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Impact of RMB Exchange Rate Fluctuations on the Performance of Cross-Border Mergers and Acquisitions of High-Tech Enterprises: A Moderated Mediation Model Based on Innovation Input

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Abstract: Cross-border mergers and acquisitions (M&A) serve as a crucial pathway for the international development of high-tech enterprises. However, currency exchange and foreign exchange transactions are frequent occurrences during cross-border M&A processes, making exchange rate fluctuations significantly influential on the success rate and performance of such endeavors. By analyzing the impact of exchange rate volatility on high-tech enterprises, this study introduces innovation input as a moderating mediating variable. The findings reveal that greater exchange rate fluctuations lead to poorer M&A performance. Moreover, innovation input acts as a mediating variable in the relationship between exchange rate volatility and M&A performance. The study contributes to strategic insights for the international M&A activities of enterprises.

Keywords: Exchange rate fluctuation, high-tech enterprises, M&A performance, innovation input, moderated mediation model

1. Introduction

Since the onset of economic globalization and technological modernization following China's reform and opening up, companies have encountered increased competition pressures, prompting frequent domestic M&A activities. Among the traditional eight high-tech enterprises, the electronics, information, and new materials industries dominate the sector. The technology-intensive high-tech industry plays a significant role in the economic development of developing countries. Mergers and reorganizations between enterprises are essential for resource allocation, industrial structure adjustments, expanded production, and enhanced technological capabilities.

Cross-border M&A serves as a vital approach for the international development of high-tech enterprises. The enactment and implementation of national strategies such as China's "going global" and the "Belt and Road Initiative" have created a conducive environment and favorable conditions for the cross-border M&A activities of Chinese high-tech enterprises.

Impact of exchange rate fluctuations on M&A: With the strengthening of China's trade liberalization and gradual reduction of government interventions in the foreign exchange market, the formation and management mechanisms of the RMB exchange rate have increasingly leaned toward

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marketization, leading to an expansion of the fluctuation range. As a result, the bi-directional fluctuation of the RMB will likely become a norm in the future. During cross-border M&A, businesses frequently engage in currency exchange and foreign exchange transactions, making exchange rate fluctuations significantly impactful on the success rate and performance of M&A. The technical synergy that enterprises can gain during M&A can result in economies of scale along with technical innovation.

This study considers innovation input as a measure of technology and examines its mediating effect on the relationship between RMB exchange rate fluctuations and cross-border M&A performance. The significance of this research lies in both theoretical and practical domains. Theoretical significance lies in the incorporation of theories such as the currency crisis theory, synergy theory, and undervaluation theory as the theoretical foundation of this study.

Regarding the currency crisis theory, countries implementing fixed exchange rate systems may have to adjust to floating exchange rate systems under passive circumstances, which can significantly affect macroeconomics and individual enterprises. Guided by this theory, this study analyzes the impact of RMB exchange rate fluctuations on enterprise M&A performance to resolve currency crisis issues during M&A activities.

The synergy theory, introduced by Ansoff in the 1960s, posits that enterprises, post-merger, can achieve a "1+1>2" goal in terms of performance through integration over a period, meaning the overall benefits after the merger surpass the anticipated benefits of the two individual companies before the merger [1]. Efficiency theory includes operational synergy, managerial synergy, and financial synergy effects [1]. In light of this theory, this study examines the situation of enterprises' M&A activities under exchange rate fluctuations, where the nature of M&A activities and the strategic background may lead to some friction, further affecting the M&A performance of enterprises under the broader context of exchange rate fluctuations.

Hence, based on the undervaluation theory, when the market value of the target company fails to reflect its true or potential value due to certain reasons, other companies may opt for acquisition. Therefore, in the scenario of rapid technological changes and unstable market sales conditions and stock prices, M&A activities are expected to be frequent. This study analyzes the post-M&A performance of enterprises and, guided by this theory, provides empirical cases for related theories.

