Proceedings of the 2nd International Conference on Management Research and Economic Development
DOI: 10.54254/2754-1169/91/20241071

Foreign Direct Investment and New Quality Productivity of Enterprises

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Abstract: Now China is opening up to the outside world at a high level. In the process of utilising foreign investment, it is significant to study how foreign direct investment (FDI) affects the formation of new quality productivity of enterprises in China. This paper examines the impact of FDI on new quality productivity of enterprises. Results using financial statement data of A-share listed companies and FDI level data of the cities where the companies are located from 2011 to 2020 show that FDI has a significant promotion effect on the enhancement of new quality productivity of enterprises. Further analysis reveals that the positive effect is generated through the channels of improving enterprise innovation ability and easing enterprise financing constraints, predominantly observed in non-state-owned enterprises. The test for moderating effect shows that a high degree of capital market openness has a significant positive effect on the formation of new quality productivity of enterprises influenced by FDI. The results of this paper provide a theoretical perspective of FDI for further research on the new quality productivity of enterprises.

Keywords: FDI, new quality productivity of enterprises, enterprise innovation, financing constraints, capital market openness

1. Introduction

With the new round of scientific and technological revolution and industrial reform, the problems of overcapacity and insufficient innovation stemming from traditional productivity are highlighted. To counter this, cultivating strategic emerging industries and boosting new quality productivity have become one of the most important works for China. In contrast to traditional productivity, new quality productivity emphasises more on the quality of innovation. Companies are the primary drivers of innovation, making it imperative to enhance new quality productivity of enterprises for the high-quality development of China's economy.

Since the reform and opening up, China has attracted large amounts of foreign capital, which has had a profound impact on the business performance of domestic companies. Some have achieved rapid improvement by assimilating advanced technology and management expertise from foreign enterprises, while others, lacking competitiveness, have failed to withstand the impact of foreign investment and withdrew from the market. In this case, how FDI affects domestic companies has received widespread attention.

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enterprises in China. Therefore, this paper uses the financial statement data of listed enterprises and the FDI level data of the cities where the companies are located to empirically test the impact and transmission mechanism of FDI on new quality productivity of enterprises. Based on the results, policy suggestions are put forward to provide references for China to enhance the efficiency of foreign investment utilisation and formation of new quality productivity.

The potential marginal contributions of this paper are twofold. Firstly, it provides references for the study of new quality productivity of enterprises by complementing the perspective of FDI; secondly, the impact of FDI on new quality productivity of enterprises is studied from the perspective of capital market openness, offering valuable insights for China to open up the capital market and expedite the development of new quality productivity.

2. Theoretical Analysis and Research Hypothesis

Based on classical economics, Marx connected productivity with science and believed that labor productivity developed with the continuous progress of science and technology. Essentially, new quality productivity still falls within the framework of Marxist productivity theory, encompassing "highly qualified" workers, "new medium" means of labour, and "new quality" subjects of labour, and is an advanced form of productivity[1]. Furthermore, most academics believe that new quality productivity is a leap forward from traditional productivity after integrating scientific and technological innovation[2]. While scholars have developed comprehensive evaluation systems for measuring regional new quality productivity[3], there has been less focus on examining the new quality productivity of enterprises[4].

Existing studies have shown limited concern for the impact of FDI on new quality productivity of enterprises, despite a strong link between the two. On the one hand, FDI plays a positive role in promoting enterprise development. This is evidenced by the technology spillover effects of FDI, which contribute to technological progress within host country enterprises[5]. FDI technology spillovers can be achieved by integrating the advanced science and technology and management philosophy of foreign-invested enterprises into domestic enterprises, thereby enhancing the innovation ability of enterprises and promoting the improvement of new quality productivity of enterprises. Additionally, foreign-invested enterprises have an important impact on the financing cost of enterprises. FDI can effectively ease the financing constraints and increase the R&D investment of enterprises[6][7], thereby improving new quality productivity of enterprises. On the other hand, FDI may lead to competitive effects that exert pressure on domestic enterprises[8], potentially inhibiting the formation of new quality productivity of enterprises.

