

Study on the Impact of Foreign Direct Investment on Enterprise Digital Transformation

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Abstract: In the context of global economic integration and the deepening of the digital economy, enterprise digital transformation has become a core strategy for enterprises to enhance competitiveness, while foreign direct investment (FDI) has gradually become an important external driving force for economic development and technological progress. This paper focuses on the impact of FDI on enterprise digital transformation, and explores the internal logic and practical path of this impact through theoretical analysis, mechanism deduction and multi-dimensional impact discussion. Based on theories such as technology spillover, resource-based view and institutional theory, the study holds that FDI affects enterprise digital transformation through four mechanisms: technology spillover effect, resource complementary effect, competitive forcing effect and institutional environment regulation effect. Specifically, FDI promotes the improvement of enterprises' digital infrastructure, the application of digital technology and the optimization of digital organizational management by introducing advanced digital technology, supplementing capital and talent resources, intensifying market competition and improving the institutional environment. However, the impact also shows heterogeneity due to differences in industry attributes, enterprise scale and regional development levels. Finally, the paper puts forward targeted suggestions for enterprises and governments to better utilize FDI to promote high-quality digital transformation of enterprises.

Keywords: Foreign Direct Investment; Enterprise Digital Transformation; Technology Spillover; Resource Complementarity; Institutional Environment.

1. Introduction

(1) Research Background

In the context of the rapid development of the global digital economy, digital transformation has become a key path for enterprises to adapt to the new development pattern and enhance core competitiveness. [1] Enterprise digital transformation refers to the process in which enterprises deeply integrate digital technologies such as big data, cloud computing, artificial intelligence and the Internet of Things into production, operation and management, thereby optimizing production efficiency, improving service quality and reconstructing business models (Huang & Zhang, 2023). According to the "China Digital Economy Development Report (2023)" released by the China Academy of Information and Communications Technology, the scale of China's digital economy reached 50.2 trillion yuan in 2022, accounting for 41.5% of GDP, and digital transformation has become an important engine for economic growth [6].

At the same time, as an important carrier of global capital flow and technology transfer, foreign direct investment (FDI) has long played a vital role in promoting technological progress and industrial upgrading in host countries. According to the World Investment Report 2023 released by UNCTAD, global FDI flows rebounded to \$1.3 trillion in 2022, and developing economies accounted for 54% of global FDI inflows, becoming the main destination of global investment. [10] In China, FDI has maintained steady growth. In 2022, the actual use of foreign capital in China reached 1,239.7 billion yuan, a year-on-year increase of 6.3% (Ministry of Commerce of the People's Republic of China, 2023). [7] With the continuous expansion of FDI scale, its impact on the economic and social development of the host country has extended from traditional fields such as capital supplement and employment promotion to more complex

fields such as technological innovation and industrial transformation.

Against this background, whether and how FDI affects enterprise digital transformation has become an important issue worthy of in-depth discussion. On the one hand, foreign-invested enterprises usually have advanced digital technology reserves and mature digital management experience. Through channels such as technology transfer, personnel training and supply chain cooperation, they may have a spillover effect on local enterprises, promoting their digital transformation. [12] On the other hand, FDI may also bring more intense market competition, forcing local enterprises to accelerate digital transformation to cope with competitive pressure. However, in practice, the impact of FDI on enterprise digital transformation may be restricted by factors such as the absorption capacity of local enterprises, the institutional environment of the host country and the type of FDI, resulting in complex and diverse impact effects.

(2) Research Objectives and Significance

First, this study enriches the research results of the economic effects of FDI. Traditional studies on FDI mainly focus on its impact on economic growth, technological progress and industrial structure upgrading (Blomström & Kokko, 1998; Wang & Liu, 2020). [11] By exploring the impact of FDI on enterprise digital transformation, this paper expands the research scope of FDI's economic effects to the field of digital economy, providing a new perspective for understanding the role of FDI in the new era. [8] For enterprises, this study helps them clarify the role path of FDI in digital transformation, so as to better utilize FDI resources to formulate digital transformation strategies. Local enterprises can learn from the digital experience of foreign-invested enterprises, strengthen technology absorption and innovation, and improve the efficiency of digital transformation.

