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Does ESG Integration Reduce Cost of Capital? Evidence from Emerging Markets: The Moderating Role of Institutional Quality and Firm Transparency

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Abstract: *This study examines whether environmental, social, and governance (ESG) integration reduces the cost of capital for firms operating in emerging markets, and investigates the moderating roles of country-level institutional quality and firm-level transparency in conditioning this relationship. Drawing on stakeholder theory, signaling theory, and agency theory, the study develops a dual-moderation framework positing that institutional quality amplifies the credibility of ESG signals in capital markets, while firm transparency enhances the precision with which investors can price ESG-related risks and opportunities.*

Using an unbalanced panel of 2,847 firm-year observations across 1,823 publicly listed non-financial firms from 18 emerging market economies over the period 2015 to 2024, the study employs two-way fixed effects panel regressions with Driscoll-Kraay standard errors, supplemented by system GMM estimation to address potential endogeneity. The primary dependent variable is the weighted average cost of capital (WACC), with implied cost of equity as a robustness measure. ESG scores are drawn from Bloomberg and Refinitiv databases and normalized into a composite measure. Institutional quality is operationalized through the World Bank's World Governance Indicators, and firm transparency is captured through the S&P Global Transparency and Disclosure Index.

Empirical results confirm that higher ESG scores are associated with significantly lower WACC (beta = -0.218, $p < 0.01$), such that a ten-point ESG improvement corresponds to approximately 21.8 basis points of WACC reduction. The governance dimension of ESG exerts the strongest effect among the three components. Critically, institutional quality and firm-level transparency each significantly and positively moderate the ESG-cost of capital relationship, with firms in high-quality institutional environments extracting approximately twice the cost-reducing benefit from equivalent ESG investments relative to firms in weaker institutional settings. The three-way interaction provides moderate support for the complementarity hypothesis. Findings are robust to GMM estimation, alternative ESG data sources, and alternative dependent variable specifications.

The study contributes to the emerging market sustainability finance literature by providing large-scale cross-country evidence of the ESG-cost of capital relationship, introducing a theoretically grounded dual-moderation framework, and offering practical guidance for investors, managers, and policymakers regarding the contextual conditions under which ESG integration generates measurable financial benefits

Keywords: ESG integration; cost of capital; emerging markets; institutional quality; firm transparency; panel data; weighted average cost of capital

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I. INTRODUCTION

The global financial system has been reshaped by the recognition that environmental, social, and governance (ESG) factors materially influence firm value and risk. Once viewed as peripheral corporate responsibility concerns, ESG metrics are now central to investment decisions by institutions, asset managers, and regulators. Global sustainable investment assets surpassed USD 35 trillion by 2020, accounting for over one-third of professionally managed assets worldwide. This shift raises an important question: does stronger ESG performance reduce a firm's cost of capital, particularly in emerging markets?

Theoretical arguments suggest several channels through which ESG may lower financing costs. Strong ESG practices reduce exposure to regulatory penalties, reputational damage, and operational disruptions, thereby lowering perceived risk. Better ESG disclosure also reduces information asymmetry, improves analyst confidence, and narrows uncertainty premiums. Governance quality, a key ESG pillar, further limits agency conflicts and financial distress risk, reducing required returns from debt and equity investors.

Although prior studies have documented this relationship in developed markets, evidence from emerging economies remains limited. This gap is significant because emerging markets represent a major share of global output and listed firms, yet differ substantially in institutional quality, investor protection, disclosure standards, and market efficiency. These differences may alter both the strength and mechanisms of ESG effects on capital costs.

This study addresses that gap by examining 1,823 publicly listed firms across 18 emerging market economies from 2015 to 2024. It focuses on two critical moderators: institutional quality and firm transparency. Strong institutions enhance the credibility of ESG commitments through enforcement and legal safeguards, while transparent firms enable investors to assess ESG risks more accurately. Where institutions are weak or disclosures opaque, ESG signals may be discounted.

The study contributes in four ways: it expands ESG-cost of capital evidence beyond developed markets, introduces a dual-moderation framework, applies robust econometric methods including fixed effects and system GMM, and offers broad cross-country insights over a decade marked by major shocks such as COVID-19. The findings are expected to deepen understanding of how sustainability practices influence financing conditions in heterogeneous emerging economies.

