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EVALUATING THE INFLUENCE OF ENVIRONMENTAL, SOCIAL, AND GOVERNANCE FACTORS ON EARNINGS QUALITY: A PANEL STUDY OF EMERGING MARKET

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Abstract

This study examines the impact of Environmental, Social, and Governance (ESG) factors on Earnings Quality (EQ) among non-financial firms listed on the Pakistan Stock Exchange (PSX) from 2015 to 2024. Using panel data analysis, the Fixed Effects Model was identified as the most suitable estimation method based on the Hausman test results. The findings reveal that ESG factors significantly improve earnings quality, with governance having the strongest positive effect. Additionally, firm size and sales positively influence EQ, while financial leverage negatively impacts it. The model explains 40.1% of the variation in EQ (R^2 = 0.401, F = 14.454, p = 0.000), confirming its robustness. The study recommends enhancing ESG practices, optimizing financial leverage, driving revenue growth, and strengthening regulatory frameworks to improve financial transparency and corporate sustainability. Future research should expand the scope by analyzing other markets, industries, and long-term ESG effects. The findings highlight the critical role of strong ESG frameworks in promoting financial stability, investor confidence, and corporate growth.

Keywords: ESG Factors, Environment, Social, Governance, Earnings Quality (EQ), , Stakeholders Theory, Fixed Effect Model

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INTRODUCTION

ESG factors have become critical in evaluating corporate sustainability, ethical responsibility, and financial performance. ESG criteria help investors, regulators, and stakeholders assess risks, opportunities, and long-term value creation. The Environmental aspect focuses on issues like climate change and resource use, Social examines stakeholder relationships, and Governance evaluates leadership and internal controls.

The increasing importance of ESG in corporate decision-making has led to extensive academic debate. While some studies suggest that ESG enhances firm performance through efficiency and stakeholder engagement, others argue that the costs associated with ESG initiatives may outweigh benefits, especially in the short term. Additionally, inconsistencies in ESG disclosures across industries and regions create challenges in standardizing assessments.

Return on Equity (Earnings Quality – EQ) is a key financial metric that reflects a company's efficiency in generating profits from equity capital. Several studies highlight the mixed impact of ESG on financial performance, with contextual factors such as industry type, firm size, and regulatory environment playing a significant role. Given the limited research on ESG's financial impact in emerging economies like Pakistan, this study examines how ESG factors influence financial returns and firm value for non-financial firms listed on the Pakistan Stock Exchange (PSX) from 2015 to 2024.

Despite the increasing significance of Environmental, Social, and Governance (ESG) pillars in shaping firm performance, a substantial portion of existing research in this domain relies on outdated datasets and is predominantly centered on developed economies, including the United States, Europe, Germany, France, Belgium, the United Kingdom, Canada, and Australia. While these studies provide valuable insights, they often fail to account for the distinct challenges and contextual differences that firms in developing economies encounter. Consequently, there exists a critical gap in the literature concerning the impact of ESG practices on firm performance in emerging markets, particularly in Pakistan. Although recent studies have examined the role of ESG factors, limited research (Jamil & Siddiqui, 2020; Jan & Zahid, 2024; Naeem, Ullah, & Jan, 2021) has specifically investigated their influence on financial returns and firm value within the context of an emerging economy.

To bridge this gap, the present study aims to analyze the influence of ESG pillars—Environmental, Social, and Governance—on Earnings Quality using a sample of firms listed on the Pakistan Stock Exchange (PSX) over the period 2015 to 2024. This research seeks to provide a rigorous empirical assessment of how ESG practices contribute to firm Earnings quality context, thereby enriching the literature with both theoretical and empirical insights. Grounded in Stakeholder Theory, this study underscores the pivotal role of corporate managers in addressing the expectations and interests of both internal and external stakeholders. Within this framework, ESG practices are conceptualized as strategic managerial efforts to fulfill stakeholder demands, which, in turn, drive improvements in earnings quality. By investigating the relationship between ESG factors and firm performance in Pakistan, this study makes significant contributions to the existing body of literature by offering empirical evidence on ESG-performance dynamics in an emerging market setting. Furthermore, the findings provide actionable insights for academics, investors, corporate managers, and policymakers, facilitating informed decision-making regarding ESG integration and its implications for sustainable business practices.

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The remainder of this paper is organized as follows. Section 2 presents a literature review on ESG (Environmental, Social, and Governance) factors, their relationship with financial performance, and their impact on firm value. Section 3 outlines the data sources, sample selection criteria, and methodological approach employed in the study. Section 4 provides the empirical results, including descriptive statistics and regression analysis, to assess the influence of ESG factors on financial outcomes. Finally, Section 5 concludes the paper by summarizing key findings, discussing their implications, and offering recommendations for future research.

LITERATURE AND HYPOTHESES

THEORETICAL LITERATURE

Various theories explain the relationship between ESG factors and Earnings Quality (EQ), providing a foundation for understanding their impact. The key theories discussed below highlight the role of stakeholders, resources, and governance in shaping financial performance and sustainability. Several theoretical frameworks explain the relationship between ESG factors and financial performance. Agency Theory suggests that conflicts of interest between managers (agents) and shareholders (principals) can be mitigated through strong governance practices, leading to reduced agency costs, increased transparency, and better financial outcomes (Collaku & Merovci, 2021). Stakeholder Theory expands this perspective by arguing that firms should consider the interests of all stakeholders, not just shareholders. Prioritizing environmental sustainability, social responsibility, and governance can enhance reputation, reduce risks, and improve long-term financial returns (Khan, Usman, ul Hassan, Student, & Tariq, 2024; Petare, Muthulakshmi, Bhattacharjee, Sharma, & Kumar, 2023). Similarly, the Resource-Based View (RBV) suggests that ESG factors can serve as valuable, inimitable resources—such as brand reputation, employee satisfaction, and efficient resource management—that contribute to competitive advantage and long-term profitability (Mahonen, 2024). Legitimacy Theory posits that firms engage in socially responsible practices to gain legitimacy in the eyes of stakeholders, particularly in industries subject to environmental or social scrutiny. By adopting ESG initiatives, firms can enhance trust among investors, customers, and regulators, thereby improving financial performance (Al Amosh, Khatib, & Ananzeh, 2023). Signaling Theory suggests that firms use ESG practices to signal quality, ethical standards, and long-term growth potential to the market, positively influencing investor decisions and increase the ratio of Earnings (Carnini Pulino, Ciaburri, Magnanelli, & Nasta, 2022). Lastly, Social Contract Theory argues that businesses operate within implicit social agreements, and by addressing societal needs, firms can sustain their license to operate, ultimately leading to better financial outcomes (Khan et al., 2024). Collectively, these theories provide a comprehensive foundation for knowing the influence of ESG on EQ.

EMPIRICAL LITERATURE

ENVIRONMENTAL FACTORS AND EARNINGS QUALITY

Several empirical studies have explored the impact of environmental factors on Earnings Quality (EQ), showing a normally +ve relationship b/w environmental sustainability and financial performance. Rahman, Bintoro, Dewi, and Kholilah (2024) found that firms investing in pollution prevention technologies experienced improved EQ within two years due to cost-savings & operational-efficiency. Mao, Wang, and Lin (2024) observed that companies adopting renewable energy reported higher EQ, attributed to reduced energy costs and access to government incentives. Kumar and Firoz (2022) indicated that firms in

