
13. M. A. Siddique, M. Akhtaruzzaman, A. Rashid, and H. Hammami, “Carbon disclosure, carbon performance and financial performance: International evidence,” *International Review of Financial Analysis*, vol. 75, p. 101734, 2021, doi: 10.1016/j.irfa.2021.101734.

14. L. Almada, R. Simões Guimarães e Borges, and B. Pérez Ferreira, "Are Natural-RBV Strategies Profitable? A Longitudinal Study of the Brazilian Corporate Sustainability Index," *Review of Business Management*, vol. 24, no. 3, pp. 533–555, 2022, doi: 10.7819/rbgn.v24i3.4185.
15. S. W. Latifah and N. Soewarno, "The environmental accounting strategy and waste management to achieve MSME's sustainability performance," *Cogent Business & Management*, vol. 10, 2023, doi: 10.1080/23311975.2023.2176444.
16. O. Nwabuko, "An Overview of Research Study Designs in Quantitative Research Methodology," *American Journal of Medical and Clinical Research & Reviews*, vol. 3, pp. 1–6, 2024, doi: 10.58372/2835-6276.1169.
17. M. d. A. Halim and S. Moudud-Ul-Huq, "Green economic growth in BRIC and CIVETS countries: The effects of trade openness and sustainable development goals," *Heliyon*, vol. 10, p. e30148, 2024, doi: 10.1016/j.heliyon.2024.e30148.
18. D. Arkhangelsky and G. W. Imbens, "Doubly robust identification for causal panel data models," *The Econometrics Journal*, vol. 25, no. 3, pp. 649–674, 2022, doi: 10.1093/ectj/utac019.
19. R. E. Al-Fakir, A. Rashid, S. Shams, and S. Bose, "Corporate carbon performance and firm risk: Evidence from Asia-Pacific countries," *Journal of Contemporary Accounting & Economics*, vol. 20, p. 100427, 2024, doi: 10.1016/j.jcae.2024.100427.
20. S. R. Radwan and W. Xiongyuan, "Environmental, Social, and Governance (ESG) Practices and Firm Value: Evidence from BRICS Countries," *International Journal of Economics, Business and Management Research*, vol. 7, pp. 88–103, 2023, doi: 10.51505/IJEBMR.2023.71107.
21. D. H. Nguyen and I. P. Khominich, "The measurement of green economic quality in the BRICS countries: Should they prioritize financing for environmental protection, economic growth, or social goals?," *Russian Journal of Economics*, vol. 9, pp. 183–200, 2023, doi: 10.32609/j.ruje.9.101612.
22. S. S. Elhossade, A. A. Zoubi, and A. A. Zagoub, "Barriers of environmental management accounting practices in developing country," *Risk Governance and Control: Financial Markets and Institutions*, vol. 12, no. 1, pp. 8–20, 2022, doi: 10.22495/rgcv12i1p1.
23. S. Mukwarami, C. Nkwaira, and H. M. van der Poll, "Environmental Management Accounting Implementation Challenges and Supply Chain Management in Emerging Economies' Manufacturing Sector," *Sustainability*, vol. 15, no. 2, p. 1061, 2023, doi: 10.3390/su15021061.
24. M. M. Rahaman, S. Akter, M. d. A. Hossain, A. R. B. Chowdhury, and R. Wu, "Green accounting and reporting in Bangladesh's pharmaceutical and textile industries: A holistic perspective," *PLOS ONE*, vol. 19, no. 10, p. e0310236, 2024, doi: 10.1371/journal.pone.0310236.

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo