Research on the Impact of Foreign Direct Investment on the Growth Performance of Enterprises

----Mediation Effect based on Dual Innovation Capability

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Abstract. Based on the perspectives of foreign direct investment and dual innovation theory, this study empirically investigates the impact of foreign direct investment on the growth performance of high-tech listed companies in Shanghai and Shenzhen from 2011 to 2020. The mediating effect of dual innovation capability between foreign direct investment and corporate growth performance is analyzed, and whether network centrality has a moderating effect on the relationship between foreign direct investment and corporate growth performance is explored. The empirical results show that: (1) Foreign direct investment has a positive impact on the growth performance of enterprises; (2) Dual innovation capability plays a mediating role between FDI and growth performance, while applied innovation capability and exploratory innovation capability play a partial mediating role between them; (3) Network centrality plays a positive moderating role in the relationship between foreign direct investment and corporate growth performance. This article proposes that high-tech enterprises should actively introduce foreign investment, enhance dual innovation capabilities.

Keywords: Foreign direct investment; Corporate growth performance; Dual innovation; Network Centrality.

1 Introduction

Over the past 40 years of reform and opening up, the Chinese economy has maintained high-speed growth for a long time, achieving tremendous achievements that have amazed the world. As an emerging market, China is still at the bottom of the global value chain and urgently needs to achieve a transformation from "Made in China" to "Created in China".[1] At the macro level, the Chinese economy needs to increase its innovation driving force in all aspects, enhance its ability to participate in global resource allocation and global competition; At the micro implementation level, enhancing the core competitiveness of enterprises as market entities and their position in the global value chain is a crucial task. Therefore, in-depth research on the micro level factors influencing corporate performance has important practical significance.

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Currently, foreign direct investment (FDI) is an important means for countries around the world to achieve openness. The new growth theory believes that FDI is an important influencing factor of technological progress and a significant source for enterprises to carry out innovation and achieve innovation. [2]In 2019, the State Council issued the "Opinions on Further Improving the Utilization of Foreign Investment", which clearly stated that "foreign investment has played a unique and important role in China's economic development, and promoting high-quality development and modernization construction must always attach great importance to the utilization of foreign investment.". According to the latest data released by the National Bureau of Statistics of China, as of the end of 2020, the actual amount of foreign investment utilization in China reached 144.37 billion US dollars, making it the second largest investment attraction country in the world for four consecutive years. Foreign direct investment (FDI) has reduced the cost of introducing advanced foreign technologies, and effectively promoted the high-speed growth of China's economy.

The existing literature on the impact of FDI mainly focuses on promoting regional innovation or upgrading regional industries. By reviewing these research results, it can be found that: firstly, scholars believe that the innovation promotion effect of FDI knowledge spillover varies significantly in different regions of China [3-5]. This difference may be caused by the "threshold effect" or "double threshold effect", that is, the impact of FDI on regional or industry innovation will be regulated by the economic and technological foundation and digestion and absorption capacity[6]; Secondly, scholars have divergent views on the impact of FDI on innovation, including three theories: the containment theory, the promotion theory [7-9], and the "double-edged sword" theory [10-11]. The above studies are mostly conducted at the regional or industry level, but there are relatively few research results on the specific impact of FDI on micro enterprises. Therefore, studying the impact of FDI on the growth performance of enterprises has certain theoretical value.

According to the dual innovation capability theory, the innovation activities of enterprises can be divided into two types: exploratory innovation and exploitative innovation [12]. Among them, exploitative innovation is the improvement of products or services based on existing knowledge and resources. Exploratory innovation fundamentally breaks through previous technologies and develops disruptive new technologies and products on higher-level technology platforms. When a company accepts FDI, the funds it receives become internal resources. From the perspective of internal resources, if FDI has a significant impact on the company's innovation ability, does FDI promote or weaken the company's innovation, and is it more conducive to exploratory innovation ability or exploitative innovation ability?[13] Based on this, it is necessary to study the impact mechanism of dual innovation capability on the relationship between foreign direct investment and corporate growth performance.