For the government, the research conclusions can provide a reference for formulating policies to attract investment and promote digital transformation. The government can optimize the investment environment, guide FDI to flow into key digital fields, and strengthen the construction of supporting systems such as talent training and technology services, so as to give full play to the role of FDI in promoting enterprise digital transformation [6].

(3) Research Methods and Framework

This paper mainly adopts the method of theoretical analysis and literature research. By combing and summarizing the relevant literature on FDI and enterprise digital transformation, it sorts out the theoretical basis of the impact of FDI on enterprise digital transformation. On this basis, the mechanism of FDI affecting enterprise digital transformation is deduced, and the specific performance of the impact is analyzed in combination with practical cases. The structure of this paper is as follows: The first part is the introduction, which expounds the research background, significance, methods and framework. The second part sorts out relevant theories and analyzes the mechanism of FDI affecting enterprise digital transformation. The third part discusses the specific impact of FDI on enterprise digital transformation from multiple dimensions. The fourth part summarizes the research conclusions and puts forward policy suggestions.

2. Analysis of Relevant Theories and Mechanisms

(1) Review of Relevant Theories

Enterprise digital transformation is a long-term and high-input process, which requires sufficient capital, talent and technology resources. Many local enterprises, especially small and medium-sized enterprises, are constrained by resource endowments and find it difficult to independently complete digital transformation. FDI can make up for the resource shortage of local enterprises through resource complementary effect:

First, capital supplement. Digital transformation requires a lot of investment in digital infrastructure (such as cloud servers, IoT sensors), digital technology research and development, and digital talent training. FDI can provide capital support for local enterprises through equity investment, joint ventures and other forms, alleviating the financial pressure of digital transformation. For example, foreign venture capital institutions may invest in local technology startups with digital transformation potential, providing funds for their research and development of digital products and market expansion.

Second, talent supplement. Foreign-invested enterprises usually have a sound talent training system and can attract global digital talents. Through technical cooperation, joint research and development and other forms, local enterprises can share the talent resources of foreign-invested enterprises. For example, local enterprises and foreign-invested enterprises carry out joint projects on artificial intelligence application, and local employees can participate in project research and development, learn from foreign experts' technical experience, and improve their own digital skills. [7] At the same time, foreign-invested enterprises may also carry out public welfare training courses on digital skills for local enterprises, helping them cultivate digital talents.

Third, technology supplement. FDI can directly introduce advanced digital technology to local enterprises through

technology licensing, technology transfer and joint research and development. For example, foreign-invested automobile enterprises may authorize local partners to use their intelligent driving algorithms and vehicle networking technologies, helping local automobile enterprises accelerate the digital transformation of new energy vehicles.

(2) Competitive Forcing Effect

FDI will intensify market competition in the host country, and local enterprises will face more intense competition from foreign-invested enterprises, which will force local enterprises to accelerate digital transformation to enhance their competitiveness.

First, product and service competition. Foreign-invested enterprises often use digital technology to improve product quality and service efficiency, providing consumers with more personalized and high-quality products and services. In order to avoid being eliminated in the market competition, local enterprises must carry out digital transformation to improve product innovation capabilities and service levels. For example, in the financial industry, foreign-invested banks such as HSBC and Citibank have launched digital financial services such as mobile payment and intelligent wealth management, which have had a great impact on local banks. Local banks have accelerated the layout of digital finance, such as building online banking platforms and developing intelligent customer service systems, to compete with foreign-invested banks.

Second, efficiency competition. Digital technology can significantly improve production efficiency and reduce operating costs. Foreign-invested enterprises with high digital levels often have lower production costs and higher response speeds, which puts cost pressure on local enterprises. Local enterprises must improve their production and operation efficiency through digital transformation to maintain price competitiveness. [2] For example, in the manufacturing industry, foreign-invested enterprises using intelligent production lines can achieve flexible production and rapid delivery, while local enterprises still relying on traditional production methods are at a disadvantage in terms of production efficiency. This forces local manufacturing enterprises to invest in intelligent transformation, such as introducing industrial robots and building digital workshops.