The level of openness in the capital market has a significant impact on foreign capital inflows. When the capital market openness is high, it reduces barriers for foreign capital to enter domestic companies and increases opportunities for companies to attract foreign investment, thus promoting the sustainable development of companies. The implementation of the "Shanghai-Hong Kong Stock Connect" and "Shenzhen-Hong Kong Stock Connect" policies has led to a significant increase in innovation output and the total factor productivity of companies[9], contributing to the improvement of new quality productivity of enterprises. Based on the above analysis, this paper proposes the core hypothesis:

H1: FDI has a significant positive impact on the new quality productivity of enterprises.

3. Model Design and Variable Description

3.1. Sample Selection and Data Sources

Based on the research purpose and data availability, this paper selects the financial statement data of A-share listed enterprises from 2011 to 2020, as well as FDI level data in the cities where these

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companies are located. The relevant data is processed as follows: ①samples of ST and *ST listed enterprises are excluded; ②samples from the financial industry are excluded; ③Winsor2 shrinkage processing is performed on the samples. Ultimately, 25871 sample data points are obtained. All data used in this study are sourced from the CSMAR database.

3.2. Modeling

According to Song, Zhang & Pan (2024) who conducted a study on the new quality productivity of enterprises[4], the following regression model (1) and transmission mechanism model (2) have been constructed:

$$NPro_{it} = \alpha_0 + \alpha_1 FDI_{it} + \delta X_{it} + v_j + \omega_k + \gamma_t + \varepsilon_{it} \quad (1)$$

$$MV_{it} = \beta_0 + \beta_1 FDI_{it} + \delta X_{it} + v_j + \omega_k + \gamma_t + \varepsilon_{it} \quad (2)$$

In model (1), NPro is the dependent variable, representing the new quality productivity of enterprises; FDI is the independent variable, representing the FDI level in the cities where the companies are located; X_{it} is a set of control variables; v_j, ω_k and γ_t represent industry fixed effects, region fixed effects and year fixed effects respectively; ε is a random perturbation term; the subscripts i, t, j and k represent companies, time, industry and province respectively. In model (2), MV is the mediating variable, and the regression is conducted with Patent and KZ as dependent variables. Patent represents the number of patent applications of listed companies to measure enterprise innovation ability while KZ index measures financing constraints.

3.3. Description of Variables

3.3.1. Dependent Variable

The dependent variable in this paper is the new quality productivity of enterprises (NPro). According to Song et al. (2024), the index system of new quality productivity is constructed from the perspective of labour force, including living labour and materialized labour, as well as production tools, encompassing hard technology and soft technology[4]. The Entropy Method is employed in this paper to measure the new quality productivity of enterprises.

3.3.2. Independent Variable

The independent variable in this paper is the FDI level in the cities where the companies are located (FDI). This is calculated as the natural logarithm of the ratio of actual utilised foreign investment to GDP.

3.3.3. Control Variables

In this study, the following variables are utilised: Board (the natural logarithm of the number of board members), Indep (the proportion of independent directors to the number of board members), Dual (1 if the chairman of the board and general manager are combined into one person, 0 otherwise), Top10 (the proportion of shares held by the top ten shareholders), FirmAge (the current year minus the year of establishment), Opinion (1 if the auditor's opinion is unqualified, 0 otherwise).

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4. Empirical Analysis

4.1. Descriptive Statistics

The mean value of NPro is 4.94, with the minimum and maximum values being 0.04 and 28.38, respectively. This indicates disparities in new quality productivity within the sample, suggesting that there is low new quality productivity among enterprises, leaving ample room for improvement. The significant difference between the minimum and maximum values of FDI suggests varying level of FDI across different cities. Similarly, a series of control variables also exhibit noticeable differences, highlighting their potential to effectively control for this study.

4.2. Baseline Regression

Table 1 shows the results of the baseline regression, In column (1), the regression results are shown after incorporating industry, region, and industry fixed effects. In column (2), the regression results are displayed after simultaneously controlling for fixed effects and adding control variables. The coefficients of FDI are both significantly positive at the 5% level, indicating that FDI has a significant positive effect on the new quality productivity of enterprises, thus validating hypothesis H1 of this paper. This may be attributed to the financial support provided by FDI to domestic companies, leading to improved enterprise performance and attracting high-end talents, ultimately enhancing the new quality productivity of enterprises.

Table 1: Baseline Regression

Variables and statistical parameters	NPro	
	(1)	(2)
FDI	0.0241**	0.0243**
	(2.12)	(2.14)
Constant	3.61***	1.52***
	(25.09)	(4.42)
Control Variables	No	Yes
Fixed Effects	Yes	Yes
Sample Size	25871	25871
R^2	0.220	0.224

Note: *, **, and *** denote 10%, 5%, and 1% significance levels respectively, with parentheses for t statistics.