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highly regulated industries often exhibit insignificant or even negative relationships between environmental practices and EQ due to compliance costs. Kanagaretnam, Lim, and Lobo (2014) highlighted that firms integrating renewable energy solutions improved financial performance, particularly through cost reductions and enhanced stakeholder confidence. Alipour, Ghanbari, Jamshidinavid, and Taherabadi (2019) found that firms managing carbon emissions effectively achieved superior EQ, benefiting from minimized regulatory risks and attracting environmentally conscious investors. Włodarczyk, Szczepańska-Woszczyna, and Urbański (2024) established a positive correlation between carbon efficiency and EQ among European firms, driven by cost savings and improved market reputation. Srouji, Hamdallah, Al-Hamadeen, Al-Okaily, and Elamer (2023) and Ayaz, Khan, and Shad (2022) noted that environmental transparency and disclosure significantly enhance EQ by reducing capital costs and increasing investor confidence. Hence, in light of previous studies, the following hypothesis is proposed:

H_1: The Environmental Factors positively and significantly impacts Earnings Quality.

SOCIAL FACTORS AND EARNINGS QUALITY

Social factors, including corporate social responsibility (CSR), employee relations, customer satisfaction, and community engagement, have been increasingly recognized as influencing Earnings Quality (EQ). Various empirical studies highlight the impact of social initiatives on financial performance, particularly EQ, by fostering trust, reducing business risks, and improving stakeholder relationships. Bozzolan, Fabrizi, Mallin, and Michelon (2015) found that firms in developing countries that adopted socially responsible practices experienced improved financial performance, particularly in EQ, due to enhanced stakeholder trust and loyalty. Similarly, Brahem, Depoers, and Lakhal (2022) conducted a meta-analysis and reported a positive correlation between social factors and financial performance, as firms that prioritize social concerns tend to attract investor confidence and improve long-term profitability. Fink and Whelan (2016) emphasized that organizations focusing on employee welfare and ethical business practices often outperform their competitors in terms of financial returns, with EQ serving as a key indicator of success. Additionally, Arian (2024) confirmed through a meta-analysis of ESG factors that social considerations significantly enhance financial returns. Firms prioritizing customer satisfaction, employee benefits, and community engagement reported higher EQ due to stronger reputational capital and operational efficiencies. The collective evidence suggests a strong and positive association between social factors and EQ, reinforcing the notion that socially responsible firms gain financial advantages through better risk management and improved corporate reputation. Hence, in light of previous studies, the following hypothesis is proposed:

H_2: Social Factors positively and significantly impact Earnings Quality.

GOVERNANCE FACTORS AND EARNINGS QUALITY

Recent empirical studies have extensively examined the influence of corporate governance mechanisms on Earnings Quality (EQ), highlighting the critical role of robust governance structures in enhancing financial reporting quality.

Board Independence and Financial Flexibility: Haji, Adwimurti, Rahmani, and Sudrajat (2025) demonstrated that poor earnings quality negatively affects corporate financial flexibility. Their findings also revealed that strong corporate governance, particularly through board independence, positively moderates this relationship, suggesting that effective oversight enhances EQ and financial adaptability. Governance Mechanisms and Idiosyncratic Risk: Elnahass, Salama, and Yusuf (2022) investigated the