The practical significance of this study primarily manifests in three aspects. Firstly, for governmental institutions, this study, based on cross-border M&A events of high-tech enterprises, examines the relationship between exchange rate fluctuations and pre- and post-M&A performance. This research is of practical significance for relevant government agencies to guide high-tech enterprises toward efficient cross-border M&A and to promote China's high-tech enterprises' international trade and economic activities. Secondly, for enterprises, the ultimate purpose of cross-border M&A activities is to create wealth effects for shareholders and increase enterprise value. With bi-directional fluctuations becoming the norm in exchange rates, exchange rate fluctuations can lead to exchange rate risks, causing uncertainties in the returns of multinational corporations and impacting their values. This study takes the completion of cross-border M&A activities by enterprises as a time node, exploring its impact on cross-border M&A performance based on the 2019 exchange rate level and its fluctuations. This research is of practical significance for high-tech enterprises in improving cross-border M&A financing arrangements, effectively reducing the external impact of exchange rates, and enhancing cross-border M&A performance. Thirdly, for investors, in an environment where the RMB exchange rate continues to fluctuate in both directions with potentially significant fluctuations, understanding the effects of exchange rate fluctuations on different performance and stock prices of companies provides valuable insights for investors in asset allocation. Balancing assets scientifically can achieve better comprehensive returns.

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2. Literature Review

Research on the Impact of Exchange Rate Fluctuations on Cross-Border M&A Performance

Through a review of relevant literature, it is observed that most scholars believe that the more significant the exchange rate fluctuations, the more negative the impact on cross-border M&A performance. Some scholars, however, argue that exchange rate fluctuations do not significantly affect the performance of corporate M&A.

Regarding the impact of exchange rate fluctuations on the performance of cross-border mergers and acquisitions (M&A), Xie Hongjun and Jiang Dianchun in China have conducted empirical research on overseas M&A by Chinese enterprises and found no significant effect of nominal exchange rates on cross-border M&A [3]. Therefore, they were unable to explain whether exchange rate fluctuations have an incremental impact on the economic consequences of M&A.

In the research on the influence of exchange rate fluctuations on corporate innovation investment, Mahagaonkar et al. have examined the impact of real exchange rate fluctuations on the research and development (R&D) intensity in the manufacturing and service sectors. Their study focused on OECD countries [4]. They asserted that exchange rate fluctuations directly or indirectly affect the R&D intensity in both the manufacturing and service sectors. They found that fluctuations indirectly impact R&D intensity because they have a negative effect on exports. Becker's research revealed that an increase in the volatility of the euro-dollar exchange rate tends to shift R&D investment from the euro area to the UK, thereby increasing the R&D investment levels of domestic companies in the UK [4]. Sheng Bin incorporated the heterogeneity of financial structure into the analytical framework and systematically examined the relationship between exchange rate fluctuations and a country's technological innovation level [1]. The study found that exchange rate fluctuations have a significant inhibitory effect on a country's technological innovation, with a greater negative impact on developing countries than on developed ones. Liu Qiren's research, based on a study of customs data from 2008 to 2011 and the National Tax Survey Database, found that unfavorable exchange rate shocks can lead to insufficient funding for companies, resulting in a decrease in their R&D investment levels. Additionally, companies reduce their R&D investment scale when facing an anticipated increase in exchange rate volatility [5]. Meng Yuchao's study on the effects of smooth and abrupt exchange rate fluctuations suggests that the continuous component of exchange rate fluctuations leads to an increase in corporate R&D investment, while the abrupt component leads to a decrease in corporate R&D investment [4].

In the study on the impact of innovation investment on the performance of cross-border M&A, A. Goudarz and C. Francesco have categorized corporate innovation, stating that organizational innovation positively affects the export performance of companies, with technological innovation serving as an intermediary, implying that companies promote exports by maintaining technological innovation [6]. Ji Shengbao and others, when examining the influence of foreign R&D embedding on foreign direct investment, found that technological innovation significantly affects this path, and they divided technological innovation into market innovation performance and technological progress. Market innovation performance played an intermediary role, while technological progress exhibited a significant moderating effect [6]. Zhang Yuchun and others suggest that based on technological innovation factors, companies clarify their goals more precisely when engaging in cross-border M&A activities. Cross-border M&A activities become more targeted, and under the influence of technological innovation factors, companies engage in secondary M&A activities, constructing their own continuous M&A model to ensure the value of cross-border M&A activities [6]. Wang Wanqiu used multiple regression analysis to examine the relationship between the technological proximity of the main acquiring entities and innovation performance in the case of technology M&A events with listed companies as the main acquirers from 2007 to 2013. The study found that R&D investment

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plays a positively moderating role in the relationship between the technological proximity strength of the acquirer and the post-merger innovation performance [7].

