

ESG DISCLOSURE AND DIGITAL FINANCIAL TRANSPARENCY AS DETERMINANTS OF FIRMS' COST OF CAPITAL: EVIDENCE FROM PAKISTAN

Shaheryar Arif^{*1}, Dr. Syed Umer Farooq², Dr. Mahboob Ullah³, Muhammad Farhan Amjad⁴

^{*1}Assistant Manager, Assurance Ernst and Ayoung Professional Services

²Professor, Abasyn University, Peshawar

³Associate Professor, Department of Management Sciences, Abasyn University Peshawar

⁴Manager Performance at a Power Plant

^{*1}chaudaryshaheryar@gmail.com, ²syed.umarfarooq@abasyn.edu.pk, ³mahboob.ullah@abasyn.edu.pk,
⁴farhan.sheikh@ymail.com

Corresponding Author: *

Shaheryar Arif

DOI: <http://doi.org/10.5281/zenodo.21290609>

Received	Accepted	Published
22 January 2026	03 March 2026	20 March 2026

ABSTRACT

This study examined the impact of Environmental, Social, and Governance (ESG) disclosure and digital financial transparency on firms' cost of capital in Pakistan. Grounded in signaling theory, agency theory, and stakeholder theory, the research investigated how enhanced corporate transparency influences financing costs in an emerging capital market context. A quantitative, cross-sectional research design was employed, using data from 230 non-financial firms listed on the Pakistan Stock Exchange (PSX). ESG disclosure was measured through a structured disclosure index, while digital financial transparency was assessed based on firms' adoption of digital reporting and information accessibility practices. The cost of capital was proxied by the weighted average cost of capital (WACC), and panel regression analysis was applied to test the hypotheses.

The empirical results revealed that both ESG disclosure and digital financial transparency have a significant negative effect on firms' cost of capital. ESG disclosure exhibited a stronger impact, indicating that sustainability reporting plays a critical role in reducing investor risk perception and improving access to external financing. Digital financial transparency also significantly reduced financing costs by enhancing information accessibility and reducing uncertainty. The findings further confirm that transparency mechanisms collectively improve market efficiency and financial decision-making in emerging economies.

The study contributes to the literature by integrating ESG and digital transparency within a unified framework to explain variations in cost of capital. It also provides practical implications for corporate managers, investors, and regulators seeking to enhance financial efficiency through improved disclosure practices.

Keywords: ESG Disclosure; Digital Financial Transparency; Cost of Capital; Pakistan Stock Exchange; Sustainability Reporting; Information Asymmetry; Corporate Finance; Emerging Markets.

INTRODUCTION

In contemporary corporate finance, Environmental, Social, and Governance (ESG) disclosure has emerged as a key determinant of firms' financial performance and capital market outcomes. Globally, investors and regulatory authorities increasingly emphasize sustainability reporting, transparency, and ethical governance, as these factors reduce information asymmetry and enhance investor confidence. Empirical studies suggest that higher ESG disclosure is associated with lower perceived risk and improved access to external financing, ultimately reducing firms' cost of capital (Alam & Tariq, 2023; Jafar et al., 2024). Alongside ESG developments, digital financial transparency has significantly transformed corporate reporting practices. The adoption of digital reporting systems, automation in financial disclosures, and real-time data accessibility have improved the quality and timeliness of financial information. This enhanced transparency reduces uncertainty among investors and creditors, thereby lowering information risk and influencing the required rate of return. In emerging economies, where financial reporting inefficiencies are more prevalent, digital transparency plays a particularly important role in improving capital market efficiency and reducing financing costs (Fatima et al., 2024; Xia et al., 2023).

In Pakistan, firms listed on the Pakistan Stock Exchange operate in an environment characterized by information asymmetry, weak enforcement of disclosure standards, and uneven adoption of sustainability reporting practices. Although ESG reporting is gradually gaining importance, it remains largely voluntary and inconsistent across sectors. Existing evidence indicates that firms with stronger ESG performance tend to experience lower cost of capital due to improved investor trust, reduced risk perception, and enhanced corporate reputation (Thepdawala & Siddiqui, 2025; Alam & Tariq, 2023).

