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Audit Quality and ESG Signaling: A Mediation Analysis from Selected Emerging Markets on Firm Value Addition

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Abstract: This study is among the first to investigate whether ESG (Environmental, Social, and Governance) factors mediate the relationship between audit quality and value addition of non-financial firms in the selected emerging markets, using the theoretical lens of signaling theory. More specifically, the study focuses on BRICST (Brazil, Russia, India, China, South Africa, and Turkey) economies and uses Seemingly Unrelated Regression (SUR) system and bootstrapping to perform the mediation analysis on unbalanced panel data. The results show evidence that ESG does mediate the relationship between audit quality and value addition; however, contrary to the notions of stakeholder theory, the indirect effect is negative. Similarly, the direct impact of audit quality on value addition also remains negative. The study contributes theoretically by refining signaling theory through the lens of institutional and contextual factors. It demonstrates that both audit quality and ESG scores act as signals for stakeholders. Practically, the findings highlight the need to integrate ESG practices into the overall firm strategy, showing that ESG disclosures in emerging markets remain symbolic without strategic integration. The findings also highlight growing stakeholder expectations beyond assurance of financial information, covering the credibility of ESG disclosures as well.

Keywords: Audit quality, ESG, signaling theory, stakeholder theory, sustainability, value addition.

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INTRODUCTION

Background

In the evolving business climate, value addition has long been an enigma for practitioners and scholars alike. Jensen and Meckling (1976) identify wealth maximization as the primary aim of investors when making investment decisions. However, the stakeholder theory proposed by Freeman (2010) expands the concept of value addition by including the perspectives of wider stakeholder groups into the accountability framework of firms. These developments compel firms to move beyond traditional financial performance and demonstrate their capacity to generate sustainable value over the long term (Siddiqui, Khan, & Sohail, 2024). This evolving

preference of stakeholders and regulators has prompted scholars to investigate mechanisms through which modern businesses are driving value.

Additionally, information symmetry remains a key driver of trust in the overall market. If the users cannot rely on the presented information by firms, firms will not be able to generate value (Faiteh & Aasri, 2022). This is where the role of auditors comes into play. Auditors help provide assurance on the reported information of the firms, ensuring accountability for the firms and fostering trust in the users. This helps reduce information asymmetry in the market and enables value creation for firms. Therefore, audit plays a central role in sustainability, as without it, users will not be able to decide whether the information presented by firms shows their true performance and position (Newman & Comfort, 2018). Therefore, it can be argued that strong sustainability (often captured through ESG (Environmental, Social, and Governance) factors (Siddiqui et al., 2024; Tan, Cai, Luo, Zhou, & Shen, 2024)) is seen as a strategic signal of long-term orientation, which is only effective when supported by reliable and trustworthy reporting mechanisms.

Furthermore, this relationship between audit quality, ESG, and value addition becomes more complex when examined through the lens of institutional settings (Siddiqui et al., 2024). For example, in emerging markets, categorized with weaker market transparency and evolving ESG expectations of the stakeholders (Fan, Wei, & Xu, 2011; Siddiqui et al., 2024), the effectiveness of audit and ESG signals may become limited when driving firm value addition. In particular, BRICST markets (Brazil, Russia, India, China, South Africa, and Turkey) represent a cluster of nations undergoing rapid economic transition (Siddiqui et al., 2024). These markets offer a unique context for examining the extent to which audit quality contributes to value addition, and whether the ESG factors serve as an effective mediating channel in this relationship.

Examining recent literature shows that the relationship between audit quality and ESG (Song, Wu, & Ma, 2023; Zhang, Liu, & Wang, 2023) and ESG and firm value (Siddiqui et al., 2024) have been thoroughly examined. However, studies focusing on the value addition capabilities of audit quality remain limited. Similarly, studies focusing on the channels in the modern business environment, through which audit quality enables (or impairs) value addition also remain scarce, specifically in the case of emerging markets.

The current study addresses these identified gaps in the literature by examining the mediating role of ESG factors between audit quality and value addition. Our findings show that ESG does mediate this relationship; however, contrary to the notions of stakeholder theory, the mediation is partial and negative. Similarly, the direct impact of audit quality on BRICST markets' value addition also remains negative. However, audit quality shows a positive impact on the ESG scores of firms. These findings have significant theoretical and practical implications. From a theoretical perspective, the study contributes by refining signaling theory through an institutional and contextual lens. The findings demonstrate that although audit quality and ESG scores act as signals for stakeholders in BRICST markets, their impact remains adverse from a value addition perspective. Practically, the findings of the current study show that firms must ensure effective integration of ESG practices into their strategic objectives to ensure that these measures are not merely symbolic. The findings also reflect the evolving expectations of stakeholders, moving beyond financial assurance to include ESG assurance as well.

Theoretical Foundations

Audit quality, ESG performance, and value addition, all three constructs are quite complex. Where audit derives its theoretical foundations from agency theory, as Jensen and Meckling (1976) argue that monitoring costs will be incurred by businesses if they enable information symmetry (reducing the agency problem and leading to wealth maximization or value addition for investors). Conversely, sustainability (or ESG) concept draws its roots from stakeholder theory, where Freeman (2010) argues that firms need to be held accountable to a wider stakeholder group, not just the investors or shareholders. This notion has later evolved into what literature refers to as the modern value addition theory, where a business case is developed for sustainability by integrating ESG risks into the firm's governance and operational structure. The argument that is made to support this claim is that, based on the efficient market hypothesis proposed by Fama (1970), markets consider risk premia for factors when determining prices for securities. As such, markets would also consider factoring

in the premium for the ESG risks of the firms. Therefore, the modern value addition concept, linking the stakeholder and shareholder perspectives, is expressed in Figure 1.

