

Effect of State-owned Equity on Innovation in Cross-Border Acquisitions: Evidence from Chinese Manufacturing Firms

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Abstract: State-owned equity is a crucial factor affecting the innovation performance of cross-border acquisitions. We construct a three-dimensional "country-region-industry" model to explore the relationship between state-owned equity and cross-border acquisition innovation, and investigate the moderating effects of local regional marketization and we also investigate the moderating effects of local regional marketization and industry-related factors on the relationship between the two. Based on the cross-border acquisition cases of Chinese multinational enterprises, we use empirical research analysis to investigate the combined effects of state-owned equity, local regional marketization, and industry relevance on the innovative performance of cross-border acquisition. We find an inverted U-shaped relationship between state-owned equity and cross-border acquisition innovation performance. We also find that local regional marketization and industry relevance have moderating effects on the relationship between state-owned equity and cross-border acquisition innovation performance. This study provides a new perspective on the study of cross-border acquisition performance in emerging markets. Our findings provide some compelling conclusions, which contribute to an in-depth understanding of the relationship between SOEs and innovation performance in cross-border acquisitions and provide empirical evidence for firms' innovation decisions and practices.

Keywords: Cross-Border Acquisitions; Innovation Performance; State-Owned

Equity; Regional Marketization; Industry Relevance

1. Introduction

In today's world, technology is changing rapidly, the international environment is becoming increasingly complex, and international competition among enterprises is severe. Cross-border acquisition have become an important means of achieving technological innovation in Chinese manufacturing enterprises. Some scholars have studied different perspectives on whether cross-border acquisitions by Chinese firms can achieve their expected innovation motives^[1]. Other scholars focused on the influence of environmental factors on innovation in cross-border acquisitions. Scholars emphasize that the governments of emerging market countries have an indelible influence on firm development, particularly the Chinese government. The Chinese government's influence on firm development is self-evident, especially in firms with a high share of state-owned equity. Some studies have explored differences in the strategic behavior and performance of SOEs and non-SOEs in cross-border acquisitions. Du and Boateng (2015) argue that SOEs do not operate with purely commercial interests but with a certain political purpose and may be forced to give up their profit maximization goals due to political orientations, such as government pressure to alleviate employment^[2]. However, but existing studies do not reveal the role of SOEs in the impact of Chinese firms' innovation in cross-border acquisition. On the other hand, previous studies on the impact of state-owned equity on firms, have mainly focused on the impact of firm

ownership type on firm innovation performance, lacking discussion in the context of cross-border acquisition^[3]. The first element of this study is to reveal the impact of the size of Chinese firms' SOE on the innovation performance of cross-border acquisitions. Further, the level of marketability of the home region in which the firm is located directly affects the level of appropriation of resources in the market, which, in turn, has an impact on the firm's post-merger management as well as innovation activities^[4]. Meanwhile, the greater the degree of information asymmetry in cross-border acquisition activities, the more difficult it is for firms to integrate post-merger, the higher the costs they need to invest, and the greater the risk of adverse selection. Some scholars argue that the higher the degree of industry correlation between acquisition parties, the easier it is for managers to master advanced management techniques in the same industry and acquire better management capabilities, which also facilitates the transfer of technological resources to the target party, creating synergies and economies of scale and improves post-merger innovation performance^[5]. Therefore, another major component of this study is to test the moderating effects of the level of local marketisation in the region where Chinese firms are located and the industry relevance of the acquisition parties on the innovation performance of state-owned equity and cross-border acquisition. On this basis, this paper uses cross-border acquisition transactions of Chinese manufacturing firms from 2013-2017 as a research sample to explore the effect of state equity on cross-border acquisition innovation performance, and attempts to use the local regional marketization level and industry relevance as moderating variables to verify whether the local regional marketization level and industry relevance have moderating effects on the relationship between state equity and cross-border acquisition innovation, in order to be able to provide an empirical basis and suggestions for improving firms' innovation performance and promoting their sustainable development.

