

INSURANCE OR RETRENCHMENT? GEOPOLITICAL RISK AND ENVIRONMENTAL, SOCIAL, AND GOVERNANCE IN ASIA ACROSS PEACE REGIMES, DEVELOPMENT STATUS, AND REGULATORY QUALITY

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ABSTRACT

This study investigates how country-level geopolitical risk (GPR) influences firms' environmental, social, and governance (ESG) performance across 27 Asian economies over the period 2000–2024. The study addresses an important question in the ESG literature: (1) whether firms respond to geopolitical uncertainty by strengthening sustainability engagement as a form of strategic insurance and signalling, or (2) by retrenching ESG commitments under resource pressure. Using firm-level ESG data from Refinitiv and the Caldara–Iacoviello GPR index, we estimate firm fixed-effects models with extensive controls and further address endogeneity through an instrumental variable approach. The results show that, on average, higher GPR is associated with higher subsequent firm ESG scores, with the strongest response observed in the environmental pillar. However, this average effect conceals substantial institutional heterogeneity. The positive GPR-ESG association is stronger in high-peace, developing, and low-regulatory-quality settings, but weakens or turns negative in low-peace, developed, and high-regulatory-quality contexts. These findings indicate that ESG functions as a context dependent risk-management and signalling tool rather than a uniform response to geopolitical shocks. The study contributes by identifying

peace regimes as a key boundary condition in the GPR-ESG relationship and offers implications for managers, investors, and policymakers seeking to strengthen corporate resilience under geopolitical uncertainty.

Keywords: *geopolitical risk, ESG, institutional heterogeneity, corporate governance, Asia*

INTRODUCTION

Geopolitical relations have become a first-order determinant of how economies and firms operate in an era of deep globalisation (Jahanger et al., 2023). Shocks to bilateral and multilateral relations now propagate rapidly through trade, finance, and information networks, amplifying disruptions to global supply chains and corporate operations (Liu, Li et al., 2023; Qin et al., 2023; Roscoe et al., 2022). Recent episodes, from post-Cold War conflicts and the 2008 global financial crisis to the COVID-19 pandemic and the Russia-Ukraine war, highlight the broad economic consequences of geopolitical tensions, including recessionary pressure, energy insecurity, supply-chain disruption, and policy reversals (Abakah et al., 2023; Song & Zhou, 2020; Sulong et al., 2024; Yu et al., 2022). At the firm-level, these shocks are especially consequential because firms have limited shock-absorption capacity and are directly exposed to spikes in input costs, labour-market frictions, financing constraints, and production shortfalls (Abdullah et al., 2023; Brutger & Guisinger, 2022; Duryea et al., 2007; Fan et al., 2022; Lee et al., 2023; Zanetti, 2019).

Against this backdrop, firms' environmental, social, and governance (ESG) activities have become increasingly important as instruments of risk management, stakeholder engagement, and long-term legitimacy (Fang et al., 2023; Fatemi et al., 2018; Nirino et al., 2021; Rajesh, 2023). ESG may help firms preserve investor confidence, maintain supply-chain relationships and strengthen resilience under heightened uncertainty. At the same time, ESG commitments are costly and often require sustained managerial attention, financing capacity, and longer planning horizons. Geopolitical shocks may therefore undermine ESG through energy-price volatility, supply-chain reconfiguration, and tighter financing conditions that raise the cost of long-term sustainability investment (Agoraki et al., 2022; Maneenop et al., 2023). This give rise to a central question: whether geopolitical risk (GPR) induces firms to strengthen ESG as a strategic insurance and signalling device or to retrench ESG under resource pressure.

Existing evidence on the firm-level ESG effects of country-level GPR is inconclusive. One strand of research finds that heightened GPR weakens ESG performance by increasing uncertainty, disrupting operations, and tightening financing conditions, thereby crowding out longer-horizon sustainability investment (Abdullah et al.,

2024; Jiang, Klein et al., 2024; Erzurumlu et al., 2025). Another strand suggests that firms may instead strengthen ESG engagement and disclosure under stress to preserve legitimacy, sustain stakeholder confidence, and reassure investors (Albuquerque et al., 2019; Lins et al., 2017). The implication is that the GPR-ESG relationship is unlikely to be homogeneous and is more plausibly contingent on the institutional setting in which firms experience geopolitical shocks.

This unresolved heterogeneity points to a central gap in the literature. Prior studies have not sufficiently specified the conditions under which GPR induces ESG strengthening rather than ESG retrenchment. In particular, institutional context remains undertheorised. Firms do not respond to geopolitical shocks in a vacuum; their responses are shaped by the surrounding peace environment, level of development, and regulatory quality. This issue is especially salient in Asia, where countries differ sharply in conflict exposure, institutional stability, capital-market maturity, and ESG-related governance frameworks (Ahmad et al., 2024). Yet systematic evidence on how such cross-country institutional differences condition the GPR-ESG nexus in Asia remains limited.

This study addresses these gaps by examining how country-level GPR affects firms' ESG performance across 27 Asian economies over 2000–2024. We focus not only on the average relationship between GPR and ESG, but also on the institutional conditions under which this relationship changes. Specifically, we examine heterogeneity across peace intensity (high-peace vs. low-peace), development status (developed vs. developing), and regulatory quality (high vs. low). We also investigate whether the response varies across the ESG pillars, given differences in visibility, adjustment speed, and resource intensity.

The novelty of the study lies primarily in its treatment of peace regimes as a core contextual boundary condition. Rather than treating peace intensity as a descriptive sub-sample characteristic, we conceptualise it as a theoretically meaningful condition that helps explain whether firms respond to geopolitical shocks through ESG strengthening or ESG retrenchment. This perspective helps reconcile conflicting findings in the literature by showing that GPR does not generate a uniform sustainability response across countries. The study also extends existing work by providing Asia-wide evidence on pillar-level ESG adjustment and by examining additional institutional heterogeneity related to development status and regulatory quality.

Empirically, we draw on a large firm-level panel and estimate fixed-effects models with extensive controls. To strengthen identification, we also employ an instrumental variable approach using the Global Terrorism Index (GTI) rank as an instrument for GPR, complemented by a range of robustness checks. Our findings show that, on average, higher GPR is associated with stronger ESG performance,

particularly in the environmental pillar. However, this average relationship masks substantial heterogeneity across institutional settings. Specifically, the positive association is stronger in high-peace, developing, and low-regulatory-quality environments, but weakens or turns negative in low-peace, developed, and high-regulatory-quality contexts.

This paper makes three contributions. First, it provides broad Asia-wide evidence on the GPR–ESG relationship and helps reconcile mixed findings in prior work by explicitly modelling institutional heterogeneity rather than assuming a uniform effect. Second, it identifies peace intensity as the key boundary condition through which GPR translates into either ESG strengthening or ESG retrenchment, thereby highlighting the study’s central conceptual contribution. Third, it documents important asymmetries across ESG pillars and strengthens empirical credibility through a fixed-effects framework, instrumental variable estimation, and extensive robustness analysis.

LITERATURE REVIEW

Theoretical Foundations

The relationship between GPR and ESG performance is theoretically ambiguous because firms may respond to geopolitical shocks through two competing mechanisms. On the one hand, an insurance and signalling mechanism suggests that firms may strengthen ESG engagement under heightened uncertainty. Risk management theory argues that firms adopt strategies to mitigate exposure to non-diversifiable risks, including geopolitical uncertainty (Borghesi et al., 2019). In this sense, ESG can function as a strategic hedge by helping firms preserve supply-chain continuity, reinforce stakeholder confidence, and reduce reputational vulnerability during periods of stress (Broadstock et al., 2021; Jiang, Feng et al., 2024). This logic is further reinforced by signalling theory, which views ESG disclosure as a credible signal of stability, governance quality, and long-term commitment, particularly in environments characterised by information asymmetry and limited transparency (Spence, 1973). Under this pathway, firms may respond to rising GPR by strengthening ESG performance to preserve legitimacy and attract stakeholders who value credible sustainability commitments (Erzurumlu et al., 2025).

On the other hand, a resource-draining retrenchment mechanism predicts that geopolitical shocks may weaken ESG performance. Rising GPR can increase energy and logistics costs, disrupt production networks, and tighten financing conditions, thereby encouraging firms to hoard cash and prioritise short-term operational continuity (Adra et al., 2023; Kotcharin & Maneenop, 2020). Because many ESG

initiatives require sustained managerial attention, financial flexibility, and multi-year commitments, such investments may be postponed or scaled back when firms face immediate disruption. This mechanism is likely to be especially relevant in environments where financial frictions are severe and external financing is costly. In such settings, geopolitical shocks may lead firms to deprioritise discretionary sustainability efforts, resulting in lower ESG scores.

