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RESEARCH ON THE REVERSE INNOVATION EFFECT OF CHINA'S FOREIGN DIRECT INVESTMENT EFFICIENCY

ДОСЛІДЖЕННЯ ЗВОРОТНОГО ІННОВАЦІЙНОГО ВПЛИВУ ЕФЕКТИВНОСТІ ПРЯМИХ ІНОЗЕМНИХ ІНВЕСТИЦІЙ КИТАЮ

Foreign direct investment projects have and will continue to expand the potential space for high-quality economic growth in China. Continuously stimulating the innovative effect of high-level investment projects and programs are an important way to achieve this function. Based on the data of China's A-share listed companies from 1999 to 2020, this article measures the investment efficiency of foreign direct investment projects enterprises, examines and explains the innovative inhibitory effect of inefficient investment and its mechanism of action. The results show that increasing non-efficiency investment is not conducive to corporate innovation, and the innovation inhibition effect of insufficient investment is greater than over-investment; investment projects efficiency can act on corporate innovation through production efficiency, management efficiency and profitability; the innovation inhibition effect of non-efficiency investment projects varies by different enterprise scale, ownership, industry attributes, investment layout and investment structure, among which small, private, high-competitive, high-tech, weak diversified and high-concentration enterprises are more affected.

Keywords: *foreign direct investment projects, investment efficiency, corporate innovation, multinational enterprises, internationalization.*

Предметом даного дослідження є існуючі програми та проєкти прямих іноземних інвестицій, які розширюють потенційний простір для економічного зростання в Китаї. Актуальність дослідження обумовлено значним розривом між можливостями виявлення ризиків та раннього їх попередження, якістю інвестиційних проєктів підприємств та розвинених країн, переходом від розширення масштабу проєктів прямих іноземних інвестицій підприємств до підвищення їх ефективності та досягнення високоякісного «виходу на ринок». Метою дослідження є визначення взаємозв'язку між ефективністю проєктів прямих іноземних інвестицій китайських підприємств та інноваціями підприємств, а також механізму їхньої дії. Важливим засобом досягнення цієї мети є постійне стимулювання інноваційного ефекту інвестиційних проєктів і програм високого рівня. Базуючись на даних китайських компаній, зареєстрованих на біржі А, з 1999 по 2020 рр., у цій статті за допомогою методів інструментальних змінних, зіставлення показників схильності проведені виміри інвестиційної ефективності підприємств, що реалізують проєкти прямих іноземних інвестицій, досліджується та пояснюється інноваційний гальмівний ефект неефективного інвестування та механізм його дії. Практична цінність статті обумовлюється дослідженням абсорбації наслідків поширення технологій та стимулювання корпоративного інноваційного потенціалу за допомогою високоякісних прямих інвестицій. Результати дослідження показують, що збільшення кількості неефективних інвестицій не сприяє корпоративним інноваціям, а ефект гальмування інновацій від недостатніх інвестицій більший, ніж від надмірних інвестицій; ефективність інвестиційних проєктів може впливати на корпоративні інновації через ефективність виробництва, ефективність управління та прибутковість; ефект гальмування інновацій від неефективних інвестиційних проєктів залежить від масштабу підприємства, форми власності, галузевих характеристик, інвестиційної структури, серед яких більшою мірою страждають малі, приватні, висококонкурентні, високотехнологічні, слабкодиверсифіковані підприємства та підприємства високої концентрації.

Ключові слова: *проекти прямих іноземних інвестицій, ефективність інвестицій, корпоративні інновації, транснаціональні підприємства, інтернаціоналізація.*

Problem statement. In recent years, under the background of the "Belt and Road" policy, the pace of Chinese enterprises' "going global" has gradually accelerated, and the degree of internationalization has become increasingly higher. How to gain more technological progress through high-quality foreign direct investment projects (OFDI) to promote higher-level economic construction is an important issue. Although China's foreign direct investment projects have firmly ranked among the top three in the world, due to China's foreign direct investment starting late, there is a big gap between the risk identification and early warning capabilities and investment quality of enterprises and the quality of investments from developed countries. Faced with a complex and changeable development environment, "promoting the construction of an open world economy" requires that enterprises' foreign direct investment projects should gradually transform from scale expansion to efficiency improvement, and achieve high-quality "going out". Therefore, the international investment of enterprises should not only seek to increase in quantity, but also pay attention to improving quality, give full play to the effectiveness of various factors, and improve investment efficiency.

