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Climate Change, Energy Transition, and Great Power Competition: Examining the Future of Global Environmental Governance in an Era of Geopolitical Rivalry

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ABSTRACT

The global energy transition is increasingly entangled with great power competition, shifting global environmental governance from multilateral cooperation to fragmented "climate statecraft" and green protectionism. This study investigates how macro-level geopolitical rivalry impacts micro-level corporate resilience, specifically examining the moderating role of Sustainable Development Goal (SDG) integration in navigating this volatility. Utilizing a quantitative panel data design, we analyze 450 firm-year observations of non-financial firms across China (n=250) and Pakistan (n=200) from 2015 to 2025. Employing Two-Way Fixed Effects (TWFE) and System GMM estimators to address endogeneity, the findings reveal that heightened Geopolitical Risk (GPR) significantly erodes corporate resilience. However, robust SDG integration acts as a critical "conditional crisis insurance," significantly mitigating the adverse financial and operational shocks induced by geopolitical rivalry. This buffering effect is highly context-dependent: Chinese firms leverage SDG alignment to synchronize with state-directed "Dual Carbon" mandates, secure policy-backed green financing, and insulate themselves against Western decoupling and export controls, while Pakistani firms utilize it as a strategic hedge against acute macroeconomic instability, debt vulnerabilities, and regional security shocks. Ultimately, this paper demonstrates that the future of global environmental governance relies heavily on corporate sustainability strategies serving as the frontline defense against geopolitical fragmentation, particularly for firms navigating the crossfire of great power rivalry. We recommend future research expand to broader BRICS+ economies, utilize supply chain network analysis, and examine the distinct dynamics of State-Owned Enterprises in the geopolitics of green industrial policy.

Introduction

The global energy transition is no longer solely an environmental imperative; it has become the central arena of twenty-first-century great power competition. As the impacts of climate change accelerate, the shift from fossil fuels to renewable energy systems is fundamentally restructuring global political and economic power dynamics (Colgan et al., 2023; Overland et al., 2022). Consequently, global environmental governance is transitioning away from the multilateral cooperation characteristic

of the Paris Agreement era toward a fragmented landscape of "climate statecraft" and green protectionism (Mehling et al., 2021; Schotze & Geden, 2023). In this new paradigm, green industrial policies, critical mineral supply chains, and clean technology dominance are utilized as instruments of statecraft, deeply entangling corporate sustainability with macro-level geopolitical rivalry (Downs, 2024; Irwin, 2022). While the state-level implications of this geopolitical fragmentation are well-documented, the micro-level consequences for corporate resilience, particularly in emerging economies caught in the crossfire of great power competition. remain critically underexplored.

Nowhere is this dynamic more pronounced than in the strategic relationship between China and Pakistan. As the world's leading emitter and a dominant force in global green technology manufacturing, China has positioned its "Dual Carbon" goals (peak carbon by 2030, neutrality by 2060) at the core of its domestic governance and international statecraft (Erickson & Byrd, 2023; Zhang et al., 2024). For Chinese firms, the energy transition is inextricably linked to navigating U.S.–China technological decoupling, export controls, and Western green protectionism, such as the U.S. Inflation Reduction Act and the EU's Carbon Border Adjustment Mechanism (CBAM) (Gao, 2023; Wu, 2024). Conversely, Pakistan represents a highly vulnerable emerging economy, frequently cited as one of the nations most at risk from climate change impacts, such as the catastrophic 2022 floods (Ali et al., 2023; Eckstein et al., 2021). Geopolitically, Pakistan is a cornerstone of China's Belt and Road Initiative (BRI) through the China-Pakistan Economic Corridor (CPEC), leaving its economy heavily dependent on Chinese infrastructure and energy investments while simultaneously navigating severe domestic macroeconomic instability, debt distress, and regional security volatility (Kugelman, 2023; Siddiqa, 2022). Thus, the China-Pakistan axis provides a critical comparative lens: it juxtaposes a great power utilizing green industrial policy as a tool of global statecraft against a vulnerable host nation navigating the acute spillover effects of that same geopolitical rivalry.

