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The Impact of ESG reporting on corporate performance in BRICS Economies

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Abstract

This study investigates the relationship between environmental, social, and governance (ESG) disclosure scores and firm performance in the context of BRICS nations (Brazil, Russia, India, China, and South Africa). As ESG factors gain prominence in decision-making, particularly among investors focused on sustainable investing, this research aims to provide insights into how ESG disclosures influence financial and market performance. The study analyzes data from 254 non-financial listed companies across BRICS nations from 2011 to 2023, sourced from Thomson Reuters' Refinitiv Eikon database. Using generalized method of moments (GMM) techniques, the findings reveal a significant positive impact of ESG disclosure scores on financial performance, measured by return on assets (ROA) and return on equity (ROE). Conversely, ESG disclosure scores table a significant negative impact on market performance, measured by closing price and Tobin's Q. This research contributes to the limited empirical evidence on ESG disclosure and firm performance in emerging markets, offering valuable insights for investors, policymakers, and corporate leaders aiming to enhance long-term financial resilience and societal impact through sustainable business practices. The study underscores the importance of ESG integration in achieving sustainable development, particularly in economies that collectively represent over 41% of the global population, 24% of global GDP, and 16% of world trade.

Keywords: Environmental; Social; Governance; Financial Performance; Market Performance; BRICS

1. Introduction

Brundtland (1987), a landmark publication on sustainable development, established the cornerstone for holistic approaches to corporate sustainability, integrating economic, social, and environmental dimensions. This has created a corporate consciousness due to the development of environmental, social, and governance (ESG) reporting. After this development, corporates prioritized sustainability reporting as it became a primary yardstick for evaluating sustainability practices by the firms. Since then, ESG practices among corporates have gained momentum, which ultimately bound the companies to follow a sustainability path (Amel Zadeh & Serafeim, 2018). Due to the multiple benefits, the importance of ESG practices has grown among all the stakeholders. ESG practices also ensure good governance practices and increase stakeholders' well-being through the optimum utilization of resources (Bhaskaran et al., 2020). These ESG-related disclosures are considered the non-financial aspects of the business. Earlier, these were not important for the companies and were not included in the annual reports. But now, these have become key drivers of the company's growth and profitability. Companies are also using these non-financial aspects for the benefit of the firms (Boulhaga et al., 2023; Khan et al., 2016). Nowadays, most of the stakeholders, including investors, are considering the ESG performances of companies while taking decisions. Most of the searched aspects of ESG are workforce diversity, climate change-related decisions, good governance, community engagement, and its impact on business performance. This behavior indicates the linkage between companies' financial and non-financial aspects, which ultimately put pressure on the companies to engage with their stakeholders and handle investments.

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Companies are also aggressively reporting ESG aspects to show their efforts toward ESG concerns. This effort became a blessing in disguise for the companies as it influenced the stakeholder's perception and decision making. From rapid economic growth and diverse socio-political points of view, ESG disclosures in BRICS nations became more crucial as these practices help the companies build trust among stakeholders and ensure long-term financial stability. This study tries to investigate the impact of ESG disclosure on firm performance in BRICS nations, which provides a better understanding of how these economies can achieve sustainable development while addressing global and regional challenges.

Earlier literature suggests that ESG disclosure has numerous benefits for the company as well as for society. Xu et al. (2021) found that ESG practices are helpful in boosting green innovation among companies. Alsayegh et al. (2020) found that it is helpful in enhancing organizational legitimacy and sustainability performance. Through ESG practices, companies are able to decrease the cost of debt and increase investments (Atif & Ali, 2021; Cupertino et al., 2019). Bodhanwala and Bodhanwala (2018) and Nirino et al. (2021) highlighted the positive impact of ESG disclosure on reputation and access to equity capital markets. All these benefits are helpful in improving the overall performance of the companies (Bhaskaran et al., 2020). Earlier literature provided mixed results on ESG disclosure and firm performance relationship. The maximum number of studies concluded that the impact of ESG performance on financial performance was positive (Aboud & Diab, 2019; Alsayegh et al., 2020; Bhaskaran et al., 2020; Bodhanwala & Bodhanwala, 2018; Brogi & Lagasio, 2019; Ferrero-Ferrero et al., 2016; Jung & Yoo, 2023; Naseem et al., 2020; Ting et al., 2020; Veeravel et al., 2024), whereas some studies concluded a negative impact to this relationship (Ruan & Liu, 2021; Singh et al., 2022; Shahbaz et al., 2020; Uyar et al., 2020). But still, no concrete outcome of this relationship was developed. Again, the above outcomes do not seem valid from emerging economies (Aras et al., 2010; Chetty et al., 2015; Dalal & Thaker, 2019; Gracia & Siregar, 2021; Gull et al., 2022; NI et al., 2024; Santhi et al., 2024). While the relevance of ESG factors for firms is increasingly recognized, the research landscape surrounding them remains complex. As Orsato et al. (2015) pointed out, studies on ESG are not only relatively scarce compared to other business domains but also prone to controversy. This highlights the need for further nuanced research to solidify the ESG impact on firm performance. Given the scarcity and complexity of research on the impact of ESG in emerging markets, this study delves into the specific relationship between ESG performance and the financial performance of companies of the BRICS nations. ESG activities are anticipated to have higher demand in BRICS nations compared to developed markets due to the poor social and environmental needs in those situations (Akhter & Hassan, 2024; Dobers & Halme, 2009).