In the literature review, it is evident that existing research primarily focuses on the relationships between exchange rate fluctuations, innovation investment, and M&A performance in pairs, with no studies on the relationship between all three. Regarding the impact of exchange rate fluctuations on the performance of cross-border M&A, most scholars believe that the greater the degree of exchange rate fluctuations, the more negative the impact on cross-border M&A performance. However, a minority of scholars argue that the degree of exchange rate fluctuations has no significant impact on cross-border M&A performance. In the study of the impact of exchange rate fluctuations on corporate innovation investment, the majority of scholars believe that the more severe the exchange rate fluctuations, the more significant the impact on corporate innovation investment. Thus, it is evident from the analysis of these two aspects that when a country experiences more severe exchange rate fluctuations, it tends to have a negative impact on the performance of related companies. Moreover, through further research on the relationship between innovation investment and the performance of cross-border M&A, it is mainly observed that innovation investment has a primarily positive impact on the performance of cross-border M&A.

Given the relatively limited research on the integration of exchange rate fluctuations, innovation investment, and M&A performance into a single system, this paper reorganizes the ideas and aims to study these three aspects together. Moreover, it is noted that current research on exchange rates primarily focuses on the fluctuation of exchange rates, with relatively little analysis on the impact of exchange rate fluctuations on companies. Therefore, this paper specifically investigates the relevant economic impacts of exchange rate fluctuations to provide certain policy recommendations for a country's cross-border M&A activities.

3. Theoretical Foundation and Research Hypotheses

3.1. Theoretical Foundation

3.1.1. Interest Rate Parity Theory

As one of the important influencing factors for currency internationalization, the development of capital markets often determines the pace of this process. It is essential to clarify the theoretical logic of the development of capital markets to understand the transmission path of their impact on currency internationalization. The central idea of the interest rate parity theory introduced in this section is that exchange rate fluctuations will affect currency internationalization through the transmission of interest rates.

$$F/S = (1 + i)/(1 + i*) \quad (2.1)$$

This interpretation of the relationship between exchange rates and interest rates influenced by the interest rate parity theory explains that currency fluctuations affect interest rates, thereby impacting capital markets and then transmitting to the development of currency internationalization. When a country's currency exchange rate increases, regardless of whether foreign interest rates remain stable or domestic interest rates remain stable, the domestic interest rates will increase relative to the other country's interest rates. If there are differences in interest rates between countries, investors are more inclined to invest in the higher interest rate country. However, if the loss from exchange rate differences is higher than the benefit from the interest rate differential, then capital will find it difficult to flow. This implies that exchange rate fluctuations affect the interest rates i and i* of both countries. When the currency of any country appreciates, it will lead to an increase in its interest rates, attracting more funds globally and significantly enhancing the domestic currency flow. If a country's currency

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decreases in value, the actual interest rate will also decrease, leading the global capital market to withdraw capital from that country, reducing the circulation of the domestic currency.

3.1.2. Innovation Theory

The innovation theory, initially proposed by the American-Austrian economist Joseph Schumpeter, explains the development and cycles of capitalist economies. Schumpeter defined innovation as the establishment of a new production function, involving entrepreneurs implementing a new combination of production factors. This includes: 1) introducing a new product, 2) adopting a new production method, 3) opening up new markets, 4) obtaining new supply sources for raw materials or semi-finished products, and 5) establishing new forms of enterprise organization. This paper uses this theory as a guide, incorporating innovation investment as an intermediate moderating variable for analysis and analyzing technological innovation as the subject of study, thus enriching the relevant theoretical implications.