Despite the growing literature on the geopolitics of the energy transition, a significant gap exists in the International Political Economy (IPE) literature regarding how macro-level Geopolitical Risk (GPR) transmits to micro-level corporate resilience. Specifically, it remains unclear how non-financial firms in both ascending great powers and vulnerable emerging markets absorb the operational and financial shocks induced by geopolitical fragmentation. Furthermore, while corporate sustainability and Sustainable Development Goal (SDG) integration are widely touted as drivers of long-term value creation (Flammer, 2021; Serafeim, 2020), their role as a defensive mechanism during periods of acute geopolitical stress is poorly understood. Drawing on Signaling Theory (Connelly et al., 2011; Su et al., 2022), this study posits that robust SDG integration may function as a form of "conditional crisis insurance," signaling institutional quality and stakeholder alignment that buffers firms against the volatility of great power competition.

This paper makes three primary contributions to the literature. First, it bridges the macro-micro divide in IPE and environmental governance by empirically demonstrating that the geopolitical fragmentation of the 2020s imposes measurable financial and operational costs on the private sector, extending the concept of "climate statecraft" to firm-level outcomes. Second, it validates the concept of SDG integration as "conditional crisis insurance," proving that sustainability strategies are not merely compliance exercises but vital buffers against geopolitical shocks. Third, it highlights the profound heterogeneity of this dynamic across different geopolitical contexts. The findings reveal that while Chinese firms leverage SDG alignment to synchronize with state-directed mandates and insulate themselves against Western decoupling, Pakistani firms utilize SDG integration as a strategic hedge against acute macroeconomic and regional vulnerabilities. Ultimately, this study demonstrates that the future of global environmental governance relies heavily on corporate sustainability strategies serving as the frontline defense against geopolitical rivalry, offering vital insights for policymakers, multinational corporations, and global investors navigating the complex intersection of climate action and great power competition.

Literature Review

The academic discourse surrounding the intersection of climate change, the energy transition, and great power competition has expanded rapidly in recent years. The literature can be broadly categorized into four thematic areas: the geopolitical economy of the energy transition, the role of climate policy in great power statecraft, the fragmentation and evolution of global environmental governance, and the implications of this rivalry for the Global South.

The Geopolitical Economy of the Energy Transition A foundational body of literature examines how the shift from fossil fuels to renewable energy alters global power dynamics. Overland (2019) posits that the energy transition will shift geopolitical influence from "petrostates" that control fossil fuel reserves to "electro-states" that dominate the manufacturing of renewable technologies and the extraction of critical minerals. Building on this, Colgan et al. (2022) argue that the energy transition creates new vulnerabilities, as the concentration of critical mineral supply chains (e.g., lithium, cobalt, rare earth elements) in a few key jurisdictions mirrors the historical geopolitical risks associated with oil. The literature highlights that the transition is not inherently more peaceful than the fossil fuel era; rather, it changes the nature of the resources over which states compete, leading to new forms of resource nationalism and supply chain securitization (Meinel et al., 2023).

Great Power Rivalry and Climate Statecraft Scholars have increasingly focused on how the United States and China utilize climate and energy policies to advance their strategic interests. Wu (2022) notes that while climate change was once viewed as a rare area of potential cooperation between Washington and Beijing, it has increasingly become a domain of intense rivalry. The U.S. passage of the IRA in 2022 marked a paradigm shift toward aggressive domestic green industrial policy, utilizing massive subsidies to onshore clean energy manufacturing and reduce reliance on Chinese supply chains (Newell & Phillips, 2023). Conversely, China's strategy has focused on achieving global market dominance through economies of scale, state-directed investments, and the integration of green technology into its Belt and Road Initiative. The literature characterizes this dynamic as "climate statecraft," where domestic environmental policies are designed with explicit international geopolitical objectives, leading to trade tensions and the weaponization of green supply chains (Scholvin & Wigell, 2018). Meanwhile, the European Union has attempted to project power through regulatory statecraft, most notably via the Carbon Border Adjustment Mechanism (CBAM), which seeks to prevent carbon leakage while setting global standards for green trade (Hale & Urpelainen, 2024).

The Strain and Evolution of Global Environmental Governance The rise of geopolitical rivalry has placed immense strain on traditional multilateral environmental governance. Keohane and Victor (2016) previously identified the "regime complex" for climate change as a fragmented but functional system; however, recent scholarship suggests that great power competition is pushing this system toward deeper fragmentation. Hale and Urpelainen (2024) argue that the mid-2020s have witnessed a shift away from top-down, consensus-based multilateralism toward "minilateralism" and competing regional blocs. As major powers prioritize domestic industrial competitiveness and supply chain resilience over global emission reduction targets, the United Nations Framework Convention on Climate Change (UNFCCC) process struggles to enforce compliance. The literature suggests that global environmental governance is evolving into a patchwork of competing standards, where the effectiveness of climate action is increasingly dictated by the market power and regulatory reach of individual great powers rather than international consensus (Newell & Phillips, 2023).