Building on the principles of signaling theory as proposed by Spence (1978) and institutional theory, the current study posits that in the modern economic environment, characterized by heightened stakeholder interest in sustainability, as argued by Siddiqui et al. (2024); Tan et al. (2024) and Wong, Batten, Mohamed-Arshad, Nordin, and Adzis (2021), a firm's ESG performance serves as a signal through which value is added or created.

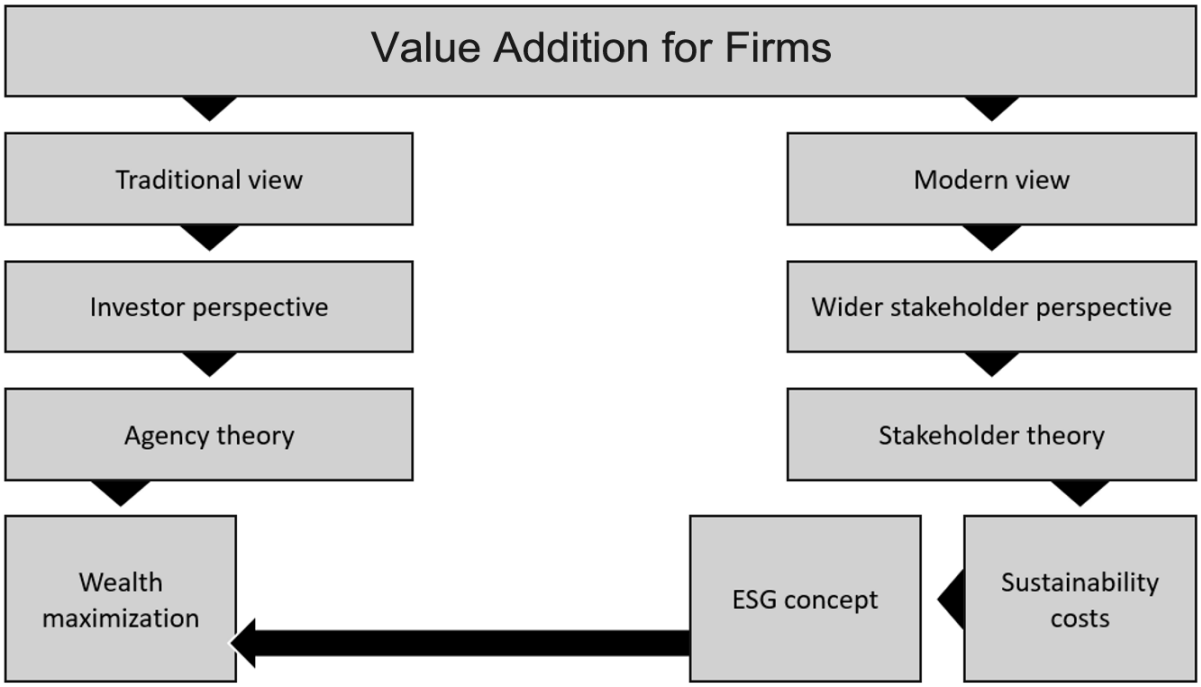

Figure 1: The Modern Value Addition Concept

Note: This figure shows the link between traditional and modern value addition perspectives, connecting the ESG concept with traditional wealth maximization concept.

Recent Literature

Building on the theoretical foundations developed in the earlier sub-section, here we develop hypotheses for the current study from recent literature.

Starting with the impact of audit quality on ESG factors, practitioners like IIA (2021) and PwC (2021) highlight that the audit profession has already started to adapt to the evolving stakeholder expectations and needs for transparency and trust around ESG reporting. However, one major concern regarding sustainability or ESG reporting is the lack of standardization in the reporting process. This issue impairs auditors' ability to provide assurance to stakeholders on firms' ESG risks and performance reporting. Nonetheless, studies of Song et al. (2023) and Zhang et al. (2023) provide support to the notions of signaling theory by demonstrating that ESG disclosures impact audit fees of firms. Where Song et al. (2023) show that improved ESG performance lowers risk and reduces audit fees, and Zhang et al. (2023) show that increased ESG disclosures increase audit fees of the firms. Similarly, La Torre, Sabelfeld, Blomkvist, and Dumay (2020) and Tsagas and Villiers (2020) argue that firms use ESG-related disclosures to foster trust and meet stakeholder expectations. As such, these studies also hint towards firms using ESG reporting as signals for stakeholders.

Moving on to the impact of ESG performance and value addition, Figure 1 shows integration of ESG factors and matrix in the strategy of firms as a means of value addition. However, this theorized relationship is not as simple, considering the complexity of the ESG construct. For example, Aydoğmuş, Gülay, and Ergun

(2022); Fatemi, Glaum, and Kaiser (2018); Tan et al. (2024); Wong et al. (2021); Wu, Li, Du, and Li (2022), and Yoon, Lee, and Byun (2018) all show that ESG factors improve firm value and performance. However, Pu (2023) and Rastogi, Singh, and Kanoujiya (2024) provide evidence that this impact is non-linear in nature. Furthermore, the work of Siddiqui et al. (2024) shows that the three pillars of the ESG construct (Environmental, Social, and Governance) have varying effects on firm-specific factors like value and performance. These findings are corroborated by Behl, Kumari, Makhija, and Sharma (2022), who show that the impact of ESG on the value of firms changes signs based on different lag levels. Nonetheless, literature agrees that ESG factors do impact the value of firms, and most literature inclines toward a positive impact between these variables.