From a theoretical perspective, signaling theory explains that ESG disclosure serves as a credible signal of firm quality, reducing information asymmetry between firms and investors.

Stakeholder theory further suggests that transparent ESG and digital reporting practices help firms meet stakeholder expectations, thereby strengthening financial stability. Additionally, agency theory highlights that greater transparency reduces monitoring costs and aligns managerial actions with shareholder interests, ultimately contributing to a lower cost of capital.

Despite growing global literature on ESG and digital transformation, there remains limited empirical evidence on the combined impact of ESG disclosure and digital financial transparency on firms' cost of capital in emerging markets such as Pakistan. This study addresses this gap by examining how both factors jointly influence financing costs in PSX-listed firms. The findings are expected to contribute to sustainable finance literature and provide practical insights for policymakers, regulators, and corporate managers seeking to enhance financial efficiency through improved transparency mechanisms.

Problem Statement

In modern capital markets, firms' cost of capital is strongly influenced by the level of transparency and quality of information disclosed to investors.

In developed economies, Environmental, Social, and Governance (ESG) disclosure and digital financial transparency have become important mechanisms for reducing information asymmetry, enhancing investor confidence, and lowering financing costs. However, in emerging markets such as Pakistan, these practices remain inconsistent, weakly regulated, and unevenly adopted across firms.

Firms listed on the Pakistan Stock Exchange (PSX) continue to face higher cost of capital, partly due to limited ESG integration, inadequate sustainability reporting, and fragmented digital financial reporting systems. Although regulatory frameworks are gradually evolving, many firms still rely on traditional reporting structures that do not fully meet global transparency standards. As a result, investors face higher uncertainty and risk perception, which increases required returns and raises the overall cost of capital.

Furthermore, while existing literature has separately examined ESG disclosure and financial

transparency, there is limited empirical evidence on their combined effect on firms' cost of capital in Pakistan. The absence of integrated analysis creates a significant research gap, particularly in understanding how digital transformation in financial reporting interacts with ESG practices to influence financing costs.

Therefore, this study addresses the need to empirically examine ESG disclosure and digital financial transparency as joint determinants of firms' cost of capital in the context of an emerging market economy like Pakistan.

Research Questions

1. What is the impact of ESG disclosure on firms' cost of capital in Pakistan?
2. How does digital financial transparency influence firms' cost of capital in Pakistan?
3. Does ESG disclosure significantly reduce firms' cost of capital through improved investor confidence?
4. To what extent does digital financial transparency enhance capital market efficiency by lowering financing costs?
5. What is the combined effect of ESG disclosure and digital financial transparency on firms' cost of capital in Pakistan?

Research Objectives

General Objective

To examine the impact of ESG disclosure and digital financial transparency on firms' cost of capital in Pakistan.

Specific Objectives

1. To analyze the effect of ESG disclosure on firms' cost of capital in Pakistan.
2. To evaluate the influence of digital financial transparency on firms' cost of capital.
3. To assess the role of ESG disclosure in reducing information asymmetry and financing costs.
4. To examine how digital financial transparency improves investor confidence and capital market efficiency.
5. To investigate the combined impact of ESG disclosure and digital financial transparency on firms' cost of capital in PSX-listed firms.

Significance of the Study

This study holds substantial significance in both theoretical and practical domains by examining the impact of ESG disclosure and digital financial transparency on firms' cost of capital in Pakistan. In an era where capital markets are increasingly driven by sustainability, transparency, and digital transformation, understanding these determinants is essential for improving financial efficiency and market stability in emerging economies.

From a theoretical perspective, the study contributes to the existing body of literature on corporate finance and sustainable reporting by integrating ESG disclosure and digital financial transparency within a unified analytical framework. While previous studies have largely examined these constructs independently, this research advances the literature by exploring their combined effect on firms' cost of capital. It also extends signaling theory, stakeholder theory, and agency theory by demonstrating how enhanced disclosure and digital reporting mechanisms function as credible signals that reduce information asymmetry and financial risk in emerging markets such as Pakistan.