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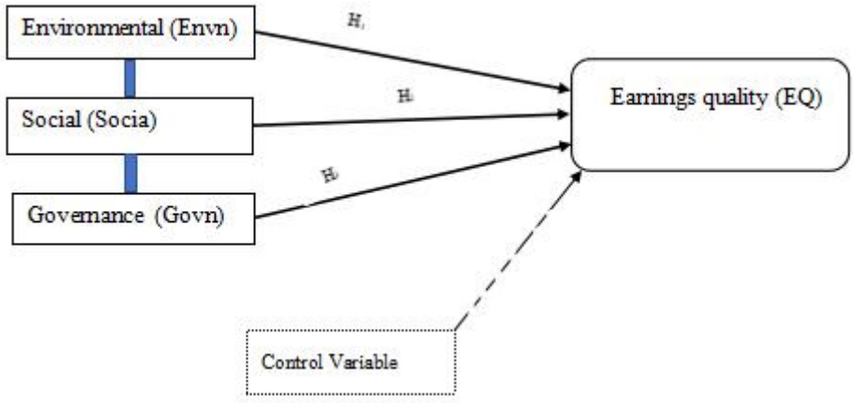
impact of corporate governance on idiosyncratic risk in an emerging market context. Analyzing data from Pakistani firms, they found that robust governance mechanisms, including board independence and audit committees, are associated with higher earnings quality, thereby reducing firm-specific risk. Corporate Governance and Earnings Management. Nguyen and Nguyen (2024) explored the relationship between corporate governance and earnings management in Vietnamese listed firms. Their study indicated that effective governance practices, such as a higher proportion of independent directors and the separation of CEO and chairman roles, are linked to reduced earnings manipulation, leading to improved earnings quality. Board Characteristics and Earnings Quality During Crises: Magnis and Louiza (2024) analyzed UK firms during the COVID-19 pandemic to assess how corporate governance affects earnings quality in times of crisis. They discovered that companies with larger, more independent boards and well-structured audit committees maintained higher earnings quality, even amidst economic disruptions.
Good Corporate Governance and Firm Value: Nurisyah and Setiany (2022) and Khan and Arshad (2023) examined the effect of good corporate governance on firm value among Indonesian companies. Their research concluded that elements such as institutional ownership, managerial ownership, and the presence of independent commissioners positively influence earnings quality, which in turn enhances firm value.

Collectively, these studies underscore the importance of robust corporate governance structures in promoting high-quality financial reporting. Mechanisms such as board independence, effective audit committees, and clear separation of leadership roles are pivotal in enhancing earnings quality and, consequently, firm value.

H_3: The Governance Factors positively and significantly impacts Earnings Quality.

CONCEPTUAL FRAMEWORK



METHODOLOGY

RESEARCH APPROACH

This study adopts a quantitative research approach, employing panel data analysis to evaluate the impact of ESG factors on Earnings Quality (EQ). The study follows a deductive reasoning framework, using established theories and empirical literature to formulate hypotheses that are tested through statistical methods.

DATA SOURCES AND SAMPLE SELECTION

This study relies on secondary data obtained from multiple sources to ensure a comprehensive analysis. Financial data is collected from the financial reports of firms listed on the Pakistan Stock Exchange (PSX), while ESG-related disclosures are sourced from corporate sustainability reports and regulatory filings. Additionally, databases such as

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Bloomberg, Reuters Eikon, and DataStream are utilized to retrieve ESG scores and financial data, providing a robust dataset for empirical analysis (Khan, Arshad, Bashir, Nadeem, & Gujjar, 2022).

SAMPLE SELECTION CRITERIA

The sample for this study comprises firms listed on PSX from 2015 to 2024, selected based on data availability and relevance. Firms included in the sample must have publicly accessible ESG disclosures and financial performance data to ensure a robust analysis. Both financial and non-financial firms are considered; however, banks and insurance companies are excluded due to their unique regulatory environment, which may introduce inconsistencies in ESG reporting and financial performance metrics.

TABLE 1: OPERATIONAL DEFINITION OF VARIABLES

Variable	Type of variables	Definition	Measurement	Source
Earnings Quality (EQ)	DV	Measures the reliability of reported earnings	Operating Cash Flow / Net Income	Pratiwi & Pralita (2021), Putra & Subowo (2016)
Environmental (ENVN)	ID	Firm's impact on natural resources and sustainability efforts	Carbon emissions, renewable energy usage, waste management	Tohang et al. (2024)
Social (SOCIA)	ID	Firm's relationship with employees, customers, and communities	Employee well-being, CSR activities, workplace policies	Tohang et al. (2024)
Governance (GOVN)	ID	Internal controls, leadership structure, and transparency	Board independence, shareholder rights, audit committee effectiveness	Tohang et al. (2024)
Firm Size (F-SIZE)	CV	Scale of company's operations	Log of total assets	Giannopoulos et al. (2022) & Giannopoulos et al. (2022)
Financial Leverage (F-LEVRG)	CV	Extent of debt financing	Total debt / Total assets	Giannopoulos et al. (2022) & Giannopoulos et al. (2022)
Sales Growth (F-SALE)	CV	Firm's revenue expansion	(CY Sales – Prev Year Sales) / Previous Year Sales	Giannopoulos et al. (2022) & Giannopoulos et al. (2022)