Based on the notions of agency theory, literature shows a direct relationship between audit quality and value addition (Alrashidi, Baboukardos, & Arun, 2021; Boyle & Lewis-Western, 2018; Sri & Solimun, 2019). However, considering the aforementioned strand of literature that hints at a potential indirect link between audit quality and value addition through ESG performance, the current study theorizes a mediating role of ESG performance between audit quality and value addition.

Furthermore, considering the findings of Fan et al. (2011) and Siddiqui et al. (2024), market settings and institutional frameworks play a significant role in how variables impact one another. For example, Siddiqui et al. (2024) argue that the priorities of developing markets are different from those of developed markets, due to which the level of government intervention for sustainability in developing markets may not match the commitment of developed markets. Further, the authors empirically demonstrate that the impact of ESG factors on firm-specific variables (like value, performance, and risk) statistically differs between developed and other markets. As such, considering contextual factors is important when interpreting signaling effects of complex constructs like ESG and audit quality on value addition. Therefore, given the relative scarcity of literature examining the depth of ESG and audit quality dynamics in emerging markets, the current study focuses on the BRICST economies to improve contextual understanding around the highlighted constructs.

Finally, owing to the complexity and subjectivity embedded within the concepts of sustainability (or ESG), audit quality, and value addition, literature operationalizes them using different proxies. ESG factors of firms are most popularly represented by the ESG index or scores, of which a reliable and credible source is the Refinitiv ESG index (Aydoğmuş et al., 2022; Siddiqui et al., 2024; Thomson, 2017). For value addition, the most popular measures used are Economic Value Added (EVA) and Market Value Added (MVA), where EVA considers value addition from an accounting or internal perspective, and MVA measures it from a market or external perspective (Siddiqui & Raheman, 2025). Additionally, there is a relatively recent alternative for value addition available as well, referred to as Corporate Value (CV) (Siddiqui & Raheman, 2025). Finally, for audit quality, audit fee is a popular proxy used, where the literature argues that the higher the audit fees paid to auditors, the higher the scrutiny expected from them by users. As this measure is easily comprehensible and is usually disclosed in financial statements, it remains one of the most readily available proxies for audit quality for users (Alrashidi et al., 2021; Guzmán-Raja, González-Sánchez, Rúa-Alonso-De-Corrales, & Sánchez-García, 2021; Zhang et al., 2023).

Conceptual Framework Summary and Hypotheses Development

To summarize, literature rigorously examines the impact of audit quality on ESG, and ESG on value addition; however, it does not explicitly test the potential intervening role of ESG factors between audit quality and value addition. Additionally, literature examines the impact of audit quality on firm-specific factors (like performance, access to finance, risk, and value) but does not adequately examine a business case for audit by testing its role in the value addition of firms. Finally, the examinations performed are relatively limited in emerging markets compared to developed markets. Based on prior literature and the developed theoretical foundations, we hypothesize the following:

H_1: Audit quality has a significant positive impact on the value addition capabilities of non-financial firms operating in BRICST markets.

H_2: ESG scores mediate the impact of audit quality on the value addition capabilities of non-financial firms operating in BRICST markets.

The current study bridges these gaps by testing the conceptual model shown in Figure 2.

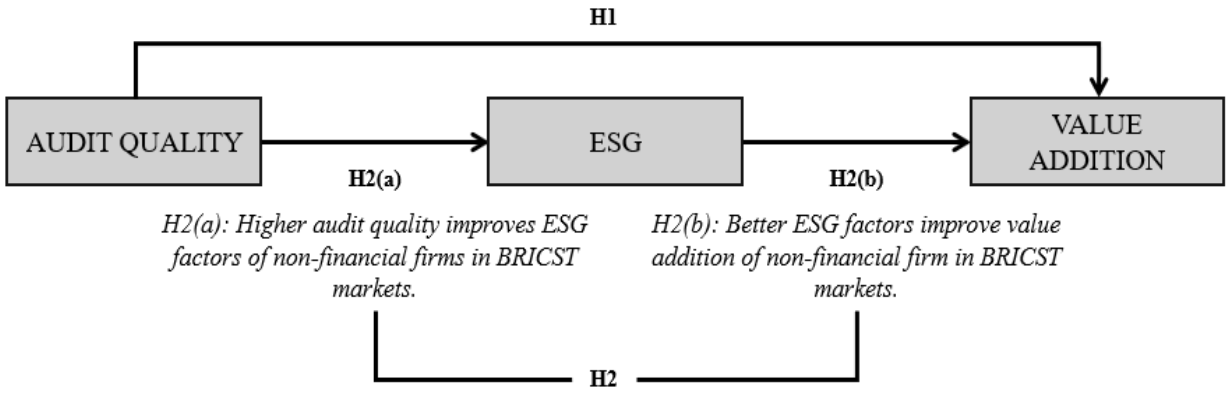

Figure 2: Summary of the Conceptual Model

Note: This figure shows the summary of the conceptual model developed. The figure also states the hypotheses that are empirically tested in the current study.

METHODS

Overall Approach, Sample, and Data

The study tests the developed hypotheses (Figure 2) using a quantitative approach. For focus and clarity, the scope of the study is limited to non-financial firms. As financial and non-financial firms have different regulatory frameworks and serve different purposes in the market, literature argues to examine them separately (Siddiqui et al., 2024). Additionally, the study selects a popular market index (referred to in Table 1) for each of the BRICST countries. Annual data from 2005 to 2023 is collected for the variables (Table 2) from Refinitiv Datastream, and estimations are performed on a final sample of 4,881 unbalanced panel data.

Table 1 shows the details of the sample construction used to perform the analysis.