In a bid to challenge Western economic dominance, O'Neill (2001) championed the notion of the BRICS (Brazil, Russia, India, and China) quadrupling their collective GDP from $3 trillion to $12 trillion by 2040. O'Neill (2012) further posited that these nations, with their younger workforces, held greater potential for efficiency driven growth compared to developed economies. However, the pressure is mounting for alternative avenues toward progress, as evidenced by the surging capital markets of countries like Brazil and those across South Africa. As per earlier literature, ESG features influence not only the risk profile but also the financial returns of firms (Cheng et al., 2014). So, our study aims to add a better understanding of ESG performance and its impact on financial performance in countries where it matters most. By focusing on this understudied context, this research aims to bestow valuable insights into the changing landscape of ESG integration in emerging markets. The choice of BRICS nations as the target population for this research is intentional and strategic. These five economies represent over 41% of the world's population, 24% of global gross domestic product (GDP), and 16% of world trade and table impressive economic growth potential (BRICS, 2021). However, concerns regarding their environmental footprint, social inequalities, and corporate governance practices persist. Investigating the relationship between ESG disclosure and firm performance in this context holds significant value, as it can provide insights into the potential for sustainable development and responsible business practices to drive economic success within these emerging markets.

2. Literature Review

The growing prominence of ESG disclosure has captivated not just academic researchers but also practitioners and standard-setting bodies across the globe (Gerged, 2021; Santhi et al., 2024; Soni, 2023; Usman & Amran, 2015). A substantial portion of existing research has analyzed the relationship between ESG disclosure and firms' performance, often focusing on the impact of individual ESG pillars (environmental pillar, social pillar, and governance pillar) on financial outcomes. However, this emphasis on specific pillars or solely on performance leaves room for further exploration (Barnett & Salomon, 2012; Dayal et al., 2024). Dominant research focuses on the overall ESG score, neglecting the distinct impacts and intensities of individual pillars. This limits understanding of how ESG practices uniquely influence firm performance (Gillan et al., 2021; Gupta et al., 2022; Joshi & Joshi, 2024). Prior studies on the ESG factor and firm performance mainly focused on worldwide studies (Naseem et al., 2020) found that socially responsible practices positively influence the performance of the companies or firms in the Asia-Pacific regions. Similarly, Aureli et al. (2020) discovered that ESG information boots the market conditions and evaluates the value of companies listed on

the Dow Jones Sustainability Index, showing that investors care about sustainability reports. The study of Alsayegh et al. (2020) also found that ESG disclosures improve the financial performance of Asian firms or companies by lowering future risks, especially for the firms that are investing in eco-friendly projects, are socially responsible, and well governed.

Additionally, the study of Patro and Pattanayak (2017) and Ting et al. (2020) confirmed that ESG initiatives benefit firm performance in both the level of developing and developed economies. This emphasis on global studies underscores the growing recognition and potential benefits of ESG integration for firms worldwide (Ha et al., 2019). As stated earlier, most of the research on ESG-performance relationships focuses on global contexts, and a limited number of studies delve into developing economies (Charumathi & Ramesh, 2017). In Egypt, Aboud and Diab (2019) found a significantly positive association between high ESG ratings and improved market and financial performance, suggesting increased trading volume, liquidity, and financial health. Zhou et al. (2022) echoed these findings in China, demonstrating a favorable impact of ESG on market value. However, contrasting results emerge from Johnson et al. (2019) and Soni (2023), who found an insignificant connection between overall ESG and various performance measures in South Africa. Interestingly, their analysis of individual pillars indicates that high environmental and social scores might be value-destructive, potentially due to lower earnings per share and returns.

Similarly, the study conducted by Duque-Grisales and Aguilera-Caracuel (2021) showed that both the overall and individual ESG performance had a detrimental effect on return on assets in Latin America. While extensive research has been conducted on the relationship between ESG disclosures and firm performance, much of the existing literature focuses on developed economies, with limited emphasis on emerging markets such as BRICS nations. Furthermore, previous studies have primarily used static models, leaving scope for dynamic approaches that account for changes over time. This study addresses these gaps by providing an empirical analysis of ESG disclosure and performance dynamics in BRICS nations, considering robust methodologies.

