International Journal of Innovative Research and Scientific Studies, 8(1) 2025, pages: 2599-2609

IJIRSS
International Journal of Innovative Research & Scientific Studies

ISSN: 2617-6548

URL: www.ijirss.com

The impact of ESG practices and change support on firm performance: The mediating role of innovation culture

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Abstract

This study examines the impact of Environmental, Social, and Governance (ESG) practices on corporate performance, focusing on the mediating role of innovation culture and the moderating effect of change support. Given the growing emphasis on corporate sustainability, understanding the internal mechanisms that drive ESG effectiveness is crucial. A cross-sectional survey was conducted with 614 valid responses collected from employees and managers of mid-to-large multinational corporations (MNCs) actively implementing ESG initiatives. Structural equation modeling (SEM) was employed to test the hypothesized relationships and assess the direct, mediating, and moderating effects of ESG practices on corporate performance. The results indicate that ESG practices positively influence both financial and organizational performance. Innovation culture plays a mediating role by translating ESG investments into tangible performance improvements through enhanced innovation capabilities. Moreover, change support significantly moderates the ESG-innovation-performance relationship, emphasizing the importance of leadership commitment, resource allocation, and employee engagement in driving ESG effectiveness. This study highlights the crucial role of innovation culture in bridging ESG initiatives and corporate performance while also demonstrating how change support strengthens ESG's impact. Firms that integrate ESG into their innovation strategies and foster organizational readiness for change are better positioned to achieve sustainable competitive advantages. Managers should prioritize building a strong innovation culture and implementing structured change support mechanisms to maximize ESG outcomes. Companies can enhance ESG-driven innovation by investing in employee training, promoting cross-functional collaboration, and providing leadership support. These insights offer practical guidance for firms seeking to align ESG strategies with long-term performance and sustainability goals.

Keywords: Change support, Corporate performance, ESG practices, Innovation culture, Sustainability.

DOI: 10.53894/ijirss.v8i1.5034
Funding: This study received no specific financial support.
History: Received: 16 January 2025 / **Revised:** 18 February 2025 / **Accepted:** 25 February 2025 / **Published:** 28 February 2025

Competing Interests: The authors declare that they have no competing interests.
Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.
Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Publisher: Innovative Research Publishing

1. Introduction

As global economic and environmental challenges reshape business landscapes, corporations are increasingly integrating Environmental, Social, and Governance (ESG) principles into their core strategies to meet regulatory demands, investor expectations, and shifting consumer preferences. Research suggests that firms with strong ESG performance attract greater market interest, demonstrate financial stability, and mitigate operational risks [1, 2]. However, the mechanisms through which ESG influences corporate performance remain insufficiently explored, particularly regarding the role of internal organizational culture and management practices. A systematic theoretical and empirical understanding of these dynamics is still needed.

Innovation culture has been identified as a crucial link between ESG practices and corporate performance. Organizations that foster a culture of innovation are more likely to transform ESG initiatives into technological advancements and process improvements, thereby strengthening their competitive advantage [3, 4]. Some scholars argue that ESG facilitates investment in green technologies and sustainable business models, which, in turn, enhance corporate innovation [5]. Conversely, others contend that ESG implementation may increase operational costs and compliance burdens, potentially constraining innovation investment, particularly in capital-intensive industries [6].

Beyond innovation culture, change support may also influence how ESG affects corporate innovation. When organizations provide strong leadership commitment, resource allocation, and employee engagement, ESG-driven transformations are more likely to be embedded into corporate culture, fostering innovation and improving performance [7, 8]. However, excessive change management efforts can elevate employee stress, hinder adaptability, and negatively impact innovation behaviors [9]. Therefore, the extent to which change support consistently enhances the ESG–innovation culture relationship requires further empirical validation.

This study examines how ESG practices influence corporate performance through innovation culture and whether change support moderates this relationship. Specifically, it proposes three hypotheses: (1) ESG positively affects corporate performance, (2) innovation culture mediates the relationship between ESG and corporate performance, and (3) change support moderates the ESG–innovation culture relationship, amplifying ESG's impact on innovation. By addressing these gaps, this study contributes to both academic research and managerial practice by providing empirical insights into ESG implementation, innovation management, and change strategies, ultimately informing corporate ESG transformation efforts.

2. Literature Review and Research Hypotheses

2.1. ESG and Financial Performance

Environmental, Social, and Governance (ESG) considerations have become essential in corporate strategy, influencing brand reputation, market competitiveness, risk management, and investment attractiveness [10]. With increasing regulatory scrutiny and shifting investor and consumer expectations, firms are increasingly integrating ESG into their core business strategies [11]. Existing studies indicate that ESG initiatives enhance financial and organizational performance, strengthening long-term corporate competitiveness.

Firms with strong ESG performance often demonstrate advantages in key financial metrics, including revenue growth, cost of capital, investment returns, and market valuation. Huang, et al. [12] found that highly rated ESG firms achieve superior market valuations and greater stability during economic fluctuations. ESG leaders also benefit from lower capital costs, as investors associate them with reduced risk and stronger governance frameworks [2]. These firms are more likely to access favorable financing terms, ensuring long-term financial stability [13]. Additionally, robust ESG practices enhance brand equity, attracting sustainability-conscious consumers and driving sales growth [14]. Governments further support ESG-aligned firms through incentives such as tax reductions and subsidies, reinforcing their market position [6].