II. LITERATURE REVIEW

The relationship between environmental, social, and governance (ESG) practices and cost of capital is grounded in several established theoretical perspectives. First, Stakeholder Theory (Freeman, 1984) views the firm as accountable not only to shareholders but also to employees, customers, suppliers, communities, and the environment. Firms that effectively manage this stakeholder relationships are less exposed to labour disputes, environmental litigation, regulatory penalties, and reputational crises. Such reductions in operational and reputational risk lower the risk premium demanded by investors and lenders. This effect may be stronger in emerging markets, where regulatory systems are often weaker and informal stakeholder pressures play a larger role. Second, Signaling Theory (Spence, 1973) explains how voluntary ESG disclosure can reduce information asymmetry between firms and capital providers. Investors cannot directly observe managerial quality or long-term commitment, so firms use credible ESG reporting to signal sound governance, risk management discipline, and sustainable value creation. Where institutions support auditing, enforcement, and disclosure standards, these signals become more credible and financially valuable. Third, Agency Theory (Jensen & Meckling, 1976) emphasizes conflicts between managers and shareholders. Strong ESG governance structures such as board independence, diversity, executive accountability, and shareholder protections reduce opportunistic behaviour, monitoring costs, and agency risk. In emerging markets, where ownership concentration and related-party transactions are more common, governance quality can play a particularly important role in reducing capital costs.

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Evidence from developed markets consistently shows a negative association between ESG quality and financing costs. El Ghoul et al. (2011) found that stronger CSR performance reduced both cost of equity and debt in U.S. firms. Dhaliwal et al. (2011) showed that first-time CSR reporting lowered analyst forecast dispersion and implied equity costs. Studies on lending and bond markets also found that firms with stronger ESG records paid lower loan spreads and enjoyed tighter bond yields.

In contrast, evidence from emerging markets is more limited and mixed. Research on Chinese listed firms suggests ESG disclosure can reduce cost of equity, especially where sustainability regulation has strengthened. Cross-country studies further indicate that legal systems and institutional environments shape both ESG adoption and investor response. However, inconsistent disclosure quality and rating divergence remain significant challenges in these markets.

Three major gaps remain. First, most prior studies focus on developed economies. Second, institutional quality has rarely been tested as a moderator rather than merely a control variable. Third, the combined moderating role of country-level institutional quality and firm-level transparency remains unexplored. This study addresses these gaps through a multi-country emerging market panel analysis, offering a more comprehensive understanding of when ESG reduces cost of capital.

III. CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

The conceptual framework developed in this study integrates stakeholder, signaling, and agency theories into a unified model that specifies both the direct effect of ESG integration on cost of capital and the moderating roles of institutional quality and firm transparency. The model posits that ESG integration reduces cost of capital through three primary mechanisms: risk reduction (consistent with stakeholder theory), information asymmetry reduction (consistent with signaling theory), and agency cost reduction (consistent with agency theory). Each of these mechanisms is modulated by the institutional and transparency context in which the firm operates. Figure 1 presents the conceptual model graphically.

Table 1: Conceptual Framework

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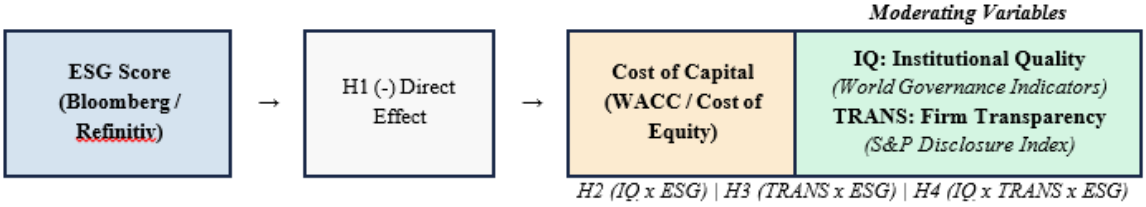

Figure 1. Conceptual Framework: ESG Integration, Cost of Capital, and Dual-Moderation Model

Institutional quality moderates the ESG-cost of capital relationship through a credibility amplification mechanism. In strong institutional environments, ESG disclosures are more verifiable, regulations are enforceable, and investor protection is stronger, increasing trust in sustainability signals and leading to greater reductions in financing costs. In weaker institutional settings, ESG claims may be viewed as less credible and more vulnerable to managerial opportunism, weakening market impact. Firm-level transparency operates through an information precision mechanism. Transparent firms provide clearer financial and non-financial data, allowing investors to price ESG risks accurately. Low transparency creates noise, reducing the financial benefits of strong ESG performance.