Table 1: Sample Construction

Details		Firms	Observations
Count		2,069	41,680
Less: Financial sector firms		-230	-4,700
Less: Firms with missing data		-1,341	-32,099
Final sample		498	4,881
Country-wise summary			
Country	**Market Index**	**Observations**	**%**
Brazil	Bovespa Index	693	14.2%
China	Shanghai Composite Index	2,228	45.6%
India	FTSE Index	1,065	21.8%
Russian Federation	Moex Index	129	2.6%
Turkey	XU100	120	2.5%
South Africa	FTSE/JSE Africa All Shares Index	646	13.2%
Final sample		**4,881**	**100%**

Note: This table shows sample construction and country-wise breakup of the sample.

Variables of the Study

Table 2 shows the details and measurements for the variables of the study. The variables are classified into five categories. Value addition is represented by MVA in the baseline estimations. For robustness check, we estimate the models by swapping MVA with Corporate Value Added (CVA). As highlighted by Siddiqui and Raheman (2025), CV is a relatively fresh measure to represent value addition; however, it views value addition

from the accounting or internal perspective. We adapt the approach of Siddiqui and Raheman (2025) to compute CVA by scaling the CV of the current year by its lagged value (refer to Table 2 for details). The independent variable used to represent audit quality is the audit fee. The primary reason to use this as the proxy for audit quality is its popularity and ease, as it is readily available to investors and other stakeholders, as highlighted by Alrashidi et al. (2021). The ESG index (or score) of firms from Refinitiv Datastream is used to represent sustainability practices and performance. This index comprises a total of 178 indicators from 10 categories of the Environmental, Social, and Governance pillars of the ESG construct (Thomson, 2017). Finally, we use firm size, capital structure, performance, and growth as firm-level control variables, and inflation (represented by the consumer price index) collected from the World Bank (2024) Databank as a country-level control variable. The control variables are identified and selected based on literature (refer to Table 2 for references).

Table 2: Variable definition and measurement

Nature	Variables	Symbol	Definition and measurement	References
Dependent	Market value added	MVA	[(Issued share capital multiplied by the market price per share) less book value of total assets] divided by total assets.	Siddiqui and Raheman (2025)
	Enterprise or company value added	CVA*	(Market capitalization plus long-term interest-bearing debt less cash and cash equivalent from last period) divided by corporate value of last period.	Siddiqui and Raheman (2025)
Independent	Audit fee	FEE	Natural log of the total fee paid to the auditors for a particular year (including both statutory audit fee and other services).	Chen, Elemes, Hope, and Yoon (2024)
Mediating	Sustainability	ESG	ESG index – a score representing the three pillars of sustainability (environmental, social, and governance).	Kartikasary, Adi, Sitinjak, Hardiyansyah, and Sari (2023)
Control (firm level)	Reporting entity (firm) size	SIZE	Size of the reporting entity represented by the net revenue reported in the statement of profit or loss of the relevant year.	Choi, Byun, Moon, and Guiral (2023) and Fedyk, Hodson, Khimich, and Fedyk (2022)
	Reporting entity (firm) leverage	LEV	Financial leverage of the reporting entity, measured by the ratio of total (current and non-current) debt and equity.	Choi et al. (2023) and Fedyk et al. (2022)
	Reporting entity (firm) performance	ROA	Financial performance of the reporting entity measured through return on assets (ROA) – calculated as net income reported in the statement of profit or loss divided by total assets appearing in the statement of financial position.	Choi et al. (2023) and Fedyk et al. (2022)
	Reporting entity (firm) growth	GRW	Growth in revenue computed as current net revenue less lagged net revenue divided by lagged net revenue appearing in the statement of profit or loss.	Choi et al. (2023)
Control (country level)	Inflation	INF	The average annual inflation rate, represented by the consumer price index.	Diaye, Ho, and Oueghlissi (2022)

Note: This table shows the measurement and calculation for the variables of the study. For CVA*, the construction has been adapted from the approach of Siddiqui and Raheman (2025) to compute CVA from CV.

Source: Specific references stated in the final column of the table.

Empirical Model and Estimation Approach

Baron and Kenny (1986) highlight a three-step regression approach to test mediation. Under this approach, we first test whether the relationship between dependent and independent variables is statistically significant or not, excluding the mediating variable from the regression. We then test if the independent variable shows a statistically significant impact on the mediating variable. Finally, we test if the mediating variable shows a statistically significant impact on the dependent variable in the presence of the independent variable. If the independent variable turns insignificant in the third step, we classify this mediation as full mediation; otherwise, we refer to it as partial mediation (Abu Afifa, Saleh, & Taqatqah, 2023).

Furthermore, Hayes and Rockwood (2020) highlight that the indirect effect of independent variable is the product of the coefficient of independent variable from the second regression in the three-step process discussed above, and the coefficient of the mediating variable from the third regression.

Using this understanding, the conceptual model of the current study can be empirically expressed as:

$$\mathrm{MVA}_{it} = \alpha_0 + \alpha_1 \mathrm{FEE}_{it-1} + \sum_{k=2}^{5} \alpha_k X_{kit} + \alpha_6 \mathrm{INF}_{jt} + \mu_{it} \quad (1)$$

$$\mathrm{ESG}_{it} = \beta_0 + \beta_1 \mathrm{FEE}_{it-1} + \sum_{k=2}^{5} \beta_k X_{kit} + \beta_6 \mathrm{INF}_{jt} + \eta_{it} \quad (2)$$

$$\mathrm{MVA}_{it} = \gamma_0 + \gamma_1 \mathrm{FEE}_{it-1} + \gamma_2 \mathrm{ESG}_{it} + \sum_{k=3}^{6} \gamma_k X_{kit} + \gamma_7 \mathrm{INF}_{jt} + \nu_{it} \quad (3)$$

Here 'i' shows the cross-sections (firms), 't' shows year, 't-1' shows previous year, 'j' shows country, ∑X are control variables, and μ, η, and ν are respective error terms. Additionally, we introduce audit fee in lagged form in the equations to mitigate endogeneity and reverse causality concerns.