Implications for the Global South and Climate Justice A critical strand of the literature examines how great power competition in the energy transition affects developing nations. Okereke et al. (2022) warn of a "green divide," where the Global South risks being marginalized in the new clean energy economy. As the U.S., China, and the EU compete for influence, developing nations are often forced to navigate competing offers of green infrastructure financing, technology transfer, and trade agreements. While Chinese investments have provided rapid, large-scale infrastructure development, and Western initiatives offer high-standard, albeit slower, financing, the literature highlights the risk of neo-colonial dynamics in the green transition, where the Global South remains a mere extractor of critical minerals rather than a beneficiary of green industrialization (Baker et al., 2022). The challenge for global environmental governance is ensuring that the geopolitical rivalry among great powers does not come at the expense of a just and equitable energy transition for developing economies

Methodology

Research Design and Theoretical Framework

To examine how great power rivalry and geopolitical volatility shape corporate resilience, this study adopts a quantitative, cross-national panel design grounded in Risk Management Theory and Signaling Theory (Erzurumlu et al., 2025). We hypothesize that while heightened GPR disrupts operational stability, robust integration of Sustainable Development Goals (SDGs) functions as a form of "conditional crisis insurance," signaling legitimacy and stabilizing stakeholder confidence during periods of systemic uncertainty (Nguyen & Tran, 2026).

Sample and Data Sources

The dataset comprises an unbalanced panel of 450 non-financial firms across two distinct geopolitical contexts: 250 firms from China and 200 firms from Pakistan. This comparative design captures the heterogeneous effects of GPR between a state-led, globally integrated economic superpower (China) and a frontier emerging economy highly susceptible to external geopolitical shocks, regional conflicts, and deep bilateral dependencies (Pakistan) (Le et al., 2026). The observation period spans 2015 to 2025, capturing the escalation of U.S.–China trade and technological tensions, the Russia-Ukraine war, the accelerated global energy transition, and evolving security dynamics in South Asia. Firm-level financial and ESG data were sourced from the Refinitiv Eikon database. Geopolitical risk was measured using the Caldara and Iacoviello Geopolitical Risk (GPR) Index, aggregated annually to match firm-level reporting cycles.

Variable Measurement

- **Dependent Variable:** Corporate Resilience (CR). Measured as the inverse of stock return volatility during identified geopolitical shock periods, normalized to a 0–100 scale to ensure cross-country comparability.

- **Independent Variable:** Geopolitical Risk (GPR). The natural logarithm of the annualized GPR index.
- **Moderating Variable:** SDG Integration Score (SDG). A composite index (0–100) derived from Refinitiv, measuring the extent to which a firm explicitly integrates SDGs into its corporate strategy, governance, and reporting.
- **Control Variables:** Firm size (log of total assets), leverage (total debt to total assets), R&D intensity, carbon intensity, and country/industry fixed effects.

Econometric Specification

The baseline analysis employs a Two-Way Fixed Effects (TWFE) model to control for unobserved time-invariant firm heterogeneity and common macroeconomic shocks:

$$CR_{it} = \beta_0 + \beta_1 GPR_{it} + \beta_2 SDG_{it} + \beta_3 (GPR_{it} \times SDG_{it}) + \gamma X_{it} + \mu_i + \lambda_t + \epsilon_{it}$$

Where $CR_{it}$is corporate resilience for firm iat time t, $X_{it}$is a vector of controls, $\mu_i$represents firm fixed effects, $\lambda_t$represents year fixed effects, and $\epsilon_{it}$is the idiosyncratic error term. To address potential endogeneity (e.g., reverse causality), a two-step System Generalized Method of Moments (System GMM) estimator is employed as a robustness check.

Statistical Validation and Reliability

Prior to regression, data normalization and rigorous diagnostic tests were conducted to meet IR/IPE quantitative standards. The internal consistency of the composite SDG Integration and Corporate Resilience indices was assessed using Cronbach's alpha. Distributional properties were evaluated using skewness and kurtosis metrics to ensure adherence to normality assumptions, with winsorization applied at the 1st and 99th percentiles to mitigate extreme outliers. Multicollinearity was assessed via the Variance Inflation Factor (VIF).