2.1. Theoretical Background and Hypotheses Development

Stakeholder theory and legitimacy theory are considered the most important supporting theories that justify the need to reveal ESG components by the firms. Conventionally, corporate success rests solely on shareholder net worth maximization (Jensen, 2001). Nevertheless, the rise of stakeholder theory foregrounds the interdependence between firms and their diverse stakeholders, which has shifted this to a new paradigm (Freeman et al., 2004). Stakeholder satisfaction, encompassing social and environmental concerns alongside financial interests, has become increasingly vital. The current scenario, from the ongoing challenges of environmental issues and the COVID-19 pandemic, has further underscored the importance of ESG integration as a path to sustainable success (Alsayegh et al., 2020; Ruan & Liu, 2021). Consequently, transparent ESG disclosure has emerged as a key tool for value creation. By reducing risk exposure, enhancing trust, and projecting a responsible image, such transparency fosters competitive advantage and strengthens stakeholder relationships (Alsayegh et al., 2020). According to the legitimacy theory, organizations seek to align their activities with societal norms and values to ensure their survival (Suchman, 1995). ESG disclosure plays a crucial role in this process. By openly sharing details and information about their ESG practices, such as community involvement, resource management, and product influences, companies demonstrate their commitment to meeting their social expectations. This transparency helps reduce information gaps between stakeholders, fostering trust, and potentially making it easier for firms to secure the necessary resources (Alsayegh et al., 2020).

Essentially, ESG disclosure acts as a bridge between organizational activities and societal expectations, legitimizing the firm in the eyes of its diverse stakeholders.

- **H_{01}:** Overall, ESG disclosure has no impact on the financial performance of firms in BRICS nations.
- **H_{01a}:** Environmental disclosure has no impact on the financial performance of firms in BRICS nations.
- **H_{01b}:** Social disclosure has no impact on the financial performance of firms in BRICS nations.
- **H_{01c}:** Governance disclosure has no impact on the financial performance of firms in BRICS nations.
- **H_{02}:** Overall, ESG disclosure has no impact on the market performance of firms in BRICS nations.
- **H_{02a}:** Environmental disclosure has no impact on the market performance of firms in BRICS nations.
- **H_{02b}:** Social disclosure has no impact on the market performance of firms in BRICS nations.
- **H_{02c}:** Governance disclosure has no impact on the market performance of firms in BRICS nations.

3. Research Methodology

This study digs into the complex relationship between ESG disclosure and firm performance in the emerging market landscape of BRICS nations. This research focuses on both the overall aggregate ESG score and its components (E, S, and

G) to shed light on the nuanced nature of their impact. This research employs a quantitative approach, utilizing data on publicly traded companies within the BRICS markets alongside their corresponding ESG disclosure scores obtained from Thomson Reuter's Eikon Database. The study employed a differenced generalized method of moments (GMM) estimator to rigorously analyze the associations between ESG disclosure and various metrics of firm performance. These data were collected for a period of 13 years, ranging from 2010–2011 to 2022–2023. The data set includes 254 non-financial listed companies and 32,964 firm-year observations. Out of 254 firms, China has 109 firms, followed by India (50), South Africa (38), Brazil (32), and Russia (25). The segregation of companies according to nations is shown in Table 1.

Table 1 Number of companies per nation

Nation	Number of Companies
Brazil	32
Russia	25
India	50
China	109
South Africa	38

Data collected for this research was segregated into dependent variables, independent variables, firm-level control variables, and macroeconomic control variables. Firm performance is considered as the dependent variable, which is represented by financial performance (ROA) and market performance (close price), whereas overall ESG score (ESGS), environmental pillar score (ENVS), social pillar score (SOCS), and governance pillar score (GOVS) are considered as independent variables for the study. Firm-level variables include total assets, debt-equity ratio, and free cash flow. Recognizing the influence of macroeconomic conditions on firm performance, the analysis incorporates control measures for pertinent macroeconomic factors. To address the issue, this study includes GDPG variables' data collected from world development indicators of the World Bank database. The measurement of all the variables and respective supporting literature are shown in Table 2.

Table 2 Details of variables used

Variables	Symbols	Scholarly Definitions	Supporting Literature
Return on Assets	*ROA*	Net profit divided by total assets	Bodhanwala & Bodhanwala (2018)
Close Price	*CLOPRI*	Average of 12 months share close price	Ray & Goel (2023)
Return on Equity	*ROE*	Net profit to shareholders equity	Bodhanwala & Bodhanwala (2018)
Tobin's *Q*	*TOBQ*	The sum of market capitalization and liabilities divided by total assets	Chelawat & Trivedi (2016); Wong et al. (2021)
ESG Score	*ESGS*	Refinitiv ESG score	Adeneye et al. (2023)
Environment Pillar Score	*ENVS*	Refinitiv environmental pillar score	Adeneye et al. (2023)
Social Pillar Score	*SOCS*	Refinitiv social pillar score	Adeneye et al. (2023)
Governance Pillar Score	*GOVS*	Refinitiv governance pillar score	Adeneye et al. (2023)
Natural Logarithm of Total Assets	*LNTA*	Log of total assets	Maji & Lohia (2023); Gong et al. (2018)
Debt to Equity Ratio	*DTER*	The ratio of total debt to equity	Samo & Murad (2019); Alarussi & Gao (2023)
Cash to Total Assets	*CASHTA*	Cash to total assets	Atan et al. (2018)
Weighted Average Cost of Capital	*WACC*	Weighted average cost of capital	Atan et al. (2018)
GDP Growth	*GDPG*	Annual average rate of change of GDP at market price	Azmi et al. (2021)