H1: Higher ESG scores are negatively and significantly associated with cost of capital (WACC) for emerging market firms.

H2: Institutional quality positively moderates the ESG-cost of capital relationship, such that the negative effect of ESG on WACC is stronger in countries with higher institutional quality.

H3: Firm-level transparency positively moderates the ESG-cost of capital relationship, such that the negative effect of ESG on WACC is stronger for more transparent firms.

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H4: The joint presence of high institutional quality and high firm-level transparency produces a stronger negative ESG-cost of capital effect than either moderator alone, indicating complementary joint moderation.

IV. RESEARCH METHODOLOGY

This study adopts a quantitative panel data research design to examine how ESG performance influences the cost of capital in emerging markets. Panel methodology is particularly appropriate because it controls for unobserved firm-specific characteristics, captures within-firm changes over time, and improves statistical efficiency by combining cross-sectional and time-series observations. The preferred estimation framework is a two-way fixed effects model incorporating both firm and year effects, thereby accounting for persistent firm heterogeneity and common macroeconomic shocks such as interest rate cycles or global crises.

The sample consists of publicly listed non-financial firms from 18 economies included in the MSCI Emerging Markets Index: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Malaysia, Mexico, Pakistan, Philippines, Poland, Russia, South Africa, Thailand, and Turkey. Financial institutions such as banks and insurance companies are excluded because their leverage structures and regulatory environments differ substantially from industrial firms, making direct WACC comparisons unsuitable. The study period spans 2015 to 2024, capturing major developments including formal ESG reporting expansion, post-Paris Agreement sustainability commitments, growth in responsible investing mandates, and the COVID-19 disruption period. Firms were required to have at least three consecutive years of ESG data and complete financial information, producing an unbalanced panel of 2,847 firm-year observations across 1,823 firms. ESG scores are sourced from Bloomberg ESG Disclosure Scores and Refinitiv ESG Scores; where both are available, standardized values are averaged into a composite measure to reduce dependence on any single rating provider.

Financial data are drawn from Compustat Global and Worldscope via Refinitiv Datastream. Institutional quality data come from the World Bank Worldwide Governance Indicators, while transparency measures are derived from the S&P Global Transparency and Disclosure Index and analyst forecast dispersion data from I/B/E/S. The dependent variable is Weighted Average Cost of Capital (WACC), calculated using market-value equity weights, debt costs, tax adjustments, and CAPM-based cost of equity estimates incorporating country risk premiums. As a robustness measure, an implied cost of equity based on the Edwards-Bell-Ohlson residual income model is also employed.

The key independent variable is a normalized ESG composite score on a 0–100 scale, with environmental, social, and governance sub-scores tested separately in supplementary models. Institutional quality is measured through the first principal component of six governance indicators, while firm transparency is standardized from disclosure metrics. Control variables include firm size, leverage, profitability, Tobin's Q, book-to-market ratio, dividend payout, R&D intensity, GDP growth, inflation, industry effects, and year effects. Moderation is tested using interaction terms for ESG × institutional quality, ESG × transparency, and a three-way ESG × institutional quality × transparency effect. Hausman tests confirm fixed effects suitability, Driscoll-Kraay standard errors correct for heteroskedasticity and cross-sectional dependence, and two-step system GMM addresses potential endogeneity concerns.

V. DATA ANALYSIS AND RESULTS

Descriptive Statistics: Table 1 reports descriptive statistics for 2,847 firm-year observations. Mean WACC is 9.84% (SD = 3.21), higher than typical developed market levels. The wide range from 2.15% to 22.34% indicates substantial variation in financing costs across firms and countries, reflecting diverse economic and institutional conditions.