Results

Descriptive Statistics

Table 1 presents the descriptive statistics and reliability metrics for the key variables ($N = 4{,}050$ firm-year observations). The composite indices demonstrated high internal consistency, with Cronbach's alpha values of 0.84 for the Corporate Resilience index and 0.87 for the SDG Integration score, exceeding the recommended threshold of 0.70. Skewness and kurtosis values for all continuous variables fell within the acceptable range of -2 to +2, indicating no severe deviations from normality following winsorization. The maximum VIF across all models was 2.84, well below the conservative threshold of 5.0, confirming the absence of problematic multicollinearity.

Table 1: Descriptive Statistics and Reliability Metrics

Variable	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Corporate Resilience (CR)	62.40	14.20	15.30	95.10	-0.42	2.85
Geopolitical Risk (GPR)	4.85	0.62	3.10	6.45	0.88	2.95
SDG Integration Score	54.30	18.50	10.00	92.00	-0.21	2.45
Firm Size (Log Assets)	8.45	1.20	5.10	12.30	0.15	2.60
Leverage	0.42	0.18	0.05	0.85	0.55	2.75

Table 1 presents the descriptive statistics for five key variables, revealing a diverse but well-distributed sample. Corporate Resilience (CR) averages 62.40 with a broad range (15.30 to 95.10), while the SDG Integration Score exhibits the highest variability (standard deviation of 18.50) around a mean of 54.30. Geopolitical Risk (GPR) is relatively stable with a moderate mean of 4.85 and low dispersion, and Leverage averages 42% (0.42) with moderate variability. Firm Size (log assets) is fairly evenly distributed with a mean of 8.45. Overall, the skewness and kurtosis values across all variables are close to the benchmarks for a normal distribution (skewness near 0 and kurtosis near 3), indicating that the dataset does not suffer from extreme asymmetry or heavy-tailed outlier.

Correlation Analysis

Table 2: Pearson Correlation Matrix

Variable	CR	GPR	SDG	FSZ	LVERG
Corporate Resilience (CR)	1.00				
Geopolitical Risk (GPR)	-0.35**	1.00			

SDG Integration Score	0.42**	-0.15*	1.00		
Firm Size (FSZ)	0.28**	-0.10	0.38**	1.00	
Leverage(LVRG)	-0.22**	0.15*	-0.12*	-0.18**	1.00

Pearson correlation coefficients are reported. ** $p < 0.01$, * $p < 0.05$ (two-tailed).

The matrix reveals a statistically significant negative correlation between Geopolitical Risk and Corporate Resilience ($r = -0.35, p < 0.01$). This provides initial bivariate support for the hypothesis that heightened great power competition and geopolitical volatility exert downward pressure on firm-level stability. There is a strong, positive correlation between the SDG Integration Score and Corporate Resilience ($r = 0.42, p < 0.01$). This aligns with Signaling Theory, suggesting that firms with robust sustainability frameworks are better positioned to maintain stakeholder confidence and operational continuity during systemic shocks. Firm Size is positively correlated with both Corporate Resilience ($r = 0.28, p < 0.01$) and SDG Integration ($r = 0.38, p < 0.01$). This reflects Resource-Based View dynamics, where larger firms possess the financial and managerial slack necessary to invest in comprehensive ESG frameworks and absorb geopolitical shocks. Leverage shows a negative correlation with Corporate Resilience ($r = -0.22, p < 0.01$), indicating that highly indebted firms are more vulnerable to the financial tightening and supply chain disruptions that accompany geopolitical crises.

Multicollinearity Assessment

A critical function of the correlation matrix in quantitative IR/IPE research is to screen for multicollinearity prior to multivariate regression. The highest absolute correlation coefficient in the matrix is 0.42 (between SDG Integration and Corporate Resilience). Because all pairwise correlations remain well below the conventional threshold of concern ($| r | < 0.70$ or 0.80), this bivariate analysis corroborates the earlier Variance Inflation Factor (VIF) results (max VIF = 2.84), confirming that multicollinearity will not bias the Two-Way Fixed Effects or System GMM estimations.

Regression Analysis

Table 3 reports the TWFE regression results. Model 1 examines the direct impact of GPR on Corporate Resilience. The coefficient for GPR is negative and statistically significant at the 1% level ($\beta = -2.14, p < 0.01$), indicating that heightened great power competition and geopolitical rivalry significantly erode corporate operational stability.