In summary, existing research has the following shortcomings: there is relatively little research on the impact of FDI on corporate growth performance from a micro perspective; From the perspective of dual innovation capability, the moderating role of network centrality in the impact of FDI on firm growth performance has also been rarely explored. Therefore, compared with existing research, the innovation of this study is reflected in two aspects: firstly, in terms of the research object, it attempts to

explore the impact of FDI on the growth performance of enterprises from a micro enterprise perspective, and focuses on the impact effects on different types of innovation, providing certain ideas for enterprises to clarify the direction of FDI utilization; The second is to examine the impact of network centrality on the relationship between foreign direct investment and corporate growth performance from the perspective of dual innovation capability.

2 Theoretical Foundations and Research Hypotheses

2.1 Foreign Direct Investment (FDI)

FDI is one of the important research contents of the new growth theory, which points out that FDI has a significant impact on the technological progress of both developed and developing countries. Developed country enterprises can obtain material and human capital from underdeveloped areas through outward direct investment to reduce R&D costs. [8]As enterprises in emerging market countries, they can obtain the innovation effect of international technology spillovers [14], they can make up for technological deficiencies and achieve breakthroughs.

As mentioned earlier, from a macro or meso perspective, scholars believe that FDI has three possible impacts on regional or industry innovation capabilities: promoting, restraining, or double-edged sword. For example, studies by Huang Yejing [15], Cao Yong et al. [7] have shown that the technology spillover effect of FDI has a significant promoting effect on regional innovation and industrial technology innovation in China. Chen Minghua's research points out from the perspective of regional coordination that FDI has become the most important influencing factor for the coordinated development of the Beijing Tianjin Hebei economy. However, as research deepens, the negative effects of FDI are gradually being taken seriously. For example, the study by Bai Yongliang et al. [16] shows that FDI can lead to host countries overly relying on foreign technology, hindering or hindering green innovation in industries. From this, it can be seen that scholars do not completely deny the promoting effect of FDI on innovation, but believe that the long-term innovation ability of enterprises requires independent research and development. Therefore, in recent years, scholars have gradually begun to explore the double-edged sword effect of FDI on innovation. For example, Zhou Jieqi et al. believe that FDI can bring innovation motivation and pressure to domestic enterprises, while the negative effect of competition also suppresses the motivation of domestic enterprises for independent research and development.

Through literature review, it was found that more and more scholars have begun to explore the "threshold effect" or "double threshold effect" of FDI on innovation.For example, only when enterprises have a good economic and technological foundation and the ability to digest and absorb, can the spillover effects of FDI be fully utilized. If the corresponding labor threshold is not reached, the impact of FDI on certain regions or industries in the host country is not significant [17].

2.2 FDI and Corporate Growth Performance

The resource-based view holds that competition between enterprises or organizations is based on competition for resources and capabilities. [18]Foreign direct investment can have a significant impact on the technological progress of developing country enterprises. Firstly, FDI has brought abundant funds to enterprises. Especially for listed companies, FDI often attracts the attention of various investors and increases the confidence of banks or credit institutions [19].Secondly, FDI brings management experience to enterprises. Foreign-funded enterprises also need to cooperate with research institutions in the host country, which to some extent improves the research capabilities of research personnel in the host country and achieves talent accumulation for innovation in host country enterprises [20-21]; Once again, FDI has generated technology spillover effects, which are manifested as the technological progress of host country enterprises generated by multinational corporations making direct investments in the host country [22]. Finally, FDI has to some extent lifted patent constraints. By establishing joint ventures with foreign funded enterprises and achieving technology transfer. On this basis, further technological research and development can be carried out, enabling host country enterprises to obtain higher technological research and innovation capabilities.

The growth performance of a company mainly refers to its growth potential and operational development status. Zhang et al. [23] proposed that the growth performance of a company includes innovation growth performance and operational growth performance; Yin et al. [24] considered the changes in the dynamic environment and divided the growth performance of enterprises into two categories: financial performance and non-financial performance, exploring the growth performance of enterprises from the perspective of internal and external business operations. Ding Bin et al. [25] proposed that the technological innovation capability of enterprises is closely related to the growth of enterprise performance [26]. This article believes that there is a close correlation between foreign direct investment and innovation output, which can to some extent promote the improvement of enterprise innovation capabilities, and thus affect the market value and financial performance of enterprises, that is, the growth performance of enterprises. Therefore, the following hypothesis is proposed:

H1: The growth of FDI has a significant positive impact on the growth performance of enterprises.