(3) Institutional Environment Regulation Effect

The institutional environment of the host country regulates the impact of FDI on enterprise digital transformation. A good institutional environment can strengthen the positive impact of FDI, while an imperfect institutional environment may weaken or even offset the positive impact.

First, intellectual property protection system. A sound intellectual property protection system can encourage foreign-invested enterprises to transfer more advanced digital technologies, because it can protect the legitimate rights and interests of foreign-invested enterprises in technology and reduce the risk of technology leakage. At the same time, it can also encourage local enterprises to carry out independent innovation on the basis of absorbing foreign technologies, forming a virtuous circle of "introduction - absorption - innovation". If the intellectual property protection system is not sound, foreign-invested enterprises may be reluctant to transfer core digital technologies, and local enterprises may also lack the motivation for independent innovation, thus weakening the technology spillover effect of FDI.

Second, digital infrastructure and policy support. The refine of digital infrastructure (such as 5G networks, data

centers) and policy support (such as digital transformation subsidies, tax incentives) can reduce the cost of local enterprises' access to FDI digital spillovers and improve their absorption capacity. [1] For example, regions with perfect 5G networks are more conducive to the application of digital technologies such as the Internet of Things and industrial internet, enabling local enterprises to better absorb the digital technology spillovers of foreign-invested enterprises.

Third, marketization level. A high level of marketization means a more fair and transparent market environment, which is conducive to the free flow of factors such as technology, talent and capital between foreign-invested enterprises and local enterprises, and promotes the realization of technology spillover and resource complementary effects. [3] In regions with low marketization levels, due to factors such as administrative intervention and market segmentation, the flow of factors between foreign-invested enterprises and local enterprises is blocked, which is not conducive to the role of FDI in promoting digital transformation.

3. Analysis of the Impact

Based on the above theories, this paper holds that FDI affects enterprise digital transformation through four mechanisms: technology spillover effect, resource complementary effect, competitive forcing effect and institutional environment regulation effect.

(1) Impact on Digital Infrastructure

The technology spillover effect is the most direct mechanism for FDI to promote enterprise digital transformation. Foreign-invested enterprises, especially those from developed countries, usually have advanced digital technology and mature digital application models. [5] These technologies and models will spill over to local enterprises through multiple channels: Digital infrastructure is the foundation of enterprise digital transformation, including hardware facilities such as servers, sensors and intelligent equipment, and software systems such as cloud platforms, big data analysis systems and ERP systems. FDI has a significant promoting effect on the improvement of enterprises' digital infrastructure.

First, FDI promotes the upgrading of enterprises' digital hardware facilities. Foreign-invested enterprises usually have high requirements on the hardware level of production and operation, and will invest a lot of money in the purchase and upgrading of digital hardware. Through supply chain cooperation and technology spillover, local enterprises will be driven to upgrade their digital hardware facilities. For example, in the electronics manufacturing industry, foreign-invested enterprises such as Apple's suppliers require the use of high-precision intelligent testing equipment and automated production lines. [6] Local enterprises in the supply chain have to purchase advanced digital production equipment to meet the cooperation requirements, which has promoted the upgrading of digital hardware facilities in the electronics manufacturing industry.

Second, FDI promotes the popularization and application of enterprise digital software systems. Foreign-invested enterprises have rich experience in the application of digital software systems and can provide guidance and support for local enterprises in the selection and application of software systems. For example, foreign-invested consulting companies such as Accenture and IBM can help local enterprises customize ERP systems and CRM systems suitable for their own characteristics, and provide training on system operation,

promoting the application of digital software systems in local enterprises. According to the "China Enterprise Digital Transformation Development Report (2022)" issued by the China Association for Information Technology, the proportion of enterprises using cloud computing, big data and other digital software services in regions with high FDI inflows is 20-30% higher than that in regions with low FDI inflows, indicating that FDI has a positive impact on the popularization of digital software systems.

(2) Impact on Digital Technology Application

The application of digital technology is the core of enterprise digital transformation, including the application of digital technology in production, marketing, R&D and customer service. FDI promotes the deep application of digital technology in enterprises through technology spillover and resource complementarity.