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RESEARCH MODEL AND ECONOMETRIC SPECIFICATION

The study employs the following panel regression model to test the nexus between ESG factors and Earnings Quality:

$$EQ_{Eit} = \beta_0 + \beta_1(Envn)_{it} + \beta_2(Socia)_{it} + \beta_3(Govn)_{it} + ß_4(F\text{-}size)_{it} + ß_5(F\text{-}Levrg)_{it} + ß_6(F\text{-}Sale)_{it} + \varepsilon_{it}$$

Where:

EQ_{it} = Earnings Quality

$Envn_{it}$ = Environmental Factor

$Socia_{it}$ = Social Factor

$Govn_{it}$ = Governance Factor

β_o = Constant of Regression equation

F-size = Firm Size

F-Levrg = Firm Leverage

F-Sale = Firm Sale Growth

ε_{it} = Error term

MODEL SELECTION OR SELECTION

Generally, three models are used for the analysis of the Panel Data of the Study. These models are hereunder: a. Pooled OLS b. REM c. FEM For the purpose of selecting the suitable Model, the following relevant tests (stated in table below) should be conducted before using the model of analysis of Data of the study.

TABLE 2: COMPARISON OF MODELS

S.no	Comparison of Models	Name of Test	Preferred Model if Sig
1	Pooled OLS vs FEM	F-Test	FEM
2	Pooled OLS vs REM	Breusch-Pagan LM Test	REM
3	FEM vs REM	Hausman Test	FEM

DIAGNOSTIC TESTS FOR ROBUSTNESS

Even after selecting the most appropriate model (Pooled OLS, REM, or FEM), it is crucial to validate its assumptions and robustness to ensure that the results are reliable and the model is properly specified (Usman, Bashir, Arshad, & Khan, 2025). By performing these diagnostic tests and ensuring the robustness of your model, you can be more confident in the validity of your results and the appropriateness of your chosen model (Pooled OLS, REM, or FEM). The key diagnostics tests are stated below in table:

TABLE 3: DIAGNOSTIC TESTS FOR ROBUSTNESS

Test	Purpose	Remedy if Violated
Heteroscedasticity	Check for non-constant variance in errors	Use robust standard errors
Autocorrelation	Check for serial correlation in residuals	Use robust standard errors or GLS
Cross-Sectional Dependence	Check for correlation between entities' errors	Use FGLS or clustered standard errors
Multicollenearity	Check for correlations among independent variables	Drop or combine variables, use PCA
Normality of Residuals	Check if residuals are normally distributed	Use robust standard errors or GMM

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Model Specification	Check for omitted variables or incorrect functional form	Add missing variables, change functional form
Endogeneity	Check if independent variables are correlated with error term	Use IV or 2SLS
R-squared and Adjusted R-squared	Measure model fit	Consider alternative models if too low

RESULTS AND DISCUSSIONS

The relevant Data of the top 100 non-financial firms for the analysis is obtained from reliable platforms, such as PSX, the National Bank of Pakistan (NBP), and other reliable websites for the period 2015 to 2024 targeting companies that actively engage in ESG practices and have publicly available data. The detailed results of (i) descriptive statistics, (ii) correlation matrix, (iii) model specification tests, and the (iv) regression analyses are reflected in this section.

ANALYSIS AND DISCUSSION

DESCRIPTIVE ANALYSIS

Descriptive analysis summarizes the data's key characteristics, highlighting patterns and relationships. It provides the mean, standard deviation, minimum, and maximum values for the study's dependent and independent variables.