2.3 Foreign Direct Investment and Dual Innovation Capability

Based on the dual innovation capability theory, March [27] pointed out that organizations should simultaneously engage in exploratory innovation and exploitative innovation. Exploratory innovation is a fundamental technological innovation that emphasizes the complete subversion of the status quo, while exploitative innovation is a slow and gentle innovation activity [28]. It originates from upgrading and improving existing knowledge and resources, gradually enhancing customer experience [29]. These two innovative activities have different activity modes and risk levels, and the two innovations often interweave or alternate. In dual innovation, exploratory innovation is more radical [30]. Therefore, the implementation of dual innovation requires sufficient

financial support and heterogeneous resources, and foreign direct investment can provide support in these areas. Firstly, foreign direct investment contributes to the acquisition of heterogeneous resources for exploratory innovation. While accepting foreign direct investment, enterprises gain opportunities to access new knowledge and technologies and promote the improvement of exploratory innovation performance; Secondly, foreign direct investment provides financial security for enterprises, avoiding the possibility of losing opportunities or interrupting research and development due to insufficient funds; In addition, foreign direct investment creates a strong relationship between enterprises and investing enterprises, which to some extent reduces the potential risks in exploratory innovation through collaboration [31].

Utilizational innovation is the improvement and refinement of existing knowledge and technology. Enterprises imitate new technologies brought by foreign companies through "learning by doing", and then achieve the integration of existing and new technologies through the absorption and transformation of knowledge. [32] Through exploitative innovation, enterprises can continuously refine and integrate existing knowledge and capabilities, achieve improvements in existing technologies or market trajectories. Foreign direct investment also brings advanced management experience to enterprises, helping them accelerate the absorption efficiency of innovative elements, enhance their existing operational capabilities, and enhance their ability for exploitative innovation.

Based on hypothesis H1, two sub hypotheses are proposed as follows:

H1a: FDI has a positive promoting effect on exploratory innovation in enterprises;

H1b: FDI has a positive promoting effect on the utilization innovation of enterprises.

2.4 Foreign Direct Investment, Dual Innovation, and Corporate Growth Performance

Enterprises obtain financial support and heterogeneous resources through foreign direct investment. Lee pointed out that there is not a direct relationship between foreign direct investment and performance, but rather a certain transmission mechanism [33]. Therefore, scholars hope to introduce some exogenous variables to explore their propagation paths. For example, Xiao Renqiao et al. [34] explored the nonlinear impact of foreign direct investment on a company's new product performance at various levels from the perspective of dual innovation capability theory. Wang Jianping et al. [35] pointed out that in the social environment of information and technology, foreign direct investment plays an important role in promoting dual innovation and company development performance.

Dual innovation is an important means to address technological and product innovation in the development process of enterprises, as well as to improve organizational resilience and performance. [36] In the face of constantly changing environments, enterprises need to maintain the coordination and adaptability of internal resources by enhancing their dual innovation capabilities. Zhao Tingting et al. [37] believe that companies accepting FDI will strengthen the improvement of innovative thinking and execution capabilities; Scuotto et al. [38] demonstrated through empirical research that

foreign direct investment has a positive impact on dual innovation, FDI is a major driving force for improving corporate performance.

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

H2a: The positive impact of foreign direct investment on corporate growth performance is transmitted through the mediating effect of exploitative innovation.

H2b: The positive impact of foreign direct investment on corporate growth performance is transmitted through the mediating effect of exploratory innovation.

2.5 The Regulatory Role of Network Centrality

The theory of resource dependence states that no organization can achieve complete self-sufficiency, and in order to survive, it must rely on some external resources of the organization. [39]In today's fierce market competition, enterprises can only ensure their long-term market advantage by continuously innovating. In order to improve innovation capability, enterprises need to continuously form cooperative relationships with other enterprises through various means, ultimately leading to the formation of a certain scale of innovation network between enterprises and other enterprises.