First, in the field of production. FDI promotes the application of digital technology in enterprise production processes, such as intelligent manufacturing, digital process control and predictive maintenance. Foreign-invested manufacturing enterprises have mature experience in intelligent production, and local enterprises can learn from their production models through imitation and cooperation. [5] For example, in the automobile manufacturing industry, foreign-invested enterprises such as Toyota and Volkswagen have applied digital technologies such as digital twins and industrial Internet in production, realizing the whole process visualization and intelligent control of production. Local automobile enterprises such as Geely and Great Wall have learned from these experiences and built intelligent factories, which have improved production efficiency by 30-50% and reduced defect rates by more than 20% after transformation.

Second, in the field of marketing. FDI promotes enterprises to carry out digital marketing by introducing digital marketing concepts and technologies. Foreign-invested enterprises are good at using big data, artificial intelligence and other technologies to analyze consumer behavior, carry out precise marketing and improve marketing efficiency. Local enterprises can learn digital marketing methods from foreign-invested enterprises, such as building user data platforms, developing intelligent recommendation systems and carrying out social media marketing. For example, foreign-invested fast-moving consumer goods enterprises such as Procter & Gamble and Unilever use big data to analyze consumer preferences and carry out personalized product recommendations and advertising placements. Local fast-moving consumer goods enterprises such as Liby and Nice have followed up and built digital marketing teams to improve marketing accuracy through data analysis.

Third, in the field of R&D. FDI promotes enterprises to carry out digital R&D by introducing digital R&D tools and methods. Digital R&D can shorten the R&D cycle, reduce R&D costs and improve R&D efficiency. Foreign-invested enterprises often use digital R&D platforms such as CAD, CAE and PLM to realize collaborative R&D and virtual simulation. Local enterprises can improve their R&D digital level through technology introduction and joint R&D with foreign-invested enterprises. For example, in the aerospace industry, foreign-invested enterprises use digital simulation technology to carry out aircraft aerodynamic performance testing, which greatly shortens the R&D cycle. Local aerospace enterprises have introduced similar digital R&D tools, and the R&D cycle of new models has been shortened by 20-40%.

(3) Impact on Digital Organizational Management

Digital organizational management refers to the adjustment and optimization of organizational structure, management model and corporate culture by enterprises to adapt to the needs of digital transformation, including flat organizational structure, data-driven decision-making and digital corporate culture. FDI promotes the optimization of enterprises' digital organizational management through management experience spillover and institutional environment improvement.

Foreign-invested enterprises usually adopt a flat organizational structure to improve the efficiency of information transmission and decision-making, which is more suitable for the rapid response needs of digital transformation. Through personnel flow and management consulting, local enterprises will learn from the experience of foreign-invested enterprises and adjust their organizational structure from the traditional pyramid structure to a flat structure. For example, foreign-invested Internet enterprises such as Google and Microsoft have a flat organizational structure with few management levels, which enables employees to communicate and collaborate directly, and improves the efficiency of digital project promotion. Local Internet enterprises such as Alibaba and Tencent have also optimized their organizational structure, reducing management levels and establishing cross-departmental digital project teams to adapt to the rapid development of digital business.

Second, data-driven decision-making. FDI promotes enterprises to establish a data-driven decision-making model. Foreign-invested enterprises attach great importance to the role of data in decision-making, and have established a complete data collection, analysis and application system. Local enterprises can learn from this experience to realize the transformation from experience decision-making to data decision-making. [7] For example, foreign-invested retail enterprises such as Walmart use big data analysis to predict market demand, adjust procurement plans and optimize inventory management, which has significantly reduced inventory costs. Local retail enterprises such as Suning and JD.com have built big data analysis platforms to carry out sales forecasting and inventory optimization through data analysis, improving the efficiency of operation and management.

