Research on the Influence Mechanism of Cross-border Mergers and Acquisitions on ESG Performance of Manufacturing Enterprises

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Abstract: With the increasing global emphasis on sustainable development, environmental, social, and governance (ESG) performance has become a key indicator for evaluating corporate sustainability and long-term value creation. Cross-border mergers and acquisitions (M&A) represent an important strategy for firms to achieve international expansion and acquire strategic resources. However, whether cross-border M&A contributes to firms' ESG performance remains an open empirical question.

Using panel data from Chinese A-share manufacturing listed firms from 2018 to 2023, this study investigates the impact of cross-border M&A on corporate ESG performance. A difference-in-differences (DID) model is employed to estimate the causal effect of cross-border M&A. Furthermore, this paper explores the mediating roles of R&D investment and green innovation as well as the moderating effect of internal control quality.

The empirical results indicate that cross-border M&A significantly improves firms' ESG performance. Mechanism analysis reveals that R&D investment and green innovation serve as important channels through which cross-border M&A enhances ESG performance. In addition, internal control quality strengthens the positive effect of cross-border M&A on ESG performance.

This study contributes to the literature by examining ESG performance from the perspective of corporate internationalization and provides practical implications for firms seeking to achieve sustainable development through global strategic expansion.

Keywords: Cross-border M&A; ESG performance; Green innovation; R&D investment; Corporate governance

I. Introduction

1.1 Research Background and Significance

1.1.1 Research Background

In the process of global economic integration and industrial chain restructuring, cross-border mergers and acquisitions (M&As) have become a core approach for Chinese manufacturing enterprises to achieve internationalization. Supported by the Belt and Road Initiative and high-level opening-up policies, enterprises rapidly acquire international resources and enhance their technological capabilities through cross-border M&As.

Meanwhile, the concept of sustainable development has taken deep root in society. As a core indicator measuring corporate environmental responsibility, social responsibility and corporate governance, ESG performance has attracted extensive attention from investors and regulators[1] Cross-border M&As provide an important channel for enterprises to access advanced institutional environments and green technologies. Constrained by strict standards in host countries during M&As, enterprises improve their ESG performance through institutional learning and technology spillovers. However, existing studies mostly focus on the financial performance of cross-border M&As, with insufficient discussion on ESG performance and inconsistent conclusions on its mechanism, calling

for in-depth research[2]..

1.1.2 Research Significance

Theoretical Significance: Existing studies on the influencing factors of ESG mainly focus on corporate governance and external supervision, with limited attention to the impact of enterprise internationalization. This paper incorporates cross-border M&As into the ESG analysis framework, takes manufacturing enterprises as samples, and constructs a difference-in-differences (DID) model to test the causal relationship between the two. From the cross-perspective of enterprise internationalization and innovation behavior, it enriches the research dimensions of ESG and provides new empirical evidence for understanding the interaction between globalization strategies and sustainable development.

Practical Significance: Empirically verifying the improvement effect and mechanism of cross-border M&As on the ESG performance of manufacturing enterprises can provide implications for the government to optimize supporting policies for cross-border M&As and guide high-quality M&As. It also offers practical references for enterprises to strengthen ESG management in the process of internationalization and realize the benign interaction between economic benefits and sustainable development.

1.2 Research Content and Methods

1.2.1 Research Content

Centering on the core issue of the impact of cross-border M&As on the ESG performance of manufacturing enterprises, this study conducts the following research:

1.Sort out relevant literature, build an analytical framework based on three major theories and propose hypotheses;

2.Analyze the current situation of cross-border M&As and ESG performance of manufacturing enterprises from 2018 to 2023;

3.Empirically test the direct impact by using the difference-in-differences method;

4.Introduce mediating and moderating variables to reveal the mechanism;

5.Conduct heterogeneity analysis;

6.Verify the conclusions through robustness tests and put forward policy suggestions.

1.2.2 Research Methods

1.Literature Research Method: Systematically review literature related to cross-border M&As and ESG, summarize the theoretical basis, and provide support for hypothesis formulation and framework construction.