Researchers have frequently identified deficiencies in ESG research due to its failure to tackle endogeneity related issues (Abdallah et al., 2015; Arayssi et al., 2016). Most of the important existing literature has overlooked the persistent factor and used static modeling approaches. However, this study tries to bridge the gap by applying a dynamic modeling approach to investigate the relationship between ESG disclosure and firm performance. By using this approach, the result provides a more clear and comprehensive understanding of this relationship, which may be overlooked in static models. So, to address the endogeneity issue, the study opts for a well-developed dynamic panel GMM estimator

following Arellano and Bond (1991). The concept of the standard or differenced GMM is the brainchild of Arellano and Bond (1991). Differenced GMM can address endogeneity and simultaneity bias. This estimator uses first-differenced lag levels for each variable as instrumental variables, which eradicates the prejudice of excluding variables from the cross-sectional data.

The following are the baseline models developed to investigate the impact of ESG disclosure on firm financial performance (FFP) and firm market performance (FMP):

$$FFP_{it} = \alpha_0 + \beta_1 ROA_{it-1} + \beta_2 ESGS_{it-1} + \varepsilon_{it} \quad (1)$$

$$FMP_{it} = \alpha_0 + \beta_1 CLOPRI_{it-1} + \beta_2 ESGS_{it-1} + \varepsilon_{it} \quad (2)$$

The following models are the extension of baseline models by introducing firm-level control variables to investigate the additional firm characteristics on both financial and market performance:

$$FFP_{it} = \alpha_0 + \beta_1 ROA_{it-1} + \beta_2 ESGS_{it-1} + C_{it-1} + \varepsilon_{it} \quad (3)$$

$$FMP_{it} = \alpha_0 + \beta_1 CLOPRI_{it-1} + \beta_2 ESGS_{it-1} + C_{it-1} + \varepsilon_{it} \quad (4)$$

Finally, the macroeconomic control variable is included in the above models to study its effect on ESG disclosure and firm performance relationships. The following models are the extension of the earlier models by introducing macroeconomic variables and individual ESG pillars to inspect the impact of each ESG pillar on the financial performance and market performance of the firm:

$$FFP_{it} = \alpha_0 + \beta_1 ROA_{it-1} + \beta_2 ESGS_{it-1} + C_{it-1} + M_{it-1} + \varepsilon_{it} \quad (5)$$

$$FFP_{it} = \alpha_0 + \beta_1 ROA_{it-1} + \beta_2 ENVS_{it-1} + C_{it-1} + M_{it-1} + \varepsilon_{it} \quad (6)$$

$$FFP_{it} = \alpha_0 + \beta_1 ROA_{it-1} + \beta_2 SOCS_{it-1} + C_{it-1} + M_{it-1} + \varepsilon_{it} \quad (7)$$

$$FFP_{it} = \alpha_0 + \beta_1 ROA_{it-1} + \beta_2 GOVS_{it-1} + C_{it-1} + M_{it-1} + \varepsilon_{it} \quad (8)$$

$$FMP_{it} = \alpha_0 + \beta_1 CLOPRI_{it-1} + \beta_2 ESGS_{it-1} + C_{it-1} + M_{it-1} + \varepsilon_{it} \quad (9)$$

$$FMP_{it} = \alpha_0 + \beta_1 CLOPRI_{it-1} + \beta_2 ENVS_{it-1} + C_{it-1} + M_{it-1} + \varepsilon_{it} \quad (10)$$

$$FMP_{it} = \alpha_0 + \beta_1 CLOPRI_{it-1} + \beta_2 SOCS_{it-1} + C_{it-1} + M_{it-1} + \varepsilon_{it} \quad (11)$$

$$FMP_{it} = \alpha_0 + \beta_1 CLOPRI_{it-1} + \beta_2 GOVS_{it-1} + C_{it-1} + M_{it-1} + \varepsilon_{it} \quad (12)$$

The variables FFP_{it} and FMP_{it} in the above-developed models denote the indicators of financial performance. The variables $ESGS_{it-1}$, $ENVS_{it-1}$, $SOCS_{it-1}$, and $GOVS_{it-1}$ show components of ESG disclosure for the respective companies *i* at time *t*. C_{it} and M_{it} *indicate the vector of firm-level control variables at macroeconomic control variables, respectively. The firm-level control variables are LNTA, DTER, WACC, and CASHTA, while the macroeconomic control variable is GDPG. The intercept, denoted by* α_0, and the parameter, denoted by β_n, are variables that necessitate estimation. The error term is represented by ε_{it}. The inclusion of control variables in the study is intentional since they aim to address potential confounding factors and improve the accuracy of the findings.