Additionally, Table 3 shows the computation of the coefficient of indirect effects and the standard errors from the above simultaneous equations.

Table 3: Conditional Indirect Effects of Audit Quality

Item	Computation
Coefficient	$\beta_1 \times \gamma_2$
Standard error	$\sqrt{(\gamma_2{}^2 \times \mathrm{SE}_{\beta_1}{}^2) + (\beta_1{}^2 \times \mathrm{SE}_{\gamma_2}{}^2)}$

Note: This table shows the calculation for the standard error and coefficient of indirect effects.

Further, building on the work of Biørn (2004) for panel data, Seemingly Unrelated Regression (SUR) system is more appropriate, as it does not 'pool' data but rather considers firm effects in the panel data.

Similarly, there are additional advantages to using the SUR system for testing mediation in panel data. The SUR system employs MLE (Maximum Likelihood Estimation) to estimate coefficients. This approach is considered superior to Ordinary Least Squares (OLS) when dealing with non-linear data (O'Brien & Silcox, 2024). Similarly, SUR approach allows for using robust covariance matrix, which controls the problem of heteroscedasticity, a common issue when dealing with panel data (Siddiqui et al., 2024).

RESULTS AND DISCUSSION

Descriptive Statistics and Correlation

Table 4 shows the summary of the descriptive statistics of the variables of the study. Where MVA, FEE, and SIZE are scaled or expressed in natural log forms. Interestingly, the mean and median values for MVA are negative. This shows that, on average, firms in BRICST markets have their market capitalization lower than the book value of the total assets, demonstrating that they struggle to create or add value from the market perspective. The reason for transforming MVA, FEE, and SIZE is to improve their linearity. When considering the transformed versions of these three variables, the highest level of dispersion in terms of standard deviation is shown by ESG scores of the firms, followed by inflation. Additionally, all variables hint towards non-normality when considering the values of their excess kurtosis and skewness.

Further, Figure 3 shows a correlation matrix in the form of a heatmap. Here, red indicates positive correlation, and blue indicates negative correlation. The strongest positive correlation is between audit fees and firm size (0.54), demonstrating that larger firms in terms of revenue tend to pay higher fees to their auditors. The second strongest positive correlation is between ROA and MVA (0.40), indicating that firms with good performance also tend to show higher market value addition capabilities. The strongest negative correlation is between LEV and MVA (-0.38), followed by FEE and MVA (-0.36). This suggests that geared firms and firms paying higher audit fees have lower value addition capabilities. It is also noteworthy that, apart from these two variables, MVA shows negative correlations with SIZE, indicating that firms generating higher revenue tend to have lower value addition capabilities. Although these three negative correlations are moderate (below 60%), the correlations between MVA and FEE contradict the theoretical framework developed in the study. Additionally, none of the correlations exceed ±0.80, indicating no multicollinearity, which is further confirmed through Variance Inflation Factor (VIF) testing in the subsequent subsection.

Table 4: Descriptive Statistics of the Variables

Variable	Unit	Mean	Median	St.Dev.	Kurt.	Skew.	Min.	Max.
MVA	Log	-0.276	-0.344	1.372	1.885	0.24	-5.885	8.18
FEE	Log	13.635	13.723	1.265	0.389	-0.35	7.882	16.96
ESG	Index	48.394	49.468	18.61	-0.717	-0.09	1.359	94.05
SIZE	Log	22.21	22.056	1.154	6.858	0.31	6.908	26.90
LEV	Ratio	1.044	0.578	1.538	11.972	3.25	0	8.85
ROA	Ratio	0.064	0.055	0.087	21.92	-0.276	-1.131	0.96
GROW	Ratio	0.078	0.07	0.242	1.753	0.12	-0.659	0.83
INF	Index	4.736	3.73	6.541	68.96	7.58	-0.728	72.31

Note: This table shows the descriptive statistics summary. Where St.Dev. is standard deviation, Kurt. is excess kurtosis, Skew. is skewness, Min is minimum value, and Max is maximum value.

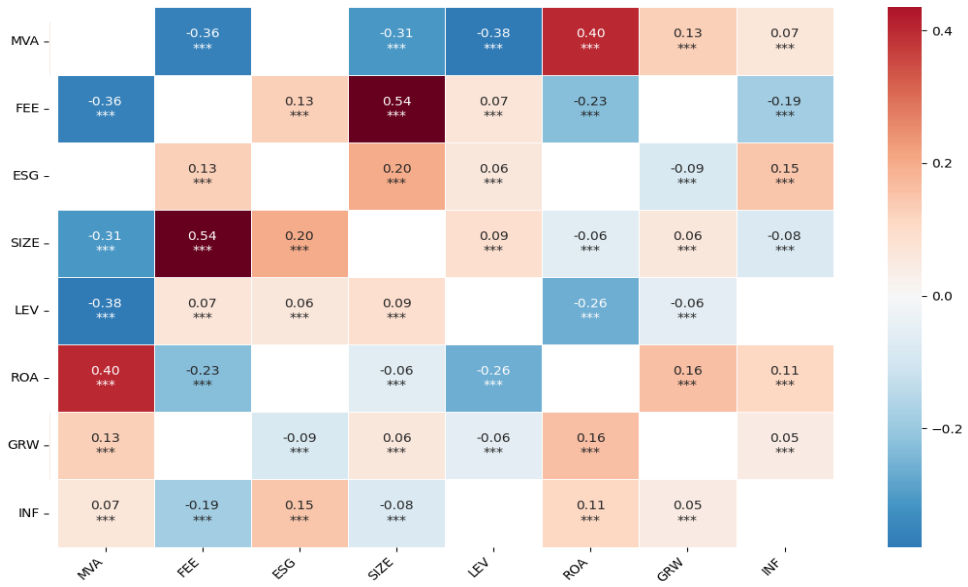

Figure 3: Correlation matrix – heatmap

Note: This figure displays the correlation coefficients of the variables of the study as a heatmap. Where (***) shows significance at 1%.