2. Literature Review and Hypothesis

2.1 Innovative Performance of

State-Owned Equity and Cross-Border Acquisition

Based on the ownership advantage theory and resource base view, firms with a large share of state-owned equity are likely to gain more implicit resources and thus leverage innovation performance in cross-border acquisitions^[6]. The Chinese government has taken many proactive measures to encourage Chinese firms to go abroad and has worked to improve the legitimacy of Chinese manufacturing firms, which has strengthened the belief that Chinese firms undertake cross-border acquisition innovation. Moreover, the state's resource support puts firms with a larger share of state-owned equity in a more advantageous position to take risks in cross-border acquisitions, and they are more inclined to undertake large-scale acquisitions and acquire foreign technological resources in cross-border acquisitions. After the completion of cross-border acquisition, enterprises must establish an effective service system and channel network to build their international brand image, which requires substantial financial support. Companies with a high percentage of state-owned equity can share and utilize more resources, reduce cumbersome procedures, and effectively reduce unnecessary costs, which makes companies more confident in cross-border acquisitions, and is more conducive to rapid integration after cross-border acquisitions, and powers the subsequent innovation performance.

State-owned enterprises are in a special market position, with strong policy support and preferential treatment, and can rely on the government to directly achieve "seedling" strategic results^[7]. However, excessive government injection of subsidies can also promote corporate inertia and even trigger policy arbitrage, causing firms to develop lazy cancer, which will negatively affect their incentive to innovate in the long run. Thus, scholars of resource dependence theory and organizational inertia theory argue that excessive resource appropriation by firms will cause inertia in their routinized operations and poison their innovation drive, and that the evolution of organizational, institutional, and technological development needs to be carried out based on the basis of following the logic of efficiency.

When the proportion of state-owned equity is in the moderate region, the growth rate of resource utilization is greater than the growth rate of organizational inertia destruction, and state-owned equity can enhance acquisition innovation. When the proportion of state-owned equity exceeds a certain limit, the growth rate of organizational inertia destruction exceeds the growth rate of resource utilization. When the proportion of state-owned equity exceeds a certain limit, the growth rate of organizational inertia exceeds the growth rate of resource utilization, and an excessive proportion of state-owned equity hinders corporate innovation. Based on this, this study proposes the following:

H1: The proportion of state-owned equity has an inverted U-shaped relationship with the innovation performance of enterprises after cross-border acquisitions. The innovation performance of cross-border acquisitions increases and then decreases with an increase in the proportion of state-owned equity.

2.2 The Moderating Effect of Local Regional Marketization

The level of marketization in the local region in which the enterprise is located directly influences the level of appropriation of market resources by the enterprise. The firm's dependence on external players determines the efficiency of the allocation of market resources and thus has an impact on the firm's post-merger management as well as innovation activities^[8]. Local regional marketization is conducive to firms' capture of external resources in cross-border acquisition activities, and the higher the degree of local regional marketization, the faster the flow of production factors, and the more conducive it is to the utilization of firms' allocation of resources in the market, thus enhancing firms' cross-border acquisition innovation performance.

Innovation support tends to vary considerably across countries and between regions, as reflected by significant differences in the degree of coordination between regional governments in terms of policy support and resource funding for firms' economic activities. Similarly, the transformative nature of the Chinese economy exhibits considerable industrial variation in key institutional attributes, such as government control and

industrial policy. These differences arise in part because the Chinese government often sets industry-specific policies and provides preferential support for the development of high-tech industries. More market-oriented regions have more abundant factor resources and innovation intermediaries, and enjoy stronger protection of intellectual property rights. Simultaneously, governments try to foster innovation networks, thus reducing the risk of innovation, and cooperating with firms in advanced R&D and product development, thus creating a favorable environment for SOEs to innovate, generate R&D scale effects, and create synergies with state-owned equity for cross-border acquisition innovation. By contrast, in regions with less developed markets, the government is less efficient, and the market environment with less developed institutions constrains the role of firms as innovation agents and limits their innovation development. For example, in regions with underdeveloped markets in China, it takes much longer to resolve customs clearances and launch new businesses.

Therefore, the level of local regional marketization can enhance the overall resource-promoting effect of state-owned equity overall.

The resource facilitation effect of state-owned equity mainly comes from the fact that firms can access the key resources needed for technological innovation, which facilitates better absorption of innovative knowledge by firms. Higher regional marketization levels have richer factor resources and innovation intermediaries, which makes it easier to absorb advanced technology and management knowledge brought by foreign investors and improve technology levels. Compared to enterprises with lower local regional marketization levels, enterprises with higher marketization levels have higher overall matching factors with innovation generation. Based on this, this study proposes the following:

H2: Home region marketization has a moderating effect on the relationship between state equity and cross-border acquisition innovation performance: the inverted U-shaped relationship between state equity and cross-border acquisition innovation performance is strengthened for firms with higher levels of marketization compared to

those with lower levels of marketization.