From a practical perspective, the findings of this study are highly relevant for corporate managers, investors, regulators, and policymakers. For corporate managers, the study highlights the financial benefits of adopting strong ESG practices and advanced digital reporting systems, particularly in terms of reducing financing costs and improving firm valuation. For investors, the study provides valuable insights into how transparency and sustainability disclosures influence risk assessment and investment decisions in the Pakistan Stock Exchange (PSX). For regulatory authorities such as the Securities and Exchange Commission of Pakistan (SECP), the study offers evidence-based implications for strengthening ESG reporting frameworks and promoting digital financial transparency standards. Enhanced regulatory enforcement can contribute to improved market efficiency, reduced information asymmetry, and increased investor confidence in capital markets.

Overall, this study is significant as it provides empirical evidence from an emerging market context, where limited research exists on the intersection of ESG disclosure, digital transformation, and cost of capital. The insights generated are expected to support sustainable financial development and improve corporate transparency practices in Pakistan.

Literature Review

ESG Disclosure and Firms' Cost of Capital

Environmental, Social, and Governance (ESG) disclosure has emerged as a central theme in corporate finance literature due to its role in reducing information asymmetry and improving investor confidence. Firms that provide higher levels of ESG disclosure are generally perceived as less risky, more transparent, and more sustainable in the long run. This perception reduces investors' required rate of return, thereby lowering the firm's cost of capital. Recent empirical studies indicate that ESG performance is significantly associated with reduced equity and debt financing costs, particularly in markets where transparency concerns are high (Alam & Tariq, 2023; Jafar et al., 2024).

In emerging economies such as Pakistan, ESG reporting is still evolving, with many firms voluntarily disclosing sustainability information. However, firms with stronger ESG practices tend to attract more stable investors and experience improved market valuation. The literature suggests that ESG disclosure functions as a signaling mechanism, reducing uncertainty and improving access to external financing (Thepdawala & Siddiqui, 2025). Despite growing global attention, ESG integration in Pakistan remains inconsistent, creating a gap in understanding its financial implications in developing capital markets.

Digital Financial Transparency and Capital Market Efficiency

Digital financial transparency refers to the use of digital technologies, automated reporting systems, and real-time financial disclosures that enhance the quality, speed, and accessibility of financial information. It plays a crucial role in reducing

reporting delays, improving data accuracy, and increasing stakeholder trust. Studies suggest that firms adopting digital financial reporting systems experience lower information risk and improved investor responsiveness (Fatima et al., 2024).

In capital markets, transparency reduces uncertainty and enables investors to make more informed decisions, which ultimately lowers the cost of capital. In developing countries, where traditional reporting systems are often inefficient, digital transformation significantly enhances financial disclosure quality. However, the adoption of digital financial transparency in Pakistan remains limited, and empirical evidence on its direct effect on financing costs is still underdeveloped.

ESG Disclosure, Digital Transparency, and Cost of Capital Relationship

The combined effect of ESG disclosure and digital financial transparency is increasingly recognized in financial literature. While ESG disclosure improves the quality of non-financial reporting, digital transparency enhances the speed and accessibility of both financial and non-financial information. Together, these mechanisms reduce information asymmetry, strengthen investor trust, and decrease perceived investment risk.

According to signaling theory, firms that disclose more ESG-related and digitally accessible information signal higher quality and lower risk to the market. Similarly, agency theory suggests that transparency mechanisms reduce agency conflicts between managers and shareholders, thereby lowering monitoring costs and required returns. Empirical evidence supports that firms with higher transparency levels tend to enjoy lower cost of capital due to improved market perceptions (Xia et al., 2023).

Theoretical Foundations

This study is grounded in three main theories. First, signaling theory explains how ESG disclosure and digital transparency serve as signals of firm quality, reducing uncertainty for investors. Second, agency theory highlights the role of transparency in minimizing conflicts between managers and shareholders, thereby reducing

agency costs. Third, stakeholder theory emphasizes that firms must address the expectations of multiple stakeholders, including investors, regulators, and society, through transparent and responsible reporting practices.