According to social network theory, enterprises, as social actors in the network, obtain corresponding social capital through social structure or the positioning (or centrality) of social networks. Enterprises located at the center of the innovation network have a high reputation and status, often belonging to the industry leaders. Their external knowledge search and recognition abilities are strong, and they can access more cutting-edge knowledge and diversified information [40]. Their knowledge power is high, and their ability to absorb new knowledge or technologies is higher than that of enterprises located outside the center [41].

The study also indicates that international technology spillover effects are closely related to the absorption capacity of enterprises [42]. Relatively speaking, when foreign-funded enterprises directly invest in enterprises located at the center of the innovation network, the core technology spillovers of foreign-funded enterprises are more easily absorbed and integrated by these enterprises located at the center.

Therefore, for enterprises that occupy an advantageous position in the network, FDI is more conducive to their knowledge and innovation activities [43], and the following assumptions are proposed:

H3: Network centrality positively regulates the impact of FDI on firm growth performance.

From the perspective of dual innovation, both exploratory innovation and exploitative innovation are also influenced by the resources and relationships embedded in the innovation network of the enterprise. Firstly, for exploitative innovation, the improvement of its innovation capability or performance mainly relies on the expansion and integration of existing capabilities and the development trajectory of technology [44]. Relatively speaking, if the host country enterprises receiving FDI are located in a network center or advantageous position, they often become information gathering points, which is more conducive to enterprises obtaining more resources and information, and also more convenient for foreign or local enterprises to cooperate and exchange. Secondly, for exploratory innovation, it faces the development and research

of new technologies or products, serving the future needs of consumers. This innovative behavior requires a lot of knowledge accumulation and high resource investment. Often, only industry leaders and enterprises in the center of the innovation network can implement it. Therefore, only when these enterprises accept FDI can they better absorb new technologies and knowledge. In summary, based on assumption H3, the following two sub hypotheses are proposed:

H3a: Network centrality positively regulates the impact of FDI on enterprise utilization innovation;

H3b: Network centrality positively regulates the impact of FDI on exploratory innovation in enterprises.

In summary, the theoretical model of this article is shown in Figure 1:

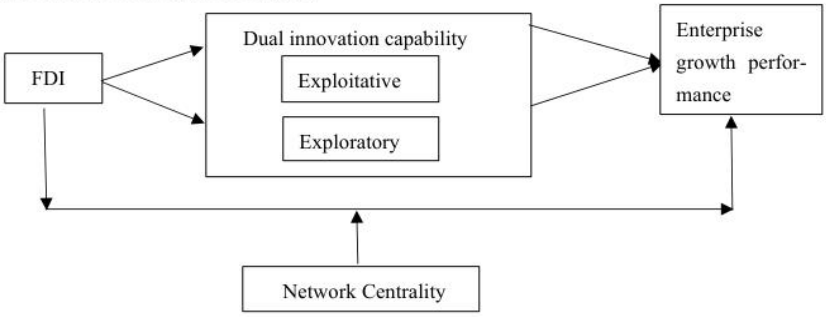

Fig. 1. Conceptual model of the impact of foreign direct investment on the growth performance of enterprises.

3 Data Sources and Variable Descriptions

3.1 Sample Selection and Data Sources

Due to the focus of the article on dual innovation capability and FDI, the core competitive advantage of high-tech enterprises is precisely reflected in their innovation capability, and high-tech enterprises are also the main body of enterprises in China that accept FDI. Therefore, the selection of high-tech enterprises as the research object of the article has a certain representativeness. The article selects high-tech enterprises from 2011 to 2020 as samples, which mainly cover the IT industry, as well as instrument and meter manufacturing, automotive manufacturing, computer, communication and other electronic equipment manufacturing, pharmaceutical manufacturing, railway, shipbuilding, aerospace and other transportation equipment manufacturing, and specialized equipment manufacturing industries. According to the industry classification of the above-mentioned companies, select high-tech enterprises listed on the A-shares of the Shanghai and Shenzhen stock markets, and the screening process is as follows: (1) exclude ST and * ST listed companies; (2) Exclude companies with zero or negative main business revenue; (3) Remove samples with outliers and severe missing indicators. The final sample size was determined to be 374 enterprises. The main financial data comes from the company's financial statements and Guotai An database,

and the company's patent results come from the National Patent Statistics Bureau, using Stata for empirical analysis.