2.3 Moderating Effect of Industry Correlation

Emerging economies often face information asymmetry challenges when conducting cross-border acquisitions and industry relevance is an important factor affecting information asymmetry. The information asymmetry problem must be solved for firms to realize the synergistic value of perusing their own resources with the resources transferred after cross-border acquisition. From the perspective of organizational capital theory, the stronger the main acquiring firms are related in the industry, the stronger the scale and synergy effects that can be generated, which facilitates the absorption of the advanced management experience of the acquired firm and reduces various costs in the production and operation process, further bringing scale to the impact of state-owned equity on post-merger performance economies^[9]. Moreover, if the acquisition is related, the acquiring firm is more familiar with the acquired firm's operating field and business, which helps compensate for the lack of legitimacy brought about by a firm's cross-border acquisition of state-owned equity, which in turn improves innovation performance. When industry relevance is low, the main acquiring firms are prone to information distortion in terms of knowledge transfer, which creates difficulties in post-merger integration, thus reducing the positive impact of SOEs on cross-border acquisitions.

Therefore, industry correlation can enhance the resource facilitation effect of SOEs as a whole. The resource facilitation effect of state-owned equity mainly comes from the fact that firms can access the key resources needed for technological innovation, which facilitates better absorption of innovative knowledge by firms. Industry-related enterprises make the information between acquisition parties more transparent, which can increase the trust between enterprises, and managers are better able to absorb the advanced management experience of merged enterprises, acquire better management capabilities, form more advanced management models, absorb and transform advanced technologies, and improve the

technology level. Therefore, industry-related cross-border acquisition of firms with state-owned equity and innovation generate higher synergies overall. Based on this, this study proposes the following:

H3: Industry relevance has a moderating effect on the relationship between state equity and innovation in cross-border acquisitions and the inverted U-shaped relationship between state equity and innovation performance in cross-border acquisitions is strengthened for firms with related acquisitions compared with non-industry-related acquisitions.

3. Methodology

3.1 Sample

In this study, we obtained cases of cross-border acquisition of Chinese listed manufacturing companies from 2013-2017 from the Wind acquisition deal database. Considering the completeness of the data, the upper limit of the data was set as 2017. In addition, government policies within a certain period may produce large fluctuations due to the economic cycle and produce large errors in the results. Therefore, the sample observation period should not be too long, and the acquisition events are set as 2013-2017 in this study. Referring to Du (2015) , the following criteria were used to exclude and screen the data^[2]: successful acquisitions during 2013-2017, with the main acquiring firm being an A-share non-ST listed enterprise; selection of acquirer enterprises within the manufacturing industry; deletion of samples with key data missing even after consulting annual reports to complete the information; deletion of the acquired party being a "tax avoidance The sample of acquisitions where the acquired party is a "tax haven" (e.g. Bermuda, Virgin Islands or Cayman Islands, etc.) was removed; the sample of companies with multiple acquisitions in the same year was screened, and the acquisition with the largest transaction size in the year was retained. Finally, we obtained 237 cross-border acquisition transactions of Chinese manufacturing companies from 2013-2017.

3.2 Variables

The dependent variable in this study is

innovation performance (PA) after cross-border acquisition. This study follows the existing literature on the measurement of innovation performance in terms of the number of patent applications. To exclude the lag of patent applications, we use the sum of patent applications three years after the acquisition as the measure.

The independent variable is state-owned equity (ST). State equity is measured as the ratio of state assets to total assets.

The moderating variables included local area marketability (MA) and industry relevance (RE). Among them, firms with a high level of home region marketization can obtain the advantage of synergistic effects on resources and are more conducive to post-merger innovation than firms with a low level of home region marketization thus home region marketization has a moderating effect on the positive effect of state equity and cross-border acquisition innovation. The local regional marketization level uses the indicator data of the latest provincial marketization index measured by five indicators, and the average of the marketization index is taken considering the stability of the marketization level. In addition, if the main acquiring firm acquires industry-related firms, that are more familiar with the business and economic areas of the subject party, post-merger integration is more effective and it is easier to achieve acquisition expectations, and industry-related cross-border acquisition is more conducive to innovation performance than cross-industry acquisition. Therefore, using industry relevance as a moderating variable, this study uses four-digit SIC numbers to assign a value of four to industry relevance if the acquiring company and the target company have exactly the same four-digit Standard Industrial Classification (SIC) code for their core business, three if they have the same first three digits only, two if they have the same first two digits only, one if they have the same first digit only, and to one; and zero if the four digits are completely different.