4.3. Robustness Tests

This paper conducted a series of robustness tests to mitigate the influence of other factors. After changing variable measurements using total factor productivity (TFP_OLS) and the proportion of foreign ownership (Fors) to substitute new quality productivity of enterprises and FDI, adding the regional control variable marketisation index (Market), excluding data in 2020 to reduce the impact of COVID-19 epidemic and selecting the explanatory variable lagged one period (FDI_l1) as the instrumental variable for the endogeneity test, the results remain consistent.

5. Further Analysis

5.1. Mechanism Analysis

For the transmission mechanism of enterprise innovation, the coefficient of FDI is significantly positive at the 10% level and the Sobel test shows the P-value is 0.002, which verifies that an increase

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in FDI can significantly improve enterprise innovation and promote new quality productivity of enterprises. The possible reasons are that, on the one hand, FDI improves financial situation of enterprises and encourages them to carry out R&D activities, thereby enhancing their innovation ability; on the other hand, FDI creates crisis awareness in enterprises, stimulating them to maintain their market position by increasing R&D investment and enhancing competitiveness.

For the transmission mechanism of enterprise financing constraints, the coefficient of FDI is significantly negative at the 1% level and the Sobel test shows the P-value is 0, which verifies that an increase in FDI can significantly alleviate enterprise financing constraints and promote new quality productivity of enterprises. One possible reason is that the introduction of FDI improves the efficiency of capital flow and productivity of enterprises, increases the R&D budget, and is conducive to the formation and enhancement of new quality productivity of enterprises.

5.2. Moderating Effect and Heterogeneity Test

To examine the moderating effect, a dummy variable for capital market openness is introduced, with a value of 1 indicating the implementation of the policy of Shanghai-Shenzhen-Hong Kong Stock Connect is implemented and companies are listed as the subject of Shanghai or Shenzhen Stock Connect, and 0 otherwise. The sample is regressed by group. The results indicate that for low capital market openness, the coefficient of FDI is not significant; for high capital market openness, the coefficient of FDI is significantly positive at the 5% level, suggesting that FDI has a positive impact on the new quality productivity of enterprises. Chow test shows that the P-value is 0, proving the coefficients differ significantly between subgroups.

To analyse the differentiated impact of FDI on the new quality productivity of enterprises, the sample is divided into state-owned firms (SOEs) and non-state-owned firms (NSOEs). For NSOEs, the coefficient of FDI is significantly positive at the 1% level, while for SOEs, although the coefficient of FDI is also positive, it does not pass the significance test and Chow test passes, indicating that the contribution of FDI to new quality productivity of enterprises is greater in NSOEs. The possible reason is that SOEs lack a sense of competition and innovation under government protection and have insufficient motivation to learn advanced technology and management experience from foreign-invested enterprises. In contrast, NSOEs face higher market risks, possess more innovative vitality, and can efficiently utilise FDI to improve new quality productivity.

6. Conclusions and Suggestions

Based on the data of A-share listed companies and FDI level in the cities where the companies are located from 2011 to 2020, this paper examines the impact of FDI on the new quality productivity of enterprises, and finds that, firstly, FDI has a significant positive effect on the new quality productivity of enterprises; secondly, FDI promotes new quality productivity of enterprises by enhancing enterprise innovation ability and easing enterprise financing constraints; thirdly, high capital market openness can positively moderate the effect of FDI on new quality productivity of enterprises; fourthly, the contribution of FDI to the new quality productivity is more in non-state-owned enterprises. Based on these findings, this paper proposes the following policy suggestions:

Firstly, we should establish and improve the system and mechanism to promote the inflow of foreign capital, which not only facilitates the development of Chinese enterprises, but also stimulates competition among them, encouraging them to take initiative and fostering the formation of new quality productivity of enterprises. Secondly, we should fully leverage the technological spillover effect of FDI to expand the knowledge width of Chinese enterprises. We should also take advantage of foreign capital, increase R&D investment as well as attract high-tech talents to promote new quality productivity of enterprises. Thirdly, we should further open up the capital market and relax the

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restrictions on the entry of foreign capital to allow high-quality FDI to enter China smoothly, thereby facilitating the upgrade of new quality productivity of enterprises.

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