The descriptive statistics for the dataset indicate that the mean Return on Equity earnings quality (EQ) is 4.231. A Tobin's Q is > 1 suggests that the market values the firm's stock higher than its BV, entailing that most firms in the dataset are overrated or overstated. Additionally, the greater the ROA, the more effectively a firm is generating profits from its assets. Similarly, the higher mean EARNINGS QUALITY (EQ) indicates that firms are efficient in generating profits relative to shareholders' equity. Therefore, the results suggest that the firms in this study are not only highly valued by the market but are also efficient in their profit-generation capacity.

TABLE 4: DESCRIPTIVE ANALYSIS

Variables	Min	Max	Mean	SD
Dependent Variables				
EQ	1.544	81.657	3.245	2.324
Independent Variables				
Envn	0.000	90.53	10.241	10.331
Socia	0.000	85.543	33.360	20.134
Govn	0.000	91.425	38.567	26.680
Control Variables				
Fsize	15.430	87.367	32.450	28.561
FSale	10.244	20.780	16.451	16.987
FLevrg	11.234	79.345	30.456	18.234

Table 4 presents the descriptive analysis of the study variables, including dependent, independent, and control variables. The dependent variable, EQ, has a mean of 3.245 with a standard deviation (SD) of 2.324, indicating some variability in the data. Among the independent variables, the mean values for environmental (Env), social (Soc), and governance (Gov) factors are 10.241, 33.360, and 38.567, respectively, with varying degrees of dispersion. The control variables, including firm size (Fsize), firm sales (FSale), and firm

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leverage (FLevrg), show different ranges and standard deviations, reflecting their distribution across the dataset.

CORRELATION MATRIX

RELATIONSHIP BETWEEN ESG FACTORS AND EARNINGS QUALITY

Correlation analysis assesses the strength and direction of variable relationships. Table 5 shows no significant correlation between ESG scores and Tobin's Q or EQ (Khan, 2022). However, ESG components are highly interrelated, highlighting their interdependence.

TABLE 2: PEARSON CORRELATION MATRIX

Variables	EQ	Env	Soc	Gov	Fsize	FLevrg	FSale
EQ	1						
Env	0.350	1					
Soc	0.386	0.634	1				
Gov	0.443	0.160	0.415	1			
F-size	-0.182	-0.454	0.189	0.353	1		
F-Levrg	- 0.545	0.532	-0.723	-0.340	-0.354	1	
F-Sale	0.190	0.359	-0.424	0.211	0.124	0.305	1

Table 6 presents the Pearson correlation coefficients for the dep. variable (EQ), ind, variables (Env, Soc, Gov), and control variables (F-size, F-Levrg, F-Sale). The Pearson correlation coefficient measures the strength and direction of linear relationships between variables, with values i.e., -1 & +1, where positive values indicate a direct relationship and negative values indicate an inverse association.

The results indicate a positive correlation between EQ and the three ESG factors: Environmental (0.350), Social (0.386), and Governance (0.443), suggesting that firms with stronger ESG performance tend to have higher Earnings Quality. Among the control variables, financial leverage (-0.545) and firm size (-0.182) show negative correlations with EQ, implying that higher debt levels and larger firm size may negatively impact Earnings Quality. Additionally, ESG components are highly interrelated, with a strong correlation between Social and Environmental factors (0.634), reflecting their interconnected nature in sustainability practices. The significance levels are represented as *** (0.01), ** (0.05), and * (0.10), indicating the reliability of the relationships observed in the correlation matrix (Arshad, Bashir, Khan, Usman, & Batool, 2024).

DIAGNOSTICS-TESTS

Section 4.2 discusses the diagnostic tests conducted to ensure the validity as well as reliability of the model. Following past studies, the sample data underwent various statistical tests to detect issues such as heteroscedasticity, multicollenearity, autocorrelation, and model misspecification. These tests help confirm that the chosen model is appropriate for analysis. The details of the diagnostic tests are provided in table 1.