3.2. Research Hypotheses

This study posits that a high exchange rate volatility may increase the exports of high-tech enterprises, contrary to the conventional belief that it suppresses exports. Exchange rate volatility increases the likelihood of profitability for enterprises, enhancing the value of export options. However, for multinational enterprises, fluctuating exchange rates imply greater exchange rate risks, including transaction risks, accounting risks, and economic risks. These risk factors act in opposition to the enterprise's desire for exports, thereby reducing its export volume. The magnitude of the impact of exchange rate volatility in both directions determines the final decisions of enterprises, and this impact depends on the relative degree of risk aversion of the enterprises. Based on this, this study proposes Hypothesis 1:

H1: For high-tech enterprises, the amplitude of exchange rate fluctuations has a negative impact on enterprise M&A performance.

The study further argues that high-tech enterprises themselves are a type of enterprise pursuing high-risk, high-return ventures, and innovation investment activities determine the development capabilities of such enterprises. However, due to the risk of exchange rate fluctuations in cross-border M&A activities, when the exchange rate fluctuates more severely, it affects the level of innovation investment in enterprises from different dimensions. When the domestic exchange rate depreciates, the innovation investment funds of the enterprise will be appropriately tightened, and the activities of innovation investment will become more cautious. When the domestic exchange rate appreciates, the innovation investment funds of the enterprise are relatively abundant, leading to increased innovation efforts. Therefore, the impact of exchange rate volatility on innovation investment in enterprises is evident. Based on this, this study proposes Hypotheses 2 and 3:

H2: For high-tech enterprises, there is a mediating effect of innovation investment between exchange rate fluctuations and enterprise M&A performance.

H3: For high-tech enterprises, there is a negative moderating effect of innovation investment between exchange rate fluctuations and enterprise M&A performance.

4. Empirical Research

4.1. Data Sources and Sample Selection

This study primarily selects data from Chinese high-tech enterprises from 2017 to 2021 for analysis. In terms of company selection, considering the characteristics of listed companies and sectors, this study mainly selects listed companies (1771) listed on the Growth Enterprise Market

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(GEM) and the Science and Technology Innovation Board (STAR Market) as representative companies. When selecting companies, the study mainly focuses on the types of multinational M&A enterprises for analysis. During the data compilation process, the study mainly performs the following data treatments: (1) excluding ST/PT-related companies, mainly due to the abnormal operating conditions of such companies, which may affect the compilation and analysis results; (2) excluding companies with missing financial data. Ultimately, this study obtained a total of 232 sample companies. During the data processing, Excel 2017 was used for data compilation, and STATA 16.0 was used for statistical analysis.

4.2. Variable Definitions

4.2.1. Dependent Variable: M&A Performance

Enterprise M&A performance refers to the situation where the target enterprise is integrated into the acquiring enterprise after the M&A process, realizing the original intention of the M&A and generating efficiency. Questions related to the evaluation of M&A performance include whether the M&A was successful or not, whether the M&A goals were achieved, whether the M&A played the expected synergistic effect, whether it accelerated the development process of the enterprise, and whether it promoted the effective allocation of resources. Based on different financial theoretical perspectives, various M&A performance evaluation methods have been derived, such as event study methods, factor analysis methods, non-financial indicator analysis methods, discounted cash flow methods, expert rating methods, brainstorming methods, etc. This study primarily selects the total asset net profit margin as the measure of M&A performance, with the specific formula as follows:

Total Asset Net Profit Margin = Net Profit / Average Balance of Total Assets

4.2.2. Independent Variable: Exchange Rate Fluctuations

This study evaluates the rate of change in exchange rates using the real effective exchange rate index of the Renminbi and applies logarithmic and differential treatments to the data. The real effective exchange rate is an index reflecting the comprehensive changes in the exchange rate of a currency against a basket of currencies, excluding the influence of prices, which can more accurately reflect the actual value changes of a currency. When the real effective exchange rate index of a country rises, the currency of that country appreciates, and vice versa.