2.Empirical Analysis Method: Select panel data to construct a DID model, conduct parallel trend tests through the event study method, build mediating and moderating effect models, and carry out robustness tests using PSM-DID, entropy balancing, etc.

3.Comparative Analysis Method: Conduct grouped regression based on enterprise technological attributes and industry competition intensity to reveal the heterogeneous characteristics of the impact.

1.3 Research Innovations

Firstly, innovation in research perspective: focusing on manufacturing enterprises as the core subject, this study expands the research scope of ESG influencing factors from the perspective of internationalization strategy.

Secondly, innovation in mechanism analysis: constructing a mediating mechanism framework of "cross-border M&As – R&D investment/green innovation – ESG performance" and a moderating mechanism framework of internal control quality.

Thirdly, innovation in research methods: combining a variety of econometric methods and test approaches to improve the robustness of conclusions.

II. Literature Review and Theoretical Basis

2.1 Literature Review

2.1.1 Research on Cross-border Mergers and Acquisitions

Cross-border mergers and acquisitions (M&As) refer to cross-border control-rights acquisition activities conducted by enterprises based on internationalization strategies, which need to cope with multiple differences and involve more complex transactions[3]. The motivations include technology acquisition, resource integration and market expansion[4]. In the research on economic consequences, conclusions on financial performance are controversial[5,6]. In terms of non-financial performance, cross-border M&As can promote innovation, improve production efficiency and governance level through technology spillovers[7].

2.1.2 Research on ESG Performance

ESG integrates three dimensions: environment, society and governance, emphasizing long-term sustainable development[8]. Its theoretical basis includes stakeholder theory, etc.[9,10]. Regarding the evaluation system, diverse rating standards have been formed both internationally and domestically[11]. Influencing factors include internal governance, executive characteristics and external institutional environment[12]. Most studies confirm that good ESG performance can enhance enterprise value in terms of economic consequences[13].

2.1.3 Research on the Relationship between Cross-border M&As and ESG Performance

Existing studies present a two-way perspective: ESG performance affects cross-border M&A decisions and performance[14], and some studies focus on the reverse impact of cross-border M&As on ESG performance[15]. However, deficiencies still exist in current research: few studies examine the reverse impact by taking ESG as an overall indicator, and empirical tests on the action path are limited.

2.2 Theoretical Basis

2.2.1 Stakeholder Theory

The stakeholder theory proposed by Freeman holds that enterprises need to balance the interests of multiple stakeholders[16]. In cross-border M&As, enterprises face a complex network of stakeholders. Good ESG performance helps to gain recognition from host countries and reduce institutional friction, prompting enterprises to attach importance to ESG performance in response to diversified expectations.

2.2.2 Resource-Based View

Barney et al. pointed out that competitive advantages of enterprises stem from scarce strategic resources[17]. ESG performance can be regarded as an intangible strategic resource. Cross-border M&As provide channels for enterprises to integrate overseas resources and promote the transformation of ESG governance into competitive advantages.

2.2.3 Institutional Theory

Institutional theory developed by Scott et al. argues that enterprises need to adapt to the requirements of the institutional environment[18]. The relatively high ESG institutional thresholds in developed countries form external

pressure, forcing enterprises to strengthen environmental governance and optimize governance structure.

2.3 Research Hypotheses

Based on the above analysis, the following hypotheses are proposed:

H1: Cross-border M&As can significantly improve the ESG performance of manufacturing enterprises.

H2: Cross-border M&As improve the ESG performance of manufacturing enterprises by increasing R&D investment.

H3: Cross-border M&As improve the ESG performance of manufacturing enterprises by enhancing green innovation capability.

H4: Internal control quality plays a positive moderating role between cross-border M&As and enterprise ESG performance.

H5: Compared with non-high-tech enterprises, the promoting effect of cross-border M&As on ESG performance is more significant for high-tech enterprises.

H6: Compared with enterprises in low-competition industries, the promoting effect of cross-border M&As on ESG performance is more significant for enterprises in high-competition industries.