Innovation not only promotes a country's economic growth, but also improves the layout of the industrial chain, promotes industrial upgrading, and enhances international competitive advantages. With the support of a series of innovation policies, China's scientific and technological innovation have achieved remarkable results and have made of China one of the innovative countries. However, many companies have not yet formed a complete technological progress mechanism, lack independent innovation capabilities, and some key products and core technologies are still highly dependent on imports, and the risk of "bottleneck" is prominent. As the new round of scientific and technological revolution continues to reconstruct the global innovation map, encouraging enterprises to draw on the host country's advanced technology and experience through high-quality foreign direct investment, and stimulate their own creativity to achieve "overtaking on the curve" or "overtaking on the lane" is the key path for China to achieve high-quality development.

Analysis of recent research and publications. Enterprises are the main actors in conducting cross-border investment and innovation activities. Yang Huan, Li Xiangju and Liu Shuo found that research on the efficiency of outward foreign direct investment has mostly focused on the macro level, using stochastic frontier gravity models to measure the efficiency of China's investment in different countries, and explore the factors that affect investment inefficiency. This paper aims to evaluate the reverse innovation effect of outward direct investment, providing new insights for better stimulating corporate innovation vitality and promoting the building of an innovative country from the perspective of "going global" [1–2].

Foreign direct investment projects can generate reverse technology spillovers for firms in the home country, not only serving as a significant motivation for companies to "go global" but also profoundly impacting innovation. Literature has explored the innovation-driven effects of foreign direct investment from various perspectives. First, the impact of foreign direct investment on firm innovation through reverse technology spillovers. Liu Hong, Wang Chenbo and Ding Ning found, using micro-data from 2004–2009, supported the conclusion that foreign direct investment promotes firm innovation. Second, the impact of dynamic decision-making in foreign direct investment on firm innovation. Firms entering international markets do not happen overnight; they must carefully consider the timing and pace of investment to overcome the "outsider disadvantage" and successfully "go global" [3]. Wu Hang and Chen Jin focused on the influence of internationalization level on firm innovation performance and further explored the moderating effect of internationalization experience [4].

Investment efficiency reflects the rationality of resource allocation; improving investment efficiency means reducing inefficiency. For companies, Liao Jing and Liu Xing discovered that the experience of reform and opening up affects executives' cognition and capabilities, thereby influencing business decisions and investment efficiency [5].

Formulation the purposes of the article. The purpose of the article is to determine the relationship between the efficiency of Chinese enterprises' foreign direct investment projects and enterprise innovation as well as the mechanism of the action.

Presentation of the main research material. The impact of FDI efficiency on enterprise innovation is manifested in the following. Innovative activities are characterized by high risk and high returns, representing an endogenous choice for companies under market competition and incentives. However, inefficient behavior in foreign direct investment may have adverse effects on corporate innovation. Good investment efficiency can foster healthy competition among companies, motivating project leaders to conduct thorough per-investment due diligence and risk assessment, selecting international investment projects that align with the company's development path, fully tapping into the potential of capital elements, and increasing innovation output.

Inefficient investment is categorized into under-investment and over-investment. Under-investing companies struggle to secure sufficient funds from banks and capital markets due to operational issues, hindering their innovative activities. In contrast, over-investing companies tend to engage in blind behavior, favoring short-term arbitrage projects over innovation activities, which creates a "crowding-out effect" on R&D investment. Compared to under-investment, over-investment is more likely to be corrected through improved management mechanisms, with limited inhibitory effects on innovation.

Hypothesis 1: Under the same conditions, inefficient investment is not conducive to enterprise innovation, and under-investment has a greater inhibiting effect on enterprise innovation than over-investment.

The mechanism of the efficiency of outward direct investment affecting enterprise innovation is manifested in the following.

Firstly, improving investment efficiency is beneficial for enhancing the allocation of human capital and boosting productivity. Human capital serves as a crucial vehicle for science and technology, with an optimal ratio to other factors. Insufficient or excessive investment can lead to resource misallocation, affecting the overall improvement in total factor productivity [6]. As investment efficiency improves, the allocation of human and physical capital within companies becomes more optimized, increasing marginal output in international operations and enhancing production efficiency. Improved productivity helps strengthen a company's competitiveness and dynamic capabilities in international markets, enabling it to adjust

resources more flexibly, learn new technologies, and adapt to market changes, driving continuous innovation.