Third, digital corporate culture. FDI helps enterprises shape a digital corporate culture that emphasizes innovation, collaboration and data-driven. Foreign-invested enterprises usually have a strong digital culture, encouraging employees to use digital technology to innovate and collaborate. Through cultural exchanges and talent training, local enterprises will gradually establish a digital corporate culture. For example, foreign-invested technology enterprises such as IBM and Intel advocate "digital innovation" and set up innovation incentives to encourage employees to carry out digital technology research and development and application. Local technology enterprises such as Huawei and Baidu have also established digital innovation platforms and incentive mechanisms to create a cultural atmosphere conducive to digital transformation. [11] Due to the differences in economic development level, institutional environment and digital infrastructure, the impact of FDI on enterprise digital transformation also shows regional heterogeneity. In eastern coastal regions with high economic development level, perfect digital infrastructure and good institutional environment, the absorption capacity of local enterprises is strong, and the technology spillover effect and resource

complementary effect of FDI can be better played, so FDI has a more significant promoting effect on enterprise digital transformation. For example, in the Yangtze River Delta and Pearl River Delta regions, which attract a large amount of FDI, local enterprises such as Zhejiang Geely and Guangdong Midea have made full use of FDI resources to carry out digital transformation and have achieved remarkable results.

In central and western regions with relatively backward economic development, the digital infrastructure is imperfect, and the absorption capacity of local enterprises is weak, so the role of FDI in promoting digital transformation is relatively limited. However, with the transfer of FDI to the central and western regions in recent years and the improvement of the local institutional environment, the promoting effect of FDI on enterprise digital transformation in these regions is gradually revealing. For example, in Sichuan and Chongqing, foreign-invested enterprises in the electronic information industry have driven local supporting enterprises to carry out digital transformation, and the digital level of the electronic information industry cluster has been significantly improved.

Small and medium-sized enterprises (SMEs) have relatively weak resource endowments and absorption capacity, and it is difficult to directly carry out large-scale digital transformation through cooperation with foreign-invested enterprises. [9] However, SMEs can improve their digital level through supply chain spillover and imitation learning. For example, SMEs that are suppliers of large foreign-invested enterprises can improve their digital management level with the help of technical guidance from foreign-invested enterprises. At the same time, SMEs can learn from the digital transformation experience of small and medium-sized foreign-invested enterprises to avoid high investment risks.

4. Conclusions

(1) Conclusions

This paper studies the impact of FDI on enterprise digital transformation based on theoretical analysis and mechanism deduction, and draws the following conclusions:

First, FDI has a positive promoting effect on enterprise digital transformation. Through technology spillover effect, resource complementary effect, competitive forcing effect and institutional environment regulation effect, FDI promotes the improvement of enterprises' digital infrastructure, the deep application of digital technology and the optimization of digital organizational management.

Second, the impact of FDI on enterprise digital transformation is realized through multiple mechanisms. The technology spillover effect promotes local enterprises to obtain digital technology and experience through personnel flow, supply chain cooperation and demonstration imitation; the resource complementary effect makes up for the shortage of capital, talent and technology in local enterprises' digital transformation; the competitive forcing effect forces local enterprises to accelerate digital transformation through market competition; the institutional environment regulation effect affects the strength of the above effects by influencing the protection of intellectual property rights, digital infrastructure and marketization level.

Third, the impact of FDI on enterprise digital transformation shows significant heterogeneity. In terms of industry, FDI has a more significant promoting effect on technology-intensive industries; in terms of enterprise scale, large enterprises benefit more from FDI in digital

transformation; in terms of region, eastern coastal regions benefit more obviously from FDI than central and western regions, but the effect in central and western regions is gradually revealing.

(2) Policy Recommendations

First, optimize the structure of FDI introduction. The government should guide FDI to flow into technology-intensive industries and high-tech fields, and encourage foreign-invested enterprises to set up R&D centers and digital technology service platforms in China, so as to enhance the technology spillover effect of FDI.

Second, improve the institutional environment for digital transformation. The government should strengthen the protection of intellectual property rights, improve the legal system related to digital economy, and encourage foreign-invested enterprises to transfer advanced digital technologies. At the same time, accelerate the construction of digital infrastructure such as 5G networks and data centers, and reduce the cost of enterprises' digital transformation.

Third, strengthen the support for enterprises' absorption capacity. The government should increase investment in education and training, cultivate a large number of digital talents, and improve the digital literacy of employees in local enterprises. For small and medium-sized enterprises and enterprises in central and western regions, provide policy support such as digital transformation subsidies and tax incentives to improve their ability to absorb FDI digital spillovers.