III. Research Design

3.1 Sample Selection and Data Sources

This paper selects China's A-share listed manufacturing companies from 2018 to 2023 as the research sample. Manufacturing is chosen as the core industry because it is the key sector for cross-border M&As, with prominent ESG characteristics and high demand for R&D and innovation.

The data sources are as follows:

1.ESG data are obtained from the Huazheng ESG Rating Database;

2.Cross-border M&A data are derived from the Wind Database;

3.Data on R&D investment and green innovation are collected from the CSMAR Database;

4.Internal control quality data are sourced from the Dibo Internal Control Index Database.

Sample Screening:

We exclude ST, *ST and delisted firms, as well as samples with missing values in key variables. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Finally, we obtain11,742 firm-year observations. The empirical analysis is conducted using Stata software.

3.2 Variable Definitions

3.2.1 Dependent Variable

Corporate ESG Performance (ESG): Measured by the Huazheng ESG rating score (ranging from 1 to 9), where a higher value indicates better ESG performance.

3.2.2 Core Independent Variable

Difference-in-Differences Variable (DID): Constructed as the interaction term Treat Post.

Treat: Dummy variable for cross-border M&A enterprises; Post: Time dummy variable for the post-M&A period.

3.2.3 Mediating Variables

1.R&D Investment (Invest): Natural logarithm of the firm's annual R&D expenditure;

2.Green Innovation (Green patent): Natural logarithm of the firm's annual green patent applications.

3.2.4 Moderating Variable

Internal Control Quality (ICQ): Measured by the Dibo Internal Control Index.

3.2.5 Control Variables

The following control variables are included:

1.Return on Assets (ROA)

2.Leverage Ratio (Lev)

3.Operating Income Growth Rate (Growth)

4.State Ownership (SOE)

5.Tobin's Q (TobinQ)

6.Firm Age (FirmAge)

Table 1 Variable Definitions

Type	Variable Name	Symbol	Definition & Description
Dependent Variable	Corporate ESG Performance	ESG	Huazheng ESG rating score
Independent Variable	Cross-border M&A Interaction Term	DID	Treat×POST
Control Variables	Return on Assets	ROA	Ratio of net profit to total assets
	Leverage Ratio	Lev	Ratio of total liabilities to total assets
	Operating Income Growth Rate	Growth	(Current operating income − Previous operating income) / Previous operating income
	Nature of Property Right	SOE	Dummy variable: 1 for state-owned enterprises, 0 otherwise
	Tobin's Q	TobinQ	Market value / Replacement cost
	Firm Age	FirmAge	Current year − Year of establishment
Mediating Variables	R&D Investment	Invest	Natural logarithm of R&D investment
	Green Innovation	Green_patent	Natural logarithm of green patent grants
Moderating Variable	Internal Control Quality	ICQ	Dibo Internal Control Index

3.3 Model Specification

3.3.1 Baseline Regression Model

$$ESG_{it} = \alpha_0 + \alpha_1 DID_{it} + \beta Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Where α_1 is the core estimated coefficient of DID. If α1 is significantly positive, Hypothesis H1 is supported.

3.3.2 Parallel Trend Test Model

$$ESG_{it} = \alpha_0 + \sum_{k=-K}^{K} \beta_k \, Event_{it}^{k} + \beta Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

If the coefficients β_k are not significant in all periods before the merger and acquisition, the parallel trend assumption is satisfied.

3.3.3 Mediating Effect Model

The first step is the baseline regression (Model 1); the second step examines the impact of cross-border M&As on the mediating variables:

$$Mediator_{it} = \alpha_0 + \alpha_1 DID_{it} + \beta Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

The third step is to incorporate the mediating variable into the baseline regression model:

$$ESG_{it} = \alpha_0 + \alpha_1 DID_{it} + \alpha_2 Mediator_{it} + \beta Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

3.3.4 Moderating Effect Model

$$ESG_{it} = \alpha_0 + \alpha_1 DID_{it} + \alpha_2 ICQ_{it} + \alpha_3 (DID_{it} \times ICQ_{it}) + \beta Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

If α_3 is significantly positive, internal control quality plays a positive moderating role.

3.3.5 Heterogeneity Analysis Model

Regressions are conducted by grouping samples according to enterprise technological attributes and industry competition intensity.