In this study, we control for several aspects of controlling variables in conjunction with the existing literature. The main variables included were as follows: (1) Institutional distance (IN), which is calculated using data from the WGI database for six indicators of the Index of Economic Freedom (government

responsibility and citizens' voice, political stability and absence of violent conflict, corruption control, legal institutions, government effectiveness, and quality of control), the formula is borrowed from that used in Shin et al (2017) the measurement of cultural distance. The formula is: where refers to the total institutional distance between China and country j ; refers to the score of China in the n th institutional dimension; refers to the score of country j in the n th institutional dimension; refers to the variance of the scores of all countries in the sample in the n th institutional dimension. (2) Host country development level (GDP), expressed as GDP per capita. (3) Host country risk (RI) using the International Country Risk Guide (ICRG) risk index for each country in the year prior to cross-border acquisition. This index reflects each country's economic, political, and financial risk profiles. (4) The leverage level (LE) measures financial leverage using the balance sheet ratio of the firm in the year prior to the acquisition. (5) Research and development investment (RD), calculated by Ahuja and Katila, using the average ratio of R&D expenditure to operating revenue of enterprises in the three years after the acquisition. The data on enterprise R&D investment were obtained from the Wind database and supplemented and corrected with the Guotaian database and annual reports of enterprises. (6) Internationalization experience (EX) is measured using the ratio of overseas operating revenue to the total operating revenue of firms in the year prior to acquisition.

4. Analysis and Results

4.1 Regression Analysis

This paper uses stata16.0 to test the hypothetical model of the negative binomial regression proposed earlier and analyzes the results. The model first tests the direct effect of state-owned equity on innovation performance, followed by the inclusion of regional marketization and industry relevance variables, respectively, to explore the moderating effect between this variable and innovation performance, and the estimated results are shown in Table 1.

Table 1 presents the empirical results of the negative binomial regressions. Model 1 is the

base regression including only the controlling variables and the main independent variables, Model 2 introduces the inclusion of regional marketization to adjust for state equity, Model 3 introduces the inclusion of regional

marketization to adjust for the square of state equity, Model 4 adds industry correlation to adjust for state equity, and Model 5 introduces the inclusion of industry correlation to adjust for the squared term of state equity.

Table 1. Regression Results

	Model 1	Model 2	Model 3	Model 4	Model 5
	PA	PA	PA	PA	PA
IN	-0.0074 (0.0332)	-0.0143 (0.0333)	-0.0142 (0.0328)	0.0050 (0.0296)	0.0048 (0.0295)
RI	-0.0451*** (0.0099)	-0.0398*** (0.0098)	-0.0368*** (0.0097)	-0.0333*** (0.0086)	-0.0331*** (0.0086)
GDP	0.5166*** (0.1227)	0.4763*** (0.1215)	0.4706*** (0.1186)	0.3858*** (0.1114)	0.3811*** (0.1114)
LE	0.8136* (0.4307)	0.8891** (0.4321)	0.9716** (0.4296)	0.4382 (0.3777)	0.4439 (0.3789)
RD	-0.0513** (0.0219)	-0.0507** (0.0202)	-0.0432** (0.0204)	-0.0435** (0.0170)	-0.0404** (0.0181)
EX	0.7195* (0.3757)	0.4234 (0.3750)	0.4155 (0.3665)	0.7926** (0.3080)	0.8019*** (0.3082)
ST	5.7132*** (0.7075)	3.4575* (1.9412)	2.7465* (0.8449)	4.9355*** (0.5021)	4.5090*** (1.0047)
ST ²	-1.5363*** (0.2328)	-1.4730*** (0.2192)	-1.2108** (0.3242)	-2.1452*** (0.2936)	-1.8489*** (0.6807)
MA		0.1839*** (0.0687)	0.1342* (0.0724)		
MA*ST		0.2408 (0.2095)	0.9834*** (0.3437)		
MA*ST ²			-0.3199** (0.1328)		
RE				1.0821*** (0.1662)	1.0529*** (0.1765)
RE*ST				2.6685*** (0.6105)	3.3031** (1.4526)
RE*ST ²					-0.3638 (0.7551)
_cons	5.6570*** (0.9485)	3.8211*** (1.1772)	3.9452*** (1.1724)	4.5050*** (0.7865)	4.4964*** (0.7855)
/lnalpha	0.4919*** (0.0810)	0.4574*** (0.0814)	0.4408*** (0.0815)	0.2121** (0.0841)	0.2113** (0.0841)
Obs.	237	237	237	237	237
LR test of alpha=0(p-value)	0.0000	0.0000	0.0000	0.0000	0.0000
Log-likelihood	-1325.3775	-1320.1284	-1317.5962	-1283.9813	-1283.8658
LR chi2	182.95	193.45	198.51	265.74	265.97
Pseudo R2	0.0646	0.0683	0.0701	0.0938	0.0939
Regression p-value	0.0000	0.0000	0.0000	0.0000	0.0000