Institutional theory helps reconcile these competing predictions by emphasising that firms' ESG behaviour is shaped by formal regulations, social norms, and legitimacy pressures (DiMaggio & Powell, 1983). Likewise, the resilience perspective suggests that ESG can serve as an adaptive capability that helps firms withstand systemic disruptions, but only when firms possess sufficient organisational slack and institutional support (DesJardine et al., 2019; Ortiz-de-Mandojana & Bansal, 2016). Taken together, these perspectives imply that the effect of GPR on ESG is conditional rather than uniform: geopolitical shocks may strengthen ESG when firms have both the incentive and the capacity to use ESG strategically but may weaken ESG when those shocks primarily absorb resources and intensify operational constraints.

Empirical Evidence

Prior ESG research identifies both internal determinants, such as governance structures, managerial traits, and ownership, and external influences, such as regulation, culture, and macroeconomic stability, as important drivers of ESG outcomes (Arayssi et al., 2020; Borghesi et al., 2014; Deng et al., 2023; Disli et al., 2022; He et al., 2023; Ho et al., 2012; Houston & Shan, 2022; Li et al., 2023; Liu, Xiong et al., 2023). Evidence from Asian settings likewise suggests that sustainability disclosure and broader transparency outcomes are shaped by monitoring structures and disclosure incentives (Meutia et al., 2023; Ariffin et al., 2024). However, GPR has only recently been incorporated into this literature as a salient external source of uncertainty with potentially first-order implications for corporate sustainability decisions.

The existing evidence on the GPR-ESG relationship remains mixed. Some studies document that GPR undermines ESG through heightened uncertainty, tighter financing conditions, and operational disruption (Abdullah et al., 2024; Jiang, Klein et al., 2024; Saharti et al., 2024). Other studies suggest that firms may strengthen ESG disclosure and stakeholder engagement during periods of stress in order to preserve legitimacy and reinforce resilience (Albuquerque et al., 2019; Bouri et al., 2023; Fiorillo et al., 2024; Lins et al., 2017). This latter interpretation is more likely to hold in environments where governance and monitoring mechanisms support transparency and enhance the credibility of ESG disclosure.

Overall, the empirical literature supports the view that the GPR-ESG relationship is unlikely to be homogeneous across countries. Rather than exerting a uniform effect, GPR appears to influence ESG differently depending on whether firms operate in environments that enable ESG to function as an insurance and signalling device or in environments where geopolitical shocks mainly drain resources and intensify short-term survival pressures.

Conceptual Framework: Peace Regimes as a Core Boundary Condition

A key implication of the foregoing theoretical and empirical arguments is that peace regimes should be treated as a core boundary condition in the GPR-ESG relationship. Peace intensity is not merely a country characteristic used for sub-sample analysis; rather, it is a theoretically meaningful contextual condition that shapes how firms interpret and respond to geopolitical shocks. This peace-regime perspective represents a key conceptual contribution of the study because it explains why the effect of GPR on ESG may differ systematically across countries.

In high-peace environments, geopolitical tensions may increase uncertainty without fully destabilising firm operations. Firms in such contexts are more likely to retain the organisational slack, financing capacity, and institutional support needed to respond strategically rather than defensively. In line with risk management theory, ESG can function as a form of strategic insurance by helping firms preserve stakeholder confidence, reduce reputational vulnerability, and maintain access to capital and supply-chain relationships. At the same time, signalling theory suggests that ESG disclosure becomes a credible way for firms to communicate stability, governance quality, and long-term commitment under stress. From a resilience perspective, firms in high-peace settings are also better positioned to sustain ESG commitments as an adaptive capability. Accordingly, the insurance and signalling mechanism is more likely to dominate in high-peace environments.

By contrast, in low-peace environments, geopolitical shocks are more likely to interact with pre-existing instability, weaker institutional support, and tighter operating constraints. Under such conditions, firms are more likely to divert managerial attention and financial resources toward liquidity preservation, operational continuity, and short-term survival. This setting is therefore more consistent with a retrenchment logic, under which ESG-related investments are more likely to be postponed, scaled back, or deprioritised. Although ESG may in principle enhance resilience, the ability to sustain such commitments is weaker when firms face repeated disruption and binding constraints. Accordingly, the retrenchment mechanism is more likely to dominate in low-peace environments.

Thus, peace regimes shape whether GPR is more likely to induce ESG strengthening through insurance and signalling incentives or ESG weakening through resource-draining retrenchment pressures. This framework directly explains why the effects of GPR on ESG may differ between low-peace and high-peace countries and highlights the distinctive contribution of the present study.

Hypothesis Development

Building on the competing mechanisms discussed above, we first expect a general relationship between GPR and subsequent firm-level ESG outcomes in Asia. Prior research does not point to a single unconditional sign. On the one hand, rising GPR can tighten financing conditions, disrupt operations, and crowd out longer-horizon sustainability investment, thereby weakening ESG performance (Abdullah et al., 2024; Jiang, Klein et al., 2024). On the other hand, firms may strengthen ESG engagement and disclosure under uncertainty in order to preserve legitimacy, reassure stakeholders, and enhance resilience, consistent with the insurance and signalling view of ESG (Albuquerque et al., 2019; Lins et al., 2017; Erzurumlu et al., 2025). Accordingly, while theory does not imply a universally uniform direction *ex ante*, it does suggest that changes in country-level GPR should be associated with subsequent changes in firm-level ESG performance.

H1: Country-level GPR is associated with subsequent changes in firms' ESG performance in Asia.

The central heterogeneity prediction of this study concerns peace regimes. Institutional theory suggests that firms' strategic responses are conditioned by the broader environment in which they operate, including the degree of stability, legitimacy pressure, and institutional support available to them. In relatively high-peace environments, firms are more likely to retain the organisational slack, financing access, and disclosure capacity needed to use ESG strategically as an instrument of insurance, signalling, and resilience (DiMaggio & Powell, 1983; DesJardine et al., 2019; Ortiz-de-Mandojana & Bansal, 2016). By contrast, in low-peace environments, geopolitical shocks are more likely to interact with pre-existing instability and binding operating constraints, making retrenchment more likely than strategic ESG strengthening. Recent work also suggests that sustainability disclosure and governance-related transparency in Asian settings depend heavily on institutional monitoring and reporting structures, which are less likely to support adaptive ESG responses in fragile environments (Meutia et al., 2023; Ariffin et al., 2024). Collectively, these arguments suggest that the association between GPR and ESG is more positive, or less negative, in high-peace contexts than in low-peace contexts.

H2: The association between GPR and ESG is more positive (or less negative) in high-peace contexts than in low-peace contexts.

Other institutional dimensions may also shape how firms translate geopolitical shocks into ESG responses. Development status captures differences in capital-market maturity, financing frictions, and the depth of ESG-related infrastructures. In developed economies, stronger institutions and higher baseline ESG norms may reduce the marginal signalling value of additional ESG responses under geopolitical stress. In developing economies, by contrast, firms may have stronger incentives to use ESG as a credibility-enhancing and legitimacy-preserving mechanism, although resource constraints may also limit substantive sustainability investment (Ahmad et al., 2024; Erzurumlu et al., 2025). These competing forces imply that the GPR-ESG relationship may differ systematically across developed and developing settings.

H3: The association between GPR and ESG differs between developed and developing economies.

Regulatory quality similarly conditions whether ESG responses are mainly compliance-driven or whether firms use ESG more actively as a voluntary signal under uncertainty. In high-regulatory-quality settings, ESG disclosure may already be more institutionalised, leaving less room for marginal adjustment following geopolitical shocks. In lower-regulatory-quality settings, firms may rely more heavily on ESG to convey credibility to investors and stakeholders when GPR rises, even if their capacity to undertake substantive ESG investment remains uneven (Broadstock et al., 2021; Jiang, Feng et al., 2024; Meutia et al., 2023). This suggests that the GPR-ESG relationship is unlikely to be uniform across regulatory environments.

H4: The association between GPR and ESG differs across high versus low-regulatory-quality contexts.