IV. Empirical Results and Analysis

4.1 Descriptive Statistics and Correlation Analysis

As shown in Table 2, the mean value of corporate ESG performance is 6.073, indicating that the overall sample is concentrated at a medium level. The mean value of DID is 0.080, suggesting that 8% of observations are firm-year data after cross-border M&As.

Among the control variables, the profitability and financial leverage of sample firms are at a reasonable level with sound growth potential, and state-owned enterprises account for 27.9% of the sample.
The multicollinearity test shows that the VIF values of all variables are less than 10, indicating no serious multicollinearity problem.

Table 2 Descriptive Statistics of Variables

VarName	Obs	Mean	SD	Min	Median	Max	1/VIF
ESG	11742	6.073	0.761	3.290	6.000	9.550	
ROA	11742	0.038	0.073	-0.375	0.039	0.255	0.73
Lev	11742	0.409	0.182	0.049	0.408	0.924	0.79
Growth	11742	0.122	0.300	-0.654	0.084	2.032	0.85
SOE	11742	0.279	0.449	0.000	0.000	1.000	0.91
TobinQ	11742	2.012	1.273	0.795	1.616	9.824	0.90
FirmAge	11742	3.088	0.249	1.946	3.091	4.220	0.93
DID	11742	0.080	0.272	0.000	0.000	1.000	0.98

4.2 Baseline Regression Analysis

Table 3 shows that after gradually adding control variables, the coefficient of DID remains significantly positive at the 1% level, indicating that cross-border mergers and acquisitions can significantly improve the ESG performance of manufacturing enterprises, thus Hypothesis H1 is supported.

Among the control variables, the coefficient of SOE is significantly positive, suggesting that state-owned enterprises have better ESG performance. The coefficients of TobinQ and FirmAge are significantly negative, which may be caused by the fact that high-growth enterprises focus on short-term expansion and established enterprises suffer from rigid governance.

Table 3 Results of Baseline Regression Analysis

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	ESG	ESG	ESG	ESG	ESG	ESG	ESG
DID	0.123***	0.123***	0.125***	0.126***	0.126***	0.122**	0.123***
	(0.048)	(0.048)	(0.047)	(0.047)	(0.048)	(0.047)	(0.047)
ROA		-0.061	-0.164	-0.119	-0.120	-0.043	-0.051
		(0.098)	(0.101)	(0.106)	(0.106)	(0.108)	(0.108)
Lev			-0.252***	-0.234***	-0.235***	-0.232***	-0.213***
			(0.077)	(0.079)	(0.079)	(0.079)	(0.079)
Growth				-0.021	-0.022	-0.017	-0.020
				(0.019)	(0.019)	(0.019)	(0.019)
SOE					0.562***	0.573***	0.553***
					(0.178)	(0.176)	(0.184)
TobinQ						-0.041***	-0.040***
						(0.008)	(0.008)
FirmAge							-0.971***
							(0.333)
Constant	6.063***	6.065***	6.172***	6.166***	6.010***	6.085***	9.077***
	(0.004)	(0.005)	(0.033)	(0.033)	(0.059)	(0.060)	(1.033)
ID/Year FE	Y	Y	Y	Y	Y	Y	Y
Observations	11,734	11,734	11,734	11,734	11,734	11,734	11,734
R-squared	0.679	0.679	0.680	0.680	0.680	0.681	0.682

4.3 Parallel Trend Test

Table 4 and Figure 1 show that the coefficients of pre2 and pre1 are not significant before cross-border M&As, indicating that the treatment group and the control group satisfy the parallel trend assumption. The coefficients of post1, post2 and post3 increase gradually and some are significant after M&As, suggesting that the promoting effect of cross-border M&As on ESG performance is persistent. The joint significance test further verifies the rationality of the hypothesis.