Note: * indicates significant correlation at the 0.1 level; ** indicates significant correlation at the 0.05 level; *** indicates significant correlation at the 0.01 level

Next, this paper draws on the Hanns et al. (2016) proposed a three-step approach to test the inverted U-shaped curve relationship to test the hypotheses of this paper^[10]: (i) the estimated coefficients of the primary term regression of the independent variable are significantly positive and the estimated coefficients of the quadratic term regression

are significantly negative; (ii) the slopes of the two endpoints of the curve are significantly steeper, i.e., the slope of the curve is negative when the independent variable takes the minimum value and positive when the independent variable takes the maximum value; (iii) the inflection point lies within the range of values of the independent

variable. From the results of the analyses, it can be found that state-owned equity has a significant inverted U-shaped effect on cross-border acquisition innovation and hypothesis H1 is tested, as shown in Figure 1.

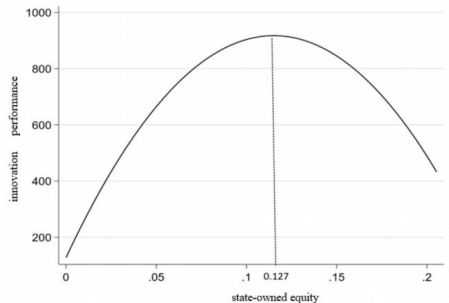


Figure 1. Main Regression Effect

In Model 3, the coefficient of the product of the level of local marketization and state equity is positive and significant at the 10% level ($p < 0.1$), while the coefficient of the product of the square of the level of local regional marketization and state equity is negative, and the paper continues to explain the moderating effect of local regional marketization on the inverted U-shaped relationship between state equity and cross-border acquisition innovation performance through mathematical analysis. This study refers to the analytical paradigm of the moderating effect on the U-shaped relationship proposed by Hanns et al. (2016)^[10].

Following Model 3, we plot the different curves of state equity on the innovation performance of cross-border acquisitions when the home region market is low and when home region marketization is high. As shown in Figure 2, we can initially see that the inverted U-shaped curve of state equity and innovation performance is flatter when the local area marketization is low, and the inverted U-shaped curve of state equity and innovation performance is steeper and the inflection point shifts to the left when the local area marketization is high, indicating that the level of local area marketization can strengthen the influence of state equity on acquisition innovation. Hypothesis H2 holds. The different curves of state equity on the innovation performance of cross-border acquisition when industry relevance is low and when industry relevance is high are plotted according to model 5, as shown in Figure 3, which shows that when industry relevance is low, the inverted U-shaped curve

of state equity and innovation performance is flatter when industry relevance is low, and when industry relevance is high. The inverted U-shaped curve of SOE and innovation performance is steeper when industry correlation is high and the inflection point is shifted to the left, indicating that industry correlation can strengthen the influence of SOE on innovation in cross-border acquisitions, and hypothesis H3 holds.