METHODOLOGY

Data Sample

We begin with all non-financial listed firms covered by Refinitiv (LSEG) in the 27 Asian economies for which both annual firm-level ESG scores and key financial/governance variables are available over the sample period. Financial and banking firms are excluded due to their distinct regulatory and reporting regimes. The sample period spans from 2000–2024, covering a broad range of geopolitical, economic, and institutional developments in the region, including the Iraq War, the global financial crisis, trade tensions between the United States and China, and the COVID-19 pandemic. To capture the influence of GPR, we merge the firm-level dataset with the country-level GPR index developed by Caldara and Iacoviello (2022), which provides a country-specific measure of geopolitical tensions and conflicts. The GPR data are obtained directly from Matteo Iacoviello's official

database (<https://www.matteoiacoviello.com/gpr.htm>). To align with firm-level and annual ESG data, the monthly GPR scores for each country are aggregated into yearly averages, allowing for consistent comparison across Asian economies and over time.

The composite ESG score serves as the primary dependent variable, reflecting the aggregated and normalised performance across the environmental, social, and governance dimensions for each firm-year observation. Firm-level data—including financial indicators, governance characteristics, and executive (CEO and board) attributes—are obtained from the LSEG (Refinitiv) Data & Analytics database. The ESG performance variables (overall and by pillar) are drawn from the same source to ensure consistency in data structure and methodology. Following common practice in sustainability and corporate governance research (Erzurumlu et al., 2025; Jiang, Klein et al., 2024), firms in the financial and banking sectors are excluded from the analysis due to their distinct regulatory environment and accounting standards, which could bias ESG comparability across industries.

Additionally, we incorporate macroeconomic control variables at the country-level, including GDP growth rate, inflation to account for broader economic and policy influences on ESG performance. These variables are sourced from the World Bank's World Development Indicators (WDI) and International Monetary Fund (IMF) International Financial Statistics (IFS) databases. All macro-level data are merged by country and year with the firm-level dataset, resulting in a balanced panel suitable for longitudinal analysis. Note that each variable has its own missing data; therefore, depending on each model, the number of observations will be different. We provide more details of descriptive statistics and observations for all variables of the main results in the next section. To reduce the influence of outliers, continuous variables are winsorised at the 1st and 99th percentiles.

Variables

Dependent variables

The main dependent variable is the composite ESG score, obtained from the LSEG database, which provides comprehensive firm-level sustainability assessments. This score consolidates the three ESG pillars (environmental, social, and governance) into a unified metric that reflects a firm's overall commitment to sustainable and ethical business practices (Chowdhury et al., 2023). According to the LSEG methodology, ESG scores are constructed using 186 individual indicators, capturing a wide range of aspects related to environmental responsibility, social contribution, and governance quality. The final ESG score is computed through a rigorous weighting and normalisation process, ensuring comparability across firms and industries.

In addition to analysing the overall ESG score, this study also investigates the effect of GPR on each ESG pillars separately. Each dimension provides unique insights into how firms in Asia adapt their sustainability strategies under geopolitical uncertainty. The environmental pillar captures firms' initiatives related to energy efficiency, pollution control, and carbon emission reduction. The social dimension evaluates corporate engagement with employees and communities, diversity and inclusion, and philanthropic activities. Finally, the governance pillar reflects the firm's internal control structure, board composition, executive compensation, and transparency in decision-making. The natural logarithm of the overall ESG score and each ESG sub-dimension is used in the regression models to standardise distributional differences and improve comparability across firms and regions.

Explanatory Variables

The GPR index developed by Caldara and Iacoviello (2022) is used in this study as a proxy for geopolitical uncertainty. According to these authors, GPR refers to “the threat, realisation, and escalation of adverse events associated with wars, terrorism, and political tensions among states that disrupt the peaceful course of international relations.” The GPR index quantifies the frequency of news articles that reference such events and related risks each month across Asian countries. These events are grouped into eight categories—such as war threats, acts of terrorism, and military buildups—based on automated keyword searches in 10 major international newspapers. This approach provides a consistent and data-driven measure of the likelihood and escalation of geopolitical events that may influence global and regional stability.

Compared to previous uncertainty indicators, the GPR index offers several advantages. It effectively isolates geopolitical sources of uncertainty from financial or macroeconomic shocks by exhibiting distinct spikes during major political and military events, including wars, terrorist attacks, and periods of diplomatic tension. This feature makes it particularly suitable for analysing how firms adjust their ESG strategies in response to geopolitical disturbances. Moreover, the GPR dataset spans a long historical period (from 1985 to the present), allowing for robust investigation of firms' dynamic responses to varying degrees of geopolitical pressure over time.

Following the methodology of Adra et al. (2023) and Le and Tran (2021), this study constructs an annualised country-level proxy for GPR by calculating the yearly average of the monthly GPR index values. This aggregation captures the overall level of geopolitical tension experienced by each country in a given year, facilitating alignment with firm-level ESG. The resulting variable reflects the persistent geopolitical environment within each Asian economy and serves as a comprehensive indicator of external uncertainty affecting corporate sustainability

behaviour. To standardise the distribution of the GPR index, we employ the natural logarithm of the yearly GPR index in our regression analyses.

Control variables

Consistent with prior studies on corporate sustainability and governance (El Ghoul et al., 2016; Ilyas et al., 2022; McGuinness et al., 2017; Vural-Yavaş, 2021), we include a set of firm-specific control variables to ensure the robustness of our empirical findings. Firm size is measured as the natural logarithm of total assets, while leverage is calculated as total debt divided by total assets. Profitability (return on assets, ROA) is defined as net income over total assets, and cash holdings represent cash and cash equivalents scaled by total assets. Tobin's Q, computed as the market value of equity plus total debt divided by total assets, captures market valuation and growth prospects. Financial slack, defined as the ratio of cash and short-term investments to total assets, whereas tangibility the ratio of fixed assets to total assets which indicates operational rigidity. Governance characteristics include CEO duality, a dummy variable equal to 1 if the CEO also serves as board chair and 0 otherwise; board size, the number of directors on the board; board diversity, the proportion of female directors; and board independence, the percentage of independent non-executive members. At the country-level, the inclusion of macro-level control variables such as annual gross domestic product (GDP) growth rate and annual inflation is grounded in the existing literature. Detailed variable definitions and measurement sources are presented in Appendix A.

Model Specification

To study the effects of GPR on ESG performance, our paper closely follows prior research in this literature (Abdullah et al., 2024; Erzurumlu et al., 2025; Jiang, Klein et al., 2024) and write our baseline model specification as follows.

$$ESG_{c,i,t+1} = \alpha + \beta \text{Geopolitical risk}_{c,t} + \zeta \text{Firm-level controls}_{c,i,t} + \lambda \text{Country-level controls}_{c,t} + \text{FirmFE} + \text{YearFE} + \varepsilon_{c,i,t} \quad (1)$$

Where $ESG_{c,i,t+1}$ represents the overall or pillar-specific ESG score for firm i in country c and year $t + 1$. We use the forward one-year ESG outcome, $ESG_{c,i,t+1}$, rather than the contemporaneous score for three reasons. First, Refinitiv ESG ratings are largely based on annual reports and disclosures that are released with reporting lags; consequently, ESG scores in year $t + 1$ more accurately reflect firms' actions, policies, and disclosure responses initiated during year t . Second, many ESG-related adjustments (e.g., environmental investments, supply-chain standards, and governance reforms) involve implementation and adjustment costs, implying that any strategic response to heightened GPR is unlikely to be fully captured in the same-year ESG assessment. Third, using $ESG_{c,i,t+1}$ mitigates

simultaneity and reverse causality concerns by ensuring that the GPR measure in year t temporally precedes the ESG outcome, strengthening the interpretation that GPR shocks are followed by subsequent ESG adjustments. *Geopolitical risk* $_{c,t}$ is the annualised GPR index for country c in year t , obtained from Caldara and Iacoviello (2022). We use annual average GPR to capture a country's persistent GPR environment over the year and to align the risk measure with the annual frequency of ESG assessment and corporate reporting. Annual averaging reduces sensitivity to short-lived spikes that may be quickly reversed and may not translate into firm-level ESG actions or disclosures within the same reporting cycle. Volatility- or peak-based measures can capture extreme episodes, but they may over-weight transitory events and introduce additional noise when ESG outcomes are recorded annually. The coefficient β is our main parameter of interest, capturing the effect of GPR on firms' ESG performance. ζ is a vector of coefficients for the set of firm-level control variables which includes firm size, leverage, ROA, cash holdings, Tobin's Q, financial slack, tangibility, CEO duality, board size, board diversity, and board independence. λ represents the coefficients associated with country-level controls, including GDP growth rate and annual inflation. Firm FE and Year FE denote firm and year fixed effects, respectively, which control for unobserved time-invariant firm characteristics and common temporal shocks. $\varepsilon_{c,i,t}$ is the error term, assumed to have a zero mean. To account for potential serial correlation within firms and cross-sectional dependence across years, standard errors are two-way clustered at the firm-year levels.