Table 4 Results of Parallel Trend Test

VARIABLES	(1)	(2)
	ESG	ESG
pre2	0.052	0.053
	(0.057)	(0.057)
pre1	0.056	0.067
	(0.061)	(0.060)
current	0.066	0.074
	(0.057)	(0.057)
post1	0.094	0.100
	(0.062)	(0.062)
post2	0.107*	0.106*
	(0.058)	(0.058)
post3	0.181***	0.179***
	(0.054)	(0.054)
Controls	N	Y
Constant	6.065***	9.050***
	(0.004)	(1.035)
ID/Year FE	Y	Y
Observations	11,734	11,734
R-squared	0.680	0.682

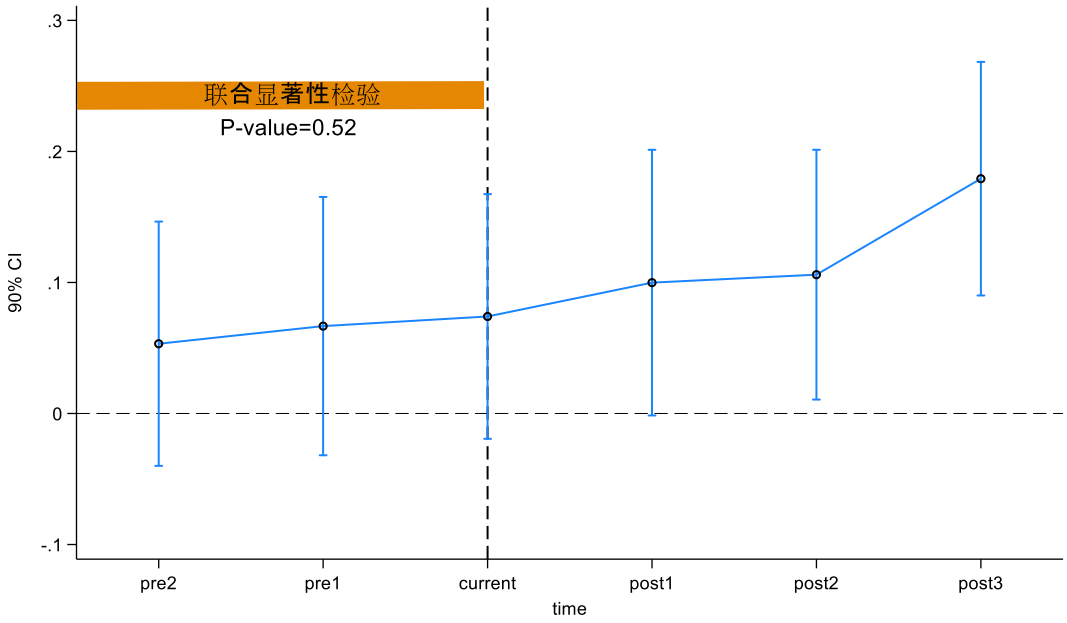

Figure 1. Dynamic Effect of Parallel Trend Test

4.4 Robustness Checks

Table 5 shows that after a series of robustness tests, including winsorization, PSM-DID, entropy balancing, excluding pandemic-affected samples, placebo test, and DDML method, the coefficients of DID remain significantly positive. These results indicate that the positive impact of cross-border M&As on ESG performance is robust and the baseline regression findings are reliable.

Table 5 Results of Robustness Checks

VARIABLES	Winsorization	PSM-DID	Entropy Balancing	Exclude Pandemic Period
	ESG	ESG	ESG	ESG
DID	0.121***	0.122***	0.095**	0.232***
	(0.046)	(0.047)	(0.047)	(0.062)
ROA	-0.058	-0.070	-0.309*	0.146
	(0.116)	(0.113)	(0.187)	(0.157)
Lev	-0.195**	-0.199**	-0.388***	-0.286***
	(0.078)	(0.080)	(0.140)	(0.111)
Growth	-0.018	-0.021	-0.002	-0.035
	(0.020)	(0.019)	(0.032)	(0.033)
SOE	0.350***	0.552***	0.610***	1.099***
	(0.036)	(0.183)	(0.192)	(0.377)
TobinQ	-0.043***	-0.041***	-0.060***	-0.084***
	(0.008)	(0.008)	(0.014)	(0.016)
FirmAge	-0.809**	-1.049***	-0.705	-1.052***
	(0.329)	(0.336)	(0.680)	(0.361)
Constant	8.632***	9.322***	8.472***	9.186***
	(1.020)	(1.041)	(2.089)	(1.114)
ID/Year FE	Y	Y	Y	Y
Observations	11,734	11,608	11,734	5,871
R-squared	0.685	0.684	0.686	0.693