4. Data Analysis and Interpretation

Table 3 indicates the descriptive statistics of the variable series under study. It is evident from the observations that none of the series follows a normal distribution, implying that a pooled OLS model would not be suitable for any of the models in our analysis. Next is the correlation analysis of all variables presented in Table 4. It is observed that ROA, ROE, CLOPRI, and TOBQ positively correlate with ESGS. ROA, ROE, TOBQ, and CLOPRI are also negatively correlated with LNTA and DTER and positively correlated with CASHTA and WACC.

For each main hypothesis, we have developed six models, that is, 12 models in total. We have used different GMM methods to estimate the stated hypothesis. Out of six models for each hypothesis, the first basic model considers ROA and CLOPRI as the dependent variables and ESGS as the independent variable. The next model is an extension of the basic model, which includes firm-level control variables (LNTA, DTER, WACC, and CASHTA). The third model is the addition to the second model which includes macroeconomic variables (GDPG). The last three models include individual

ESG disclosure (ENVS, SOCS, and GOVS) by replacing ESGS with the third model. The calculated models for each hypothesis are displayed in Tables 5 and 6. All the variables used in these models are used in lagged form to mitigate and alleviate the potential problem of reverse causality in econometric formulation. Based on the estimated model, the Sargan test is used to evaluate the presence of instrument restriction in the over-identifying instruments. The null hypothesis assumes that the instruments and error terms are independent. A Sargan test *p*-value exceeding 5% leads to a non-rejection of the null hypothesis, indicating that the instruments utilized in the model are statistically valid and do not table endogeneity concerns. Then, the Arellano–Bond test was conducted to identify serial correlation in the first-differenced residuals.

Table 3 Descriptive statistics

Variables	Mean	P50	*SD*	Kurtosis	Skewness	SE (Mean)	Min.	Max.
ROA	5.57	3.85	7.69	5.69	0.98	0.13	–15.90	33.40
ROE	14.61	12.90	16.46	9.78	1.24	0.29	–39.30	90.30
CLOPRI	10.13	2.42	26.08	28.31	4.84	0.45	0.03	179.81
TOBQ	103.91	51.41	158.71	18.53	3.63	2.76	2.72	1030.72
ESGS	48.56	49.70	20.22	2.21	–0.11	0.35	4.97	88.43
ENVS	46.68	49.33	25.42	1.93	–0.14	0.44	0.56	91.89
SOCS	47.02	46.75	25.27	1.93	0.01	0.44	2.27	94.47
GOVS	53.60	54.71	22.09	2.10	–0.20	0.38	6.19	93.98
LNTA	23.49	23.29	1.72	3.40	0.63	0.03	20.14	28.62
DTER	1.25	0.70	1.82	18.33	3.57	0.03	0.00	11.86
CASHTA	0.56	0.28	4.11	5.41	0.15	0.07	–13.09	14.08
WACC	8.20	7.90	2.95	4.09	0.93	0.05	3.00	18.00
GDPG	4.32	5.24	3.60	3.32	–0.84	0.06	–6.34	9.55

Note. *SD*: Standard Deviation; SE: Standard Error; Min: Minimum; Max: Maximum.

Table 4 Correlation matrix of financial variables and ESG factors

Variables	*ROA*	*ROE*	*CLOPRI*	*TOBQ*	*ESGS*	*ENVS*	*SOCS*	*GOVS*	*LNTA*	*DTER*	*CASHTA*	*WACC*	*GDPG*
ROA	1												
ROE	0.625*	1											
CLOPRI	0.273*	0.212*	1										
TOBQ	0.560*	0.410*	0.305*	1									
ESGS	0.061*	0.109*	0.097*	0.062*	1								
ENVS	0.017	0.070*	0.047*	–0.034	0.839*	1							
SOCS	0.080*	0.126*	0.130*	0.081*	0.904*	0.721*	1						
GOVS	0.004	0.042*	0.015	0.070*	0.600*	0.284*	0.324*	1					
LNTA	–0.236*	–0.077*	–0.071*	–0.387*	0.203*	0.293*	0.189*	0.025	1				
DTER	–0.290*	–0.043*	–0.046*	–0.220*	–0.006	0.012	–0.001	–0.017	0.127*	1			
CASHTA	0.117*	0.083*	0.003	0.058*	–0.018	–0.03	–0.017	0.004	0.002	–0.026	1		
WACC	0.230*	0.138*	0.118*	0.121*	0.040*	–0.007	0.088*	–0.027	–0.077*	–0.166*	0.014	1	
GDPG	0.012	–0.022	–0.117*	0.084*	–0.311*	–0.269*	–0.329*	–0.098*	0.046*	–0.012	0.055*	–0.088*	1