The baseline model in Equation (1) may be subject to potential endogeneity concerns arising from omitted variable bias or reverse causality. Unobservable or difficult-to-measure factors that simultaneously influence both GPR and ESG performance could bias the estimated coefficients. To address these potential endogeneity issues, we employ a two-stage least squares (2SLS) instrumental variable (IV) estimation approach. This method allows us to control for unobserved heterogeneity and mitigate potential biases, thereby enhancing the robustness and credibility of our empirical findings. Endogeneity occurs when one or more explanatory variables are correlated with the error term, leading to inconsistent and inefficient parameter estimates. The IV approach resolves this by introducing instruments that are highly correlated with the endogenous variable (GPR) but uncorrelated with the error term in the ESG equation. In the first stage, we regress GPR on the instrumental variable and control variables to obtain the predicted values of GPR. In the second stage, we replace the original GPR values with the predicted ones to estimate their effect on ESG performance.

Following recent literature, we employ the Global Terrorism Index rank (GTI rank) as an instrumental variable (IV) to address endogeneity concerns (Abdullah et al., 2024; Phan et al., 2022). The GTI rank measures the relative level of terrorism impact across countries, based on the frequency of terrorist incidents, casualties,

and the extent of property and economic damage. Our identification relies on the assumption that GTI affects firm ESG outcomes primarily through its impact on broad country-level GPR. Conceptually, terrorism events operate as security shocks that heighten national and international risk perceptions, intensify geopolitical uncertainty, and increase the salience of geopolitical tensions captured by the GPR index. Conditional on firm fixed effects, year fixed effects, and macroeconomic controls, we argue that the remaining variation in terrorism exposure is more plausibly linked to ESG outcomes through the GPR environment that firms face rather than through firm-specific sustainability decisions. We nevertheless acknowledge a limitation: terrorism could influence ESG via additional channels (e.g., social stability concerns, governance oversight, or policy/regulatory responses). We therefore interpret IV estimates with appropriate caution and complement them with robustness checks and alternative specifications.

The following equations are used for our instrumental variable regression.

First stage:

$$\begin{aligned} \text{Geopolitical risk}_{c,t} = & \alpha + \beta \text{ Global terrorism index rank}_{c,t} \\ & + \zeta \text{ Firm - level controls}_{c,i,t} + \lambda \text{ Country - level controls}_{c,t} \\ & + \text{FirmFE} + \text{YearFE} + \varepsilon_{c,i,t} \end{aligned} \quad (2)$$

Second stage:

$$\begin{aligned} \text{ESG}_{c,i,t+1} = & \alpha + \beta \text{ Geopolitical risk}_{c,t} + \zeta \text{ Firm - level controls}_{c,i,t} \\ & + \lambda \text{ Country - level controls}_{c,t} + \text{FirmFE} + \text{YearFE} + \varepsilon_{c,i,t} \end{aligned} \quad (3)$$

Where $\text{Geopolitical risk}_{c,t}$ is the predicted geopolitical risk which is used in second stage regression. The first- and second stage regressions (Equations 2 & 3) include the same set of firms and country-level control variables as in the baseline specification. Both stages also incorporate firm and year fixed effects, with standard errors two-way clustered at the firm and year levels to ensure consistency and comparability across estimation procedures.

ANALYSIS AND FINDINGS

Sample and Descriptive Statistics

Our sample distribution is detailed in Table 1. The final sample comprises 82,700 firm-year observations from 4,272 unique firms across 27 Asian countries and 10 industries. This distribution reflects the economic landscape of the region, as the data is largely concentrated in Asia's major economies: China (27.19% of observations), Japan (14.96%), and India (14.58%). This concentration is central to

our study, as these nations face distinct and significant geopolitical exposures, such as trade tensions, regional security concerns, and supply-chain vulnerabilities, providing a rich context to examine GPR impacts. Furthermore, the sample is primarily drawn from the Industrials (21.59%) and Materials (15.51%) sectors. These sectors are characterised by their globalised supply chains and high environmental sensitivity, making them particularly vulnerable to both geopolitical tensions and stakeholder pressures regarding ESG performance. This composition ensures our sample is highly relevant for investigating the nexus between GPR and corporate sustainability practices.

Table 1

Sample distribution

	Firms (N)	Firms (%)	Firm-year observations (N)	Firm-year observations (%)
Panel A: Sample distribution by country				
Azerbaijan	1	0.02	20	0.02
Bahrain	7	0.16	138	0.17
Cambodia	1	0.02	21	0.03
China	1,263	29.56	22,484	27.19
Hong Kong	159	3.72	3,514	4.25
India	612	14.33	12,056	14.58
Indonesia	76	1.78	1,513	1.83
Israel	43	1.01	807	0.98
Japan	547	12.80	12,369	14.96
Jordan	1	0.02	25	0.03
South Korea	172	4.03	3,469	4.19
Kuwait	11	0.26	247	0.30
Macau	3	0.07	54	0.07
Malaysia	560	13.11	10,167	12.29
Mongolia	2	0.05	27	0.03
Oman	4	0.09	77	0.09
Pakistan	4	0.09	100	0.12
Philippines	31	0.73	647	0.78
Qatar	31	0.73	561	0.68
Saudi Arabia	65	1.52	1,138	1.38
Singapore	102	2.39	1,889	2.28
Sri Lanka	1	0.02	25	0.03
Taiwan	186	4.35	4,231	5.12
Thailand	197	4.61	3,778	4.57
Turkey	113	2.65	2,081	2.52
United Arab Emirates	57	1.33	892	1.08
Vietnam	23	0.54	370	0.45

(continued)

Table 1 (continued)

	Firms (N)	Firms (%)	Firm-year observations (N)	Firm-year observations (%)
Panel B: Sample distribution by industry				
Communication services	237	5.55	4,373	5.29
Consumer discretionary	570	13.34	10,946	13.24
Consumer staples	373	8.73	7,313	8.84
Energy	139	3.25	2,727	3.30
Healthcare	328	7.68	5,940	7.18
Industrials	914	21.40	17,857	21.59
Information technology	586	13.72	10,838	13.11
Materials	618	14.47	12,824	15.51
Real estate	337	7.89	6,481	7.84
Utilities	170	3.98	3,401	4.11

On average, among these Asian firms, the mean ESG score is 43.119. The mean governance score (48.231) is the highest, followed by the social score (40.928) and environmental score (40.131). This significant variation in aggregate and pillar-level scores is similar to prior research highlighting the heterogeneity of ESG adoption across Asian markets (Ahmad et al., 2024).

Also, in line with recent studies on GPR (Jiang, Klein et al., 2024; Maneenop et al., 2023), the mean value for our key independent variable, GPR, is 0.295 with a standard deviation of 0.280. Our control variables perform largely similar statistics to previous studies. Specifically, the mean values of ROA, leverage, and firm size are 0.058, 0.245, and 20.661, respectively. We present all descriptive statistics of our variables in Table 2.

Table 2

Summary statistics

	count	mean	sd	min	p25	p50	p75	max
ESG	30,713	43.119	20.301	0.188	26.813	42.870	58.739	94.889
Environmental	30,781	40.131	27.166	0.000	16.456	39.889	62.606	99.131
Social	30,781	40.928	24.378	0.048	20.510	39.355	59.800	98.630
Governance	30,782	48.231	22.077	0.101	30.459	48.499	65.999	98.294
GPR	78,624	0.295	0.280	0.011	0.062	0.214	0.388	1.917
Firm size	82,691	20.661	1.990	15.905	19.262	20.758	22.072	25.119
Leverage	78,912	0.245	0.182	0.000	0.089	0.227	0.370	0.752
ROA	77,834	0.058	0.083	-0.253	0.019	0.050	0.094	0.339
Cashflow	82,038	0.075	0.089	-0.202	0.026	0.069	0.120	0.357

(continued)

Table 2 (continued)

	count	mean	sd	min	p25	p50	p75	max
Tobin'Q	74,430	1.905	1.798	0.477	0.946	1.267	2.083	11.632
Financial slack	82,534	0.168	0.150	0.002	0.057	0.124	0.230	0.716
Cash	81,497	0.123	0.123	0.001	0.036	0.086	0.167	0.617
Tangibility	81,828	0.314	0.224	0.000	0.131	0.280	0.463	0.905
CEO duality	30,715	0.303	0.459	0.000	0.000	0.000	1.000	1.000
Board size	30,509	2.336	0.289	1.609	2.079	2.303	2.485	3.091
Board diversity	30,213	5.249	5.417	0.000	0.000	4.412	8.341	22.756
Board independence	29,195	0.395	0.171	0.000	0.300	0.385	0.500	0.833
GDP growth	82,528	4.798	3.716	-5.778	2.340	5.111	7.425	14.150
Inflation	79,621	2.689	2.985	-1.353	0.537	2.075	3.806	16.332

Note: This table presents the summary statistics of all variables; sd = standard deviation; min = minimum; max = maximum; p25 = 25% percentile; p50 = 50% percentile; p95 = 95% percentile.