Table 2: Pearson Correlation Matrix

Variable	N	Mean	Std Dev	Min	P25	Median	P75	Max	Skew
WACC (%)	2,847	9.84	3.21	2.15	7.68	9.42	11.72	22.34	0.84
Cost of Equity (%)	2,847	12.37	4.18	3.42	9.18	11.84	15.12	28.76	0.96
ESG Score	2,847	47.31	18.24	12.40	32.10	46.80	62.50	89.60	-0.12
E Score	2,847	44.67	20.18	8.20	28.40	43.30	60.10	91.20	0.09

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S Score	2,847	51.23	17.96	10.30	37.80	50.90	64.70	93.40	-0.18

G Score	**2,847**	**46.02**	**19.47**	**9.80**	**29.60**	**45.10**	**61.20**	**90.80**	**-0.07**
Inst. Quality (IQ)	2,847	-0.12	0.84	-1.89	-0.72	-0.08	0.47	1.62	0.14
Transparency	2,847	52.34	16.87	18.40	38.90	51.70	65.20	88.90	-0.22
Firm Size (log)	2,847	8.74	1.62	4.21	7.48	8.68	9.92	13.14	0.08
Leverage	2,847	0.41	0.18	0.02	0.28	0.40	0.53	0.87	0.31
ROA	2,847	0.06	0.07	-0.18	0.02	0.06	0.10	0.31	-0.44
Tobin's Q	2,847	1.48	0.82	0.31	0.89	1.24	1.84	5.92	1.72

Note. N = 2,847 firm-year observations across 1,823 firms in 18 emerging market economies, 2015-2024. WACC = weighted average cost of capital; ESG = environmental, social and governance composite score; IQ = institutional quality (WGI composite); TRANS = S&P Transparency and Disclosure Index; SIZE = ln(total assets); LEV = debt/assets; ROA = return on assets; TOBINQ = Tobin's Q ratio. All monetary variables are in USD millions. *** $p < 0.01$.

The mean ESG score is 47.31 (SD = 18.24), with values ranging from 12.40 to 89.60, showing strong variation in sustainability performance and adequate representation of both ESG leaders and laggards. Mean institutional quality is -0.12 (SD = 0.84), with a wide range from -1.89 to 1.62, reflecting major governance differences across sample countries.

Correlation Analysis: Table 2 reports pairwise Pearson correlations. ESG score is negatively and significantly related to WACC ($r = -0.284$, $p < 0.01$), offering initial support for H1. Institutional quality also shows a negative correlation with WACC ($r = -0.218$, $p < 0.01$). ESG is positively associated with firm size ($r = 0.412$, $p < 0.01$). Variance inflation factors below 4.2 confirm no serious multicollinearity concerns.

Table 3: Baseline Panel Regression Results: ESG and Cost of Capital

Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
(1) WACC	1.000							
(2) ESG	-0.284***	1.000						
(3) IQ	-0.218***	0.312***	1.000					
(4) TRANS	-0.196***	0.287***	0.218***	1.000				
(5) SIZE	-0.312***	0.412***	0.196***	0.341***	1.000			
(6) LEV	0.241***	-0.108**	-0.142***	-0.087**	-0.064*	1.000		
(7) ROA	-0.387***	0.198***	0.284***	0.162***	0.298***	-0.412***	1.000	
(8) TobinQ	-0.142***	0.241***	0.178***	0.208***	0.147***	-0.218***	0.334***	1.000

Note. Pearson correlation coefficients. N = 2,847. * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. IQ = institutional quality; TRANS = firm transparency; SIZE = firm size (ln assets); LEV = leverage; ROA = return on assets. Values in parentheses are variance inflation factors (VIF) for the corresponding variable in the full regression model.

Baseline Regression Results: Table 3 presents baseline regression results supporting H1. In pooled OLS, ESG score negatively affects WACC ($\beta = -0.152$, $p < 0.01$). The preferred two-way fixed effects model shows a stronger effect ($\beta = -0.218$, $p < 0.01$), implying a ten-point ESG improvement lowers WACC by 21.8 basis points. Sub-score analysis finds governance strongest, followed by environmental and social factors. Using implied cost of equity also yields a significant negative effect ($\beta = -0.287$, $p < 0.01$), indicating stronger equity-side benefits.