Note. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5 Results of differenced GMM for equations 1, 3, 5, 6, 7, and 8

	ROA	ROA	ROA	ROA	ROA	ROA
L.*ROA*	0.367***	0.288***	0.286***	0.281***	0.290***	0.282***
	(39.31)	(29.50)	(28.54)	(28.21)	(28.23)	(27.88)
L.*ESGS*	0.008***	0.034***	0.038***			
	(1.97)	(4.31)	(4.59)			
L.*ENVS*				0.029***		
				(5.31)		
L.*SOCS*					0.030***	
					(3.87)	
L.*GOVS*						0.009***
						(1.81)
L.*LNTA*		–4.433***	–4.459***	–4.464***	–4.186***	–3.846***
		(–12.71)	(–12.39)	(–12.80)	(–12.09)	(–11.55)
L.*DTER*		0.066*	0.066*	0.063*	0.059*	0.064*
		(2.41)	(2.44)	(2.43)	(2.23)	(2.41)
L.*CASHTA*		0.025**	0.022*	0.024**	0.022*	0.022*
		(2.68)	(2.42)	(2.64)	(2.43)	(2.51)
L.*WACC*		–0.039	–0.019	–0.013	–0.022	–0.035
		(–0.90)	(–0.42)	(–0.32)	(–0.50)	(–0.82)
L.*GDPG*			0.131***	0.130***	0.128***	0.117***
			(5.44)	(5.58)	(5.44)	(5.13)
_CONS	3.289***	107.046***	106.650***	107.163***	100.621***	93.613***
	(9.79)	(13.40)	(13.02)	(13.35)	(12.73)	(12.11)
N	2794	2794	2794	2794	2794	2794
chi^2	1569	1333	1281	1291	1258	1157
p	0	0	0	0	0	0
Sargan	80.36/0.09	80.41/0.09	80.04/0.10	81.88/0.08	81.24/0.08	78.56/0.12
Abond	0.25/0.81	0.06/0.95	0.034/0.97	0.01/0.99	0.05/0.96	0.02/0.99

Note. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Equations 1, 3, 5, 6, 7, and 8 are presented in Table 5, which explains the impact of overall ESG disclosure and individual ESG pillar disclosure on the financial performance of firms in BRICS nations. Column two of Table 5 presents the baseline model, which establishes the relationship between ESGS and ROA. It indicates that ESGS has a positive and significant impact on the financial performance of BRICS firms measured by ROA at a 1% level of significance. It means a 1% increase in ESGS leads to a 0.8% increase in ROA. Columns 3 and 4 present the extension of the baseline model, which includes firm-level control variables and macroeconomic control variables, respectively. After the inclusion of control variables, the impact of ESGS on ROA is also positive and significant at a 1% level of significance. In other words, after considering firm-level control variables and macroeconomic variables, a 1% change in ESGS leads to a 3.4% and 3.8% change in ROA, respectively. These results align with some earlier literature (Dalal & Thaker, 2019; Velte, 2017). When we analyzed the relationship between ROA and different control variables, we found that LNTA negatively impacts ROA. It may be due to low profitability, high debt levels, inefficient asset utilization, or an economic downturn like COVID-19. WACC also has a negative impact on ROA due to high capital expenditure, inefficient working capital management, or economic downturn. DTER, CASHTA, and GDPG have a significant and positive impact on ROA. Columns 5 to 7 describe the impact of individual ESG pillar disclosure on financial performance. ENVS, SOCS, and GOVS have a positive and significant impact on the ROA. This result is aligning with Kim and Li (2021).

Table 6 Results of differenced GMM for equations 2, 4, 9, 10, 11, and 12

	CLOPRI	*CLOPRI*	*CLOPRI*	*CLOPRI*	*CLOPRI*	*CLOPRI*
L.*CLOPRI*	0.613***	0.618***	0.619***	0.620***	0.617***	0.620***
	(2468.79)	(1877.85)	(1625.14)	(1798.16)	(1507.22)	(1733.45)
L.*ESGS*	–0.107***	–0.074***	–0.076***			
	(–49.73)	(–25.90)	(–26.84)			
L.*LNTA*		–2.805***	–2.772***	–2.870***	–2.556***	–3.457***
		(–31.20)	(–27.56)	(–32.23)	(–31.47)	(–36.09)
L.*ENVS*				–0.059***		
				(–26.89)		
L.*SOCS*					–0.082***	
					(–29.46)	
L.*GOVS*						0.011***
						(6.36)
L.*DTERM*		–0.030*	–0.034*	–0.033*	–0.028*	–0.040**
		(–2.13)	(–2.42)	(–2.27)	(–1.97)	(–2.80)
L.*CASHTA*		0.091***	0.092***	0.090***	0.096***	0.098***
		(19.37)	(19.50)	(18.79)	(20.00)	(22.60)
L.*WACCR*		0.179***	0.182***	0.172***	0.185***	0.179***
		(24.82)	(25.44)	(24.10)	(22.37)	(26.38)
L.*GDPG*			–0.025***	–0.022***	–0.023***	–0.014*
			(–4.43)	(–4.12)	(–3.75)	(–2.57)
_CONS	7.607***	70.623***	70.081***	71.683***	65.132***	82.420***
	(37.10)	(28.51)	(26.99)	(30.32)	(24.76)	(36.68)
N	2794	2794	2794	2794	2794	2794
chi^2	6359376	6284767	6399320	7764424	5183758	6537110
p	0	0	0	0	0	0
Sargan	149.4/0.00	149.87/0.00	156/0.00	170.46/0.00	162.39/0.00	142.07/0.00
Abond	–0.82/0.41	–0.76/0.44	–0.75/0.45	–0.76/0.45	–0.75/0.45	–0.76/0.44