These theories collectively support the argument that improved disclosure practices reduce perceived risk and lower firms' cost of capital, particularly in emerging markets with weak information environments.

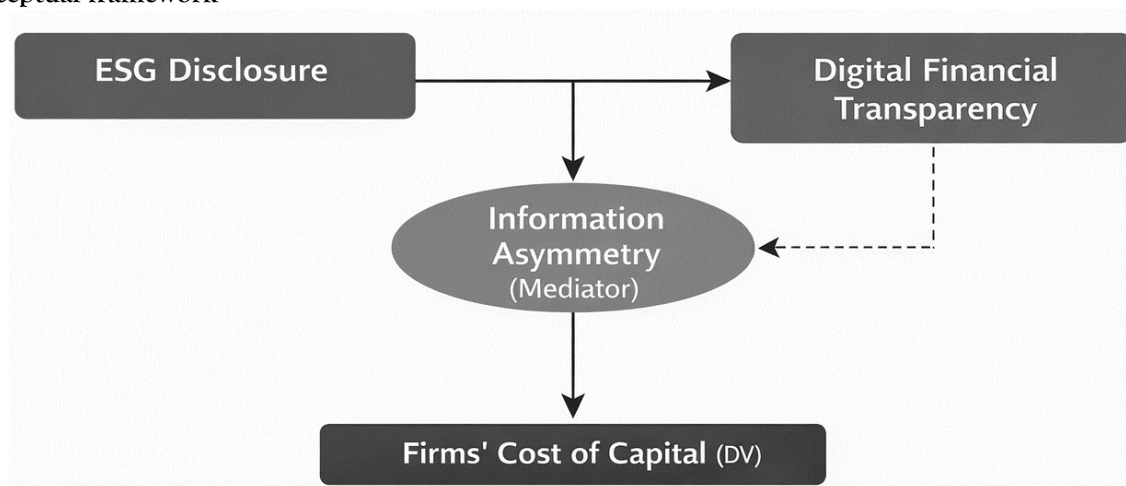
Research Gap

Although extensive research exists on ESG disclosure and financial performance in developed economies, limited empirical studies have examined the joint impact of ESG disclosure and digital financial transparency on firms' cost of capital in Pakistan. Most existing studies focus on

either ESG factors or financial reporting quality separately, without integrating digital transformation as a moderating or complementary mechanism. This gap highlights the need for a comprehensive framework that examines how both factors interact to influence capital market outcomes in emerging economies.

The existing literature confirms that ESG disclosure reduces information asymmetry and enhances firm valuation, while digital financial transparency improves reporting efficiency and investor trust. However, there is limited evidence on their combined effect on cost of capital, particularly in Pakistan. This study addresses this gap by integrating both constructs into a unified framework to better explain financing costs in emerging capital markets.

conceptual framework



Hypotheses

Based on the theoretical foundations of signaling theory, agency theory, and stakeholder theory, as well as prior empirical literature, the following hypotheses are developed to examine the relationship between ESG disclosure, digital financial transparency, and firms' cost of capital in Pakistan.

H1: ESG disclosure has a significant negative impact on firms' cost of capital in Pakistan.

H2: Digital financial transparency has a significant negative impact on firms' cost of capital in Pakistan.

H3: ESG disclosure significantly improves investor perception by reducing perceived investment risk in Pakistani firms.

H4: Digital financial transparency significantly reduces information asymmetry between firms and investors in Pakistan.

H5: ESG disclosure and digital financial transparency jointly have a significant negative effect on firms' cost of capital in Pakistan.

H6: Digital financial transparency moderates the relationship between ESG disclosure and firms' cost of capital in Pakistan, such that the relationship becomes stronger when transparency is high.

Methodology

Research Design

This study adopted a quantitative, cross-sectional research design to examine the impact of ESG disclosure and digital financial transparency on firms' cost of capital in Pakistan. The design was considered appropriate as it allowed for the systematic testing of hypothesized relationships using numerical data collected at a single point in time.