Regarding the formation of innovation networks: Collect information through databases such as the Wande database and the patent database of the Intellectual Property Office, and collect statistics on new product development cooperation and patent joint applications with other enterprises. If enterprises sign joint development agreements or jointly apply for patents, it is considered that there is a connection between them, with a value of 1. Otherwise, it is 0, forming an undirected two-dimensional network adjacency matrix. Due to the persistence of enterprises embedded in innovation networks, this article assumes that the duration of enterprises in the innovation network is 2 years, forming innovation networks from 2011 to 2012, 2012 to 2013, 2013 to 2014, 2014 to 2015, 2015 to 2016, 2016 to 2017, 2017 to 2018, 2018 to 2019, and 2019 to 2020. Nine adjacency matrices of time windows are constructed, consisting of "0" and "1", representing unrelated and related, respectively. Based on this, network centrality is calculated.

3.2 Variable Definition

(1) Explained variable: Business Growth Performance (TBQ)

The dependent variable is the growth performance of the enterprise. Currently, the academic community mainly measures the growth performance of the enterprise through market indicators such as Tobin's Q value, as well as financial indicators such as asset return rate and sales profit margin [45-46]. Due to the lag between digital investment and innovation investment, industry or enterprise evaluation needs to consider both short-term performance and long-term development status. Therefore, drawing on existing research [47-48], Tobin's Q value, which can represent the combination of financial performance and market value, is selected to measure enterprise growth performance.

(2) Explanatory variable: Foreign Direct Investment (FDI)

According to the research of Xie Hongjun and Lv Xue (2022) [49], FDI of listed companies includes two categories: cross-border mergers and acquisitions and Greenfield investments. The former is based on Thomson Reuters' SDC Global Mergers and Acquisitions Database, while the latter is based on the Financial Times' fDi Market Database. This article connects the English names of companies in the fDi Markets database and the securities codes in the SDC Global Mergers and Acquisitions Database with the CSMAR database to obtain relevant information on sample listed companies. At the annual level of Enterprise 110 International Trade Issues, Issue 5, 2023, the total investment amount of Greenfield Investment and cross-border mergers and acquisitions is summed up to obtain FDI data for service industry listed companies from 2011 to 2020.

(3) Mediating variable: Dual innovation capability

The dual innovation ability is divided into exploratory innovation (EI) and exploitative innovation (BI). For the measurement of dual innovation, some scholars have adopted questionnaire survey, content analysis, patent data measurement and other methods. Invention patent refers to the improvement of existing products, processes

and services, while design and utility model focus on the redesign of product structure and appearance. It can be seen that invention patent is more in line with the definition of exploratory innovation ability, and utility model and design are closer to the definition of exploitative innovation ability [50]. Based on the judgment of accuracy and feasibility, this paper draws on the existing research results [51-53] and uses the number of enterprise invention patents to measure the exploratory innovation ability, and the number of enterprise design and utility model patents to measure the exploitative innovation ability.

(4) Moderating variable: network centrality (SC)

Network centrality (SC) is one of the key research issues in social network theory, which refers to the rights or central position that individuals or organizations have in their social networks. [54]The article selects intermediate centrality as the measurement variable of network centrality, which measures the degree of resource control by actors. Input the undirected two-dimensional network constructed in the previous text into UCINET software to obtain the intermediate centrality of each sample enterprise to measure sc.

(5) Control variables

The control variable mainly selects industry characteristics (ind), which is measured by the average number of patent applications in the industry. It is obtained by adding 1 to the average number of patent applications in each industry and taking the logarithm; Select the marketization index of Wang Xiaolu and Fan Gang for the market environment (mark); The age of a company is measured by taking the logarithm of the difference between the current year and the time the company was established.