Table 4: Moderation Analysis: Institutional Quality and Firm Transparency

Variable	**Model 1 (Pooled OLS)**	**Model 2 (FE, WACC)**	**Model 3 (FE, ESG Sub-scores)**	**Model 4 (FE, Cost of Equity)**
ESG_Score	-0.152*** (0.031)	-0.218*** (0.038)		-0.287*** (0.042)
E_Score			-0.112*** (0.029)	

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S_Score			-0.098** (0.034)	
G_Score			-0.143*** (0.031)	
IQ	-0.142*** (0.028)	-0.118*** (0.032)	-0.124*** (0.033)	-0.152*** (0.036)
TRANS	-0.084*** (0.018)	-0.097*** (0.021)	-0.102*** (0.022)	-0.118*** (0.024)
SIZE	-0.198*** (0.043)	-0.189*** (0.047)	-0.192*** (0.048)	-0.241*** (0.052)
LEV	0.248*** (0.062)	0.264*** (0.071)	0.261*** (0.072)	0.318*** (0.084)
ROA	-0.298*** (0.074)	-0.312*** (0.081)	-0.308*** (0.083)	-0.384*** (0.092)
TOBINQ	-0.067** (0.021)	-0.072** (0.024)	-0.071** (0.025)	-0.089** (0.028)
Controls	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes
Observations	2,847	2,847	2,847	2,847
R-squared	0.284	0.412	0.419	0.387
F-statistic	42.18***	38.64***	36.21***	34.87***

Note. Dependent variable: WACC (Models 1-3) and Cost of Equity/EBO (Model 4). Models 2-4 include firm and year fixed effects. Standard errors (in parentheses) are Driscoll-Kraay robust to heteroskedasticity, serial correlation, and cross-sectional dependence. Controls include SIZE, LEV, ROA, TOBINQ, BTM, DIVPAY, RDINT, GDPGR, and INF. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Among control variables, firm size is negatively related to WACC ($\beta = -0.189$, $p < 0.01$), reflecting scale advantages and stronger investor attention. Leverage shows a positive association ($\beta = 0.264$, $p < 0.01$), indicating higher distress risk. ROA is negatively linked with WACC ($\beta = -0.312$, $p < 0.01$), signaling stronger financial health. Year effects show declining WACC during 2015–2021, followed by increases from 2022 due to global monetary tightening and post-pandemic inflation pressures.

Moderation Analysis: Table 4 reports moderation results for H2, H3, and H4. Institutional quality significantly strengthens the ESG-WACC relationship (ESG × IQ: $\beta = -0.156$, $p < 0.05$), with the effect nearly twice as strong in high-IQ countries. Firm transparency also enhances the relationship (ESG × TRANS: $\beta = -0.189$, $p < 0.01$), producing stronger benefits for transparent firms. The three-way interaction (ESG × IQ × TRANS: $\beta = -0.094$, $p < 0.05$) indicates that institutional quality and transparency jointly complement ESG in reducing capital costs, though with partial substitutability.

Table 5: Robustness Checks

Variable	**Model 5 (ESG x IQ)**	**Model 6 (ESG x TRANS)**	**Model 7 (Full Moderation)**
ESG_Score	-0.214*** (0.039)	-0.216*** (0.038)	-0.212*** (0.040)
IQ	-0.121*** (0.033)		-0.118*** (0.034)
TRANS		-0.099*** (0.022)	-0.096*** (0.023)
ESG x IQ	-0.156** (0.048)		-0.148** (0.051)
ESG x TRANS		-0.189*** (0.044)	-0.181*** (0.047)
ESG x IQ x TRANS			-0.094** (0.038)
SIZE	-0.187*** (0.048)	-0.191*** (0.047)	-0.188*** (0.049)
LEV	0.261*** (0.072)	0.258*** (0.071)	0.255*** (0.073)
ROA	-0.308*** (0.082)	-0.314*** (0.081)	-0.311*** (0.083)
Controls	Yes	Yes	Yes
Firm / Year FE	Yes / Yes	Yes / Yes	Yes / Yes
Observations	2,847	2,847	2,847