Population and Sample

The population of the study consisted of all non-financial firms listed on the Pakistan Stock Exchange (PSX). Financial firms such as banks, insurance companies, and leasing firms were excluded due to their distinct regulatory and financial reporting structures.

A sample of 250 PSX-listed non-financial firms was selected using a purposive sampling technique. The selection was based on the availability of complete annual reports, ESG-related disclosures, and financial data for the study period. After data screening and removal of incomplete observations, 230 firms were retained for final analysis.

Data Collection

Secondary data were collected from annual reports, sustainability reports, financial statements, and official PSX filings of the selected firms. ESG disclosure data were extracted using content analysis of sustainability and annual reports, while digital financial transparency was assessed based on the presence and extent of digital reporting practices, online disclosure accessibility, and adoption of financial reporting technologies.

Financial data required for calculating firms' cost of capital were obtained from audited financial statements and publicly available databases.

Measurement of Variables

- **Dependent Variable (Cost of Capital):**

The cost of capital was measured using the Weighted Average Cost of Capital (WACC), which incorporated both cost of equity and cost of debt.

- **Independent Variable 1 (ESG Disclosure):**

ESG disclosure was measured using a disclosure index approach, where firms were scored based on the presence and quality of environmental, social, and governance information in their reports.

- **Independent Variable 2 (Digital Financial Transparency):**

Digital financial transparency was measured using an index developed from indicators such as online reporting accessibility, digital annual reports, real-time disclosure practices, and use of financial technologies.

- **Control Variables:**

Firm size, leverage, profitability, and firm age were included as control variables to ensure robustness of the model.

Data Analysis Techniques

The collected data were analyzed using descriptive statistics, correlation analysis, and panel regression techniques. The analysis was conducted using statistical software to examine relationships between variables.

The following analytical methods were applied:

1. Descriptive analysis was used to summarize the characteristics of the data.
2. Correlation analysis was conducted to assess the initial relationships among variables.
3. Panel regression analysis (fixed and random effects models) was used to test the hypotheses.
4. The Hausman test was applied to determine the appropriate model specification.
5. Diagnostic tests, including multicollinearity and heteroscedasticity tests, were performed to ensure model validity and reliability.

Ethical Considerations

Since the study relied on secondary data from publicly available sources, no direct human participation was involved. However, all data were used responsibly, ensuring accuracy, proper citation, and adherence to academic integrity standards.

Data Analysis and Results

Descriptive Statistics

Table 1 presents the descriptive statistics of the study variables, including ESG disclosure, digital

financial transparency, cost of capital, and control variables.

Table 1: Descriptive Statistics (n = 230 firms)

Variable	Mean	Std. Deviation	Minimum	Maximum
Cost of Capital (WACC)	11.42	3.18	5.60	19.80
ESG Disclosure Index	0.56	0.21	0.12	0.94
Digital Financial Transparency	0.61	0.19	0.15	0.95
Firm Size (Log Assets)	15.32	1.74	11.10	19.80
Leverage	0.54	0.22	0.08	0.91
Profitability (ROA)	0.07	0.05	-0.10	0.22

The descriptive results show that the average cost of capital (WACC) for PSX-listed firms is relatively high at 11.42%, indicating significant financing pressure in the Pakistani corporate sector. ESG disclosure levels show moderate adoption (mean = 0.56), suggesting that sustainability reporting is

still developing. Digital financial transparency also shows moderate implementation (mean = 0.61), reflecting gradual adoption of digital reporting systems. The variation in ESG and transparency scores indicates inconsistency across firms, which may contribute to differences in financing costs.

Correlation Analysis

Table 2: Correlation Matrix

Variables	WACC	ESG	DFT	Size	Leverage	ROA
WACC	1					
ESG Disclosure	-0.62**	1				
Digital Transparency	-0.58**	0.65**	1			
Firm Size	-0.41**	0.39**	0.44**	1		
Leverage	0.36**	-0.28**	-0.31**	-0.22**	1	
ROA	-0.49**	0.42**	0.40**	0.35**	-0.38**	1

Note: $p < 0.01$

The correlation results indicate a strong negative relationship between both ESG disclosure and cost of capital ($r = -0.62$), and digital financial transparency and cost of capital ($r = -0.58$). This suggests that firms with higher ESG transparency and stronger digital reporting practices tend to have lower financing costs. Additionally, ESG disclosure is positively correlated with digital

transparency ($r = 0.65$), indicating that firms adopting ESG practices are also more likely to implement digital reporting systems.