Secondly, reducing inefficient investments by companies means improving the utilization efficiency of existing resources, which has a positive effect on corporate value. Management efficiency reflects managerial capability; capable managers typically have stronger risk tolerance and are confident in selecting high-risk, high-reward innovative projects. They also creatively integrate resources to develop innovative opportunities, expanding the company's innovation boundaries.

Thirdly, the higher the efficiency of outward direct investment, the more profits it brings to enterprises, and inefficient behaviors in investment will have adverse effects on business operations. On one hand, improving investment efficiency helps form economies of scale. On the other hand, enhancing investment efficiency helps alleviate financial distress, strengthen sustainable growth and profitability, thereby easing internal financing constraints and promoting R&D innovation.

Hypothesis 2a: Improving investment efficiency is conducive to improving the allocation of human capital, improving production efficiency and promoting innovation.

Hypothesis 2b: Improving investment efficiency is conducive to stimulating the potential of management, improving management efficiency and promoting innovation.

Hypothesis 2c: Improving investment efficiency is conducive to increasing revenue and profit, enhancing profitability and promoting innovation.

In order to identify the reverse innovation effect of inefficient investment, this paper constructs the following econometric model to test the influence of foreign direct investment efficiency on enterprise innovation level:

$$Innovit = \alpha 1 + \beta 1 Ieffit + \gamma Controlit + \Sigma firm + \Sigma year + \varepsilon it \quad (1)$$

In this equation, *i* represents the firm, *t* represents the year; *Innovit* represents the innovation level of firm *i*; Ieffit represents the efficiency of foreign direct investment; *Controlit* represents control variables, including firm age, firm size, current ratio, cash flow, retained earnings, fixed asset ratio, Tobin's Q value, debt-to-asset ratio, and return on assets; Σ*firm* and Σ*year* represent firm and year fixed effects, respectively; εit represents the random disturbance term; β1 is the coefficient of primary interest.

We will select the indicator and data source.

1. Control variables. This paper selects the following control variables.

① Firm Age (age). ② Firm Size (scale). ③ Liquidity Ratio (liquidity). ④ Cash Flow (cash). ⑤ Fixed Asset Ratio (tangibility). ⑥ Retained Earnings (re). ⑦ Debt-to-Asset Ratio (lev). ⑧ Return on Assets (roa). ⑨ Tobin's Q (tobinq).

2. Data sources.

This paper focuses on Chinese A-share listed companies from 1999 to 2020, primarily using patent data, financial and operational data of listed companies, as well as foreign direct investment data.

3. Characteristic facts.

According to Table 1, from 1999 to 2020, the investment efficiency of Chinese enterprises engaged in outbound direct investment showed a fluctuating upward trend. The inefficiency investment item peaked at 1.005 in 2001 and fell to its lowest level of 0.286 in 2014. In recent years,

Table 1

Changes in OFDI efficiency (mean) from 1999 to 2020

Year	Ensemble	Over capitalize	Under-capitalize	Large-scale	Small-scale	Producer services	Non-productive services
1999	0.650	0.767	0.568	0.969	0.587	0.869	0.640
2000	0.978	0.810	1.247	0.863	1.015	1.326	0.965
2001	1.005	0.853	1.223	0.816	1.065	1.289	0.996
2002	0.884	0.752	1.073	0.805	0.913	1.294	0.857
2003	0.888	0.936	0.842	0.713	0.960	0.985	0.881
2004	0.720	0.619	0.858	0.661	0.749	0.867	0.709
2005	0.531	0.497	0.571	0.471	0.562	0.590	0.527
2006	0.709	1.102	0.524	0.493	0.853	0.729	0.708
2007	0.571	0.559	0.585	0.478	0.646	0.849	0.551
2008	0.482	0.421	0.560	0.511	0.459	0.646	0.472
2009	0.402	0.392	0.414	0.386	0.417	0.414	0.401
2010	0.438	0.344	0.581	0.393	0.482	0.565	0.428
2011	0.420	0.349	0.529	0.343	0.487	0.393	0.422
2012	0.346	0.349	0.344	0.293	0.391	0.329	0.347
2013	0.298	0.319	0.279	0.269	0.326	0.311	0.297
2014	0.286	0.252	0.329	0.221	0.347	0.177	0.290
2015	0.299	0.277	0.323	0.243	0.360	0.325	0.297
2016	0.323	0.380	0.280	0.292	0.363	0.367	0.321
2017	0.404	0.504	0.339	0.344	0.482	0.319	0.408
2018	0.420	0.818	0.282	0.326	0.548	0.345	0.423
2019	0.340	0.581	0.238	0.318	0.370	0.331	0.340
2020	0.290	0.369	0.237	0.251	0.349	0.267	0.291
Ensemble	0.408	0.445	0.377	0.335	0.482	0.449	0.406