To examine initial relationships and assess multicollinearity, we also analysed the pairwise correlation matrix for all variables. Other than the expected high correlations between the aggregate ESG score and its Environmental, Social, and Governance pillars, correlation coefficients among other variables remain relatively low, mitigating potential multicollinearity concerns. Correlation coefficients reveal inconclusive preliminary signs of the relationship between GPR and corporate ESG scores. GPR shows a slight negative correlation with the aggregate ESG score and a mixed relationship with the individual pillars. Regarding the control variables, firm size, ROA, and board independence are positively correlated with the ESG score. Contrary to some expectations, leverage and financial slack are negatively correlated with the aggregate ESG score. The negative pairwise correlation between GPR and ESG reflects unconditional cross-country patterns that combine persistent differences in disclosure regimes, institutions, and market structure with within-firm dynamics. Our regressions instead identify within-firm changes after absorbing firm and year fixed effects and controlling for firm and macro fundamentals; therefore, the conditional coefficient can differ in sign from the simple correlation.

Baseline Results

Table 3 reports the baseline estimates from Equation (1). We examine the effect of country-level GPR on the forward one-year aggregate ESG score (Column 1), the environmental score (Column 2), the social score (Column 3), and the governance score (Column 4). Across specifications with firm and year fixed effects and the full set of controls, the estimated coefficients on GPR are positive and statistically significant at the 1% level: 0.216 for ESG, 0.484 for environmental, 0.268 for social, and 0.141 for governance.

In economic terms, interpreting the log-log coefficients as elasticities implies that a 1% increase in GPR is associated with a 0.216% increase in the composite ESG score, a 0.484% increase in the environmental score, a 0.268% increase in the social score, and a 0.141% increase in the governance score. Model fit is strong, with adjusted R-squared values ranging from 0.71–0.81. Overall, the baseline results indicate that higher GPR is associated with stronger subsequent ESG performance on average, with the largest response observed in the environmental pillar. These findings support H1.

Control variables behave broadly in line with established ESG determinants. Firm size is positively associated with ESG and the individual pillars, while board independence is positively associated with ESG and governance. Several balance-sheet variables show smaller and less uniform associations across specifications.

Table 3

Baseline analysis of GPR country effects on ESG scores and pillar subsets

Variables	(1)	(2)	(3)	(4)
	ESG	Environmental	Social	Governance
GPR	0.216*** (0.038)	0.484*** (0.093)	0.268*** (0.055)	0.141*** (0.044)
Firm size	0.127*** (0.009)	0.249*** (0.026)	0.161*** (0.012)	0.067*** (0.010)
Leverage	0.034 (0.034)	0.291*** (0.089)	−0.006 (0.050)	0.005 (0.041)
ROA	−0.222*** (0.050)	−0.995*** (0.131)	−0.211*** (0.073)	−0.107* (0.061)
Cashflow	0.082* (0.047)	0.412*** (0.116)	0.024 (0.067)	0.006 (0.056)
Tobin'Q	−0.004 (0.002)	−0.020*** (0.006)	0.002 (0.004)	−0.008*** (0.003)
Financial slack	0.182*** (0.054)	0.423*** (0.137)	0.230*** (0.078)	0.097 (0.062)
Cash	−0.139** (0.057)	−0.286** (0.138)	−0.111 (0.082)	−0.115* (0.069)
Tangibility	−0.117*** (0.041)	−0.203* (0.109)	−0.091 (0.059)	−0.107** (0.049)
CEO duality	0.010 (0.008)	0.075*** (0.019)	0.009 (0.012)	−0.018** (0.009)
Board size	−0.007 (0.016)	−0.002 (0.038)	0.052** (0.023)	−0.114*** (0.020)

(continued)

Table 3 (continued)

Variables	(1)	(2)	(3)	(4)
	ESG	Environmental	Social	Governance
Board diversity	−0.001 (0.001)	−0.011*** (0.002)	−0.005*** (0.001)	0.007*** (0.001)
Board independence	0.098*** (0.029)	−0.103 (0.074)	0.121*** (0.044)	0.321*** (0.034)
GDP growth	−0.002 (0.001)	−0.009*** (0.003)	−0.003* (0.002)	0.002* (0.001)
Inflation	−0.004*** (0.001)	−0.017*** (0.003)	−0.004* (0.002)	0.005*** (0.002)
Constant	0.882*** (0.196)	−2.047*** (0.573)	−0.155 (0.269)	2.437*** (0.218)
Observations	22,376	22,376	22,376	22,377
R-squared	0.806	0.749	0.792	0.712
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm x year clustering	Yes	Yes	Yes	Yes
Ad-R-square	0.769	0.702	0.752	0.656

Note: This table reports baseline OLS estimates of the effect of country-level GPR on firms’ ESG performance. The dependent variables are ESG score in Column (1), environmental score in Column (2), social score in Column (3), and governance score in Column (4). All models include firm and year fixed effects. Standard errors clustered at the firm × year level are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Results using two-way clustered standard errors are reported in Appendix Table A1.

Endogeneity Concerns

To address potential endogeneity in our baseline ordinary least squares (OLS) estimates, arising from unobserved time-varying country-level confounders that may jointly influence GPR and corporate ESG, we employ a two-stage least squares (2SLS) instrumental variable (IV) approach. We instrument GPR with the country-level rank of the GTI, following recent literature that links terrorism to geopolitical instability (Abdullah et al., 2024; Phan et al., 2022). The validity of this instrument rests on two standard assumptions. First, the relevance condition is met, as terrorism is a salient driver of geopolitical tensions and security uncertainty, ensuring a strong first stage correlation with GPR. Second, the exclusion restriction is plausibly satisfied; conditional on our full set of macro controls and fixed effects, it is unlikely that national terrorism incidence directly determines firm-year ESG outcomes through any channel other than its impact on GPR. Our choice to use the GTI rank rather than its raw score further strengthens identification. This

non-parametric transformation mitigates the influence of heavy-tailed outliers in terrorism intensity, preserves the monotonic risk ordering while attenuating measurement error, and improves first stage stability.

Table 4 reports the instrumental variable results using the GTI rank as the instrument for country-level GPR. In the first stage, GTI rank is positively associated with GPR with coefficient 0.056, significant at the 1% level. The Cragg–Donald and Kleibergen–Paap F statistics exceed conventional weak-instrument thresholds, and the Anderson–Rubin tests reject the null of no causal effect for the aggregate ESG score and for the environmental and governance pillars at the 1% level; the social pillar is positive and marginally significant. In the second stage, the GPR coefficients are 1.208 for ESG, 3.843 for environmental, 0.410 for social, and 0.858 for governance, with significance levels as reported in the table. Under the log-log specification, a 1% increase in GPR implies increases of about 1.21% in ESG, 3.84% in environmental, 0.41% in social, and 0.86% in governance. Overall, the instrumental variable results corroborate the baseline and support a causal interpretation: higher GPR is followed by stronger ESG engagement, led by the environmental pillar.