4.2.3. Moderating Mediating Variable: Innovation Investment

Technological innovation refers to innovation with the purpose of creating new technologies or innovations based on scientific and technological knowledge and the resources created by it. The former includes creating a new laser technology, while the latter includes developing a new product or service based on existing laser technology. Both are combined into one. Technological innovation is an important source of enterprise competitive advantage and an important guarantee for sustainable development. Understanding the essence, characteristics, and laws of technological innovation is an important prerequisite for effective management of technological innovation. This study selects the logarithm of the amount of R&D investment as the measure of technological innovation.

4.2.4. Control Variables

This study mainly selects the total asset turnover ratio and the proportion of R&D investment to operating income as control variables, with specific variable definitions as shown in Table 1:

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Table 1: Variable Definition Table

Variable Type	Variable Name	Variable Symbol	Measurement Method
Dependent Variable	M&A Performance	ROA	Net Profit / Average Balance of Total Assets
Independent Variable	Exchange Rate Fluctuations	ERF	Logarithmic Difference of Real Effective Exchange Rate
Moderating Mediating Variable	Innovation Investment	IN	Ln (Amount of R&D Investment)
Control Variable	Total Asset Turnover Ratio	TAT	Total Sales Revenue / Average Total Assets
	Investment to Operating Income Ratio	SGR	R&D Investment / Operating Income

4.3. Model construction

To test Hypothesis 1, this study constructs the following regression models. Model

$$ROA_{it} = \beta_0 + \beta_1 ERF_{it} + \beta_i control_{it} + \varepsilon \quad (1)$$

(2)

$$\begin{cases} ROA_{it} = \beta_0 + \beta_1 ERF_{it} + \beta_2 IN_{it} + \beta_n control_{it} + \varepsilon & ① \\ ROA_{it} = \beta_0 + \beta_1 ERF_{it} + \beta_2 IN_{it} + \beta_3 IN_{it} * ERF_{it} + \beta_n control_{it} + \varepsilon & ② \end{cases}$$

(3)

$$\begin{cases} IN_{it} = \beta_0 + \beta_1 ERF_{it} + \beta_n control_{it} + \varepsilon & ① \\ ROA_{it} = \beta_0 + \beta_1 IN_{it} + \beta_n control_{it} + \varepsilon & ② \\ ROA_{it} = \beta_0 + \beta_1 ERF_{it} + \beta_2 IN_{it} + \beta_n control_{it} + \varepsilon & ③ \end{cases}$$

This paper verifies Hypothesis H1 by constructing Model (1). For H1, the main observation concerns the direction and significance of β1. A positive β1 indicates a positive impact of exchange rate fluctuations on M&A performance, and vice versa.

Regarding Hypothesis H2, the paper tests its validity through Model (2). Its moderation effect is primarily achieved through stratified regression. Firstly, in Model (2), part ① analyzes the presence of a moderation effect by observing the significance of β2 and the variation in R2 to assess the existence of the moderation effect. Upon the validation of Model ①, the paper further conducts statistical analysis on Model ② to verify the direction of the moderation effect. When the coefficient β3 of the interaction term INit*ERFit in Model ② is positive and significant, it implies that the amplitude of exchange rate fluctuations has a positive impact on M&A performance, and vice versa.

Regarding Hypothesis 3, the study first analyzes the significance of the coefficient β1 in the effect of exchange rate fluctuations on innovation investment, combined with Model ①. If β1 is not significant, it indicates that innovation investment does not have a mediating effect. If β1 is significant, the study proceeds to the next step. In the second step, Model ② analyzes the significance of the coefficient β1 in the impact of innovation investment on enterprise M&A performance. If β1 is significant, the study proceeds to the next step. Finally, by incorporating innovation investment and the amplitude of exchange rate fluctuations into the econometric model, Model ③ is constructed. If β1 is significant, it suggests that innovation investment partially mediates between exchange rate fluctuations and M&A performance. If it is not significant, it implies that innovation investment has a complete mediating effect.

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4.4. Empirical Analysis

4.4.1. Descriptive Statistics

In order to further understand the data distribution, this paper conducts descriptive statistics on the variables. The specific results are shown in Table 2.