Fourth, promote regional balanced development. The government should guide FDI to transfer to central and western regions, improve the digital infrastructure and institutional environment in central and western regions, and strengthen the connection between enterprises in central and western regions and foreign-invested enterprises, so as to promote the balanced development of digital transformation in different regions. This paper only carries out theoretical analysis and mechanism deduction, and lacks empirical test with micro data, which may lead to the insufficient persuasiveness of some conclusions. In the future, empirical research can be carried out using enterprise-level micro data to test the impact of FDI on enterprise digital transformation and its mechanism, and further explore the differences in the impact of different types of FDI (such as cross-border mergers and acquisitions) on digital transformation. At the same time, the long-term impact of FDI on enterprise digital transformation and the dynamic evolution of the impact mechanism can be studied to provide more in-depth theoretical support and practical guidance for promoting enterprise digital transformation.

In labor-intensive industries (such as textiles, clothing and traditional manufacturing), the digital level of foreign-

invested enterprises is relatively low, and the competitive forcing effect is the main mechanism for FDI to promote digital transformation.

References

- [1] Cai Sihang. Research on the Impact of Regional Digital Finance Development on the Location Choice of FDI in China [D]. Hunan University, 2022. DOI:10.27135/d.cnki.ghudu.2022.003994.
- [2] Ma Wen, Tian Liwen. Research on the Development Status and Strategies of Inclusive Finance in the Digital Economy Era [J]. *Market Modernization*, 2024(07):117 - 119. DOI:10.14013/j.cnki.scxdh.2024.07.036.
- [3] Kolstad I, Wiig A. What determines Chinese outward FDI? [J]. *Journal of World Business*, 2012, 47(1):26 - 34.
- [4] Dong Tingting. Research on the Influencing Factors of the Location Choice of China's Outward Foreign Direct Investment in the Context of the Digital Economy [D]. Liaoning University, 2021. DOI:10.27209/d.cnki.glniu.2021.001292.
- [5] Zhu Wentao, Gu Naihua. Land Prices and the Location Choice of FDI - An Empirical Study Based on the Spatial Durbin Model [J]. *Journal of International Trade Issues*, 2018, (11):162 - 174. DOI:10.13510/j.cnki.jit.2018.11.012.
- [6] Desbordes, R., & S. J. Wei. The Effects of Financial Development on Foreign Direct Investment [J]. *Journal of Development Economics*, 2017, 127:153 - 168.
- [7] Lü Chaofeng, Huang Meibo. Can Financial Development Affect the Location Choice of FDI? [J]. *Journal of Financial Research*, 2018, (08):137 - 154.
- [8] Tan Lingzhi, Zhang Yuzheng, Zhou Zongshe. The Impact of Digital Inclusive Finance on Multidimensional Relative Poverty in Rural Areas - An Empirical Analysis Based on Provincial Panel Data [J]. *Journal of Agro - Forestry Economics and Management*, 2023, 22(02):224 - 232.
- [9] Chen Xiao, Wang Haonan, Wang Guofeng. Research on the Common Prosperity Effect of Digital Inclusive Finance - Based on the Test of the Inflection Point Effect [J]. *Economic Problems*, 2024, (03):53 - 60.
- [10] Tan Lingzhi, Zhang Yuzheng, Zhou Zongshe. The Impact of Digital Inclusive Finance on Multidimensional Relative Poverty in Rural Areas - An Empirical Analysis Based on Provincial Panel Data [J]. *Journal of Agro - Forestry Economics and Management*, 2023, 22(02):224 - 232.
- [11] Li Muchen, Feng Sixian. Digital Inclusive Finance, Digital Thresholds and the Urban - Rural Income Gap [J]. *Management Review*, 2023, 35(06):57 - 71.
- [12] Ye Jinsong, Fang Jiabin, Zhong Changbiao. Regional Market Segmentation, Digital Economy Development and the Introduction of Foreign Direct Investment [J/OL]. *Collected Essays on Finance and Economics*, 1 - 14 [2024 - 04 - 12].