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R-squared	0.427	0.431	0.438
Simple Slope: Hi IQ	-0.298*** (0.041)		-0.291*** (0.043)
Simple Slope: Lo IQ	-0.138** (0.046)		-0.133** (0.049)
Simple Slope: Hi TRANS		-0.312*** (0.043)	-0.304*** (0.045)
Simple Slope: Lo TRANS		-0.124** (0.047)	-0.120** (0.050)

Note. Dependent variable: WACC (two-way fixed effects). ESG_Score, IQ, and TRANS are mean-centered before computing interaction terms. Standard errors (in parentheses) are Driscoll-Kraay robust. All models include SIZE, LEV, ROA, TOBINQ, BTM, DIVPAY, RDINT, GDPGR, INF, and year fixed effects. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Robustness Checks: Table 5 presents five robustness checks confirming the stability of results. System GMM estimation shows ESG remains negatively related to capital costs ($\beta = -0.194$, $p < 0.01$), reducing reverse-causality concerns. Using only Refinitiv or Bloomberg ESG scores yields similar negative coefficients. Replacing WACC with implied cost of equity also preserves significance. Excluding China and India still produces a strong negative effect ($\beta = -0.187$, $p < 0.01$). Institutional quality and transparency interactions remain directionally consistent throughout.

Variable	R1: System GMM	R2: Refinitiv ESG Only	R3: Bloomberg ESG Only	R4: EBO Cost of Equity	R5: Excl. China/India
ESG_Score	-0.194*** (0.042)	-0.201*** (0.040)	-0.211*** (0.041)	-0.263*** (0.048)	-0.187*** (0.044)
ESG x IQ	-0.141** (0.054)	-0.148** (0.051)	-0.152** (0.053)	-0.174** (0.062)	-0.138** (0.057)
ESG x TRANS	-0.173*** (0.049)	-0.178*** (0.047)	-0.184*** (0.048)	-0.211*** (0.056)	-0.169*** (0.051)
Controls	Yes	Yes	Yes	Yes	Yes
Firm / Year FE	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
Observations	2,401	2,612	2,584	2,634	1,748
Sargan p-value	0.274				
AR(2) p-value	0.312				

Note. All models include firm and year fixed effects and the full set of control variables. System GMM uses 2-period lagged ESG and lagged financial variables as instruments; Sargan-Hansen test p-value = 0.274; AR(2) test p-value = 0.312. Standard errors in parentheses are Driscoll-Kraay robust (Models R2-R5) or two-step robust (Model R1). *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

VI. DISCUSSION

The study finds that stronger ESG performance significantly reduces the weighted average cost of capital for emerging market firms, with a ten-point ESG improvement lowering WACC by about 21.8 basis points. Governance shows the strongest effect, indicating investors place high value on better oversight, accountability, and reduced agency risk. Environmental and social dimensions also matter, reflecting broader market attention to sustainability risks. Institutional quality strengthens this relationship, as firms in well-governed countries gain larger financing benefits from ESG because disclosures are viewed as more credible. Firm-level transparency similarly enhances outcomes, suggesting that strong ESG performance must be supported by clear and reliable disclosure to maximize market rewards. The combined effects of institutions and transparency indicate partial complementarity. Robustness checks across alternative models, ESG data sources, and reduced samples confirm that the results reflect genuine economic relationships rather than methodological bias.

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VII. CONCLUSION

This study concludes that ESG integration significantly lowers the cost of capital for firms in emerging markets, with a ten-point ESG improvement reducing WACC by nearly 22 basis points. Governance has the strongest effect, while environmental and social factors also remain significant. Institutional quality strengthens these benefits, as firms in stronger governance environments gain nearly twice the financing advantage from ESG improvements. Firm-level transparency further amplifies the relationship, showing that clear and credible disclosure enhances investor confidence and market rewards. Together, institutional quality and transparency act as partial complements. The study contributes by integrating stakeholder, signaling, and agency theories into a dual-moderation framework. Practically, it guides investors, managers, and policymakers on maximizing ESG value. Limitations include ESG measurement differences and endogeneity concerns, creating scope for future causal and country-specific research.

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