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TABLE 3: DIAGNOSTIC-TESTS

Description	Test	X^2	Prob. Chi-Sq.	VIF	1/VIF	F	Prob
Normality	Jarque-Bera test	0.405	0.34	-	-	-	-
Serial Correlation	Breusch-Godfrey LM test	0.065	0.151	-	-	-	-
Heteroscedasticity	Breusch-Pagan-Godfrey test	0.602	0.51	-	-	-	-
Multicollinearity	VIF (Env)	-	-	1.01	0.9846	-	-
	VIF (Soc)	-	-	1.09	0.9157	-	-
	VIF (Gov)	-	-	1.55	0.9043	-	-
	VIF (Fsize)	-	-	1.62	0.9454	-	-
	VIF (FLevrg)	-	-	1.08	0.9257	-	-
	VIF (FSale)	-	-	1.05	0.9608	-	-
Endogeneity	RESET test	-	-	-	-	2.39	0.0411

MODEL SPECIFICATION OR SELECTION TEST

To ensure accurate analysis, this study employs model selection tests for panel data: the Likelihood test (F-test) compares Pooled OLS and FEM, the Lagrange Multiplier (LM) test assesses Pooled OLS vs. REM, and the Hausman test determines whether FEM or REM is more appropriate. The test results, summarized in the table below, guide the selection of the best-fitting model for data analysis (Hu, 2024).

POOLED OLS VS FIXED EFFECT MODEL

HYPOTHESIS

- **H_0:** Pooled-OLS Model (preferable).
- **H_1:** Fixed-Effects Model (Preferable).

DECISION:

The Ho is accepted if the Chi-square probability is greater than 0.05 and otherwise rejected. The likelihood test results comparing Pooled OLS and FEM are presented below (Collaku & Merovci, 2021).

TABLE 4: LIKELIHOOD TEST RESULTS

Effect Test	Statistics	df	Prob
Cross-section F	13.47623	(12.05)	.0000
Chi-square cross-section	110.43564	12.000	0.000

The Chow test results in Table 4 show a probability of 0.0000, resulting in the rejection of the Ho. This confirms that the FEM is the most appropriate panel data estimation method for this study.

FE VS RE MODEL

HAUSMAN TEST

It determines whether FEM or REM is more suitable.

- **H_0:** REM is preferred.
- **H_1:** FEM is preferred.

If the chi-square probability > 0.05, REM is chosen; otherwise, FEM is preferred. In STATA, xtreg was used to estimate both models, and the Durbin-Wu-Hausman (DWH) test confirmed the selection.

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TABLE 5: HAUSMAN TEST

	Coeff.
Chi-square test value	20.321
P-value	0.000

The results in Table 5 show a significant Chi-square probability ($p < 0.05$), leading to the rejection of $\mathbf{H_0}$ and acceptance of $\mathbf{H_1}$, confirming the Fixed Effects Model (FEM) as the best fit. The Hausman test validates this choice by rejecting the Random Effects Model (REM). A summary of the tests supporting this decision is provided below.

TABLE 6: SUMMARY OF TESTS

Comparison of Models	Test	Chi- Square Value	P-Value	Result
Pooled OLS vs FEM	Likelihood-Test	10	0000	FEM
FEM vs REM	Hausman Test	15	0000	FEM

REGRESSION ANALYSIS

This study analyzes the impact of ESG factors on financial returns and firm value among PSX-listed non-financial firms, using Stakeholder Theory. Under the Hausman test, the FE Model was selected. Tables 11 and 12 summarize the regression results and hypothesis testing.

ESG FACTORS AND EARNINGS QUALITY (EQ)

The regression analysis confirms that ESG factors positively impact Earnings Quality (EQ) of PSX-listed firms (2015–2024). Model-1 is significant at the 1% level ($F = 15.481$), explaining 50% of EQ variation. Environmental factors show a strong positive effect (coefficient = 31.83, $p = 0.003$), indicating that a one-unit increase in the environmental score boosts EQ by 31.83 units, supporting Hypothesis 1 that better environmental practices enhance financial performance.