Table 4

Instrumental variable regression results

Variables	(1)		(2)		(3)		(4)	
	1 st stage	2 nd stage	1 st stage	2 nd stage	1 st stage	2 nd stage	1 st stage	2 nd stage
	GPR	ESG	GPR	Environmental	GPR	Social	GPR	Governance
GTI rank	0.056*** (0.005)		0.056*** (0.005)		0.056*** (0.005)		0.056*** (0.005)	
GPR		1.208*** (0.189)		3.843*** (0.486)		0.410* (0.249)		0.858*** (0.206)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,699	19,699	19,699	19,699	19,699	19,699	19,700	19,700
R-squared		-0.019		-0.063		0.018		-0.002
Firm FE		Yes		Yes		Yes		Yes
Year FE		Yes		Yes		Yes		Yes
Firm xyear clustering		Yes		Yes		Yes		Yes
C-D F-stat		950.9		950.6		950.6		951.1
K-P F-stat		145.8		145.7		145.7		145.8
AR F-stat		52.04		73.76		2.776		18.49
p-value AR		0		0		0.0957		1.72e-05

Note: This table reports the 2SLS results using GTI rank as an instrument for country-level GPR. The first stage predicts GPR, and the second stage estimates its effect on ESG and its three pillars. All models include baseline controls, firm and year fixed effects. Robust standard errors clustered at the firm × year level are reported in parentheses. C-D, K-P, and AR statistics are reported for diagnostic tests. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Robustness Check

Table 5 extends our analysis with an alternative risk proxy, historical country-level GPR, to assess robustness. The estimates remain positive and statistically significant across all outcomes; the coefficient is 0.182 for the composite ESG score, 0.534 for the environmental pillar, 0.208 for the social pillar, and 0.113 for the governance pillar (all at the 1% level). Under the log-log specification, a 10% increase in historical GPR implies increases of 1.8% in ESG, 5.3% in environmental, 2.1% in social, and 1.1% in governance. Using a historical measure mitigates concerns that contemporaneous ESG actions mechanically co-move with short-run risk spikes, and it emphasises the role of persistent geopolitical uncertainty rather than transitory shocks. The consistency of signs, magnitudes, and significance relative to Table 3 indicates that our main result is not an artefact of the specific GPR construction but reflects a stable association between higher GPR and stronger ESG engagement, especially along the environmental dimension.

Table 5

Robustness checks using alternative measures: Historical country-level GPR

Variables	(1)	(2)	(3)	(4)
	ESG	Environmental	Social	Governance
Historical GPR	0.182*** (0.027)	0.534*** (0.065)	0.208*** (0.040)	0.113*** (0.032)
Constant	0.829*** (0.197)	-2.207*** (0.576)	-0.215 (0.270)	2.404*** (0.218)
Controls	Yes	Yes	Yes	Yes
Observations	22,376	22,376	22,376	22,377
R-squared	0.806	0.750	0.792	0.712
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm xYear Clustering	Yes	Yes	Yes	Yes
Ad-R-square	0.769	0.702	0.752	0.656

Note: This table reports a robustness check using an alternative GPR measure, historical GPR on ESG performance. The analysis is performed across four dependent variables: the aggregate ESG score in Column (1), the environmental score in Column (2), the social score in Column (3), and the governance score in Column (4). The dependent variables are the forward one-year natural logarithm ESG scores (aggregate and sub-pillars). Our main independent variable, historical GPR, is the natural logarithm of the historical GPR index for a firm's home country, where higher values correspond to higher geopolitical uncertainty. Control variables are the same as in the baseline. Models include firm fixed effects, year fixed effects. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Sub-sample Analysis

Asia provides a particularly informative setting for heterogeneity analysis because economies differ markedly in institutional strength, regulatory enforcement, conflict exposure, and integration into global supply chains. These features shape whether geopolitical shocks primarily operate as a resource-draining constraint (crowding out discretionary sustainability spending) or instead increase the value of ESG as an “insurance” and signalling device to maintain legitimacy and capital access. Therefore, we examine moderation along three Asia-relevant institutional dimensions—peace intensity, development status, and regulatory quality—which map closely into the theoretical channels and allow us to identify when ESG is more likely to be scaled up versus retrenched.

Heterogeneity by peace intensity

Table 6 presents the sub-sample estimates by peace intensity and provides the main empirical test of H2. In high-peace settings, where geopolitical tensions are relatively low, GPR is positively associated with firms’ ESG performance. By contrast, in low-peace settings, characterised by elevated geopolitical tensions, GPR is negatively associated with ESG performance. This pattern is observed not only for the aggregate ESG score but also across the individual ESG pillars, with the environmental dimension showing the sharpest contrast between the two sub-samples.

These results indicate a clear sign reversal across peace regimes and suggest that the average positive association reported in the baseline analysis masks substantial heterogeneity across institutional environments. Overall, the estimates provide strong support for H2.

Table 6

Sub-sample analysis: Low-peace vs. high-peace countries

Variables	Low-peace countries				High-peace countries			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ESG	Environmental	Social	Governance	ESG	Environmental	Social	Governance
GPR	−0.145** (0.064)	−0.645*** (0.134)	−0.099 (0.095)	−0.128* (0.075)	0.550*** (0.051)	1.383*** (0.138)	0.676*** (0.072)	0.435*** (0.060)
Constant	0.768** (0.363)	−2.615*** (0.834)	−0.770 (0.536)	2.301*** (0.420)	1.454*** (0.236)	0.370 (0.707)	0.577* (0.317)	2.729*** (0.278)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,042	10,042	10,042	10,042	11,482	11,482	11,482	11,483
R-squared	0.805	0.758	0.767	0.709	0.826	0.767	0.833	0.739
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm x year clustering	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ad-R-square	0.776	0.723	0.732	0.666	0.780	0.706	0.789	0.669

Note: This table presents a sub-sample analysis examining how the impact of country-level GPR on ESG performance varies by the level of peace, measured by the Global Peace Index (GPI). The sample is split into two groups based on the mean value of the GPI. Columns (1)–(4) report results for firms in countries with low-peace (GPI below the mean), while Columns (5)–(8) report results for firms in countries with high-peace (GPI above the mean). The analysis is performed across four dependent variables: the aggregate ESG score, the environmental score, the social score, and the governance score. These are the forward one-year natural logarithm ESG scores (aggregate and sub-pillars). Our main independent variable, GPR, is the natural logarithm of the GPR index for a firm's home country. Control variables are the same as in the baseline. Models include firm fixed effects, year fixed effects. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. To operationalise peace intensity, we use the GPI and classify countries into high-peace and low-peace regimes based on the sample distribution of GPI values. Specifically, we define high-peace (low-peace) countries as those with GPI values above (below) the sample mean over the study period. This split is theoretically motivated: in higher-peace environments, institutional stability and lower conflict exposure make ESG investments more likely to function as an “insurance” and credibility signal, whereas in lower-peace environments, elevated conflict risk and binding constraints can strengthen resource-draining mechanisms and limit firms' ability to sustain ESG investment.

Heterogeneity by development status and regulatory quality

Developed versus developing countries

Table 7 examines whether the GPR-ESG relationship varies by stage of economic development. The Asian context is especially suitable for this analysis because the sample includes both institutionally mature developed markets and a large set of developing economies. The results show that the positive relationship between GPR and ESG disappears in developed countries. In contrast, in developing countries the estimated relationship remains positive, statistically significant, and economically larger than the baseline effect. These findings support H3 and indicate that the ESG response to geopolitical shocks differs systematically across development contexts.

Low-regulatory-quality versus high-regulatory-quality countries

Table 8 further explores heterogeneity by regulatory quality. In low-regulatory-quality countries, GPR is positively and strongly associated with ESG outcomes. In high-regulatory-quality countries, by contrast, GPR is negative for the composite ESG score and weaker across the pillars. These results support H4 and indicate that the response of firms' ESG performance to geopolitical shocks is also conditioned by the surrounding regulatory environment.

Additional Evidence on Moderating Mechanisms

In this section, we examine a number of mechanisms that can mitigate the positive impact of GPR on ESG performance. Particularly, we include the role of firm size and role of Chair-ex CEO in the GPR-ESG relationship.

Chair-ex CEO versus non-Chair-ex CEO

Table 9 investigates whether the chair being a former CEO moderates the GPR-ESG relation. Consistent with the baseline findings, GPR is positively associated with all ESG outcomes. However, the interaction between GPR and Chair-Ex CEO is negative and economically meaningful for the composite ESG score and the social pillar. This indicates that the elasticity of ESG with respect to GPR is attenuated when the board chair is a former CEO.