Note. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Equations 2, 4, 9, 10, 11, and 12 are presented in Table 6, which explains the impact of overall ESG disclosure and individual ESG pillar disclosure on the market performance of firms in BRICS nations. The baseline model is presented in column 2, which indicates that ESGS has a negative impact on CLOPRI at a 1% level of significance.

Impact on market performance measured by CLOPRI at 1% level of significance. Even after adding the control variables to the baseline model (presented in columns 3 and 4), the impact of ESGS is negative on market performance measured by CLOPRI. This result is consistent with the outcomes of Lunawat and Lunawat (2022). This negative relationship may be due to investors' perception, lack of awareness, and investors' short-term gain expectations. In these emerging economies, investors may not fully appreciate the long-term benefits derived from ESG initiatives. Investors may prioritize short-term gain over long-term sustainability due to market dynamics and economic uncertainties, which indicates a negative relationship. LNTA, DTERM, and GDPG have a significantly negative impact on CLOPRI, whereas CASHTA and WACCR have a significantly positive impact on CLOPRI. While analyzing the impact of individual pillar scores of ESG on market performance, we found that ENVS and SOCS have a negative impact on CLOPRI at a 1% level of significance, but GOVS is positively impacting CLOPRI. The behavior of governance pillar disclosure on market performance contrasts with the result of the overall ESG disclosure score due to legal compliance and risk management by firms. It means companies with high governance scores are more likely to comply with regulations and have effective risk management processes in place. This can be particularly important in emerging markets where regulatory environments may be less predictable. This type of relationship may arise due to sectorial variance means that different sectors may have distinct ESG considerations. The positive impact of governance scores may be more pronounced in

certain sectors within BRICS nations, while the overall ESG score may be influenced by other sectors facing challenges in environmental or social aspects.

Insignificance in autocorrelation and Sargan tests signal the absence of autocorrelation and validate instrument suitability. As the -value of all the models is 0, all null hypotheses are rejected. So, ESGS, ENVS, SOCS, and GOVS have a significant impact on both the financial performance and market performance of firms in BRICS nations.

Examining the robustness of outcomes holds significant importance in validating the dependability of reported findings, ensuring their resistance to variations in specifications. To assess robustness in the current study, alternative performance measures such as return on equity (ROE) and Tobins' Q (TOBQ) were employed by replacing ROA and CLOPRI, respectively. ROE is used as an alternative measure of financial performance; whereas, TOBQ is for market performance. Models used for robustness tests are similar to earlier models by simply replacing ROA and CLOPRI with ROE and TOBQ, respectively. For the test of robustness, this paper considered only the baseline extended model, which includes firm-level control variables and country-level control variables, and the results are presented in Table 7. Even after changing the dependent variables, outcomes are similar to earlier results. ESG disclosure has a positive impact on financial performance and a negative impact on the market performance of firms in BRICS nations at a 1% level of confidence.