Table 2: Descriptive Statistics Result

Variables	Obs	Mean	Std. Dev.	Min	Max
ROA	733	.011	.11	-.931	.451
ERF	733	.007	.025	-.031	.031
IN	733	18.116	1.09	12.206	21.568
TAT	733	.579	.76	.008	11.975
SGR	733	7.251	6.686	.06	59.47

According to Table 2, the mean value of M&A performance (ROA) is 0.011, with a standard deviation of 0.11. This suggests that the M&A performance of the sample companies is still relatively low and needs further improvement. Further analysis reveals that the minimum value is -0.931 and the maximum value is 0.451, indicating the existence of companies with relatively poor M&A performance. Analyzing the exchange rate fluctuation amplitude (ERF), the average value is 0.007, with a standard deviation of 0.025, suggesting that the fluctuation range of the exchange rate is relatively small and the differences are minor. Further observation of the maximum and minimum values indicates relatively minor differences, implying overall exchange rate stability. Analyzing the innovation investment (IN), the average value of this indicator is 18.116, with a standard deviation of 1.09, indicating that companies exhibit substantial intensity in research and development (R&D) investment. The maximum value is 21.568, and the minimum value is 12.206, demonstrating the presence of variations in the intensity of innovation investment among companies.

4.4.2. Correlation Analysis

In order to gain further insights into the relationships between the variables, this study conducted a correlation analysis on the variables. The specific results are shown in Table 3.

Table 3: Results of Correlation Analysis

Variables	ROA	ERF	IN	TAT	SGR
ROA	1.000				
ERF	-0.114***	1.000			
	(0.002)				
IN	0.232***	0.072*	1.000		
	(0.000)	(0.051)			
TAT	-0.055	-0.008	0.018	1.000	
	(0.140)	(0.832)	(0.619)		
SGR	-0.040	0.032	0.381***	-0.003	1.000
	(0.283)	(0.385)	(0.000)	(0.932)	

*** p<0.01, ** p<0.05, * p<0.1

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4.4.3. Regression Analysis

(1) Study on the Impact of Exchange Rate Volatility on M&A Performance

Following the correlation test of Model (1) as discussed earlier, this study confirmed the absence of multicollinearity issues within Model (1). Therefore, a regression analysis was conducted on Model (1) to further validate the correctness of Hypothesis 1. The specific regression results are presented in Table 4.

Table 4: Regression Results of the Impact of Exchange Rate Volatility on M&A Performance

Variables	Model (1)
β_0	.023***
ERF	-.493***
TAT	-.008
SGR	-.001
R^2	0.017
F	4.275***

According to Table 4, it can be observed that the impact of exchange rate volatility on the M&A performance of companies is positive, with a coefficient of -0.493, and is significant at the 1% level. Therefore, as the magnitude of exchange rate volatility increases, the negative impact on the M&A performance of companies becomes stronger. Thus, Hypothesis 1 was not confirmed. However, this also suggests that companies should cautiously select their M&A strategies when operating in an environment with significant exchange rate fluctuations.

(2) The Moderating Effect of Innovation Investment on the Relationship between Exchange Rate Volatility and M&A Performance

In order to investigate the moderating effect of innovation investment on the relationship between exchange rate volatility and M&A performance, this study conducted a regression analysis on Model (2) to further verify the correctness of Hypothesis 2. The specific regression results are presented in Table 5.

Table 5: Regression Results of the Moderating Effect of Innovation Investment

Variables	Model (2)	
	①	②
β_0	-.524***	-.486***
ERF	-.578***	-.614***
IN	.031***	.028*
ERF*IN		.157***
TAT	-.009*	-.008*
SGR	-.003***	-.002***
R^2	0.097	0.101
F	19.526***	16.249***

From Model (2) in Table 5, it is evident that the F-values for (1) and (2) are 19.526 and 16.249, respectively, both exhibiting a significant positive trend at the 1% level. At the same time, when the data sample size changes in Model (2), the R-squared and adjusted R-squared are 0.097 and 0.101, respectively. This indicates that the overall model remains significant even when the data sample size changes, thus confirming the significant features of the model. Further observation reveals an increase

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in the adjusted R-squared from (1) to (2) in Model (2), with the regression coefficients for the innovation investment IN being 0.031 and 0.028, respectively, both positively significant. Therefore, it can be preliminarily demonstrated that there exists a moderating effect of innovation investment on the relationship between exchange rate volatility and M&A performance. Continuing to observe the results in Model (2) in Table 5, it is found that the regression coefficient for the interaction term ERF*IN is 0.157 at the 1% level, demonstrating a significant positive moderating effect of innovation investment on the relationship between exchange rate volatility and M&A performance, thereby validating Hypothesis 2.