Table 7

Sub-sample analysis: Developed vs. developing countries

Variables	Developing countries				Developed countries			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ESG	Environmental	Social	Governance	ESG	Environmental	Social	Governance
GPR	0.624*** (0.055)	1.598*** (0.148)	0.917*** (0.081)	0.333*** (0.069)	-0.089* (0.052)	-0.413*** (0.125)	-0.205*** (0.075)	0.021 (0.059)
Constant	1.170*** (0.252)	-1.295* (0.766)	0.593* (0.353)	2.830*** (0.312)	0.878*** (0.297)	-2.156*** (0.826)	-1.028** (0.408)	2.367*** (0.318)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,246	12,246	12,246	12,247	10,129	10,129	10,129	10,129
R-squared	0.835	0.789	0.838	0.743	0.787	0.721	0.755	0.686
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm x year clustering	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ad-R-square	0.789	0.731	0.794	0.673	0.764	0.691	0.728	0.651

Notes: This table reports sub-sample regressions for developing and developed countries. The dependent variables are ESG score and its three pillars. All models include baseline controls, firm and year fixed effects. Standard errors clustered at the firm $\times$ year level are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 8

Sub-sample analysis: Low-regulatory quality vs. high-regulatory quality

Variables	Low-regulatory quality				High-regulatory quality			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ESG	Environmental	Social	Governance	ESG	Environmental	Social	Governance
GPR	0.767*** (0.059)	1.842*** (0.163)	1.096*** (0.086)	0.417*** (0.073)	-0.119** (0.051)	-0.447*** (0.120)	-0.186** (0.073)	-0.016 (0.058)
Constant	0.979*** (0.264)	-1.655** (0.815)	0.355 (0.373)	2.761*** (0.324)	0.914*** (0.286)	-2.044** (0.795)	-1.012** (0.393)	2.437*** (0.307)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,695	10,695	10,695	10,696	11,666	11,666	11,666	11,666
R-squared	0.829	0.783	0.836	0.736	0.798	0.737	0.766	0.700
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm x year clustering	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ad-R-square	0.784	0.726	0.794	0.667	0.769	0.700	0.733	0.657

Note: This table presents a sub-sample analysis examining how the impact of country-level GPR on ESG performance varies by the level of Regulatory Quality. The sample is split into two groups based on the mean value of the WGI Regulatory Quality index. Columns (1)–(4) report results for firms in countries with Low-Regulatory Quality (below the mean), while Columns (5)–(8) report results for firms in countries with High-Regulatory Quality (above the mean). The analysis is performed across four dependent variables: the aggregate ESG score, the environmental score, the social score, and the governance score. These are the forward one-year natural logarithm ESG scores (aggregate and sub-pillars). Our main independent variable, GPR, is the natural logarithm of the GPR index for a firm’s home country. Control variables are the same as in the baseline. Models include firm fixed effects, year fixed effects. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9

Mechanism: The role of Chair-ex CEO in the GPR-ESG relationship

Variables	(1)	(2)	(3)	(4)
	ESG	Environmental	Social	Governance
GPR	0.258*** (0.039)	0.521*** (0.096)	0.314*** (0.057)	0.156*** (0.046)
Chair-ex CEO	0.030* (0.016)	0.046 (0.040)	0.054** (0.025)	-0.004 (0.018)
GPR x Chair-ex CEO	-0.125*** (0.032)	-0.114 (0.079)	-0.141*** (0.048)	-0.042 (0.039)
Constant	0.884*** (0.196)	-2.043*** (0.573)	-0.150 (0.270)	2.436*** (0.217)
Controls	Yes	Yes	Yes	Yes
Observations	22,376	22,376	22,376	22,377
R-squared	0.806	0.749	0.792	0.712
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm x year clustering	Yes	Yes	Yes	Yes
Ad-R-square	0.769	0.702	0.752	0.656

Note: This table presents results for the moderating effect of Chair-Ex CEO status on the relationship between country-level GPR and ESG performance. The analysis is performed across four dependent variables: the aggregate ESG score, the environmental score, the social score, and the governance score. These are the forward one-year natural logarithm ESG scores (aggregate and sub-pillars). Our main independent variable, GPR, is the natural logarithm of the GPR index for a firm's home country. The moderator, Chair-Ex CEO, is a dummy variable equal to one if the chairman is a former CEO of the firm, and zero otherwise. Control variables are the same as in the baseline. Models include firm fixed effects, year fixed effects. Standard errors, clustered at the firm-year level, are reported in parentheses. Statistical significance: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Large versus small firms

The additional mechanism analysis also suggests that firm size matters. Smaller firms exhibit stronger ESG responses to GPR, whereas the marginal response is weaker among larger firms. This pattern indicates that organisational characteristics shape the extent to which firms adjust ESG under geopolitical uncertainty. Collectively, the mechanism results show that governance structure and firm size moderate the GPR-ESG relationship at the firm-level.

Table 10
Mechanism test: The role of firm size in the GPR-ESG relationship

Variables	(1)	(2)	(3)	(4)
	ESG	Environmental	Social	Governance
GPR	2.225*** (0.362)	6.243*** (0.924)	4.381*** (0.536)	0.364 (0.421)
Firm size	0.154*** (0.010)	0.326*** (0.028)	0.215*** (0.014)	0.070*** (0.011)
GPR × firm size	−0.088*** (0.016)	−0.253*** (0.040)	−0.180*** (0.023)	−0.010 (0.018)
Constant	0.295 (0.222)	−3.731*** (0.621)	−1.358*** (0.306)	2.372*** (0.244)
Controls	Yes	Yes	Yes	Yes
Observations	22,376	22,376	22,376	22,377
R-squared	0.807	0.750	0.793	0.712
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Firm x year clustering	Yes	Yes	Yes	Yes
Ad-R-square	0.770	0.702	0.753	0.656

Note: This table reports the moderating effect of firm size on the relationship between country-level GPR and ESG performance. The dependent variables are ESG score and its three pillars. Firm size is measured as the natural logarithm of total assets. All models include baseline controls, firm and year fixed effects. Standard errors clustered at the firm × year level are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

DISCUSSION

The findings of this study suggest that the relationship between GPR and ESG is best understood as context dependent rather than uniform. On average, higher country-level GPR is associated with stronger subsequent ESG performance, particularly in the environmental pillar. This pattern is consistent with the view that firms may use ESG as part of a broader response to heightened uncertainty. In this sense, the baseline results align with risk-management and signalling arguments, according to which firms strengthen ESG-related practices and reporting to reassure stakeholders, preserve supply-chain relationships, and maintain access to external financing (Broadstock et al., 2021; Jiang, Klein et al., 2024; Lins et al., 2017).

The environmental pillar displays the strongest response, which is also consistent with the channels through which geopolitical shocks often propagate in Asia. GPR frequently transmits through energy security, logistics, and input-price uncertainty, all of which are closely connected to environmental decisions such as energy efficiency, emissions management, pollution control, and supply-

chain environmental standards. These actions are also relatively visible and may be implemented and disclosed more quickly than deeper organisational or governance reforms. By contrast, social and governance dimensions often adjust more slowly. Social initiatives typically require longer planning horizons and internal coordination, while governance changes are often more inertial because they depend on ownership structures, legal constraints, and entrenched internal power arrangements. This interpretation is consistent with the observed ordering of the response across pillars.

At the same time, the average positive relationship conceals substantial institutional heterogeneity. The peace intensity results are especially important in this regard. Table 6 shows a sign reversal across peace regimes: GPR is positively associated with ESG in high-peace settings but negatively associated with ESG in low-peace settings. This contrast provides the clearest evidence for the paper's central argument that the GPR-ESG relationship is conditioned by the surrounding peace environment. In more tranquil environments, geopolitical shocks appear to induce forward-looking sustainability adjustments, whereas in more fragile environments heightened uncertainty, operational disruption, and resource pressure appear to weaken firms' ability to sustain ESG investment (Abdullah et al., 2024; Le & Tran, 2021; Maneenop et al., 2023). This result is consistent with the theoretical distinction between an insurance and signalling mechanism and a resource-draining retrenchment mechanism.

The additional heterogeneity analyses reinforce this interpretation. The stronger positive relationship observed in developing countries suggests that ESG may play a more strategic role where national institutions are weaker and firms are more exposed to capital-flow volatility and supply-chain disruption (Maneenop et al., 2023; Erzurumlu et al., 2025). Conversely, the weaker or negative relationship in developed economies suggests that where legal frameworks, political systems, and capital markets are already more mature, the marginal value of ESG as a response to geopolitical shocks is lower. Similarly, the stronger response in low-regulatory-quality settings and the weaker or negative response in high-regulatory-quality environments suggest that national governance quality conditions how firms adapt to external shocks. Where formal regulation is weaker, firms appear to scale up ESG as a private risk-management and credibility-building mechanism; where regulation is already strong and baseline ESG compliance is high, shocks may instead trigger resource reallocation and retrenchment (Albuquerque et al., 2019; Dyck et al., 2019; Lins et al., 2017; Abdullah et al., 2024; Campello & Graham, 2013; Jiang, Klein et al., 2024; Ioannou & Serafeim, 2012).

The mechanism tests provide further support for this broader account. The weaker ESG response among firms with a former CEO chair is consistent with theories of managerial entrenchment and weaker monitoring, under which boards are less

likely to pursue proactive strategic adjustment under uncertainty (Adams et al., 2010; Bebchuk & Weisbach, 2010). The stronger response among smaller firms is also consistent with the idea that firms facing greater information asymmetry and tighter financing conditions may rely more heavily on ESG to reassure stakeholders and signal resilience.