Diagnostic Tests

Table 5 shows the results for the four preliminary tests, these include: (1) testing non-linearity through BDS (Broock, Dechert, Scheinkman) Test (Broock, Scheinkman, Dechert, & LeBaron, 1996); (2) testing non-

normality through JB (Jarque-Bera) Test (Jarque & Bera, 1980); (3) testing non-stationarity through ADF (Augmented Dickey-Fuller) Test (Dickey & Fuller, 1981); and (4) testing for multicollinearity through VIF (Snee & Marquardt, 1984). The findings show that the variables have the problem of non-linearity and non-normality. As the SUR system follows MLE estimation, the impact of non-linearity of the variables is reduced. Additionally, bootstrapping of the estimation outputs helps improve inference in case of non-linearity and non-normality (Preacher & Hayes, 2008). Furthermore, the variables do not show the issues of non-stationarity (all variables are stationary at level, refer to ADF test statistic) and multicollinearity (refer to VIF, which is below 2 for all variables).

Table 5: Preliminary diagnostic test results for the variables

Variables	Linearity BDS Test Statistic	Normality JB Statistic	Stationarity ADF Test Statistic	Multicollinearity VIF
MVA	115.0 ***	767.5 ***	-8.9 ***	N/A
FEE	144.2 ***	131.2 ***	-7.7 ***	1.5
ESG	161.1 ***	111.9 ***	-8.1 ***	1.1
SIZE	154.3 ***	9621.7 ***	-17.5 ***	1.5
LEV	62.8 ***	37672.0 ***	-13.1 ***	1.1
ROA	51.3 ***	97573.8 ***	-14.0 ***	1.2
GROW	19.0 ***	634.8 ***	-11.6 ***	1.0
INF	62.8 ***	1011814.7 ***	-4.5 ***	1.1

Note: This table shows the results for the diagnostic tests for the variables, BDS tests non-linearity, JB tests non-normality, ADF tests non-stationarity, and VIF tests multicollinearity. Where (***) shows significance at 1%.

Table 6 shows the results for further two additional diagnostic tests performed on the estimation output for modified Equation 3 (where FEE is regressed at level, as opposed to first lag) under GLS (random/fixed) panel estimation technique. These tests include: (1) heteroskedasticity examined through BP (Breusch-Pegan) Test (Breusch & Pagan, 1979); and (2) serial autocorrelation examined through DW (Durbin-Watson) Test (Durbin & Watson, 1950). Both tests suggest that the residuals have the problem of heteroskedasticity and positive first-order serial autocorrelation. SUR-GLS estimations with robust standard errors help reduce the problem of heteroskedasticity (Biørn, 2014), similarly bootstrapping helps control the problem of serial autocorrelation.

Table 6: Preliminary Regression for Model Diagnostic Testing

Dependent variable: MVA			
Estimator: GLS	R-squared:		0.249
No. Observations: 4881	Adj. R-squared:		0.248
Model: Random Effects	F-statistic:		**232.13** ***
Durbin-Watson Test: 1.1663	Hausman-statistic (Chi2):		0.824
Variables		**Coef.**	
C		10.155	***
FEE		-0.158	***
ESG		-0.006	***
SIZE		-0.357	***
ROA		2.497	***
LEV		-0.126	***
GRW		0.343	***
INF		-0.009	***
Breusch-Pagan Heteroskedasticity Test			
Lagrange multiplier statistic		204.468	***
F-value		30.437	***

Note: This table shows the preliminary estimation results for the panel regression performed for model diagnostic testing for heteroskedasticity (BP Heteroskedasticity Test) and autocorrelation (DW Test). Where (***) shows significance at 1%. Here, Coef. is short for coefficient.

Lastly, we test for endogeneity by extracting the residuals from the estimation of the modified Equation 3 (Table 6) and regressing them one by one with the explanatory variables used in the same equation as the dependent variables. Table 7 shows the summary of these results, where the p-value for the residual coefficients shows an insignificant impact with all the explanatory variables from Equation 3. These results provide evidence of exogeneity; nonetheless, for stronger inference related to a causal relationship between audit fees and value addition of firms, the study regresses FEE at its first lag.

Table 7: Regressing Variables with Error Term

Dependent variable	FEE	ESG	SIZE	ROA	LEV	GRW	INF
Residual coefficient	0.011	-0.569	-0.003	-0.001	0.027	-0.0001	-0.042
P-value	0.65	0.55	0.724	0.697	0.12	0.99	0.839
R-squared	0.141	0.223	0.745	0.136	0.051	0.129	0.049
Adj. R-squared	0.14	0.222	0.744	0.135	0.05	0.127	0.047
F-statistic	**16.17 *****	**19.95 *****	**246.57 *****	**106.40 *****	**35.32 *****	**55.06 *****	**12.87 *****
Hausman-statistic (Chi^2)	**35.83 *****	**17.23 *****	4.85	6.14	6.66	**417.89 *****	**35.09 *****
Model	Fixed	Fixed	Random	Random	Random	Fixed	Fixed

Note: This table shows the results for endogeneity problem by regressing all variables from the error term extracted from the estimation of modified Equation 3 (where FEE is regressed not in its first lag, but at level). Here, (***) shows significance at 1%.