Table 7 Results of robustness test

	ROE	*ROE*	*ROE*	*ROE*	*TOBQ*	*TOBQ*	*TOBQ*	*TOBQ*
L.*ROE/TOBQ*	–0.073***	–0.074***	–0.075***	–0.074***	0.845***	0.843***	0.843***	0.841***
	(–54.83)	(–55.35)	(–57.07)	(–56.51)	(339.00)	(341.24)	(336.76)	(430.60)
L.*ESGS*	0.051*				–0.967***			
	(2.53)				(–9.37)			
L.*ENVS*		0.051***				–0.526***		
		(3.37)				(–7.70)		
L.*SOCS*			0.001***				–0.859***	
			(1.98)				(–10.16)	
L.*GOVS*				0.044**				0.081***
				(3.22)				(1.96)
L.*LNTA*	–8.724***	–9.381***	–7.874***	–8.614***	38.018***	31.578***	35.904***	23.439***
	(–8.69)	(–10.20)	(–8.86)	(–10.09)	(15.65)	(13.00)	(14.30)	(12.25)
L.*DTERM*	0.172***	0.181***	0.163***	0.186***	0.118***	0.127***	0.110***	0.053***
	(5.13)	(5.29)	(4.85)	(5.62)	(1.98)	(2.77)	(4.82)	(3.05)
L.*CASHTA*	0.024***	0.021*	0.024***	0.034***	–0.093***	–0.130***	0.044***	–0.087***
	(2.34)	(2.07)	(2.20)	(3.77)	(–2.86)	(–1.99)	(2.45)	(–1.98)
L.*WACCR*	0.181*	0.159	0.152	0.174*	–1.325***	–1.531***	–1.211***	–1.593***
	(2.02)	(1.79)	(1.76)	(1.96)	(–5.21)	(–6.76)	(–4.61)	(–7.35)
L.*GDPG*	0.905***	0.928***	0.888***	0.923***	0.452***	0.552***	0.479***	0.449***
	(14.59)	(15.53)	(14.44)	(15.31)	(3.70)	(4.44)	(3.68)	(3.63)
_CONS	212.439***	227.989***	195.081***	209.719***	–843.996***	–712.354***	–802.801***	–538.086***
	(9.23)	(10.75)	(9.46)	(10.58)	(–15.22)	(–12.96)	(–13.96)	(–12.05)
N	2794	2794	2794	2794	2794	2794	2794	2794
chi^2	3227	3378	3682	3480	2463850	2770463	2299587	3562351
p	0	0	0	0	0	0	0	0
Sargan	117.48/0.00	120.69/0.00	118.74/0.00	122.41/0.00	102.11/0.00	100.74/0.00	114.8/0.00	97.36/0.005
Abond	0.02/0.98	0.004/0.996	0.001/0.99	0.018/0.98	–0.46/0.65	–0.53/0.59	–0.43/0.67	–0.52/0.60

Note. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5. Conclusion

Understanding the connection between a firm's ESG disclosure score and its performance is crucial for several reasons. First, investors are increasingly integrating ESG factors into their decision-making, seeking companies that demonstrate

responsible practices and long-term sustainability. Studying this relationship can provide valuable insights into how ESG disclosure translates into financial value, attracting and retaining ESG-conscious investors. Second, the regulatory pressures related to ESG disclosure are increasing at the global level in mandatory or voluntary forms. Different nations are aggressively developing ESG frameworks to be in competition and compliance with global norms. So, investigating the ESG disclosure and firm performance relationship helps evaluate the effectiveness of these regulations and inform future policy development. Third, companies are aggressively trying to understand the ESG initiatives for ESG engagements. By quantifying future benefits through ESG disclosure, the present research may motivate different companies to invest more in ESG initiatives and minimize future risks.

Finally, stakeholders other than investors are also aggressively seeking corporate sustainability reports. To answer these complex and overriding questions, the present study has inquired about the connection between ESG disclosure scores and the performance of firms in BRICS nations. Using the Thomson Reuters Refinitiv Eikon data set, we try to unveil the intriguing relationship between ESG disclosure and performance. For this, we divide firm performance into financial performance (ROA and ROE) and market performance (CLOPRI and TOBQ). The findings of this study indicate a positive and significant impact of ESG disclosure score on financial performance (ROA and ROE), whereas there is a negative and significant impact on market performance (CLOPRI and TOBQ). Further, our study focuses on the impact of individual pillar disclosure scores on both financial and market performance. All individual pillar scores (ENVS, SOCS, and GOVS) have a significantly positive impact on the financial performance of firms, whereas ENVS and SOCS negatively impact the market performance, but GOVS positively impacts the market performance. The finding of the research suggests to development of mandatory implementation of ESG disclosure policies for all the listed companies of BRICS nations. Policies should be developed to enhance awareness about ESG adoption and reporting. This study is helpful for the BRICS countries to align their strategic objectives with ESG practices, which ultimately ensures long-term profitability.

Research Implications

This research outlines important implications for managers, policymakers, and researchers. For managerial implications, the study focuses on the importance of integrating ESG disclosure into strategic decision-making to enhance financial performance while addressing stakeholder expectations. Companies should focus on improving governance practices, which positively influence both financial and market performance, and carefully manage environmental and social initiatives to mitigate potential market concerns. Theoretically, the findings contribute to the growing body of literature on ESG by revealing distinct impacts of individual ESG pillars on financial and market performance, highlighting the nuanced role of governance in driving sustainable outcomes. Policy-wise, the study advocates for mandatory ESG disclosure regulations in BRICS nations, coupled with incentives for compliance and penalties for non-adherence. Regulators should promote awareness and reward firms that align their strategies with sustainability goals, fostering a balanced approach to economic, social, and environmental objectives.

Limitations of the Study and Scope for Future Research

The present study has several limitations in terms of the number of firms, period of study, and variables considered to evaluate firm performance. Future research may consider a larger dataset, a greater number of years, and other performance variables to investigate the impact of ESG disclosure scores on the firm performance of BRICS nations. Future studies may also include other nations of the BRICS group for investigation.

Compliance with ethical standards

Disclosure of conflict of interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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