4.5 Heterogeneity Analysis

Table 6 presents the results as follows:

Heterogeneity in Technology Attributes: For the subsample of high-tech enterprises, the coefficient of DID is significantly positive at 0.154, while it is insignificant for non-high-tech enterprises. This supports Hypothesis H5. The reason lies in those high-tech enterprises, with stronger R&D capabilities, can better integrate overseas technological resources.

Heterogeneity in Industry Competition: For the subsample of highly competitive industries, the coefficient of DID is significantly positive at 0.148, whereas it is insignificant for less competitive industries. This supports Hypothesis H6. In a highly competitive environment, enterprises need to enhance their core competitiveness through better ESG performance.

Table 6 Results of Heterogeneity Analysis

VARIABLES	High-tech Industry	Non-high-tech Industry	Low Market Competition	High Market Competition
	ESG	ESG	ESG	ESG
DID	0.154***	-0.011	0.148***	0.020
	(0.052)	(0.114)	(0.055)	(0.093)
ROA	-0.059	0.165	0.057	-0.307
	(0.118)	(0.275)	(0.138)	(0.197)
Lev	-0.217**	-0.200	-0.151	-0.262*
	(0.087)	(0.188)	(0.097)	(0.139)
Growth	-0.033	0.021	-0.030	-0.022
	(0.020)	(0.049)	(0.021)	(0.037)
SOE	0.835***	0.201***	0.497***	0.833***
	(0.018)	(0.052)	(0.023)	(0.034)
TobinQ	-0.028***	-0.079***	-0.034***	-0.058***

	(0.008)	(0.017)	(0.009)	(0.014)
FirmAge	-1.121***	-0.251	-0.607	-1.649***
	(0.371)	(0.747)	(0.419)	(0.635)
Constant	9.459***	6.927***	7.966***	11.105***
	(1.146)	(2.339)	(1.293)	(1.976)
ID/Year FE	Y	Y	Y	Y
Observations	9,286	2,404	7,400	4,038
R-squared	0.683	0.694	0.689	0.711

4.6 Mechanism Tests

4.6.1 Mediating Effects

Table 7 presents the results as follows:

Mediating Role of R&D Investment: In Model (3), the coefficient of DID is significantly positive at 0.125. In Model (4), the coefficient of R&D Investment (Invest) is significantly positive at 0.084, and the absolute value of the DID coefficient decreases. These findings indicate that R&D investment plays a partial mediating role, thereby supporting Hypothesis H2.

Mediating Role of Green Innovation: In Model (5), the coefficient of DID is significantly positive at 0.017. In Model (6), the coefficient of Green Innovation (Green patent) is significantly positive at 1.062, and the absolute value of the DID coefficient decreases. These findings indicate that green innovation plays a partial mediating role, thereby supporting Hypothesis H3.

4.6.2 Moderating Effects

Model (2) in Table 7 shows that the coefficient of the interaction term DID×ICQ is significantly positive at 0.412. This indicates that internal control quality plays a positive moderating role, supporting Hypothesis H4. High-quality internal control can improve M&A integration efficiency and strengthen the positive impact of cross-border M&As.

Table 7 Test Results of Mediating and Moderating Effects

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	ESG	ESG	Invest	ESG	Green_patent	ESG
DID	0.141***	0.134***	0.125***	0.113**	0.017**	0.105**
	(0.052)	(0.052)	(0.045)	(0.047)	(0.007)	(0.046)
ICQ	-0.177***	-0.209***				
	(0.049)	(0.050)				
DID*ICQ		0.412**				
		(0.209)				
Invest				0.084***		
				(0.018)		
Green_patent						1.062***
						(0.181)
ROA	-0.151	-0.148	0.232*	-0.079	-0.023**	-0.027
	(0.116)	(0.116)	(0.134)	(0.109)	(0.010)	(0.107)
Lev	-0.166*	-0.167**	0.549***	-0.269***	0.003	-0.217***
	(0.085)	(0.085)	(0.110)	(0.080)	(0.008)	(0.078)
Growth	-0.040*	-0.040*	0.151***	-0.033*	-0.002	-0.018
	(0.021)	(0.020)	(0.021)	(0.019)	(0.002)	(0.019)
SOE	0.334***	0.329***	0.201	0.534***	0.014	0.538***
	(0.024)	(0.024)	(0.252)	(0.205)	(0.020)	(0.163)
TobinQ	-0.031***	-0.031***	-0.044***	-0.034***	-0.004***	-0.036***

	(0.008)	(0.008)	(0.008)	(0.008)	(0.001)	(0.008)
FirmAge	-0.713**	-0.704**	0.383	-1.018***	-0.049	-0.919***
	(0.327)	(0.327)	(0.314)	(0.334)	(0.035)	(0.330)
Constant	8.302***	8.276***	17.029***	7.703***	0.231**	8.832***
	(1.011)	(1.011)	(0.972)	(1.081)	(0.108)	(1.022)
ID/Year FE	Y	Y	Y	Y	Y	Y
Observations	9,625	9,625	11,588	11,588	11,734	11,734
R-squared	0.700	0.701	0.922	0.678	0.932	0.686

V. Conclusions and Policy Implications

5.1 Conclusions

Based on a sample of Chinese A-share manufacturing listed firms from 2018 to 2023, this paper draws the following core conclusions:

1.Main Effect: Cross-border M&As have a significantly positive impact on the ESG performance of manufacturing enterprises. This finding remains robust after a series of robustness checks.

2.Mediating Mechanisms: Both R&D investment and green innovation play partial mediating roles. Cross-border M&As facilitate technology spillovers, prompting firms to increase R&D investment and enhance green innovation capabilities, thereby improving their ESG performance.

3.Moderating Effect: The quality of internal control exerts a positive moderating effect. High-quality internal controls can strengthen the positive impact of cross-border M&As on ESG performance.

4.Heterogeneity: The promoting effect of cross-border M&As on ESG performance is more pronounced in high-tech enterprises and firms in highly competitive industries.

5.2 Policy Implications

5.2.1 Firm-Level Implications

1.Conduct High-Quality Cross-Border M&As: Firms should focus on integrating green technology and ESG governance resources and strengthen the post-acquisition absorption and assimilation of acquired technologies.

2.Scale Up R&D and Green Innovation: Increase investments in R&D and green innovation, promote the industrial application of green technologies, and incorporate ESG indicators into performance evaluation systems.

3.Improve Internal Control Systems: Establish specialized ESG governance departments to enhance the efficiency of M&A integration.

4.Formulate Differentiated ESG Strategies: High-tech enterprises should leverage their technological advantages, while firms in highly competitive industries should enhance their initiative in ESG governance.

5.2.2 Government-Level Implications

1.Optimize Supporting Policies for Cross-Border M&As: Simplify approval procedures for green technology-related M&As and provide dedicated financial support.

2.Strengthen ESG Information Disclosure and Regulation: Improve the ESG rating system and guide firms to attach importance to ESG governance.

3.Intensify Policy Support for R&D and Green Innovation: Enhance firms' green innovation capabilities through tax incentives, R&D subsidies, and the construction of industry-university-research cooperation platforms.

4.Implement Targeted Guidance Policies: Develop specific support measures for enterprises with different technological attributes and levels of industry competition.

5.3 Research Limitations and Future Outlook

This study has several limitations. First, the sample is limited to manufacturing enterprises. Second, ESG performance is measured using aggregate rating data, without considering the impact of the location and scale of cross-border M&As.

Future research can be extended in the following directions: First, expand the sample to multiple industries. Second, construct disaggregated ESG dimension indicators. Third, analyze the moderating role of the institutional environment of host countries and the type of M&As. Fourth, combine case studies to explore the specific pathways for improving ESG performance.

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