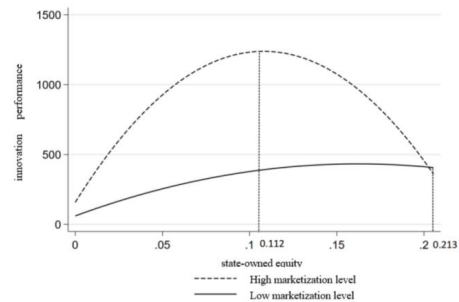


Figure 2. The Moderating Effect of Marketization Level

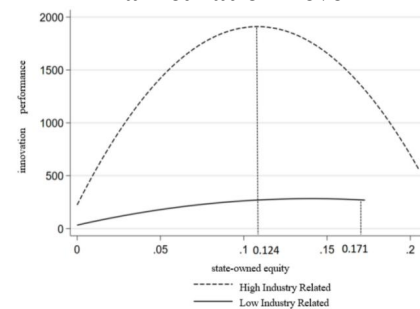


Figure 3. The Moderating Effect of Industry Relatedness

4.2. Robustness tests

To enhance the robustness of the findings, this study uses both substitution for acquisition of innovation performance and group regression. PA was replaced with the number of patent applications PA2 to test the robustness of the results of this study. The data test shows that in Model 1, the coefficient of state equity remains significantly positive, and the coefficient of squared state equity is significantly negative, which is consistent with the previous findings of H1. In Model 2, the coefficient of the cross term of regional marketization and state equity remains positive, which does not change the direction of the regulation of state equity at the marketization level. In Model 3, the coefficient of the cross term of regional marketization and the square of state equity remains negative, indicating that regional marketization continues to strengthen the

inverted U-shaped relationship between state equity and innovation performance, which is consistent with the previous H2 findings. In Model 4, the coefficients of industry correlation and the cross term of state equity are significantly positive, which is consistent with previous studies. In Model 5, the coefficient of the cross term of industry relevance and the square of state-owned equity is significantly negative, indicating that industry relevance continues to have a reinforcing effect on the inverted U-shaped relationship between state-owned equity and

innovation performance. This is consistent with the previous findings of H3, indicating that the study's findings are somewhat robust. In this study, a permutation test analysis is performed on the sample to further verify the moderating effect of the level of local regional marketization and industry correlation on cross-border acquisition innovation. The moderating variables above the mean were set as the higher group and those below the mean were set as the lower group for the permutation test, the results are shown in Table 2.

Table 2. Permutation Test of the Moderating Effect

	Regression coefficient			Permutation test		
	MA			RE		
Variables	g1	g2	g1-g2	g1	g2	g1-g2
ST	4.731	10.88***	-6.146	4.780	11.41***	-6.631
ST2	-1.250	-3.262***	2.012	-2.171	-3.378***	1.207

By testing the grouping results, we show that (i) the effect of state equity on cross-border acquisition innovation is not significant at lower levels of home region marketization, while at higher levels of home region marketization, the effect of state equity on cross-border acquisition innovation has a significant inverted U-shaped relationship, indicating that there are significant differences in the moderating effects of different levels of firms' home region marketization on state equity and cross-border acquisition innovation. The level of home region marketization moderates the effect of state equity on firms' cross-border acquisition innovation. Under the condition of low industry correlation, state-owned equity has no effect on firms' cross-border acquisition innovation, however, under the condition of high industry correlation, it has an inverted U-shaped effect on firms' cross-border acquisition innovation, and industry correlation changes the intensity of state-owned equity's effect on firms' cross-border acquisition innovation. (iii) Under the condition of high local regional marketization, the inverted U-shaped curve formed by state-owned equity and corporate cross-border acquisition innovation is steeper and the opening is smaller, which again verifies hypothesis H2; similarly, this inverted U-shaped relationship is more significant under the condition of high industry correlation, where the opening of the inverted U-shaped curve is smaller and the change is

steeper, and hypothesis H3 is again verified.

5. Conclusions and Discussion

This study investigates the effect of state-owned equity on innovation performance in the cross-border acquisition context, and specifically explores whether local regional marketization and industry relevance have moderating effects on the aforementioned relationship, with the following main findings. First, there is a significant inverted U-shaped effect of state-owned equity on innovation performance in cross-border acquisition. Second, regional marketization moderates the relationship between state equity and the innovation performance of cross-border acquisitions. Third, industry correlation moderates the relationship between state equity and cross-border acquisition innovation performance. The main theoretical contributions of this study are as follows: First, we explain the effect of state-owned equity on innovation in cross-border acquisitions in the context of ownership advantage theory and demonstrate an inverted U-shaped effect of state-owned equity on innovation performance in cross-border acquisitions. This explains the paradox of ownership advantage, that is, whether the innovation support brought by the government can fulfill the expectations of firms' cross-border acquisitions. Second, to clarify the complementary applications of ownership