Source: China Stock Market & Accounting Research Database (CSMAR) [7]

inefficiency investment has increased in some individual years, but the overall trend of gradually improving investment efficiency remains unchanged, with under-investment showing more significant improvement than over-investment. It is evident that, thanks to the deepening reform of capital markets and policy support for "going abroad" enterprises, China's outbound direct investment efficiency has steadily increased, and irrational investment phenomena have significantly decreased.

This paper uses model (1) to test the causal relationship between FDI efficiency and firm innovation, with the benchmark regression results shown in Table 2. It can be seen that as control variables are added and firm and year fixed effects are controlled, the impact of inefficient investment on firm innovation remains significantly negative. The coefficient for investment efficiency in column (4) is-0.029, indicating that for every one-unit increase in inefficient investment, the number of patent applications decreases by 2.9%. Therefore, increasing inefficient investment significantly suppresses firm innovation, verifying Hypothesis 1. Based on the type of inefficient investment, columns (5) and (6) divide the sample into over-investing firms and under-investing firms. The results show that the inhibitory effect of over-investment on firm innovation is not statistically significant, while the inhibitory effect of under-investment passes the 5% significance level test. In the sample of under-investing firms, for every one-unit increase in inefficient investment, the number of patent applications decreases by 5.1%. In the FDI sample, most firms exhibit under-investment, and focusing on improving this phenomenon will greatly enhance the firm's innovation level.

As innovation capabilities improve, companies can more confidently engage in overseas investment activities and reduce inefficient investments, leading to a reverse causal relationship between the independent variable and the dependent variable. Additionally, there is "self-selection" in companies' overseas investment behavior; those with stronger innovation capabilities tend to expand into international markets and continuously improve efficiency to enhance competitiveness. All these factors may lead to endogeneity issues. This paper employs the commonly used instrumental variable (IV) method and propensity score matching (PSM) to address potential endogeneity problems. According to Table 2, further validate the effectiveness of the instrumental variables:

The Cragg-Donald Wald F statistics are all greater than the 10% critical value of 16.38 for the Stock-Yogo weak identification test, indicating that there is no weak identification problem with the instrumental variables; the Hansen J test statistics are all 0, indicating that there is no over-identification problem. The estimation results in columns (1) and (2) of Table 3 show that after using different instrumental

Table 2

Benchmark regression results of OFDI efficiency and enterprise innovation

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	Innov	Innov	Innov	Innov	Innov	Innov
Ieff	-0.098*** (0.016)	-0.062*** (0.015)	-0.024* (0.015)	-0.028** (0.011)		
Over_Ieff					-0.019 (0.0156)	
Under_Ieff						-0.052** (0.024)
age			0.464*** (0.046)	0.044 (0.045)	-0.024 (0.067)	0.025 (0.063)
scale			0.458*** (0.015)	0.627*** (0.014)	0.604*** (0.021)	0.642*** (0.017)
liquidity			-0.000 (0.004)	-0.012*** (0.003)	-0.010** (0.005)	-0.014*** (0.004)
cash			1.767** (0.808)	4.542*** (0.796)	5.043*** (1.373)	4.524*** (0.992)
tangi-bility			-0.634*** (0.144)	-0.627*** (0.139)	-0.747*** (0.205)	-0.502*** (0.192)
re			0.041*** (0.003)	0.013*** (0.002)	0.015*** (0.004)	0.013*** (0.003)
lev			-0.016 (0.015)	0.021* (0.0123)	0.026 (0.086)	0.019 (0.014)
roa			0.115 (0.116)	0.187** (0.089)	0.397*** (0.137)	0.012 (0.119)
tobinq			0.074*** (0.013)	0.040*** (0.010)	0.061*** (0.014)	0.024 (0.016)
Corporatefixed effects	Deny	Yes	Deny	Yes	Yes	Yes
Fixed effects for years	Deny	Yes	Deny	Yes	Yes	Yes
N	9,705	9,705	9,705	9,705	4,452	5,247