Regression Analysis (Fixed Effects Model)

Based on the Hausman test results, the fixed effects model was found to be appropriate for analysis.

Table 3: Regression Results (Dependent Variable: Cost of Capital)

Variables	Beta Coefficient	t-Statistic	p-Value
ESG Disclosure	-0.418	-6.52	0.000
Digital Financial Transparency	-0.356	-5.89	0.000
Firm Size	-0.214	-3.47	0.001
Leverage	0.287	4.21	0.000
Profitability (ROA)	-0.332	-5.03	0.000
Constant	14.72	9.88	0.000

$R^2 = 0.61$

Adjusted $R^2 = 0.58$

F-statistic = 42.36 ($p < 0.001$)

The regression results confirm that both ESG disclosure and digital financial transparency have a statistically significant negative impact on firms' cost of capital in Pakistan. ESG disclosure shows a strong negative coefficient (-0.418), indicating that a one-unit increase in ESG transparency leads to a significant reduction in cost of capital. This supports the view that sustainability reporting reduces investor risk perception and improves access to cheaper financing.

Similarly, digital financial transparency also exhibits a significant negative effect (-0.356), suggesting that firms adopting advanced digital reporting systems benefit from lower financing costs due to improved information accessibility and reduced uncertainty.

Among control variables, firm profitability and size also reduce cost of capital, while leverage increases it, indicating higher financial risk associated with debt-heavy firms. The model explains 61% of the variation in cost of capital, demonstrating strong explanatory power.

The empirical results confirm that both ESG disclosure and digital financial transparency play a significant role in reducing firms' cost of capital in Pakistan. ESG disclosure has a slightly stronger impact compared to digital transparency, highlighting the importance of sustainability reporting in shaping investor perceptions. The findings also confirm that transparency mechanisms collectively enhance capital market efficiency by reducing information asymmetry and perceived investment risk.

Discussion

The findings of this study demonstrate that both ESG disclosure and digital financial transparency have a significant negative relationship with firms' cost of capital in Pakistan. This indicates that firms exhibiting higher levels of sustainability reporting and stronger digital reporting practices are able to access capital at lower costs. The results are consistent with signaling theory, which posits that voluntary disclosure serves as a credible signal of firm quality, reducing information asymmetry between firms and investors. In the context of the Pakistan Stock Exchange, where informational inefficiencies are relatively high, such signals become particularly valuable in shaping investor perceptions and financing decisions.

The stronger impact of ESG disclosure compared to digital financial transparency suggests that investors in Pakistan still place greater weight on non-financial sustainability information when assessing risk. ESG practices likely enhance corporate reputation, reduce perceived uncertainty, and reflect long-term strategic orientation, all of which contribute to lower required returns. Meanwhile, digital financial transparency, although significant, reflects a relatively newer dimension of corporate reporting in Pakistan. Its impact is growing but remains secondary to traditional ESG considerations due to varying levels of technological adoption across firms.

Overall, the results confirm that transparency—both sustainability-oriented and technologically enabled—plays a critical role in reducing financing

costs in emerging markets. The findings also highlight that firms with stronger governance and disclosure mechanisms are better positioned to attract investors and minimize capital market frictions.

Conclusion

This study concluded that ESG disclosure and digital financial transparency are significant determinants of firms' cost of capital in Pakistan. Empirical evidence revealed that both variables exert a statistically significant negative effect on cost of capital, indicating that higher transparency leads to reduced financing costs.

The study further confirmed that firms listed on the Pakistan Stock Exchange benefit financially from improved disclosure practices, particularly when sustainability reporting and digital transparency are integrated into corporate communication strategies. Among the two determinants, ESG disclosure demonstrated a relatively stronger effect, emphasizing its growing importance in shaping investor confidence in emerging markets.