From a risk management perspective, ESG strategies help mitigate environmental and social risks by promoting sustainable production, reducing regulatory penalties, and enhancing operational resilience [4]. Moreover, strong ESG governance improves supply chain stability, minimizing disruptions caused by climate change and labor-related challenges [15].

$H_{1:}$ ESG has a positive impact on financial performance.

2.2. ESG and Organizational Performance

Beyond financial outcomes, ESG significantly enhances employee satisfaction, corporate governance, and innovation capacity. In terms of employee engagement and productivity, the social dimension of ESG (S) emphasizes workplace conditions, pay equity, and diversity & inclusion (D&I), fostering a stronger sense of belonging and commitment among employees [16, 17]. Companies that actively integrate ESG into their corporate culture create a more supportive and engaging work environment, which enhances motivation and overall productivity.

From a governance perspective, firms with high ESG ratings typically establish more structured boards, effective risk management systems, and transparent decision-making processes, reducing corruption risks and improving operational efficiency [8, 18]. Strengthened governance enhances regulatory compliance and ensures strategic alignment across all levels of the organization.

Regarding corporate culture and innovation, ESG-driven firms prioritize long-term development and technological advancement. An open and collaborative work environment fosters cross-functional cooperation, accelerates the adoption of green technologies, and promotes circular economy models, thereby enhancing market competitiveness [19, 20]. Additionally, Bose, et al. [5] emphasize that in technology-intensive industries, high ESG-rated firms proactively invest in sustainable technologies to gain a competitive edge. By improving operational efficiency, driving cultural transformation,

and fostering innovation, ESG strengthens overall organizational performance. Based on this, the study proposes the following hypothesis:

H_2: ESG has a positive impact on organizational performance.

2.3. The Mediating Role of Innovation Culture

Innovation culture plays a crucial role in shaping corporate competitiveness and long-term sustainability by fostering technological, process, product, and managerial innovation [3]. A strong innovation culture enhances creativity, problem-solving, and adaptability, allowing firms to navigate dynamic business environments effectively. ESG engagement has emerged as a key driver of innovation culture, with ESG-focused firms more inclined to adopt advanced technologies and innovative management practices to enhance sustainability [21]. By integrating ESG principles into their strategies, organizations reinforce their commitment to continuous improvement, strengthen resilience, and bolster competitive positioning.

2.4. The Relationship between ESG and Innovation Culture

ESG strategies influence corporate innovation culture across three dimensions: technological advancement, responsible innovation investment, and governance enhancement. Firms committed to ESG actively cultivate innovation by promoting sustainable solutions, reinforcing corporate social responsibility, and improving operational efficiency.

From a technological perspective, ESG imperatives drive firms to develop green energy solutions, sustainable materials, and low-carbon production processes [4]. Innovation culture plays a pivotal role in this transformation, fostering employee engagement in sustainable innovation and aligning ESG efforts with long-term competitive advantages. The electric vehicle industry, particularly Tesla, exemplifies how ESG-driven innovation reshapes entire markets [15]. Regarding responsible innovation investment, ESG-aligned firms prioritize R&D in projects that enhance labor conditions, promote diversity and inclusion, and advance social equity [5]. These initiatives extend beyond immediate financial returns, positioning companies for long-term success in socially responsible business environments.

From a governance perspective, ESG fosters transparency, reduces information asymmetry, and strengthens cross-functional collaboration [14]. Many firms adopt ESG-driven governance models, leveraging open innovation platforms that engage both internal and external stakeholders in co-developing sustainable solutions [6]. ESG is thus not merely a compliance requirement but a strategic enabler of corporate innovation, driving market competitiveness, sustainable growth, and financial returns [12].

2.5. The Impact of Innovation Culture on Firm Performance

Innovation culture is widely recognized as a key driver of financial and organizational performance, particularly in ESG-driven business strategies [5]. Firms with strong innovation cultures are better equipped to respond to market shifts, develop forward-thinking products and services, and enhance management efficiency and decision-making [21].

Financially, an innovation-driven culture fuels continuous technological and product advancements, strengthening market competitiveness and driving revenue growth [12]. The electric vehicle industry, particularly Tesla, highlights the synergy between ESG strategies and innovation culture, where sustained investment in sustainable technology has secured market leadership [4]. Furthermore, innovation culture promotes efficiency in resource allocation, reducing production costs and attracting investors focused on high-growth potential firms [5].

H_3: Innovation culture has a positive impact on financial performance.

From an organizational perspective, an innovation-driven environment enhances employee satisfaction and productivity by fostering creativity and engagement [17]. Google's "20% Innovation Time" policy, which encourages employees to pursue independent projects, has led to groundbreaking innovations such as Gmail and Google Maps [8]. Additionally, innovation culture strengthens cross-functional collaboration, enabling firms to better navigate ESG-driven transformations [22]. IBM's open innovation model, integrating internal and external resources for digital transformation and green technology development, exemplifies how firms can leverage innovation culture for sustained competitive advantage [14].

H_4: Innovation culture has a positive impact on organizational performance.

Moreover, innovation culture may mediate the ESG-performance relationship. ESG initiatives often drive innovation-related activities, including green technology development, process optimization, and improved corporate management, ultimately enhancing financial and organizational performance [12]. Firms that embed ESG within their innovation strategies achieve significant gains in market competitiveness and financial outcomes [5].