These findings carry several implications. For managers, the results suggest that ESG can function as a strategic instrument for resilience and stakeholder assurance, but its effectiveness depends on the institutional environment in which the firm operates. For investors, the findings imply that ESG responses to geopolitical shocks should not be interpreted uniformly across countries, as the same increase in GPR may correspond to ESG strengthening in one setting and ESG retrenchment in another. For policymakers, the results suggest that peace conditions, development level, and regulatory quality influence firms' ability to sustain ESG commitments under uncertainty, and that fragile environments may require stronger institutional support if sustainability investment is to be maintained during periods of geopolitical stress.

CONCLUSION

This study examines how country-level GPR shapes firms' ESG performance across 27 Asian economies over the period 2000–2024. Motivated by the unresolved question of whether firms respond to geopolitical shocks by strengthening ESG as a form of strategic insurance and signalling or by retrenching ESG under resource pressure, we analyse both the average effect of GPR and its heterogeneity across institutional settings. Using firm fixed-effects models and an instrumental variable approach, we find that, on average, higher GPR is associated with stronger subsequent ESG performance, with the environmental pillar showing the strongest response.

More importantly, the results reveal that this average effect conceals substantial institutional heterogeneity. The positive association between GPR and ESG is strongest in high-peace, developing, and low-regulatory-quality contexts, but weakens or turns negative in low-peace, developed, and high-regulatory-quality settings. These findings suggest that the ESG response to geopolitical shocks is not uniform across countries. Rather, whether firms strengthen or retrench ESG depends critically on the surrounding institutional environment. In particular, the contrast between high-peace and low-peace settings highlights the study's central contribution: peace regimes constitute a key boundary condition through which GPR translates into either ESG strengthening or ESG weakening.

This study contributes to the literature in three ways. First, it provides broad Asia-wide evidence on the GPR–ESG nexus and helps reconcile mixed prior findings by explicitly modelling institutional heterogeneity. Second, it identifies peace intensity as the core contextual mechanism shaping the direction of the GPR–ESG relationship. Third, it documents important differences across ESG pillars and strengthens empirical credibility through fixed-effects estimation, an instrumental variable design, and a series of robustness checks.

Despite these contributions, the study has several limitations. First, GPR is measured at the country-level and therefore may not fully capture firm-specific exposure to geopolitical shocks. Firms within the same country can differ in internationalisation, supply-chain dependence, export exposure, and political sensitivity, which may lead to heterogeneous responses that cannot be fully observed in our data. Second, although the instrumental variable approach strengthens identification, the exclusion restriction cannot be tested directly, and the IV estimates should therefore be interpreted with appropriate caution. Third, the study focuses on listed non-financial firms covered by Refinitiv, which may limit generalisability to smaller private firms or firms in countries with more limited ESG disclosure coverage.

These limitations open several avenues for future research. Future studies could develop more granular firm-level measures of geopolitical exposure, such as trade concentration, foreign supply-chain dependence, geographic revenue exposure, or politically sensitive industry links. Additional research could also examine how ownership structure, board characteristics, state involvement, or international diversification shape firms' ESG responses to geopolitical shocks. Finally, future work could extend the analysis beyond Asia, compare regional differences more explicitly, or investigate whether the effects documented here persist over longer horizons and across alternative ESG data providers.

Overall, the evidence suggests that ESG should not be viewed as a uniform corporate response to geopolitical uncertainty. Its role depends on the institutional context in which firms operate. Understanding these contextual differences is essential for managers, investors, and policymakers seeking to sustain corporate resilience and long-term sustainability under rising GPR.

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APPENDIX

Table A1

Baseline results with two-way clustered standard errors (firm and country-year)

Variables	ESG	Environmental	Social	Governance
Geopolitical risk	0.216* (1.84)	0.484 (1.59)	0.268 (1.54)	0.141* (1.72)
Firm size	0.127*** (6.84)	0.249*** (4.51)	0.161*** (6.60)	0.067*** (3.98)
Leverage	0.034 (0.58)	0.291* (1.90)	-0.006 (-0.08)	0.005 (0.08)
ROA	-0.222*** (-3.34)	-0.995*** (-4.98)	-0.211** (-2.09)	-0.107 (-1.46)
Cashflow	0.082 (1.47)	0.412*** (2.79)	0.024 (0.30)	0.006 (0.11)
Tobin'Q	-0.004 (-0.99)	-0.020** (-1.97)	0.002 (0.30)	-0.008** (-2.27)
Financial slack	0.182** (2.16)	0.423* (1.93)	0.230* (1.92)	0.097 (1.09)
Cash	-0.139 (-1.52)	-0.286 (-1.30)	-0.111 (-0.85)	-0.115 (-1.23)
Tangibility	-0.117 (-1.61)	-0.203 (-0.99)	-0.091 (-0.84)	-0.107 (-1.39)
CEO duality	0.010 (0.74)	0.075** (2.16)	0.009 (0.47)	-0.018 (-1.43)
Board size	-0.007 (-0.22)	-0.002 (-0.03)	0.052 (1.18)	-0.114*** (-3.65)
Board diversity	-0.001 (-0.81)	-0.011*** (-2.60)	-0.005** (-2.42)	0.007*** (5.09)
Board independence	0.098 (1.51)	-0.103 (-0.63)	0.121 (1.44)	0.321*** (5.17)
GDP growth	-0.002 (-0.65)	-0.009 (-1.47)	-0.003 (-0.65)	0.002 (1.39)
Inflation	-0.004 (-1.18)	-0.017* (-1.82)	-0.004 (-0.78)	0.005* (1.67)
Constant	0.882** (2.06)	-2.047 (-1.64)	-0.155 (-0.28)	2.437*** (6.37)
Ad-R-square	0.769	0.702	0.752	0.656
Observations	22,376	22,376	22,376	22,377
Firm FE	Yes	Yes	Yes	Yes

(continued)

Table A1 (continued)

Variables	ESG	Environmental	Social	Governance
Year FE	Yes	Yes	Yes	Yes
Firm Clustering	Yes	Yes	Yes	Yes
Country x Year Clustering	Yes	Yes	Yes	Yes

Note: The dependent variables are forward one-year ESG scores (overall ESG and pillar scores). All models include firm fixed effects and year fixed effects. Standard errors are two-way clustered at the firm and country-year level to account for within-firm dependence and common shocks affecting all firms in a country in a given year. *, **, and *** denote significance at the 10%, 5%, and 1% levels.

Table A2

ESG coverage and cross-country comparability: Sub-sample evidence (high vs. low coverage countries)

Variables	Low ESG coverage countries	High ESG coverage countries
GPR	−0.018 (−0.360)	0.869*** (13.550)
Firm size	0.092*** (7.200)	0.130*** (11.320)
Leverage	0.050 (0.940)	−0.027 (−0.630)
ROA	−0.151** (−1.960)	−0.140** (−2.250)
Cashflow	0.033 (0.440)	0.054 (0.980)
Tobin'Q	0.000 (0.050)	0.001 (0.320)
Financial slack	0.0550 (0.570)	0.186*** (3.250)
Cash	0.0550 (0.560)	−0.160** (−2.570)
Tangibility	−0.183*** (−2.910)	−0.028 (−0.540)
CEO duality	−0.0290* (−1.780)	−0.001 (−0.170)
Board size	0.084*** (2.870)	−0.054*** (−2.850)
Board diversity	−0.004*** (−2.920)	0.002** (2.030)
Board independence	0.394*** (7.520)	0.057* (1.700)

(continued)

Table A2 (continued)

Variables	Low ESG coverage countries	High ESG coverage countries
GDP growth	0.001 (0.900)	−0.003* (−1.750)
Inflation	0.002 (0.960)	−0.007*** (−2.690)
Constant	1.457*** (5.180)	0.618** (2.390)
Observations	8,636	13,738
Fixed effects	Firm, Year	Firm, Year

Notes: The dependent variable is one-year-ahead log ESG. All regressions include firm and year fixed effects and the full set of firm-level and macro controls as in the baseline. To address cross-country comparability concerns in Refinitiv (disclosure-based) ESG scores, we split countries by ESG coverage, defined as the total number of firm-year observations with non-missing Refinitiv ESG scores in each country over 2000–2024. Countries with coverage at or above the sample median are classified as high-coverage (*highcov* = 1), and the remainder as low coverage (*highcov* = 0). Standard errors are two-way clustered at the firm and country-year level. t-statistics are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels.