

The Impact of Cross-Border Mergers and Acquisitions on Corporate Innovation Performance: Evidence from Chinese A-Share Listed Firms

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Abstract: *Cross-border mergers and acquisitions (M&As) have become an important strategy for firms to acquire external knowledge resources and enhance innovation capabilities. Using a sample of Chinese A-share listed firms involved in cross-border M&As from 2010 to 2024, this study employs propensity score matching (PSM) to examine the relationship between cross-border M&As and firm innovation performance, as well as its underlying mechanism. The results show that cross-border M&As significantly improve firm innovation performance, with stronger effects observed among firms located in central and western regions, state-owned enterprises, large firms, and mature firms. Further analysis reveals that R&D intensity partially mediates the relationship between cross-border M&As and innovation performance, suggesting that cross-border M&As promote innovation by enhancing firms' R&D investment. This study contributes to the literature on cross-border M&As and innovation by providing empirical evidence from an emerging market context and offering insights into how firms leverage internationalization strategies to improve innovation outcomes.*

Keywords: *cross-border mergers and acquisitions, firm innovation performance, propensity score matching, R&D intensity, heterogeneity analysis*

1. Introduction

With increasing globalization and technological competition, innovation capability has become a key determinant of firms' international competitiveness. As an important form of foreign direct investment, cross-border mergers and acquisitions (M&As) have evolved beyond capital expansion into a strategic approach for firms to access advanced technologies, acquire external knowledge, and enhance innovation capabilities. Compared with greenfield investment, cross-border M&As allow firms to rapidly obtain existing technological resources, such as patents, R&D capabilities, and tacit knowledge, thereby facilitating knowledge integration and technological upgrading.

Following China's "Going Global" strategy, Chinese firms have increasingly pursued cross-border M&As, with their motivations shifting from resource acquisition toward technology seeking ^[1]. However, whether cross-border M&As can effectively promote innovation remains debated. While prior studies highlight the positive role of knowledge acquisition and capability enhancement, others emphasize the potential constraints arising from integration costs, insufficient absorptive capacity, and organizational challenges.

Therefore, this study examines cross-border M&A activities of Chinese A-share listed firms from 2010 to 2024. Using propensity score matching (PSM) and regression analysis, this study investigates the impact of cross-border M&As on innovation performance, explores the mediating role of R&D intensity, and analyzes heterogeneous effects across firm characteristics. The findings provide empirical evidence on how emerging market firms leverage cross-border M&As to enhance innovation.

2. Literature Review

Cross-border M&As have become an important strategy for firms to acquire external knowledge, access global strategic resources, and enhance innovation capabilities. Existing studies, based on perspectives such as dynamic capabilities theory, the resource-based view, and institutional theory, have examined the relationship between cross-border M&As and firm innovation performance, highlighting

the complexity of their effects and underlying mechanisms.

2.1. Cross-Border M&A and Firm Innovation Performance

Existing literature generally suggests that cross-border M&As can enhance firm innovation performance by facilitating knowledge acquisition, resource integration, and capability development. In the context of emerging economies, cross-border M&As provide firms with opportunities to obtain overseas technologies and knowledge resources through reverse technology spillovers. Yang et al. (2024) ^[2], using data from Chinese listed firms between 2008 and 2020, found that cross-border M&As significantly improve innovation output by strengthening firms' dynamic capabilities. Particularly in high-tech industries, cross-border M&As can stimulate innovation potential by enabling firms to overcome technological constraints (Yang and Ai, 2021) ^[3]. Moreover, technology-oriented cross-border M&As and their interaction with corporate social responsibility practices have been shown to further enhance innovation performance (Li and Wu, 2022) ^[4].

However, the innovation effects of cross-border M&As remain inconclusive. Yin and Tian (2023) ^[5] argue that when firms lack sufficient learning capabilities to absorb acquired knowledge, cross-border M&As may increase integration costs and hinder innovation, resulting in a "double-edged sword" effect. In addition, excessive M&A activities may weaken innovation performance due to financial constraints and organizational integration pressures, suggesting that the relationship between M&As and innovation may vary across firms.

2.2. Mechanisms Linking Cross-Border M&A to Innovation Performance

Prior studies have identified several mechanisms through which cross-border M&As influence innovation. First, dynamic capabilities and absorptive capacity play critical roles in transforming external knowledge into innovation outcomes. Through cross-border M&As, firms can restructure their resource base and improve their ability to acquire and utilize external technologies. Zhang et al. (2024) ^[6] further demonstrate that technological differences between acquirers and targets influence the effectiveness of knowledge integration and innovation outcomes.

Second, institutional conditions may affect the realization of innovation benefits from cross-border M&As. Chen et al. (2022) ^[7] find that host-country institutional environments influence post-M&A CSR activities and innovation performance, highlighting the importance of institutional factors in knowledge transformation. Furthermore, Su (2024) ^[8] suggests that the value creation of cross-border M&As depends heavily on firms' absorptive capacity and corporate governance capabilities.

2.3. Research Gaps and Contributions

Although existing studies have provided valuable insights into the relationship between cross-border M&As and innovation performance, several issues remain unresolved. First, the innovation effects of cross-border M&As in emerging markets, particularly under China's unique institutional and industrial context, require further empirical examination. Second, while previous studies emphasize the importance of dynamic capabilities and absorptive capacity, the specific pathways through which cross-border M&As promote innovation remain insufficiently explored. In particular, the role of R&D investment as a potential mechanism requires further investigation. Third, existing research provides limited evidence regarding the heterogeneous effects of cross-border M&As across different types of firms.

To address these gaps, this study examines cross-border M&A events among Chinese A-share listed firms from 2010 to 2024. Using PSM and regression analysis, this study investigates the impact of cross-border M&As on firm innovation performance, explores the mediating role of R&D intensity, and further analyzes heterogeneous effects across different firm characteristics.

3. Theoretical Background and Hypotheses Development

3.1. Cross-Border M&A and Firm Innovation Performance

According to the Resource-Based View (RBV), firms achieve sustainable competitive advantages by acquiring and utilizing valuable, rare, and difficult-to-imitate resources. Compared with internal R&D activities, cross-border M&As provide firms with a more efficient pathway to access external

technological resources, including advanced knowledge, patents, and R&D capabilities. Through the integration of acquired resources, firms can overcome internal resource constraints and enhance their innovation capabilities.

The Knowledge-Based View further emphasizes that knowledge acquisition, integration, and recombination are fundamental processes underlying corporate innovation. Cross-border M&As enable firms to expand their knowledge boundaries by accessing heterogeneous technological resources and managerial expertise from foreign markets. Such knowledge integration can stimulate technological upgrading and improve innovation outcomes.

Existing empirical studies provide evidence supporting this theoretical argument. Cross-border M&As facilitate technology acquisition and resource integration, thereby enhancing firms' innovation performance (Stiebale, 2016; Nocke and Yeaple, 2007) ^{[9][10]}. In the context of Chinese firms, cross-border M&As have been found to promote innovation by improving R&D efficiency and facilitating knowledge spillovers (Zhang Wenfei, 2020) ^[11].

Therefore, cross-border M&As can serve as an important mechanism through which firms acquire external knowledge resources and enhance innovation performance. Accordingly, the following hypothesis is proposed:

H1: Cross-border M&A positively affects firm innovation performance.

3.2. The Mediating Role of R&D Investment

Although cross-border M&As provide firms with access to external technological resources, these resources cannot automatically be transformed into innovation outcomes. According to Absorptive Capacity Theory, firms need sufficient internal capabilities to identify, assimilate, and exploit external knowledge. R&D investment plays a critical role in strengthening firms' absorptive capacity and facilitating the transformation of acquired knowledge into innovation outputs.

Cross-border M&As may encourage firms to increase R&D investment by expanding technological opportunities and improving resource allocation efficiency. Through sustained R&D activities, firms can better integrate external technologies, enhance knowledge utilization, and develop new products or processes. Previous studies suggest that post-M&A integration and R&D investment are important channels through which acquired technological resources contribute to innovation performance (Zhu Zhizhi, 2016; Zhang Wei et al., 2025) ^{[12][13]}.

Therefore, this study argues that cross-border M&As promote innovation performance partly by increasing firms' R&D investment. Based on this reasoning, the following hypothesis is proposed:

H2: R&D investment mediates the relationship between cross-border M&A and firm innovation performance.

4. Methodology and Model Specification

4.1. Data Sources and Sample Selection

This study uses Chinese A-share listed firms on the Shanghai and Shenzhen stock exchanges from 2010 to 2024 as the initial sample. Cross-border M&A data are obtained from the Zephyr database, financial data are collected from the CSMAR database, and patent data are sourced from the CNRDS database. The sample is screened according to the following criteria:

(1) excluding firms with abnormal listing statuses, including ST, *ST, and PT firms; (2) excluding M&A transactions involving target firms located in tax havens; (3) excluding financial firms; (4) removing observations with missing key variables.

After screening, the final sample consists of 311 firms in the treatment group and 39,069 firms in the control group, resulting in 43,044 firm-year observations. To address potential selection bias, this study applies PSM to construct a comparable sample between firms with and without cross-border M&A activities. After matching, 6,670 observations are retained for the baseline regression analysis.

4.2. Variable Definitions

4.2.1. Dependent Variable

The dependent variable is firm innovation performance (Ln_Grant). Firm innovation is measured by the natural logarithm of annual patent grants plus one:

$$\text{Ln_Grant}_{it} = \ln(\text{Grant}_{it} + 1) \quad (1)$$

where Grant_{it} represents the number of patents granted to firm i in year t .

4.2.2. Core Explanatory Variable

The core explanatory variable in this study is the cross-border M&A dummy variable (Group). If a firm engaged in a cross-border M&A during the sample period, the value is 1; otherwise, it is 0.

This variable is used to characterize whether a firm has achieved external technology acquisition and resource restructuring through cross-border M&A, and its coefficient reflects the average differential effect of cross-border M&A on a firm's innovation performance.

Based on the PSM sample, the Group variable is used to estimate the net effect difference in innovation performance between firms that engaged in cross-border M&A and those that did not.

4.2.3. Mediating Variable

The mediating variable is R&D intensity (RD_intensity). It is measured as the ratio of R&D expenditure to operating revenue:

$$\text{RD_intensity}_{it} = \frac{\text{RD_expenditure}_{it}}{\text{Revenue}_{it}} \quad (2)$$

4.2.4. Control Variables

Drawing on previous research, this study selects the following control variables: firm size (Size), measured by the natural logarithm of total assets; debt-to-asset ratio (Lev), measured by the ratio of total liabilities to total assets; return on assets (ROA), measured by the ratio of net income to total assets; Cash Flow Ratio (Cashflow), measured as the ratio of net cash flow from operating activities to total assets; Growth (Growth), measured as the revenue growth rate; and Shareholding Concentration (Top10), measured as the combined shareholding ratio of the top ten shareholders.

4.3. Model Specification

4.3.1. Propensity Score Matching Model

To reduce potential selection bias arising from firms' decisions to engage in cross-border M&A, this study employs PSM. A Logit model is first estimated to calculate the probability of participating in cross-border M&A:

$$P(\text{Group}_i = 1 | X_i) = \Phi(\alpha + \beta_1 \text{Size}_{it} + \beta_2 \text{Age}_{it} + \beta_3 \text{Lev}_{it} + \beta_4 \text{ROA}_{it} + \beta_5 \text{Cashflow}_{it} + \beta_6 \text{Growth}_{it} + \beta_7 \text{Top10}_{it} + \gamma_t) \quad (3)$$

where X_i represents the matching variables, including firm size, age, leverage, profitability, cash flow, growth, and ownership concentration. Year fixed effects are included. This study applies one-to-one nearest-neighbor matching with a caliper of 0.05.

4.3.2. Benchmark Regression Model

Based on the matched sample, the following regression model is constructed to examine the relationship between cross-border M&A and firm innovation performance:

$$\text{Ln_Grant}_{it} = \alpha + \beta \text{Group}_i + \gamma X_{it} + \lambda_{\text{ind}} + \mu_t + \varepsilon_{it} \quad (4)$$

where Group represents cross-border M&A status, X_{it} denotes control variables, λ_{ind} and μ_t represent industry and year fixed effects, respectively. The coefficient β captures the association between cross-border M&A and firm innovation performance.

4.3.3. Mediation Effect Model

To examine whether R&D intensity serves as a transmission mechanism, this study adopts the three-step mediation approach proposed by Wen Zhonglin et al. (2004) [14]:

$$\text{Ln_Grant}_{it} = \alpha_1 + \beta_1 \text{Group}_i + \gamma_1 X_{it} + \lambda_{\text{ind}} + \mu_t + \varepsilon_{it} \quad (5)$$

$$\text{RD_intensity}_{it} = \alpha_2 + \beta_2 \text{Group}_i + \gamma_2 X_{it} + \lambda_{\text{ind}} + \mu_t + \varepsilon_{it} \quad (6)$$

$$\text{Ln_Grant}_{it} = \alpha_3 + \beta_3 \text{Group}_i + \delta \text{RD_intensity}_{it} + \gamma_3 X_{it} + \lambda_{\text{ind}} + \mu_t + \varepsilon_{it} \quad (7)$$

5. Empirical Analysis

5.1. PSM Matching and Balance Tests

To address potential selection bias arising from firms' decisions to engage in cross-border M&A, this study applies PSM based on a Logit model. Following previous studies, Size, Age, Lev, ROA, Cashflow, Growth, and Top10 are included as matching covariates, with year fixed effects controlled. A one-to-one nearest-neighbor matching method with a caliper of 0.05 is employed to construct a comparable sample.

The Logit regression results are presented in Table 1. Age, Size, and Top10 significantly affect firms' cross-border M&A participation decisions, indicating that firm characteristics influence the likelihood of conducting cross-border M&A.

Table 1: Logit Regression Results for Cross-border M&A Participation

Variable	Coefficient	Robust Standard Error	z-value
Size	-0.212***	(0.061)	-3.45
Age	-0.969***	(0.209)	-4.65
Top10	1.669***	(0.430)	3.88
Lev	0.342	(0.403)	0.85
ROA	2.001	(1.230)	1.63
Cashflow	-0.473	(1.054)	-0.45
Growth	0.082	(0.178)	0.46
Constant	2.729**	(1.317)	2.07

*Notes: Robust standard errors are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

The balance test results after matching are reported in Table 2. The standardized biases of all covariates are substantially reduced after matching, and none of the differences between the treatment and control groups are statistically significant ($p > 0.1$). These results suggest that PSM effectively improves sample comparability and provides a reliable basis for subsequent regression analysis.

Table 2: Balance Test Results after Propensity Score Matching

Variable	Treatment Group Mean	Control Group Mean	Standardized Bias (%)	t-value	p-value
Size	21.884	21.808	6.5	0.84	0.401
Age	2.812	2.836	-6.5	-0.78	0.436
Top10	0.352	0.357	-3.0	-0.38	0.701
Lev	0.059	0.060	-1.6	-0.22	0.824
ROA	0.053	0.058	-6.9	-0.85	0.396
Cashflow	0.199	0.204	-1.5	-0.17	0.964
Growth	0.626	0.629	-2.4	-0.30	0.765

Notes: Standardized bias (%) measures the difference in covariate distributions between the treatment and control groups after matching.

5.2. Baseline Regression Results

The baseline regression results are reported in Table 3. After controlling for firm characteristics and including industry and year fixed effects, the coefficient of the core explanatory variable (Group) is 0.158 and statistically significant at the 1% level. This indicates that firms engaging in cross-border M&A exhibit higher innovation performance compared with firms without cross-border M&A activities.

After applying propensity score matching to reduce potential selection bias, the positive association

between cross-border M&A and firm innovation performance remains significant, providing support for Hypothesis H1. This finding suggests that cross-border M&A may facilitate firms' innovation activities by enabling access to external technological resources and knowledge integration.

Regarding control variables, Size, Lev, and ROA show significantly positive relationships with innovation performance. Growth is negatively associated with innovation performance, while Top10 has a weakly positive association.

Table 3: Baseline Regression Results

Variable	(1)Ln Grant
Group	0.158*** (0.035)
Size	0.197*** (0.020)
Lev	0.350*** (0.112)
ROA	1.877*** (0.357)
Cashflow	-0.317 (0.306)
Growth	-0.155*** (0.045)
Top10	0.162* (0.121)
Industry FE	Yes
Year FE	Yes
Constant	-3.059*** (0.419)
R2	0.202
N	6 599

*Notes: Robust standard errors are reported in parentheses. ***, *, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

5.3. Heterogeneity Analysis

To further examine whether the innovation effects of cross-border M&A vary across different types of firms, this study conducts heterogeneity analyses based on region, ownership structure, firm size, and firm age. The results are reported in Table 4.

The results show significant regional heterogeneity. Cross-border M&A has a positive association with innovation performance among firms in central and western regions (0.242, $p < 0.01$), while the effect is insignificant for firms in eastern regions. This may be because firms in less-developed regions have greater potential for technological catch-up through external knowledge acquisition.