H_5: Innovation culture mediates the relationship between ESG and firm performance.

2.6. The Moderating Role of Change Support

Change support is essential for facilitating ESG-driven transformations within organizations by providing necessary resources, leadership, and management mechanisms that help employees adapt to change, reduce resistance, and enhance implementation effectiveness [7]. When firms establish strong change support structures, employees are more likely to embrace ESG initiatives, fostering a culture of innovation and improving organizational performance.

Employee resistance is a common challenge in ESG transitions, particularly when changes involve new workflows, performance metrics, or skill adaptations [9]. However, organizations that communicate a clear ESG vision, allocate appropriate resources, and demonstrate leadership commitment can enhance employee engagement and facilitate smoother transitions toward sustainability goals.

Moreover, change support strengthens the link between ESG and innovation culture. Providing employee training, incentive programs, and internal communication platforms creates an environment conducive to innovation [8]. Many companies establish "innovation labs" or "green technology research funds" to encourage sustainable innovation, thereby increasing the success rate of ESG transitions and driving corporate innovation.

Empirical research further highlights the role of change support in ESG-driven innovation. Huang, Lin, and Cheng [12] found that firms offering clear leadership direction and structured change support foster higher employee engagement in ESG-related innovations. Similarly, Bose, et al. [5] demonstrated that in technology-intensive industries, change support accelerates ESG adaptation, improving innovation efficiency and market competitiveness.

H_6: Change support positively moderates the relationship between ESG and innovation culture, amplifying ESG's impact on innovation culture.

H_7: Change support positively moderates the relationship between ESG and firm performance, strengthening ESG's impact on firm performance.

To provide a clearer overview, Figure 1 illustrates the conceptual framework, depicting the interactions between ESG strategy, innovation culture, change support, and sustainable performance.

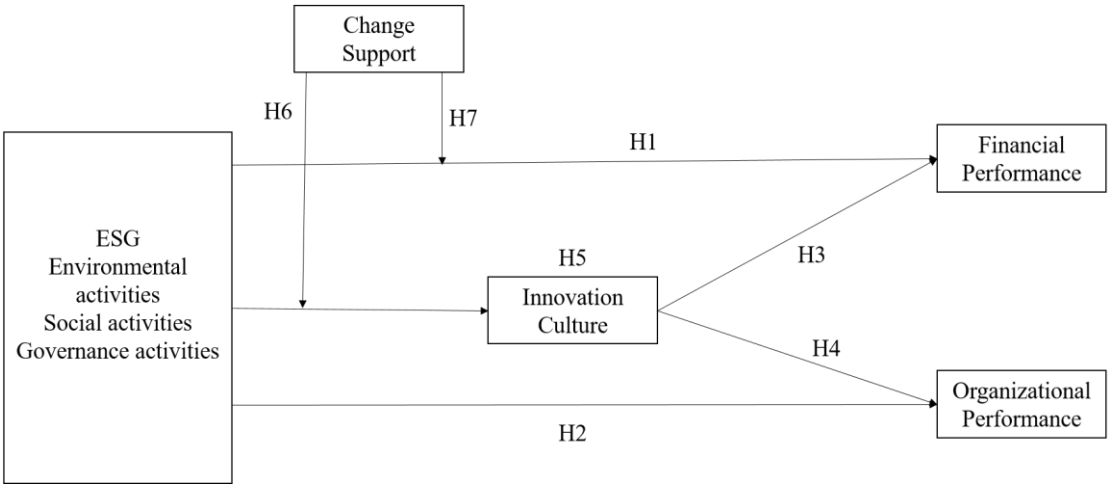

Figure 1.
Research Framework

3. Materials and Methods

3.1. The Design of Research

This study employs a quantitative research approach to examine the relationships among ESG practices, innovation culture, change support, and corporate performance in multinational corporations (MNCs). A cross-sectional survey was conducted to gather data from employees and managers across multiple industries and geographic regions, ensuring diverse organizational representation. To enhance reliability and validity, validated measurement instruments were used, and surveys were administered via an online platform, maximizing data collection efficiency and accessibility. This design facilitates a comprehensive analysis of how ESG initiatives interact with internal cultural and behavioral factors to influence both organizational and financial performance.

3.2. Research Population and Data Collection

The study targeted employees and managers from mid-to-large MNCs actively engaged in ESG initiatives. To qualify, firms had to employ at least 500 employees and operate in at least two countries, ensuring a broad organizational scope. A stratified random sampling method was applied to achieve a balanced representation across industries and regions. The study focused on four key industries—manufacturing, services, technology, and finance—due to their strong ESG engagement. The sample also covered multiple geographic regions, including Taiwan, Mainland China, Southeast Asia, and other areas, reflecting the influence of diverse regulatory and cultural environments on ESG adoption.

To ensure respondents had relevant ESG experience, a minimum tenure of one year was required for participation. Data collection spanned six months (May–October 2024), with 800 survey invitations distributed via online platforms and corporate email channels. To boost response rates, three follow-up reminders were sent. A total of 650 completed responses were received, and after rigorous data screening, 614 valid responses were retained. Non-response bias analysis confirmed no significant differences between respondents and non-respondents, ensuring the dataset's robustness and generalizability.

3.3. Measurement Instruments

To assess ESG practices, innovation culture, change support, and corporate performance, this study employed five-point Likert scales (1 = strongly disagree, 5 = strongly agree) to maintain consistency and reliability in responses. ESG activities were evaluated using a multi-dimensional framework, encompassing environmental, social, and governance factors. Environmental initiatives included resource efficiency, energy conservation, and pollution control. Social responsibility covered employee well-being, community engagement, and diversity promotion, while corporate governance measured transparency, ethical standards, and board accountability.

Innovation culture was assessed based on established models, examining an organization's innovation orientation, resource allocation for creativity, knowledge-sharing mechanisms, risk tolerance, and internal communication effectiveness. Change support was measured using a validated framework, focusing on leadership commitment, availability of ESG-related resources and training, and the extent of employee participation in change-related decision-making. Corporate performance was analyzed through two key dimensions: financial performance, which included profitability, revenue growth, and cost efficiency (adapted from Kaplan and Norton [23]), and organizational performance, which considered employee satisfaction, productivity, and operational effectiveness [24].

3.4. Data Analysis

Statistical analysis was conducted using SPSS 22 and AMOS 28. Descriptive statistics were first applied to examine sample characteristics, including gender, age, education level, job position, and geographic distribution, ensuring data representativeness and quality. To verify the reliability and validity of measurement instruments, Cronbach's Alpha was used to assess internal consistency, with all constructs exceeding 0.7, indicating strong reliability. Confirmatory Factor Analysis (CFA) was performed to evaluate structural validity, ensuring a good model fit for the measurement model.

To test direct and indirect relationships among constructs, Structural Equation Modeling (SEM) was applied. Model fit was assessed using standard indicators, including Chi-square (χ^2), Root Mean Square Error of Approximation (RMSEA $\leq$ 0.08), Comparative Fit Index (CFI $\geq$ 0.90), and Normed Fit Index (NFI $\geq$ 0.90). Additionally, to examine mediation and moderation effects, the Bootstrap resampling method (5,000 iterations) was used to quantify ESG's impact on corporate performance while also testing the moderating role of change support.

3.5. Sample Characteristics

A total of 614 valid responses were collected, ensuring broad representation across industries, job levels, and demographic backgrounds. Gender distribution was 56.4% female and 43.6% male, reflecting the increasing participation of women in ESG-related roles. The age composition was relatively balanced, with 11.7% of respondents under 30 years old, 23.8% aged 31–40, 39.7% aged 41–50, and 24.8% over 50, ensuring perspectives from different career stages were captured. Educational background varied, with 40.7% holding a bachelor's degree, 31.6% possessing a master's degree or higher, and 27.7% having an associate degree, contributing to the diversity of expertise in the sample. In terms of job roles, 35.2% were general employees, 22.1% frontline supervisors, and 42.7% mid-to-senior managers, capturing insights from multiple organizational levels. Industry representation was led by manufacturing (43.6%), followed by services (36.8%) and finance (19.6%), ensuring a diverse range of ESG strategies across sectors. Geographically, respondents were distributed across Taiwan (32.6%), Mainland China (28.8%), Southeast Asia (28.0%), and other regions (10.6%), providing cross-cultural perspectives on ESG practices. This diverse sample enhances the external validity and generalizability of findings, ensuring their applicability across a broad corporate landscape.

Table 1.
Sample Characteristics

Variable	Category	Number (N=614)	Percentage (%)
Gender	Male	268	43.6%
	Female	436	56.4%
Marriage	Single	122	19.9%
	Married	492	80.1%
Age	Under 30	72	11.7%
	31-40	146	23.8%
	41-50	244	39.7%
	Over 50	152	24.8%
Education	Diploma/Associate	170	27.2%
	Bachelor's	250	40.7%
	Master's or above	194	31.6%
Job Role	General Employee	216	35.2%
	Frontline Supervisor	136	22.1%
	Mid-to-Senior Manager	262	42.7%
Industry	manufacturing	268	43.6%
	Services	226	36.8%
	Finance	120	19.6%
Geographic Region	Taiwan	200	32.6%
	Mainland China	177	28.8%
	Southeast Asia	172	28.0%
	Other Regions	65	10.6%

3.6. Ethical Considerations

This study strictly adheres to ethical standards, ensuring that all participants provided informed consent before voluntarily completing the questionnaire. To protect respondent privacy, all surveys were conducted anonymously, and the

collected data was used solely for academic research purposes. The data was securely stored to prevent unauthorized access or misuse. Upon the study's completion, all data was appropriately disposed of following ethical guidelines, ensuring the integrity and credibility of the research process.

4. Results

The results of the Confirmatory Factor Analysis (CFA) confirm that the four key constructs—ESG practices, innovation culture, change support, and corporate performance—demonstrate strong validity and reliability. All measurement items exhibit significant factor loadings, confirming that the constructs effectively capture the intended variables. The model fit indices meet the recommended thresholds, with CFI and TLI values exceeding 0.90 and SRMR and RMSEA values below 0.08, indicating an excellent fit between the data and the hypothesized model (Table 2).

Table 2.
Results of Confirmatory Factor Analysis (CFA).

Constructs	χ^2	df	CFI	TLI	SRMR	RMSEA
ESG Practices	545	165	0.95	0.94	0.06	0.06
Innovation Culture	210	70	0.98	0.97	0.05	0.06
Change Support	165	50	0.97	0.96	0.06	0.06
Finance Performance	180	65	0.96	0.95	0.05	0.06
Organizational Performance	168.	60	0.96	0.95	0.05	0.06

Note: χ^2 (Chi-Square): A measure of model fit, with smaller values indicating better fit relative to the degrees of freedom (df); df (Degrees of Freedom): The number of free parameters in the model; CFI (Comparative Fit Index): Values above 0.90 indicate good model fit; TLI (Tucker-Lewis Index): Values above 0.90 are indicative of acceptable fit ; SRMR (Standardized Root Mean Square Residual): Values below 0.08 suggest a good fit; RMSEA (Root Mean Square Error of Approximation): A value below 0.08 indicates good model fit.

4.2. Internal Consistency

The reliability of measurement scales was tested using Cronbach's α, with all constructs scoring above 0.70, confirming strong internal consistency. Composite reliability (CR) values also exceeded 0.70, further reinforcing measurement reliability. Additionally, most constructs achieved an Average Variance Extracted (AVE) above 0.50, demonstrating good convergent validity (Table 3).

Table 3.
Internal Consistency and Convergent Validity Results (N = 614).

Constructs	Items	Factor Loadings	CR	AVE	Cronbach's α
Environmental Activities	EA1–EA6	0.78–0.89	0.93	0.59	0.92
Social Activities	SA1–SA6	0.85–0.90	0.94	0.62	0.94
Governance Activities	GA1–GA6	0.81–0.89	0.93	0.60	0.92
Innovation Culture	IC1–IC8	0.80–0.88	0.92	0.43	0.93
Change Support	SC1–CS4	0.81–0.88	0.88	0.54	0.86
Organizational Performance	OP1–OP4	0.70–0.79	0.79	0.42	0.89
Financial Performance	FP1–FP6	0.82–0.91	0.93	0.51	0.93

4.3. Demographic Analysis and Group Comparisons

Statistical tests, including independent sample t-tests and ANOVA, were conducted on the 614 valid responses to assess demographic differences in ESG practices, innovation culture, change support, and corporate performance. The results indicate that age, marital status, education level, and job position significantly impact respondents' perceptions of these constructs.

Older respondents (51 years and above) reported significantly higher scores across ESG practices, innovation culture, change support, and organizational performance ($p < 0.01$), suggesting that senior employees exhibit stronger recognition of these concepts.

Married participants scored significantly higher in innovation culture and change support ($p < 0.01$), highlighting the influence of life stability on workplace engagement. Education level influenced innovation culture, with bachelor's and master's degree holders scoring significantly higher ($p < 0.01$); however, no significant effects were observed for other constructs. Mid-to-senior managers exhibited higher scores in innovation culture, change support, and organizational performance ($p < 0.01$), indicating greater alignment with ESG-driven transformations at leadership levels.

No significant regional differences were found, suggesting that perceptions of ESG, innovation culture, and corporate performance remain consistent across different geographic locations, including Taiwan, mainland China, and Southeast Asia.

Table 4.
Demographic Information of the Data (N=614)

Attribute	N (%)	ESG Practices (M, SD)	Innovation Culture (M, SD)	Change Support (M, SD)	Organizational Performance (M, SD)	Financial Performance (M,SD)
Gender						
Male	268 (43.6%)	4.45 (0.68)	4.47 (0.68)	4.36 (0.69)	4.22 (0.70)	4.24(0.78)
Female	346 (56.4%)	4.45 (0.61)	4.43 (0.61)	4.25 (0.67)	4.12 (0.73)	4.19(0.70)
		t=-0.61	t=0.81	t=1.74	t=1.71	t=0.78
Age						
<30 years	72 (11.7%)	3.85 (1.30)	4.00 (1.33)	4.03 (0.73)	3.85 (0.85)	4.14(0.91)
31–40 years	156 (23.8%)	4.43 (0.53)	4.41(0.67)	4.22(0.68)	4.11(0.73)	3.94(0.83)
41–50 years	244(39.7%)	4.44(0.61)	4.35(0.64)	4.26(0.58)	4.14(0.66)	4.12(0.72)
>51 years	152 (24.8%)	4.58(0.54)	4.62(0.51)	4.29(0.68)	4.16(0.72)	4.36(0.65)
		F=4.94**	F=4.01**	F=4.06**	F=3.11**	F=2.91**
Marriage						
Unmarried	122 (19.9%)	4.29(0.75)	4.21(0.83)	4.03(0.80)	3.99(0.82)	4.08(0.82)
Married	492(80.1%)	4.49(0.60)	4.50(0.57)	4.35(0.64)	4.21(0.68)	4.24(0.71)
		t=-3.19**	t=-3.50**	t=-4.66**	t=-3.12**	t=-2.12*
Education						
Diploma	170(27.7%)	4.57(0.55)	4.30(0.67)	4.12(0.72)	4.11(0.72)	4.22(0.76)
University	250(40.7%)	4.52(0.57)	4.46(0.51)	4.14(0.77)	4.14(0.77)	4.27(0.75)
Master	194(31.6%)	4.46(0.64)	4.47(0.19)	4.13(0.60)	4.22(0.65)	4.32(0.64)
		F=2.01	F=4.45**	F=3.12	F=0.88	F=1.78
Job Position						
Employee	216(35.2%)	4.39(0.71)	4.36(0.75)	4.08(0.77)	3.94(0.73)	4.16(0.76)
Supervisor	136(22.1%)	4.46(0.59)	4.42(0.57)	4.36(0.58)	4.18(0.72)	4.25(0.70)
Manager	262(42.7%)	4.49(0.60)	4.52(0.55)	4.43(0.61)	4.35(0.65)	4.23(0.73)
		F=1.51	F=3.96	F=18.1**	F=21.03**	F=0.73
Work Location						
Taiwan	200(32.6)	4.46(0.68)	4.44(0.66)	4.27(0.71)	4.16(0.72)	4.24(0.73)
China	177(28.8%)	4.41(0.59)	4.40(0.62)	4.26(0.70)	4.14(0.74)	4.12(0.74)
S.E Asia	172(28.0%)	4.51(0.65)	4.50(0.61)	4.35(0.62)	4.20(0.70)	4.28(0.72)
Other	65(10.6)	4.40(0.64)	4.43(0.68)	4.28(0.72)	4.18(0.68)	4.19(0.78)
		F=0.81	F=0.78	F=0.61	F=0.24	F=1.39

Note: * $p < 0.05$; ** $p < 0.01$

4.4. Correlation Analysis Results

Correlation analysis (Table 5) confirms significant positive relationships between ESG practices, innovation culture, change support, and corporate performance, supporting the research hypotheses. Direct relationships among variables were found to be stronger than indirect effects, aligning with theoretical expectations. Variance Inflation Factor (VIF) values remained below 10, confirming that multicollinearity is not a concern, ensuring robust regression analysis results.

Table 5.
Descriptive Statistics and Correlation Matrix (N = 614).

	Mean	SD	1	2	3	4	5	6	7
1. Environmental Activities	4.465	0.6703	1	0.741**	0.700**	0.695**	0.547**	0.435**	0.553**
2. Social Activities	4.469	0.6699		1	0.843**	0.756**	0.601**	0.419**	0.635**
3. Governance Activities	4.432	0.684			1	0.805**	0.617**	0.467**	0.674**
4.Innovation Culture	4.497	0.6376				1	0.665**	0.481**	0.679**
5. Change Support	4.290	0.6844					1	0.597**	0.654**
6. Organizational Performance	4.167	0.717						1	0.569**
7. Financial Performance	4.211	0.7367							1

Note: ** $p < 0.01$.

4.5. Hierarchical Regression Analysis

Hierarchical multiple regression was performed to examine the relationships among ESG practices, innovation culture, change support, and corporate performance (organizational and financial performance). Demographic variables (gender, age, marital status, education, and job position) were included as control variables to ensure the robustness of the results.

Findings confirm that all three ESG dimensions (environmental, social, and governance) significantly impact innovation culture, organizational performance, and financial performance ($p < 0.01$). Innovation culture mediates the

effect of ESG on corporate performance, with significant positive influences on both organizational performance ($\beta = 0.48$, $p < 0.01$) and financial performance ($\beta = 0.68$, $p < 0.01$).Additionally, change support moderates the relationship between ESG and innovation culture, amplifying its impact on corporate performance. When change support is high, the effect of ESG on innovation culture and corporate performance is significantly stronger (EA × IC, SA × IC, and GA × IC interactions were all significant at $p < 0.01$). These results underscore change support as a crucial enabler of ESG-driven innovation and transformation (Tables 6 and 7).

Table 6.
Hierarchical Multiple Regression for ESG and Organizational Performance (N=614).

	Innovation Culture			**Organizational Performance**				
	M1	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**
Control Variables								
Gender	-0.01	-0.02	-0.02	-0.31	-0.14	-0.01	0.00	-0.03
Age	0.09	0.02	-0.07	-0.01	-0.18	-0.04	-0.03	-0.02
Marriage	0.06	-0.02	0.04	0.06	0.02	0.05	0.03	0.03
Occupation	-0.01	-0.02	0.01	0.02	0.02	0.04	0.03	
Education	0.02	0.04	0.03	0.03	-0.04	0.05	0.03	0.02
Job position	0.01**	0.85**	0.07**	0.43**	0.22**	0.20**5	0.22**	0.44**
Work location	0.03	0.08	-0.06	0.14	0.02	0.01	-0.09	-0.06
Independent Variables								
Environmental Activities	0.71**			0.43**				
Social Activities		0.83**			0.41**			
Governance Activities			0.59**			0.45**		
Innovation Culture (IC)							0.48**	
EA x IC SA x IC GA x IC								0.18** 0.02** 0.17**
R^2	0.49	0.70	0.68	0.25	0.23	0.27	0.30	0.32
Adj-R^2	0.48	0.69	0.67	0.24	0.22	0.28	0.29	0.35
F	66.5**	153.7**	108.1*	22.2*	20.5*	24.9*	28.7**	28.6*
Change in R^2	0.50	0.70	0.01	0.25	0.23	0.27	0.30	0.32

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

Table 7.
Hierarchical Multiple Regression for ESG and Financial Performance (N=614).