(3) The Mediating Effect of Innovation Investment on the Relationship between Exchange Rate Volatility and M&A Performance

In order to study the mediating effect of innovation investment on the relationship between exchange rate volatility and M&A performance, this paper conducted a regression analysis on Model (3) to further verify the correctness of Hypothesis 3. The specific regression results are presented in Table 6.

Table 6: Regression Results of the Mediating Effect of Innovation Investment

Variables	Model①	Model(3) Model②	Model③
	IN	ROA	ROA
β_0	17.647***	-.51***	-.524***
ERF	2.742*		-.578***
IN		.03***	.031***
TAT	.025	-.009*	-.009*
SGR	.062***	-.003***	-.003***
R-squared	0.149	0.080	0.097
F	42.415***	20.952***	19.526***

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Upon observation of Table 6, it is found that in Model (1), the coefficient of the impact of exchange rate volatility on innovation investment is significantly positively correlated at the 10% level, thus passing the first step of the mediating effect. In Model (2), the impact coefficient of the innovation investment IN on the innovation performance ROA is significantly positive at the 1% level. Moreover, in Model (3), with the inclusion of innovation investment as a mediating variable, its impact coefficient is significantly positive at the 1% level. The innovation investment coefficients in both Model (1) and Model (2) are significant, thus passing the second step of the mediating effect. In Model (3), the regression coefficient of exchange rate volatility ERF is significantly negative at the 1% level, passing the third step of the test. In summary, it can be concluded that there is a mediating effect of innovation investment on the relationship between exchange rate volatility and M&A performance, thereby validating Hypothesis 2.

5. Conclusion

This study systematically examines the relationship between exchange rate volatility and M&A performance, as well as the moderating and mediating effects of innovation investment therein. Based on empirical analysis, the following conclusions are drawn: First, there is a negative correlation between exchange rate volatility and M&A performance. As exchange rate volatility increases, the M&A performance of enterprises decreases. This finding emphasizes the importance of exchange rate stability for successful M&A, suggesting that companies should reassess their M&A strategies

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when facing significant exchange rate fluctuations. Second, innovation investment has a positive moderating effect on the relationship between exchange rate volatility and M&A performance. This implies that in the context of exchange rate fluctuations, enterprises with high innovation investment are better able to mitigate M&A risks and improve M&A performance. Third, innovation investment has a mediating effect on the relationship between exchange rate volatility and M&A performance. This means that innovation investment partly explains the relationship between exchange rate fluctuations and M&A performance, providing a new perspective for understanding the underlying mechanism of this relationship.

The research provides the following recommendations: First, from a risk management perspective, companies should establish a sound mechanism for managing exchange rate risk to mitigate the potential impact of exchange rate fluctuations on M&A performance. In M&A decision-making, a detailed assessment of exchange rate risk should be conducted, and appropriate hedging strategies should be adopted. Second, from the perspective of strengthening innovation capabilities, given the positive moderating and mediating effects of innovation investment on exchange rate volatility and M&A performance, companies should enhance their research and development capabilities to better cope with uncertainty in the market environment. Third, from a comprehensive evaluation perspective, when making M&A decisions, in addition to considering financial, market, and strategic factors, macroeconomic factors such as exchange rate fluctuations should be comprehensively taken into account to ensure the robustness of M&A decisions. Fourth, from the perspective of fostering corporate culture, companies should be encouraged to cultivate a culture that promotes innovation and encourages facing challenges, enabling employees and management to better respond to various challenges in the complex macroeconomic environment. Fifth, from a policy perspective, for the government and regulatory agencies, strengthening the regulation of the exchange rate market and providing more policy tools and guidance to help companies better cope with exchange rate risks and promote the healthy development of the M&A market.

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