The specific measurement methods for the above variables are shown in Table 1.

Table 1. Explanation and Source of Main Variables.

variable	Variable Name	Variable symbols	Variable definition
dependent variable	Enterprise growth performance	TBQ	Market value of total assets at the end of the period/total assets at the end of the period
independent variable	foreign direct investment	FDI	The total investment amount of Greenland Investment and cross-border mergers and acquisitions combined
Mediating variables	Dual innovation capability	Utilization Innovation (EI)	The sum of enterprise exterior design and utility model patents
		Exploratory Innovation (BI)	Number of enterprise invention patents
Adjusting variables	Network Centrality	SC	Calculated by UCINET software
control variable	Industry characteristics	ind	IND=ln (average total number of patent applications by industry+1)
	market environment	mark	Wang Xiaolu and Fan Gang's Marketization Index
	Enterprise age	age	Log (year - establishment time of the enterprise)

4 Empirical Analysis

4.1 Descriptive Statistics

Table 2. Descriptive Statistics and Correlation Results of Main Variables.

	mean value	standard deviation	TBQ	FDI	EI	BI	SC	ind	mark	age
TBQ	2.978	2.230	1							
FDI	7481	835.3	0.037*	1						
EI	21.284	59.652	0.066*	0.035*	1					
BI	16.686	48.830	0.021	0.032	0.511***	1				
SC	0.227	0.571	0.123***	0.065***	0.148***	0.092***	1			
ind	4.098	1.009	0.132***	0.045**	0.141***	0.107***	0.01	1		
mark	7.803	1.612	0.026	0.100***	-0.018	0.042**	-0.037*	0.192***	1	
age	2.499	0.508	0.077***	0.023	0.066***	0.069***	0.086***	0.02	0.067***	1

Note: * * * represents p<1%, * * represents p<5%, and * represents p<10%, the same below.

Table 2 reports the descriptive statistics and correlation results of the main variables. Based on the correlation analysis, it can be preliminarily determined that there is a correlation between the dependent variable and other variables, and the correlation coefficients between the main variables are all less than 0.4, indicating that there is no multicollinearity between the main variables, and the selection of variables and models is reasonable. In Table 2, the mean values of enterprise growth performance, foreign direct investment, exploitative innovation, and exploratory innovation are 2.978, 7481, 21.284, and 16.686, respectively. Other variables are also within a reasonable range and will not be repeated. Foreign direct investment is significantly positively correlated with growth performance, consistent with the expectations of this article.

4.2 Regression Analysis

4.2.1 Testing the Relationship between Foreign Direct Investment and Enterprise Growth Performance.

Given that there are multiple regression methods for panel data, this article first uses the Hausman test and combines OLS regression and fixed effects models for analysis. The regression results are shown in Table 3. It can be seen from Table 3 that foreign direct investment is positively correlated with corporate growth performance (β=0.235, $p<0.01$), indicating that the relationship between foreign direct investment and corporate growth performance is positive at a 5% confidence level. Therefore, foreign direct investment has a significant positive effect on corporate growth performance. Hypothesis H1 is verified. As hypothesized, foreign direct investment brings advantages

such as financial support, advanced management experience, a certain degree of technology spillover, and relaxation of patent constraints to enterprises, enabling them to obtain the resources necessary for sustainable development and thus improving their growth performance.

Table 3. Regression Results of Foreign Direct Investment on Enterprise Growth Performance.

variable	TBQ	EI	BI	TBQ	TBQ
FDI	0.235***	0.116***	0.149**	0.227***	0.110***
	(4.24)	(2.07)	(2.14)	(4.15)	(3.87)
BI					0.007***
					(5.96)
EI				0.006***	
				(5.03)	
ind	0.109***	0.238***	0.10***	0.113***	0.109***
	(4.38)	(7.36)	(3.63)	(4.55)	(4.39)
mark	0.035**	-0.018	0.077***	0.037**	0.039**
	(2.01)	(-0.85)	(3.80)	(2.07)	(1.90)
age	-0.985***	-1.94	0.006	-0.971***	-1.086***
	(-4.31)	(-0.5)	(0.10)	(-4.34)	(-4.79)
constant	19.995**	-20.642*	-6.63***	23.614**	23.257**
	(12.2)	(-7.20)	(-6.14)	(13.52)	(13.37)
Ob	732	732	732	732	732
R^2	0.246	0.114	0.162	0.282	0.274