Estimation Outputs

Table 8 shows the results for the baseline estimations for Equations 1, 2 and 3. Starting with the results of Equation 2, the audit fee has a positive impact on the ESG scores of firms, demonstrating that firms paying higher audit fees tend to have better ESG performance. These findings are consistent with earlier literature, for example, the work of Alrashidi et al. (2021), which shows higher audit fees improve ESG performance for firms, leading to better opportunities for creating value. Similarly, these findings conform to the notions of Zhang et al. (2023), who show that higher ESG disclosures raise audit fees for firms. However, the findings of the current study contradict the conclusions drawn by Song et al. (2023) that better ESG performance lowers audit fees of firms. Additionally, as both studies, Song et al. (2023) and Zhang et al. (2023) argue for the impact of ESG scores on audit fees, our findings also suggest potential reverse causality between audit fees and ESG scores of firms.

However, shifting the focus to Equation 3, the results are interesting. First, both audit fees and ESG scores of firms show a negative impact on MVA. This contradicts the theoretical framework developed in the study; however, the literature in this area is not consistent. For example, the work of Rastogi et al. (2024), Signori, San-Jose, Retolaza, and Rusconi (2021), Siddiqui et al. (2024), and Yoon et al. (2018) all argues for a positive impact of ESG performance on the value of firms. However, referring specifically to the emerging or developing[1] markets, Siddiqui et al. (2024) show that segregation of the ESG index into its three pillars helps decipher the impact of ESG practices of firms on firm value and performance better.

Furthermore, the bootstrapped result for indirect effects also shows a negative mediation of ESG scores between audit quality and value addition. Although inconsistent with the theoretical framework developed in the study, these results can be interpreted following the findings of Siddiqui et al. (2024), which argue that the impact of ESG in developing markets is rather complex.

Finally, considering the output of Equation 1, the study's findings provide evidence of a partial and negative mediation of ESG scores between audit quality and value addition.

[1] That is, markets that are not considered developed based on World Bank classification of countries on their income level (World Bank, 2024).

Table 8: Output for Baseline Estimation (MVA)

Equation	**1**		**2**		**3**	
Dependent Variable	**MVA**		**ESG**		**MVA**	
Variables	**Coef.**		**Coef.**		**Coef.**	
C	10.676	***	-26.025	***	0.457	***
FEE_L1	-0.191	***	7.509	***	-0.246	***
ESG					-0.012	***
SIZE	-0.375	***	1.211	***	-0.023	***
LEV	-0.127	***	-0.011	*	-0.016	**
ROA	2.829	***	-6.349	***	1.028	***
GROW	0.257	***	-4.138	***	0.328	***
INF	-0.010	***	-0.029	**	-0.003	*
Indirect effects					-0.093	***
R-sq.	0.229		0.085		0.165	
Adj. R-Sq.	0.338		0.083		0.164	
Hausman Test Statistic	-0.35		1982.65 ***		258.03 ***	
Model	Random		Fixed		Fixed	
F-test	219.54 ***		16.60 ***		30.96 ***	

Note: This table shows the estimation output for baseline estimation. Here, (***), (**), and (*) show significance at 1%, 5%, and 10%, respectively.

Robustness

Table 9 shows the estimation output for Equations 1, 2 and 3 where the proxy for value addition is changed to CVA as a robustness check. The findings are overall consistent with the baseline estimation results (Table 8). ESG scores partially and negatively mediate the relationship between audit fees and CVA. These findings also show evidence that in emerging markets selected in the sample, ESG impairs value addition abilities of non-financial firms, from an internal (CVA or accounting) and as well as an external (MVA or market) perspective.

Table 9: Output for Robustness Estimation (CVA)

Equation	**1**		**2**		**3**	
Dependent Variable	**CVA**		**ESG**		**CVA**	
Variables	**Coef.**		**Coef.**		**Coef.**	
C	2.212	***	-26.025	***	0.179	**
FEE_L1	-0.05	***	7.509	***	-0.05	***
ESG					-0.001	***
SIZE	-0.068	***	1.211	***	-0.008	**
LEV	0.015	**	-0.011	*	0.003	
ROA	-0.209	**	-6.349	***	-0.173	**
GROW	0.011		-4.138	***	-0.009	
INF	-0.002		-0.029	**	-0.001	
Indirect effects					-0.009	***
R-sq.	0.025		0.085		0.016	
Adj. R-Sq.	0.024		0.083		0.015	
Hausman Test Statistic	61.40 ***		1982.65 ***		102.07 ***	
Model	Fixed		Fixed		Fixed	
F-test	12.67 ***		16.60 ***		2.57 ***	

Note: This table shows the estimation output for robustness test (where value addition is represented by CVA). Here, (***), (**), and (*) show significance at 1%, 5%, and 10%, respectively.

Discussions

The findings of the study support the idea that sustainability or ESG factors mediate the relationship between audit quality and value addition, aligning with signaling theory. However, the negative impact of both audit fees and ESG scores of non-financial firms operating in BRICST markets contradicts modern value addition theory but partially aligns with signaling theory. These results highlight complex interactions between ESG factors, audit quality, and firm value in emerging markets.

Consistent with the arguments of Siddiqui et al. (2024), our findings provide evidence that the construct of ESG is quite complex. Market settings and institutional frameworks must be taken into context when interpreting the impact of ESG on firm attributes like value addition. Although at a glance the results of the study contradict the literature, if examined under the lens of signaling theory and the conclusions of Siddiqui et al. (2024), the findings show that for emerging markets, ESG investment and performance of firms may lack proper integration with their strategy. Due to this lack of alignment, firms operating in emerging markets are not able to add or create value. Siddiqui et al. (2024) attribute this mainly to the social pillar of the ESG construct, for such markets.