In summary, the study established that enhancing transparency through ESG reporting and digital financial systems is not only a regulatory or ethical requirement but also a financial advantage for firms operating in Pakistan's capital market.

Implications of the Study

The study offers important theoretical and practical implications. Theoretically, it contributes to the existing literature by integrating ESG disclosure and digital financial transparency within a unified framework to explain variations in firms' cost of capital. It extends signaling theory, agency theory, and stakeholder theory by demonstrating how combined transparency mechanisms influence investor behavior and financial outcomes in emerging markets.

Practically, the findings are highly relevant for corporate managers, investors, regulators, and policymakers. For corporate managers, the study highlights that improving ESG practices and adopting advanced digital reporting systems can significantly reduce financing costs and improve firm valuation. This provides a strong financial

incentive for firms to invest in sustainability and digital transformation initiatives.

For investors, the study provides insights into how transparency indicators can be used to assess firm risk and make more informed investment decisions. For regulatory authorities such as the Securities and Exchange Commission of Pakistan (SECP), the findings emphasize the need to strengthen ESG disclosure frameworks and promote standardized digital financial reporting systems to enhance market efficiency and investor protection.

Future Directions

Future research should explore the dynamic effects of ESG disclosure and digital financial transparency over time using longitudinal data to capture evolving market behavior. Comparative studies between developed and emerging markets could also provide deeper insights into how institutional environments moderate the relationship between transparency and cost of capital.

Additionally, future studies may incorporate moderating variables such as corporate governance quality, institutional ownership, and regulatory enforcement intensity to better understand boundary conditions. Researchers could also examine the role of artificial intelligence, blockchain-based reporting systems, and fintech innovations in further enhancing financial transparency and reducing capital costs.

Recommendations

Based on the findings, several recommendations are proposed. First, firms listed on the Pakistan Stock Exchange should enhance their ESG disclosure practices by adopting standardized sustainability reporting frameworks aligned with global best practices. This will improve investor trust and reduce financing costs.

Second, firms should invest in digital financial reporting infrastructure to improve the speed, accuracy, and accessibility of financial information. Regulatory bodies should encourage the adoption of real-time reporting systems to enhance market transparency.

Third, policymakers should develop mandatory ESG reporting guidelines and strengthen enforcement mechanisms to ensure consistency and comparability across firms. Additionally, investor awareness programs should be introduced to improve understanding of ESG and digital transparency indicators in investment decision-making.

Limitations of the Study

Despite its contributions, this study has certain limitations. First, the study focused only on non-financial firms listed on the Pakistan Stock Exchange, which may limit the generalizability of findings to financial institutions or unlisted firms. Second, the study relied on secondary data sources, which may be subject to reporting inconsistencies and disclosure bias.

Third, the ESG disclosure index and digital financial transparency measures, although widely used, may not fully capture the qualitative depth of reporting practices. Fourth, the study adopted a cross-sectional design, which restricts the ability to analyze changes over time and causal dynamics.

Future research addressing these limitations could provide a more comprehensive understanding of the relationship between transparency mechanisms and firms' financial outcomes in emerging markets.