advantage theory in the OLI paradigm, further research from the perspective of emerging market firms exploring innovation performance through the advantage of the home country's institutional environment and seeking overseas resources, and promote the improvement of a more comprehensive theory of internationalization, especially the ownership theory, which explains the cross-border acquisition practices of emerging market firms. Third, the study of cross-border acquisition innovation from the perspective of institutional resources enriches the microscopic research perspective in the field of cross-border acquisition innovation, and establishes the "firm-region-industry". Fourth, the study breaks the limitations of the traditional OLI paradigm theory on the ownership advantages of emerging market firms, explains the home country-specific advantages of emerging market firms from the perspective of institutional resource advantages, and builds a comprehensive internationalization theory of emerging market firms.

This study also has the following managerial implications. First, (1) firms should recognize that there is a nonlinear effect of the resources brought by state-owned equity on innovation. Therefore, when conducting internal R&D activities, enterprises should consider adding measures to R&D activities with appropriate resource input to avoid organizational inertia. (2) Market level reinforces the inverted U-shaped effect of state-owned equity and innovation performance. Enterprises should consider the regional market level while conducting cross-border acquisitions to make reasonable decisions; (3) industry relevance can have a reinforcing effect on the inverted U-shaped effect of state-owned equity and innovation performance, so enterprises' cross-border acquisitions based on innovation purposes should appropriately consider acquisitions between related industries.

Second, for the government, (1) due to organizational inertia, the government needs to increase the evaluation criteria for enterprises while providing innovation support and other preferential policies, to make the use of resources more efficient and avoid the phenomenon of "too much is too little". The government should accelerate the pace of market reform, make the local market

environment more suitable for cross-border acquisition and innovation, promote the marketization process to facilitate the flow of factors, better protect enterprises' innovation achievements, and optimize the resource allocation effect. (2) The level of marketization in the local region can strengthen the inverted U-shaped effect of state-owned equity and innovation performance. The government should accelerate the pace of market reform to make the local regional market environment more adaptable to cross-border M&A and innovation by enterprises, to promote the facilitating effect of the marketisation process on the flow of factors, to better safeguard the innovation achievements of enterprises, and to optimize the effect of resource allocation.(3) While considering the policy support and resource base for enterprises, the state needs to combine it with the regional institutional environment, so that policy support and regional differences form a targeted orientation for enterprise innovation.

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References

- [1] Ahuja G, Katil R. Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study. *Strategic Management Journal*, 2001, 22(3): 197-220.
- [2] Du M, Boateng A. State ownership, institutional effects and value creation in cross-border mergers & acquisitions by Chinese firms. *International Business Review*, 2015, 24(3): 430-442.
- [3] Atallah G, De Fuentes C, Panasian C A. Ownership, compensation and board diversity as innovation drivers: a comparison of US and Canadian firms. *International Journal of Innovation Management*, 2021, 25(03): 2150025.
- [4] Cefis E, Marsili O, Rigamonti D. In and out of balance: industry relatedness, learning capabilities and post-acquisition innovative performance. *Journal of Management Studies*, 2020, 57(2): 210-245.
- [5] Genin A L, Tan J, Song J. State

- governance and technological innovation in emerging economies: State-owned enterprise restructuring and institutional logic dissonance in China's high-speed train sector. *Journal of International Business Studies*, 2021, 52(4): 621-645.
- [6] James B E, Sawant R J, Bendickson J S. Emerging market multinationals firm-specific advantages, institutional distance, and foreign acquisition location choice. *International Business Review*, 2020, 29(5).
- [7] Parente R, Kelley K J, Thams Y, et al. Cross-border mergers and acquisitions: links between acquiring firm capabilities and resources and target country location. *Multinational Business Review*, 2020.
- [8] Sun P, Deng Z, Wright M. Partnering with Leviathan: The politics of innovation in foreign-host-state joint ventures. *Journal of International Business Studies*, 2021, 52(4): 595-620.
- [9] Xiong R, Wei P, Yang J, et al. Impact of top executive turnover on firms' R&D investment: Evidence from China. *Innovation: Organization & Management*, 2021, 23(3): 400-424.
- [10] Haans R F J, Pieters C, HE Z L. Thinking about U: Theorizing and testing U- and inverted U-shaped relationships in strategy research. *Strategic Management Journal*, 2016, 37(7): 1177-1195.