*Note: The standard error is in parentheses; *, ** and *** represent the significance levels of 10%,5% and 1%, respectively; the same applies to the table below.*

Source: compiled by the authors

variables to overcome endogeneity issues, the inhibitory effect of inefficient investment on corporate innovation remains significant, further verifying Hypothesis 1.

Propensity Score Matching Method. Following the approach of Wang Yonggui and Li Xia [8], the sample is divided into high-efficiency and low-efficiency groups based on the mean efficiency of foreign investment. Control variables are used as covariates, and nearest neighbor matching methods at ratios of 1:1, 1:2, and 1:3 are employed to pair samples. The estimated results for successfully matched samples are re-estimated, with column (3) presenting the estimation results based on the 1:3 nearest neighbor matching. This paper also groups the sample according to the median efficiency of foreign investment for matching purposes, with column (4) showing the regression results. The results in columns (3) and (4) indicate that after propensity score matching, inefficient investment still has a negative and significant impact on corporate innovation.

To further verify the robustness of the benchmark regression results, this paper changes the regression method, control variables, and regression sample. First, we change the regression method. Given that the number of patent applications by firms is greater than zero and relatively concentrated, Table 4 column (1) uses a negative binomial regression model for estimation. Second, we add control variables. Column (2) includes firm capital intensity, and column (3) adds average wage. Finally, we adjust the research sample. On one hand, considering that some firms engage in overseas investment activities for tax avoidance purposes, this paper excludes samples with investment destinations including the British Virgin Islands and the Cayman Islands, which are "tax havens" On the other hand, after the global financial crisis in 2008, China introduced multiple policies to promote corporate "going abroad" leading to a new breakthrough in outward direct investment flows in 2009 and sustained high growth thereafter. All these results indicate that the benchmark regression results of this paper are robust.

This paper employs stepwise regression to test the influencing mechanisms. The stepwise regression method consists of three steps: Step 1, regressing corporate innovation on investment efficiency; Step 2, using the mediator variable as the dependent variable to regress investment efficiency; Step 3, simultaneously including investment efficiency and the mediator variable in the baseline regression model. Given that the results of Step 1 constitute the baseline model regression, the following steps construct the econometric models for Step 2 and Step 3:

$$Mit = \kappa 0 + \kappa 1 Ieffit + \kappa 2 Controlit + \Sigma firm + \Sigma year + \delta it \quad (2)$$

$$Innovit = \theta 0 + \theta 1 Ieffit + \theta 2 Mit + \theta 3 Controlit + \\ + \Sigma firm + \Sigma year + \zeta it \quad (3)$$

Among them, *Mit* is the mediating variable, which is the total factor productivity (*lp*), management efficiency (*meff*) and operating profit margin (*profit*) of the enterprise. $\kappa 1 and \theta 2$ are the key parameters, and δit and ζit are the random disturbance terms.

1. Production efficiency

This paper measures corporate production efficiency using total factor productivity. Table 5, columns (1) and (2), report the results of the mediation effect test on production efficiency. In column (1), the coefficient of investment efficiency is

Table 3

Results of robustness test 1

Variable name	(1)	(2)	(3)	(4)
	IV1: Lagging phase ***Innov***	**IV2:Percapita international tourism income** ***Innov***	**PSM1** ***Innov***	**PSM2** ***Innov***
Ieff	-0.042** (0.018)	-1.281* (0.723)	-0.028** (0.014)	-0.032** (0.014)
Weakidentification test	2,589.950	22.766		
Over-identification tests	0.000	0.000		
Controlled variable	Yes	Yes	Yes	Yes
Corporate fixed effects	Yes	Yes	Yes	Yes
Fixed effects for years	Yes	Yes	Yes	Yes
N	6,811	8,866	5,075	7,172