4.2.2 Testing the Relationship between Foreign Direct Investment and Dual Innovation Capability.

The regression results of foreign direct investment and dual innovation capability are shown in Table 3. The coefficient of influence of FDI on exploitative innovation capability (β=0.116, $p<0.01$) and the coefficient of influence of FDI on exploratory innovation capability (β=0.149, $p<0.05$) indicate that foreign direct investment has a positive promoting effect on both exploitative and exploratory innovation of enterprises. Hypotheses H1a and H1b are tested. According to the theory of dual innovation, exploratory innovation represents revolutionary and fundamental changes in technology, requiring enterprises to have rich and heterogeneous knowledge, timely and accurate market information, and sufficient financial support. In addition to providing financial support for enterprises, FDI always brings new knowledge, new technologies, and new concepts to enterprises, thus having a significant promoting effect on exploratory innovation; Utilitarian innovation is the research and innovation that follows the existing technological trajectory, requiring the reabsorption and reuse of existing homogeneous knowledge, which also requires certain financial and technological support. Therefore, FDI will also have a positive impact on exploitative innovation.

4.2.3 Foreign Direct Investment, Dual Innovation Capability, and Corporate Growth Performance.

From Table 3, it can be seen that the coefficient of influence of foreign direct investment on corporate growth performance ($\beta=0.227$, $p<0.01$) indicates that after controlling for the mediating variable EI, foreign direct investment still has a significant positive impact on corporate growth performance. At the same time, the utilization innovation EI has a positive effect on corporate growth performance ($\beta=0.006$, $p<0.01$). Based on the above argument, it indicates that the utilization innovation capability EI plays a positive mediating role between foreign direct investment and corporate growth performance, and is a partial mediator, which is consistent with the hypothesis. Similarly, assuming H2a and H2b are validated.

In summary, exploitative innovation capability plays a partial mediating role between foreign direct investment and corporate growth performance; Exploratory innovation capability plays a partial mediating role between foreign direct investment and corporate growth performance.

4.2.4 The Regulatory Role of Network Centrality.

To study the moderating effect of network centrality on the relationship between foreign direct investment and firm growth performance, based on Table 3, foreign direct investment and network centrality were first centralized, and then the moderating variables network centrality SC, network centrality SC, and the product term of the independent variable foreign direct investment FDI were introduced. The regression results are shown in Table 4. From the results, it can be seen that the interaction coefficient between foreign direct investment and network centrality is 0.202, which is significant at the 1% level ($\beta=0.202$, $p<0.01$), indicating that network centrality positively regulates the impact of foreign direct investment on firm growth performance. Hypothesis H3 is supported; The regression analysis of the interaction term between network centrality and foreign direct investment and enterprise utilization innovation shows a coefficient of 0.207, which is significant at the 5% level ($\beta=0.207$, $p<0.05$), indicating that network centrality positively regulates the impact of FDI on enterprise utilization innovation. Hypothesis H3a is supported; The regression analysis of the interaction term between network centrality and foreign direct investment and exploratory innovation in enterprises shows a coefficient of 0.197, which is significant at the 5% level ($\beta=0.197$, $p<0.05$), indicating that network centrality positively regulates the impact of FDI on exploratory innovation in enterprises. Hypothesis H3b is supported.

In summary, network centrality has a moderating effect on foreign direct investment and corporate growth performance, and the effect is significant; Network centrality positively regulates the impact of FDI on exploitative and exploratory innovation in enterprises. Assuming H3, H3a, and H3b are validated.