Regarding ownership structure, the effect is significant for state-owned enterprises (0.338, $p < 0.01$), but insignificant for non-state-owned enterprises. This difference may be related to state-owned enterprises' advantages in accessing policy support and resources.

Furthermore, cross-border M&A is positively associated with innovation performance among large firms and mature firms (0.189, $p < 0.01$) and mature firms (0.147, $p < 0.01$), but not among small and young firms. These findings suggest that firms with stronger resource foundations and organizational capabilities are more capable of transforming external technological resources into innovation outcomes.

Table 4: Heterogeneity Analysis Results

Variable	DT							
	Region		Ownership		Firm size		Firm age	
	Eastern	Central and Western	State-owned	Non-state-owned	Large firms	Small firms	Mature firms	Young firms
Group	0.075 (1.62)	0.242*** (2.81)	0.338*** (4.13)	0.017 (0.36)	0.189*** (3.14)	0.023 (0.43)	0.147*** (2.75)	0.047 (0.76)
N	4 937	1 733	2 185	4 485	3 335	3 335	3 560	3 110
R2	0.200	0.217	0.316	0.132	0.243	0.155	0.205	0.220

*Notes: Robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

5.4. Mechanism Testing

To examine whether R&D intensity serves as a transmission mechanism between cross-border M&A and firm innovation performance, this study applies the three-step mediation approach proposed by Wen Zhonglin et al. (2004) ^[14]. The results are presented in Table 5.

The results show that cross-border M&A has a significant positive effect on innovation performance (Column 1). In Column 2, the coefficient of Group is significantly positive at the 1% level, indicating that cross-border M&A significantly increases firms' R&D intensity. After including R&D intensity in the innovation model (Column 3), R&D intensity has a significant positive association with innovation performance, while the coefficient of Group decreases but remains significant.

These results suggest that R&D intensity partially mediates the relationship between cross-border M&A and firm innovation performance, supporting Hypothesis H2.

Table 5: Mediation Effect of R&D Intensity

Variable	(1) Ln Grant	(2) RD intensity	(3) Ln Grant
Group	0.147*** (3.93)	0.005*** (4.29)	0.116*** (3.18)
RD intensity			6.669* (11.42)
Control Variables	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
N	6 009	5 993	6 009
R2	0.145	0.246	0.200

*Notes: Robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

5.5. Robustness Tests

To assess the robustness of the baseline findings, this study conducts two additional tests. The results are reported in Table 6.

First, the baseline PSM approach is replaced with caliper matching (caliper = 0.01). The coefficient of Group remains significantly positive at the 5% level, with the same direction as the baseline results, suggesting that the findings are not sensitive to the matching method.

Second, the dependent variable is replaced with a text-based digital innovation indicator derived from MD&A disclosures (Ln Digital). The coefficient of Group remains positive and statistically significant, indicating that the relationship between cross-border M&A and innovation performance is robust to alternative measures of innovation.

Overall, the robustness tests confirm the reliability of the main findings.

Table 6: Robustness Tests

Variable	(1) Caliper Matching	(2) Alternative Innovation Measure
Group	0.175** (0.039)	0.060** (0.027)
Control Variables	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
N	5 877	6 600
R2	0.196	0.200

*Notes: Robust standard errors are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

6. Conclusions and Recommendations

6.1. Conclusions

Using Chinese A-share listed firms from 2010 to 2024, this study examines the relationship between cross-border M&A and firm innovation performance through PSM and regression analyses. The findings are summarized as follows.

First, cross-border M&A is positively associated with firm innovation performance. This relationship remains robust after alternative matching methods and innovation measures are applied.

Second, R&D intensity partially mediates the relationship between cross-border M&A and innovation performance, suggesting that cross-border M&A promotes innovation by enhancing firms' R&D capabilities and knowledge transformation.

Third, the innovation benefits of cross-border M&A vary across firms. The positive association is stronger among firms in central and western regions, state-owned enterprises, large firms, and mature firms, indicating that firms' resource conditions and organizational capabilities affect the realization of innovation outcomes.

6.2. Implications

This study suggests that policymakers should facilitate firms' cross-border investment and access to global technological resources. Firms should also strengthen post-M&A integration and R&D capabilities to better transform acquired knowledge into innovation outcomes. In addition, differentiated support should be provided for firms with weaker resource bases to enhance their internationalization and technological absorption capabilities.

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