	Financial Performance				
	M9	**M10**	**M11**	**M12**	**M13**
Control Variables					
Gender	-0.05	-0.03	-0.03	-0.02	-0.02
Age	-0.01	0.02	0.00	0.01	0.02
Marriage	0.01	-0.02	0.03	0.02	0.01
Education	-0.03	-0.03	0.02	0.00	0.01
Job position	0.01	0.03	-0.03	0.02	-0.06
Work location	0.04	0.01	0.00	-0.02	0.05
Independent Variables					
Environmental Activities	0.62**				
Social Activities		0.64**			
Governance Activities			0.67**		
Innovation Culture (IC)				0.68**	
EA x IC SA x IC GA x IC					0.16** 0.23** 0.36**
R^2	0.31	0.41	0.46	0.46	0.47
Adj-R^2	0.30	0.40	0.45	0.46	0.47
F	30.3**	46.2**	56.5**	57.6**	54.3**
Change in R^2	0.31	0.41	0.46	0.46	0.47

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

4.6. Mediation Analysis of Innovation Culture

To examine the mediating role of innovation culture, the study applied [25] causal step method and Bootstrap resampling (5,000 iterations), presenting results with 95% confidence intervals (CI).Findings confirm that innovation culture significantly mediates the impact of ESG on both financial and organizational performance ($p < 0.01$). The strongest effects were observed in social (SA → IC → FP, $\beta = 0.443$, $p < 0.01$) and governance aspects (GA → IC → FP, $\beta = 0.341$, $p < 0.01$). Bootstrap confidence intervals (LLCI - ULCI) did not include zero, further validating the mediation effect. These results highlight that ESG practices enhance corporate performance both directly and indirectly by fostering an innovation-driven culture, which strengthens corporate adaptability and competitive advantage in sustainable markets (Table 8).

Table 8.
Bootstrap Significance Test for Mediating Effects

Path	Effect	B	Boot (SE)	Boot LLCI	Boot ULCI
EA –> IC –> OP	Total effect	0.199	0.052	0.097	0.302
	Direct effect	0.266	0.038	0.097	0.302
	Indirect effect	0.266	0.038	0.190	0.339
SA –> IC –> OP	Total effect	0.449	0.056	0.339	0.558
	Direct effect	0.054	0.068	-0.785	0.187
	Indirect effect	0.394	0.054	0.291	0.503
GA –> IC – >OP	Total effect	0.489	0.053	0.385	0.594
	Direct effect	0.216	0.065	0.089	0.343
	Indirect effect	0.274	0.061	0.161	0.390
EA –> IC –> FP	Total effect	0.608	0.052	0.505	0.711
	Direct effect	0.171	0.045	0.083	0.260
	Indirect effect	0.437	0.040	0.362	0.518
SA –> IC –> FP	Total effect	0.698	0.049	0.602	0.794
	Direct effect	0.255	0.057	0.143	0.368
	Indirect effect	0.443	0.057	0.329	0.555
GA –> IC -> FP	Total effect	0.725	0.046	0.636	0.815
	Direct effect	0.384	0.054	0.278	0.491
	Indirect effect	0.341	0.061	0.220	0.463

Note: Mediation analyses include all the control variables. LLCI: Low Limit Confidence Interval; ULCI: Upper Limit Confidence Interval. Bootstrap samples: 5,000. Where EA= Environmental Activities, SA=Social Activities, GA=Governance Activities, IC=Innovation Culture, OP=Organizational Performance, FP=Financial Performance

4.7. Moderating Effect of Change Support

The moderating role of change support was confirmed, demonstrating that higher levels of change support significantly amplify ESG's impact on both financial and organizational performance. Organizations with strong change support mechanisms benefit more from ESG initiatives, achieving greater adaptability, innovation capacity, and overall performance improvements.

Furthermore, change support not only enhances ESG-driven performance outcomes but also accelerates the transformation process. Firms that actively promote ESG while integrating leadership commitment, resource allocation, and employee engagement mechanisms can better leverage ESG-driven competitive advantages for long-term business growth. As a key moderating factor, change support strengthens the influence of ESG on innovation culture and corporate performance, reinforcing superior business outcomes. Companies that incorporate change management strategies into their ESG initiatives will develop more resilient and sustainable operational models, securing long-term market competitiveness and financial stability (Figures 2 and 3).

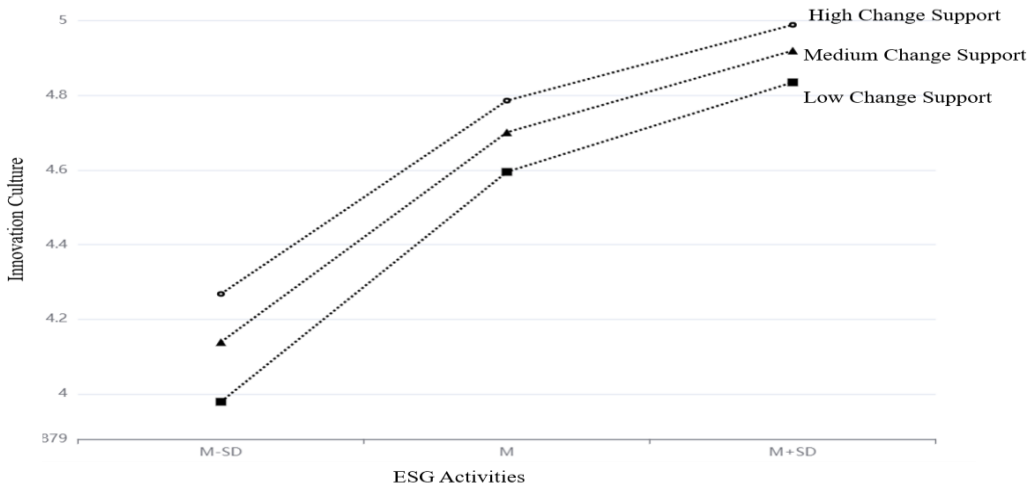

Figure 2.
The moderating effect of change support on ESG and innovation culture.