Source: compiled by the authors

Table 4

Results of robustness test 2

Variable name	(1)	(2)	(3)	(4)	(5)	(6)
	lp	***Innov***	***meff***	***Innov***	***profit***	***Innov***
	Production efficiency		**Management efficiency**		**Profitability**	
Ieff	-0.012** (0.005)	-0.028** (0.011)	-0.019*** (0.005)	-0.024* (0.013)	-0.053* (0.027)	-0.028** (0.011)
lp		0.070*** (0.024)				
meff				0.069*** (0.024)		
profit						0.008* (0.004)
Control variable	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Fixed year effect	Yes	Yes	Yes	Yes	Yes	Yes
N	9,705	9,705	9,705	9,705	9,705	9,705

Source: compiled by the authors

Table 5

Test results of the influence mechanism

Variable name	(1)	(2)	(3)	(4)	(5)	(6)
	lp	Innov	meff	Innov	profit	Innov
	Production efficiency		Managerial effectiveness		Profitability	
Ieff	-0.011** (0.005)	-0.028** (0.012)	-0.018*** (0.005)	-0.024* (0.013)	-0.054* (0.028)	-0.029** (0.012)
lp		0.070*** (0.024)				
meff				0.068*** (0.024)		
profit						0.008* (0.004)
controlled variable	Yes	Yes	Yes	Yes	Yes	Yes
Corporate fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects for years	Yes	Yes	Yes	Yes	Yes	Yes
N	9,705	9,705	9,705	9,705	9,705	9,705

Source: compiled by the authors

negative at the 5% significance level; in column (2), after adding the mediator variable to the benchmark model, the significance of investment efficiency remains unchanged, but the coefficient of *lp* is significantly positive, indicating that there is a mediation effect in the model. Additionally, combining the results of the benchmark regression, $\theta 1 is$ significant and $\kappa 1 \times \theta 2$ has the same sign as $\beta 1$, suggesting a partial mediation effect. Therefore, investment efficiency can influence corporate innovation through productivity efficiency, thus verifying Hypothesis 2a.

2. Management efficiency.

This paper draws on the approach of Xue Anwei, et al., using the ratio of total revenue to administrative expenses to measure management efficiency [9]; the higher this ratio, the more efficient the company's management. Columns (3) and (4) of Table 5 report the estimated results of how foreign direct investment efficiency influences corporate innovation through management efficiency. Column (3) shows a significant negative impact of investment efficiency on management efficiency, while column (4) indicates a positive and significant coefficient for management efficiency, suggesting that improving investment efficiency can enhance management efficiency, thereby promoting corporate innovation. In the context of integrating into global division networks, companies reducing inefficient investments can compel themselves to strengthen their management capabilities, providing institutional support for innovative activities. This result supports Hypothesis 2b.

3. Profitability.

Profit is the direct source of funds for corporate R&D investment. This paper selects the operating profit margin to measure corporate profitability. The coefficient of investment efficiency in column (5) of Table 5 is significantly negative, indicating that inefficient investments can weaken corporate profitability; the coefficient of the operating profit margin in column (6) is positively significant, suggesting that improving the operating profit margin helps promote corporate innovation. It can be shown that enhancing the efficiency of foreign direct investment is beneficial for strengthening corporate profitability, providing financial support for R&D and innovation activities, and increasing innovation output, thus verifying Hypothesis 2c.

Conclusions. Strengthening strategic layout in innovation has become an international trend. Exploring how to fully absorb the effects of technology diffusion and stimulate corporate innovation potential through high-quality outward direct investment is of practical significance. Based on data from A-share listed companies from 1999 to 2020, this paper examines the relationship between outward direct investment projects efficiency and corporate innovation, as well as their mechanisms of acting. The study finds that outward direct investment efficiency significantly impacts corporate innovation; for every one-unit increase in inefficient investment, the number of patent applications decreases by 2.9%, with under-investment having a greater inhibitory effect on innovation than over-investment. Investment efficiency can influence corporate innovation through three channels: production efficiency, management efficiency, and profitability. Heterogeneity tests show that the promoting effect of outward direct investment efficiency on innovation varies among different types of companies. Inefficient investment has a more pronounced inhibitory effect on small and private enterprises; it significantly inhibits non-labor-intensive and highly competitive firms, while having no significant impact on labor-intensive and low-competition firms; inefficient investment has a more pronounced inhibitory effect on weakly diversified and highly concentrated firms.

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