REFERENCES

- Abideen, Z. U., et al. (2023). Do behavioral biases affect investors' investment decision-making in the Pakistani equity market? *Risks*, 11(6), 109.
- Ali, M., Ansari, N. H., Chishty, B. A., Puah, C.-H., & Ashfaq, M. (2023). Investor behaviour and investment decisions: Evidence from Pakistan Stock Exchange. *Asian Academy of Management Journal*, 28(2), 1–28.
- Alam, Z., & Tariq, Y. B. (2023). Corporate sustainability performance evaluation and firm financial performance: Evidence from Pakistan. *SAGE Open*, 13(3).
- Aziz, S., Mehmood, S., Khan, M. A., & Tangl, A. (2024). Role of behavioral biases in investment decisions of Pakistan Stock Exchange investors. *Investment Management and Financial Innovations*, 21(1), 146–156.
- Fatima, K., Azam, H., Sulehri, F. A., Bukhari, S. A. F., Virk, H. K. U. R., Geng, Y., Audi, M., & Ashraf, M. S. (2024). Sustainability disclosures and their influence on cost of capital: A comprehensive bibliometric study. *Bulletin of Business and Economics*, 13(2), 799–810.
- Gul, H., Ullah, M., & Gul, S. (2024). Board structure and firm performance: Analyzing the role of audit committee in Pakistan's Modaraba sector. *Policy Research Journal*, 2(4), 166–180.
- Gul, S., Ullah, M., & Rasheed, S. (2024). Corporate governance and financial performance nexus through green investment in the automobile sector of Pakistan. *International Journal of Management Research in Emerging Sciences*, 14(3).
- Jafar, R., Basuki, B., Windijarto, W., Setiawan, R., & others. (2024). Environmental, social and governance (ESG) disclosure and cost of equity: The moderating effects of board structures. *Cogent Business & Management*, 11(1).
- Jalal, W., & Ullah, M. (2025). Green financial development and sustainable economic growth in Pakistan: A pathway to resilience and prosperity. *Center for Management Science Research*, 3(3), 470–482.
- Khan, K. M., Khan, A. M., Ullah, M., Usman, A., & Farhat, S. (2020). Closing price determination and market manipulation in Pakistan Stock Exchange. *Journal of Critical Reviews*, 7(14), 2689–2705.
- Khan, M. D., Patoli, A. Q., Ullah, M., Akbar, Z., Bajwa, A., & Iqbal, N. (2026). The impact of corporate governance on firm performance: The mediating role of investment efficiency and the moderating role of financial constraints. *Advance Journal of Econometrics and Finance*, 4(1), 628–637.

- Mahmood, F., et al. (2024). Impact of behavioral biases on investment decisions and financial literacy in emerging markets. *Finance Research Letters*.
- Qazi, S., Ullah, M., Khalil, Y. K., & Iqbal, S. (2026). Fintech adoption and financial inclusion in Pakistan: The role of digital payment platforms in enhancing access to formal financial services. *International Journal of Social Sciences Bulletin*, 4(3), 718–732.
- Sardar, H., Farooq, S. U., Ullah, M., & Habib, A. B. (2025). Impact of digital financial services on poverty alleviation and income inequality in rural Pakistan: Evidence from mobile banking and fintech platforms. *Advance Journal of Econometrics and Finance*, 3(1), 45–62.
- Saleem, A., et al. (2023). Behavioral biases, financial literacy, and investment decision-making in Pakistan. *Business Review*.
- Shah, M. D., et al. (2021). Herding behavior in the Pakistan Stock Exchange. *Journal of Economic Studies*.
- Shaikh, S., Channar, P., Shaikh, M., & Ullah, M. (2021). Financial forecasting: An individual investor perspective. *International Journal of Management*, 12(3), 60–69.
- Sohaib, O., & Kang, K. (2016). Individual-level culture effects on multi-perspective trust in B2C e-commerce. *Electronic Commerce Research*.
- Thepdawala, M. M., & Siddiqui, A. A. (2025). Does ESG performance influence capital structure? Panel evidence from ESG-sensitive sectors in Pakistan. *Journal of Accounting and Finance in Emerging Economies*, 11(2).
- Ullah, M., Afghan, N., & Afridi, A. S. (2019). Effects of corporate governance on capital structure and financial performance: Empirical evidence from listed cement corporations in Pakistan. *Global Social Sciences Review*, 4(3), 273–283.
- Ullah, M., Khan, A. M., & Usman, A. (2020). COVID-19 and global stock market volatility. *International Journal of Management*, 12(2), 374–380.
- Ullah, M., Malik, A. M., Zeb, A., & Rehman, A. (2019). Mediating role of capital structure between corporate governance and risk. *Journal of Managerial Sciences*, 13(3), 47–56.
- Xia, Z., Sun, A., Cai, X., & Zeng, S. (2023). Modeling the evolutionary trends in corporate ESG reporting: A study based on knowledge management model. *arXiv Preprint*.