Table 4. The moderating effect of network centrality.

variable	TBQ	EI	BI
FDI	0.235***	0.102	0.140***
	(4.24)	(1.49)	(1.93)
SC	0.067*	0.123***	0.031
	(1.76)	(2.24)	(0.79)
SC×FDI	0.202***	0.207**	0.197**
	(2.60)	(2.36)	(2.47)
ind	0.113***	0.258***	0.101***
	(3.45)	(7.66)	(3.28)
mark	0.037**	-0.017	0.077***
	(2.11)	(-0.51)	(3.65)
age	-0.096*	-0.182***	0.002
	(-1.76)	(-2.77)	(0.03)
Constant	20.605***	-22.051*	-6.71***
	(12.72)	(-7.23)	(-6.21)
Ob	732	732	732
R^2	0.285	0.116	0.168

5 Conclusion and Inspiration

5.1 Research Conclusion

The article takes high-tech listed companies in the Shenzhen and Shanghai stock markets as the research objects. Firstly, the independent variable of foreign direct investment is defined, and the total investment of green space investment and cross-border mergers and acquisitions is added up. Then, combined with the mediating effect of dual innovation, its impact on the growth performance of enterprises is analyzed; Next, we will use network centrality as a moderating variable to explore whether it has a moderating effect on the relationship between foreign direct investment and corporate growth performance. The following conclusions have been drawn through empirical analysis:

(1) Foreign direct investment has a positive promoting effect on the growth performance of enterprises. Foreign direct investment can first solve the problem of financial constraints for enterprises, and secondly, through the spillover of technological knowledge, supplement fresh blood for enterprise innovation.

(2) The exploitative innovation capability plays a partial mediating role between foreign direct investment and corporate growth performance, while the exploratory innovation capability also plays a partial mediating role between foreign direct investment and corporate growth performance. The dual innovation capability has a significant positive effect on the growth performance of enterprises. Compared with exploitative innovation, exploratory innovation is more inclined towards digital technology upgrading and innovation strategy transformation

(3) Network centrality positively regulates the relationship between foreign direct investment and corporate growth performance, and FDI has a more significant impact on the growth performance of enterprises located in innovation network centers. Regression analysis found that network centrality has a positive moderating effect on the relationship between FDI and firm performance. This indicates that being in a network center position can increase the promoting effect of foreign direct investment on firm growth performance, and meet the significance level.

5.2 Research Inspiration

(1) High tech enterprises should actively introduce foreign investment and expand opening up

The research object of the article is Chinese high-tech enterprises. Empirical results show that introducing foreign direct investment will positively promote the growth performance of enterprises. Therefore, it is necessary to actively open up high-tech industries that affect the people's livelihood in China and are not prohibited by the state.

(2) Utilizing foreign direct investment can focus on both exploitative and exploratory innovation

The utilization and exploratory innovation capabilities have a promoting effect on the growth performance of enterprises. In the process of receiving foreign direct investment, enterprises are easily exposed to new technologies and knowledge that may not have been touched upon before, which is conducive to the continuous expansion of enterprise knowledge breadth.

(3) Strengthen cooperation between enterprises and strive to enhance their position in the innovation network

The empirical results show that the more a company is located at the center of the network, the more significant the positive promoting effect of foreign direct investment on its growth performance. Therefore, in addition to fully utilizing foreign investment, it is also necessary to strengthen cooperation and communication with local enterprises, establish an innovation network for the company, and continuously improve the company's position in the network.

5.3 Innovation and Research Prospects

(1) Theoretical contribution

This article explores the impact of FDI on the growth performance of enterprises from a micro enterprise perspective, with a focus on the impact on different types of innovation capabilities, providing some ideas for enterprises to clarify the direction of FDI utilization; From the perspective of dual innovation, examine the impact of network centrality on the relationship between foreign direct investment and corporate growth performance.

(2) Research Outlook

Due to limited access to relevant resources, there are still some shortcomings in this article. In the future, improvements can be made in the following two aspects: expanding the time dimension and expanding the sample size on the cross-section to

estimate the lag effect, and further ensuring credibility through large sample testing; In future research, sub industries of enterprises can be further subdivided, such as studying the impact of regional differences on them, providing a theoretical basis for promoting the development of industries in different regions.

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