The negative impact of audit fees on value addition capabilities of firms also supports notions of signaling theory, suggesting that the market perceives higher audit fees as higher audit risk for the reporting entity, as argued by Zhang et al. (2023). From a signaling perspective, these findings suggest that higher audit fee translates into concerns for stakeholders, as higher audit fee means higher audit efforts (in response to higher risk associated with the entity). Therefore, this finding highlights dual nature of audit quality, that is, either (i) a transparency signal, or (ii) signaling cost, at least in weaker institutional environments like emerging markets, as argued by Siddiqui et al. (2024). However, interestingly, the study findings also show that audit quality improves ESG performance of firms. These findings again support the notions of signaling theory, suggesting that, based on the understanding of practitioners like IIA (2021) and PwC (2021), auditors are able to encourage firms in improving their sustainability or ESG performance. Additionally, Zhang et al. (2023) state that auditors assess the additional ESG-related disclosures of the reporting entities with proper scrutiny, increasing overall transparency and trust in the market. However, our findings also suggest that sustainability or ESG practices can only lead to value addition if firms are able to effectively integrate their ESG practices and matrix within their overall strategy. Currently, in the BRICST markets, firms are not able to capitalize on their ESG practices to enable value addition; however, auditors have upgraded their approach to integrate ESG disclosure assessments into their practices. For firms to take advantage of this added transparency, ESG practices must be integrated within the economic performance indicators to enable value addition.

More specifically, drawing on institutional theory, the results indicate that in emerging economies like BRICST, ESG performance may be seen as a symbolic exercise or regulatory checklist, rather than an integrated framework that is embedded within the strategic direction of the entity. In environments characterized by weak governance and transparency, as highlighted by Siddiqui et al. (2024), firms may decouple ESG practices from underlying strategic objectives. As such, consistent with the notions of Fan et al. (2011), our findings argue that in weak institutional settings, sustainability signals fail to translate into value due to a lack of transparency and trust. Therefore, ESG initiatives end up as being costs rather than value-enhancing mechanisms in emerging markets like BRICST.

CONCLUSION

The current study examines the mediating role of sustainability or ESG factors of firms between audit quality and value addition of non-financial firms operating in the BRICST markets. The findings show rather interesting results. First, the findings conform with the notions of signaling theory, showing that both audit quality and ESG factors of firms provide signals to the stakeholders and users in the market, impacting the value addition capabilities of the firms. The findings also show that although audit quality helps improve ESG factors of firms, these practices ultimately fail to improve their value addition capabilities. These findings suggest that auditors have successfully modified their approach to include examination of ESG-related disclosures in their assessments; however, reporting entities are not able to effectively integrate ESG metrics into their overall

strategy. As such, firms operating in the BRICST markets are not able to improve their value addition capabilities, either from a market perspective (MVA) or an internal perspective (CVA).

The findings of the current study offer important theoretical implications, particularly in the context of signaling theory and modern value addition theory. First, the results reaffirm the central tenet of signaling theory. Both audit quality and ESG scores act as signals for users and stakeholders. Additionally, the findings extend signaling theory by adding important contextual considerations, focusing on the BRICST markets. Second, the findings show concern regarding the notions of modern value addition theory, indicating that firms in BRICST are not able to effectively drive value through sustainable or ESG practices. For modern value addition theory to hold true, firms operating in the BRICST markets must work on improving the integration of their ESG practices and performance indicators within their overall strategic aspects, such as overall culture and key performance indicators.

From a practical perspective, these findings have numerous implications for practitioners, reporting entities, and regulatory bodies. For corporate managers and executives, our findings warn against viewing ESG disclosures as a mere compliance factor. Firms are encouraged to ensure that ESG practices are in fact integrated within their corporate philosophy. Otherwise, ESG investments fail to effectively create or add value, from both market and internal perspectives. If ESG efforts are made in an arbitrary fashion, these are nothing more than simple costs for firms. A more unified and cohesive approach must be taken by management to ensure effective integration of ESG practices with the economic performance of the firms. For auditors and assurance providers, our findings highlight the growing expectations for the audit profession to extend beyond traditional financial reporting and critically assess the credibility of the ESG disclosures of the firms. The negative impact of ESG scores on their value addition capabilities suggests that auditors need to expand their scope to assess the integration of ESG practices within the overall governance and reporting frameworks of the firms. For regulators, especially in the BRICST markets, the negative mediation of ESG shows a concerning disconnect between ESG practices and the value addition of firms. This highlights the need for a regulatory framework to ensure that ESG adoption is not merely seen as a box-ticking exercise but forces firms to ensure effective integration of ESG practices within overall corporate culture.

Finally, as with any study, the current study suffers from some limitations. First, the study uses audit fees as the sole proxy for audit quality. Although it is quite popular in the literature due to its ease and understandability, other measures like auditors' tenure, Big-4 audit firms, and discretionary accruals will help provide a more comprehensive assessment of audit quality's role in value addition through the mediation of sustainability. Second, the study exclusively focuses on the BRICST markets; focusing on other frontier and emerging markets will improve the contextual understanding developed in the current study. Additionally, a cross-regional comparison will help uncover institutional and context-specific differences between individual markets. Similarly, a sector-specific analysis may also reveal valuable insights into the impact of audit quality, ESG practices, and value addition of firms operating in different sectors. Finally, the current study uses a composite ESG index; segregating the mediation analysis based on the three ESG pillars (environmental, social, and governance) individually may reveal richer insights into the association of audit quality and value addition.

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