TABLE 7: FIXED EFFECTS MODEL FOR EARNINGS QUALITY (EQ)

Variable	Coef.	Std. Err.	PV
Environmental Factor	35.65	38.45	0.004
Social Factor	38.34	64.32	0.002
Governance Factor	34.54	42.62	0
Firm Size (Fsize)	0.05	15.21	0.003
Financial Leverage (FLevrg)	-30.34	40.36	0.004
Firm Sales (FSale)	24.56	16.47	0.041

TABLE 8: MODEL SUMMARY

Statistic	Value
Mean	0.38
R-Squared (R^2)	0.401
Adjusted R-Squared	0.391
F-test Statistic	14.454
Prob (F-Statistic)	0

The Fixed Effects Model evaluates the effect of Envn, Socia, & Govn (ESG) factors, along with firm-specific financial variables, on Earnings Quality (EQ) for PSX-listed firms. The Environmental Factor (Coef. = 35.65, $p = 0.004$) has a positive and significant effect on EQ, indicating that firms with strong environmental practices achieve higher earnings quality (Liu, Chang-Richards, Kevin, Wang, & Dirks, 2023). The Social Factor (Coef. = 38.34, $p = 0.002$) also exhibits a positive relationship, suggesting that enhanced social responsibility

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improves financial transparency (Laela, Anggraeni, & Wijayanti, 2019). The Governance Factor (Coef. = 34.54, p = 0.000) is the most significant, highlighting that stronger corporate governance leads to better earnings quality (Pong & Man, 2024). Firm Size positively influences EQ, indicating better financial reporting in larger firms (Khan et al., 2024). Financial Leverage negatively impacts EQ, suggesting that higher debt reduces earnings quality. Firm Sales enhance EQ, implying that increased revenue improves financial transparency (Khan et al., 2024; Usman, Bashir, et al., 2025).

The R-Squared (0.401) shows that 40.1% of the variation in EQ is clarified by the ind. variables. The Adj R^2 (0.391) suggests a strong model fit after adjusting for the number of predictors. The F-test (14.454, p = 0.000) confirms that the overall model is statistically significant (Sureiman & Mangera, 2020; Usman, Khan, Bashir, & Arshad, 2025).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSION

This study investigates the impact of ESG factors on Earnings Quality (EQ) among non-financial firms listed on the Pakistan Stock Exchange (PSX) using a Fixed Effects Model. The empirical findings reveal that Environmental, Social, and Governance (ESG) factors positively influence EQ, with governance exerting the most substantial effect. Additionally, firm size (Fsize) and firm sales (FSale) are found to enhance earnings quality, whereas financial leverage (FLevrg) negatively impacts it. The robustness of the model is validated by an R-squared value of 0.401 and a highly significant F-test (p = 0.000), confirming the reliability of the results.

RECOMMENDATIONS

To enhance financial transparency and performance, firms should prioritize strengthening ESG practices by improving governance, fostering ethical leadership, and implementing robust corporate social responsibility (CSR) initiatives. Maintaining a balanced debt-equity ratio and optimizing cash flow management can help firms achieve financial stability while mitigating risks associated with excessive leverage. Additionally, driving revenue growth through market expansion, operational efficiency, and digital innovation can enhance long-term profitability. Regulatory bodies such as the Securities and Exchange Commission of Pakistan (SECP) should enforce mandatory ESG disclosures and corporate governance codes to ensure compliance and accountability. Furthermore, investors should integrate ESG metrics into their decision-making processes, promoting sustainable growth and encouraging firms to adopt responsible business practices. Future studies should analyze other stock markets and sectors, explore long-term ESG effects, and consider macroeconomic factors influencing earnings quality.

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