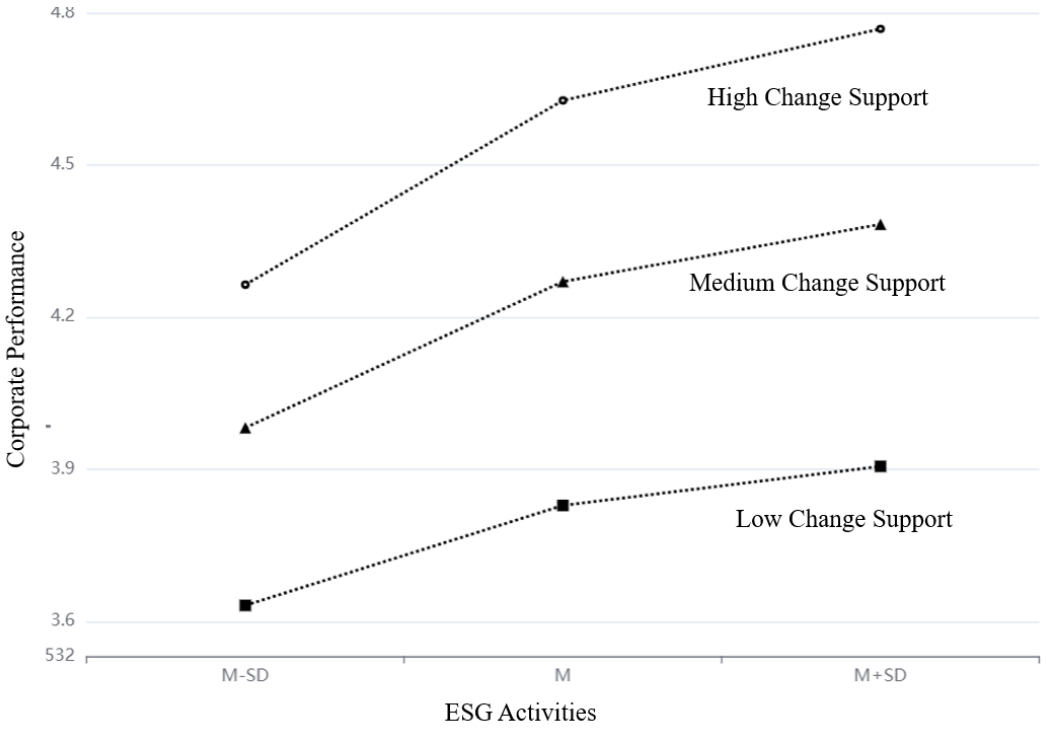

Figure 3.
The moderating effect of change support on ESG and corporate performance.

5. Discussion

This study explores the relationship between ESG practices, innovation culture, change support, and corporate performance while examining the mediating role of innovation culture and the moderating effect of change support. The findings confirm that ESG practices have a significant positive impact on both financial and organizational performance, supporting the perspective that ESG can provide firms with a competitive advantage. Additionally, innovation culture is identified as a critical link between ESG and corporate performance, indicating that companies leveraging innovation can more effectively translate ESG investments into tangible performance improvements.

The moderating effect of change support further reinforces the influence of ESG on innovation culture and performance. Firms that offer sufficient resources, leadership commitment, and employee engagement mechanisms can mitigate resistance to ESG-driven transformation, fostering organizational adaptability and innovation momentum. These results align with prior research while contributing new insights into the dynamic mechanisms through which ESG impacts internal corporate operations.

6. Conclusion

This study confirms that ESG practices enhance corporate performance through an innovation culture and highlights the pivotal moderating role of change support in maximizing ESG benefits. Companies that actively cultivate an innovation culture and provide robust change support can amplify the competitive advantages gained from ESG initiatives. The findings validate ESG's positive impact on both financial and organizational performance while addressing gaps in existing research regarding the interaction between internal organizational culture and change management.

7. Implications

From a practical perspective, businesses should integrate ESG into their innovation culture by fostering technological advancements and process optimizations to enhance long-term sustainability and competitiveness. Furthermore, organizations must implement adequate change support mechanisms—including leadership commitment, resource allocation, and employee participation—to reduce resistance and ensure a smooth ESG transition. Regarding policy and academic contributions, this study provides empirical evidence on how internal organizational mechanisms influence ESG effectiveness, offering valuable insights for policymakers aiming to develop impactful ESG regulations. Additionally, this research expands theoretical models on ESG's impact on corporate performance, laying the groundwork for future studies. Future research should further explore how ESG dynamics vary across industries and cultural contexts, offering a more comprehensive understanding of ESG's role in corporate success.

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