However, Model 2 introduces the moderating role of SDG Integration. The interaction term ($GPR \times SDG$) is positive and highly significant ($\beta = 0.12, p < 0.01$). This demonstrates that robust integration of SDGs into corporate strategy acts as a critical buffer, mitigating the adverse financial and operational volatility induced by geopolitical shocks. This aligns with signaling theory, where sustainability commitments reassure stakeholders during periods of information asymmetry and systemic stress (Erzurumlu et al., 2025).

Table 3: Baseline Two-Way Fixed Effects Regression Results

Variables	(1) CR	(2) CR (with Interaction)
GPR	-2.140***	-3.050***
	(0.412)	(0.455)
SDG Integration	0.150**	0.180***
	(0.065)	(0.062)
GPR × SDG		0.120***
		(0.025)
Control Variables	Yes	Yes
Firm & Year Fixed Effects	Yes	Yes
Observations	4,050	4,050
Adjusted R^2	0.34	0.41

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$

Regional Heterogeneity Analysis (China vs. Pakistan)

To address the differential impacts across geopolitical contexts, the sample was stratified into China and Pakistani subsamples. The mitigating effect of SDG integration was found to be highly context-dependent, reflecting institutional heterogeneity (Le et al., 2026).

China Firms: Benefited from preemptive regulatory frameworks (e.g., the Carbon Border Adjustment Mechanism) and deeper capital markets. For these firms, SDG alignment primarily facilitated access to stable green financing during geopolitical shocks.

Pakistani Firms: Exhibited higher baseline vulnerability to GPR due to regional conflicts and macroeconomic instability. However, for Pakistani firms that achieved top-quartile SDG integration scores, the negative impact of GPR on resilience was reduced by approximately 35%. This highlights the universal, yet context-dependent, value of sustainability-driven governance as a strategic hedge in emerging markets facing acute geopolitical stress.

Robustness Checks

Table 4: Robustness Checks for the Impact of Geopolitical Risk on Corporate Resilience

Variables	(1) Baseline TWFE	(2) System GMM	(3) Lagged GPR (1-Year)	(4) Alternative GPR Measure
Geopolitical Risk (GPR)	-3.050***	-2.850***		-1.950***
	(0.455)	(0.510)		(0.380)
Lagged GPR (GPR_{t-1})			-2.720***	
			(0.480)	
SDG Integration Score	0.180***	0.165**	0.175***	0.190***
	(0.062)	(0.070)	(0.065)	(0.060)
GPR × SDG	0.120***	0.110***	0.115***	0.095***
	(0.025)	(0.028)	(0.026)	(0.022)
Control Variables	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes		Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	4,050	3,600	3,800	4,050
Adjusted R^2	0.41	-	0.39	0.38
AR(2) Test (p-value)	-	0.28	-	-
Hansen J-Test (p -value)	-	0.35	-	-

The dependent variable in all models is Corporate Resilience (CR). Standard errors are reported in parentheses. Model (1) is the baseline Two-Way Fixed Effects (TWFE) estimator. Model (2) employs a two-step System Generalized Method of Moments (GMM) estimator to address dynamic panel bias and endogeneity. Model (3) introduces a one-year lag for the GPR variable to account for delayed corporate strategic responses. Model (4) replaces the aggregate GPR index with a bespoke "U.S.–China Trade Tension Index" to isolate great power rivalry effects. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Interpretation of Robustness Checks

To ensure the reliability and validity of the baseline findings, four rigorous robustness checks were conducted, the results of which are summarized in Table 4:

1. **Addressing Endogeneity (System GMM):** A primary concern in IPE research is reverse causality (e.g., highly resilient firms may possess the resources to better navigate or influence their exposure to geopolitical risk). Model 2 employs a two-step System GMM estimator. The coefficient for the GPR × SDG interaction remains positive and highly significant ($\beta = 0.110, p < 0.01$). Crucially, the Arellano-Bond test for second-order autocorrelation (AR(2)) yields a p-value of 0.28 (failing to reject the null of no autocorrelation), and the Hansen J-test yields a p-value of 0.35 (failing to reject the null of valid overidentifying restrictions). This confirms that the instruments are valid and the baseline results are not driven by endogeneity.

2. **Temporal Dynamics (Lagged Independent Variable):** Geopolitical shocks often have delayed effects on corporate supply chains and financial markets. Model 3 replaces the contemporaneous GPR variable with a one-year lag (GPR_{t-1}). The interaction term remains robustly positive and significant ($\beta = 0.115, p < 0.01$), indicating that the buffering effect of SDG integration persists even when accounting for the lagged transmission of geopolitical shocks to firm-level operations.

3. **Measurement Validity (Alternative GPR Index):** To ensure the findings are driven specifically by great power rivalry rather than general global instability, Model 4 substitutes the aggregate Caldara-Iacoviello GPR index with a bespoke, supply-chain-weighted "U.S.–China Trade Tension Index." The negative main effect of this specific rivalry metric and the positive, significant moderating effect of SDG integration ($\beta = 0.095, p < 0.01$) confirm that the core theoretical mechanism holds when isolating great power competition.

4. **Consistency of Controls and Fixed Effects:** Across all specifications, the control variables (firm size, leverage, R&D intensity, carbon intensity) and the inclusion of firm and year fixed effects remain consistent, ensuring that the observed moderating effect of SDG integration is not confounded by unobserved time-invariant firm heterogeneity or macroeconomic shocks.

Conclusion

This study set out to examine the future of global environmental governance in an era defined by great power competition, specifically investigating how macro-level geopolitical rivalry and volatility impact micro-level corporate resilience and the efficacy of the energy transition. By analyzing a panel of 450 non-financial firms across China and Pakistan from 2015 to 2025, this research bridges a critical gap in the International Political Economy (IPE) literature: the intersection of state-centric geopolitical risk, particularly the spillover of U.S.–China rivalry into the Global South, and firm-level sustainability strategies.

The empirical findings yield three major conclusions. First, the escalation of great power competition and geopolitical risk (GPR) significantly erodes corporate resilience, confirming that the geopolitical fragmentation of the 2020s imposes severe operational and financial costs on the private sector, even in state-directed economies. Second, and most notably, the robust integration of Sustainable Development Goals (SDGs) acts as a vital "conditional crisis insurance." Firms with high SDG integration scores demonstrated a significantly higher capacity to absorb and mitigate the adverse shocks of geopolitical rivalry, validating Signaling Theory in the context of global environmental governance. Third, the impact of this dynamic is highly heterogeneous. While Chinese firms leveraged SDG integration primarily to align with state-directed "Dual Carbon" mandates, secure policy-backed green financing, and insulate themselves against Western decoupling and export controls, Pakistani firms utilized SDG alignment as a critical strategic hedge against acute macroeconomic instability, debt vulnerabilities, and regional security shocks.

Ultimately, this paper demonstrates that the future of global environmental governance cannot be understood solely through the lens of state-level diplomacy and multilateral treaties (e.g., the UNFCCC). The success of the global energy transition is increasingly contingent on the micro-level strategic adaptations of multinational corporations navigating the crossfire of great power competition. As the U.S. and China utilize green industrial policy, critical mineral supply chains, and initiatives like the Belt and Road (BRI) as instruments of statecraft, the private sector's ability to sustain climate investments relies heavily on institutional buffers like SDG integration. Therefore, global environmental governance is evolving from a purely cooperative, state-driven regime into a complex, fragmented ecosystem where corporate sustainability strategies are the frontline defense against geopolitical volatility, with firms in allied or host nations (like Pakistan) heavily dependent on the strategic calculus of great powers (like China).

Future research should expand beyond the current China–Pakistan comparative framework to include a broader spectrum of emerging economies, particularly other BRICS+ and Global South nations, to capture the heterogeneous impacts of geopolitical shocks across varying degrees of state capacity and market maturity. Methodologically, scholars are encouraged to move beyond aggregate Geopolitical Risk (GPR) indices and employ firm-level supply chain network analysis to trace the precise transmission mechanisms of U.S.–China trade tensions, technology embargoes, and regional conflicts. Furthermore, as competing green industrial policies like the U.S. Inflation Reduction Act and the EU's Carbon Border Adjustment Mechanism mature, future studies must investigate whether these frameworks are forcing multinational corporations, and their regional partners, to bifurcate their sustainability strategies, potentially leading to a decoupled global environmental governance regime. Finally, examining the distinct resilience and reporting dynamics of State-Owned Enterprises (SOEs) in critical mineral and energy sectors, particularly Chinese SOEs operating abroad and their Pakistani counterparts, will provide vital insights into how statecraft directly intersects with, and potentially overrides, corporate climate action in an era of great power rivalry.

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