

Analysis of the influence of foreign direct investment on the international trade pattern of host countries

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Abstract. This paper aims to explore the impact of foreign direct investment (FDI) on the international trade patterns of host countries. Based on a comprehensive analysis of relevant domestic and foreign literature, this study sorted out the basic theoretical framework of the interaction between FDI and international trade. On this basis, using the latest panel data and econometric methods, this study conducted an empirical analysis of how FDI affects the export structure, import structure and trade balance of host countries. The findings indicate that foreign direct investment (FDI) plays a crucial role in enhancing the technological advancement of host nations, boosting the sophistication and value of exported goods, and aiding in the diversification of imported products while decreasing reliance on specific raw materials and technologies. In addition, the study also found that FDI can help the host country to improve its trade deficit and enhance its position in the global value chain. Finally, this paper further verifies the above conclusions through case analysis, and puts forward some policy suggestions for the government, including optimizing the foreign investment introduction policy, strengthening the cooperation between local enterprises and foreign enterprises, so as to make better use of FDI to promote the sustainable and healthy economic development of the host country. This study offers a new perspective for understanding the dynamic relationship between FDI and international trade, but also provides an empirical basis for formulating more effective foreign investment policies.

1 Introduction

Due to the ongoing progress of globalization, the economic connections between nations have grown stronger. As one of the important forms of transnational capital flow, Foreign Direct Investment (FDI) plays an important role in promoting the optimization of global resource allocation and the transfer of technology and management experience. In the past few years, the fast growth of China's economy has drawn in a significant amount of Foreign Direct Investment (FDI). It has not only advanced the improvement of the domestic industrial structure, but also significantly impacted China's international trade pattern. This study aims to explore the specific impact of FDI on the international trade patterns of host countries and its mechanism[1]. Through the review and analysis of the existing literature, it can be found that although scholars generally believe that there is a close correlation between FDI and international trade, there are still different views on the specific manifestation of the relationship between the two and the driving factors behind them. On the one hand, FDI may promote the export capacity of the host country by introducing advanced technology, management experience and market channels. On the other hand, FDI may also intensify market competition, prompting local enterprises to improve efficiency or withdraw

market, thus changing the structure of import and export commodities.

In view of this, this study will analyze how FDI affects the international trade pattern of host countries from both theoretical and empirical levels[2]. Firstly, the basic mechanism of FDI's influence on international trade is theoretically expounded, including technology spillover effect, competition effect, export creation effect and import substitution effect. Secondly, based on the latest statistical data, this paper empirically analyzes the impact of FDI on China's international trade pattern using econometric methods. Finally, combined with the case study, the corresponding policy recommendations are put forward.

2 Literature review

2.1 Review of FDI theoretical basis and research status

As an important form of transnational capital flow, foreign direct investment (FDI) is mainly based on international economics. One of the most influential theories is the International Production Compromise theory (OIL Framework) developed by British economist John Dunning. According to this theory, enterprises should have Ownership Advantages, Internalization Advantages and Location Advantages

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when conducting FDI. The existence of these advantages determines whether enterprises will choose FDI as their way to enter the international market. In addition to the eclectic theory of international production, other theories have also been used to explain the FDI phenomenon, such as the incomplete market theory and the comparative advantage theory[3]. These theories together form the basis of our understanding of FDI behavior.

The international academic community is widely involved in the research on the correlation between foreign direct investment (FDI) and international trade, which is mainly divided into two research orientations: macro level and micro level. One side discusses the influence of FDI on the overall trade performance of the country in which it invests. The other explores its role in changing trade patterns in specific industries or regions. At the macro level, many analyses have confirmed that the influx of FDI can enhance the overall trade vitality of the host country, especially the stimulation of export trade. The reason is that FDI is often accompanied by the import of technology transfer and management practices, which greatly improves the production efficiency of local enterprises and further strengthens their competitive position in the global market. However, micro-analysis shows that FDI has different impacts on trade in various fields. For example, in the manufacturing industry, FDI usually promotes the expansion of exports, while in the service industry, FDI may more easily demonstrate its effects through service outsourcing and other forms [4]. Moreover, FDI will reshape the trade structure of host countries, which is reflected in the increasing proportion of high-tech exports.

2.2 Definition of relevant concepts

In order to ensure the accuracy and consistency of follow-up studies, we need to clarify the following concepts:

Foreign Direct investment (FDI) : A foreign investor establishes a new business in a host country, purchases shares in an existing business, or otherwise acquires long-term control of that business.

International trade pattern: This refers to the changes in the structure of import and export commodities caused by FDI in the host country, including changes in the diversification of export products and import dependence.

Technology spillover effect: refers to the diffusion effect of advanced technology and management knowledge brought by FDI among local enterprises.

Export creation effect: refers to new export opportunities or expansion of original export scale caused by FDI.

Import substitution effect: The host country is able to produce goods and services that would otherwise need to be imported domestically due to the introduction of FDI, thus reducing its dependence on external markets.

Through the review of the above theoretical and empirical studies, it can be seen that although there are many research results, there are still many problems

worthy of further discussion[5]. In particular, with the changes in the global economic environment, the specific mechanism of FDI's impact on the host country's international trade pattern may be different, which requires in-depth analysis combined with the latest data.

3 Theoretical analysis

3.1 FDI affects the basic mechanism of international trade

The mechanism of transnational enterprises' penetration into the host country's international trade mode includes technology diffusion effect, market competition and cooperation effect, export promotion effect and import substitution effect. The added value of foreign direct investment (FDI) is not only limited to capital injection, but also the transfer of cutting-edge technology and governance strategies. When foreign enterprises apply the technology to the territory of the investor country, the technology spillover effect will appear, in the form of the gradual penetration of novel technologies and management practices to local enterprises. Technology transfer can be implemented through various channels such as technology exchange, joint operation and supply chain collaboration. The transfer of such knowledge and skills helps to enhance the production capacity of enterprises in the investor country, upgrade product quality and technology density, further help to enhance export potential and optimize the terms of trade. The continuous influx of FDI has given rise to the fierce competition of foreign-funded enterprises in the internal market of the host country, which not only encourages local enterprises to strengthen operation efficiency and service quality, but also leads to the natural elimination of inefficient enterprises and further optimizes the industrial structure from the macro level. This indirectly drives the overall economic efficiency of the host country and strengthens its competitive advantage in the global market. Foreign investors often move in with global distribution networks to promote local products to the international market, while foreign companies become the main export force, using the host country's resource endowment and cost-effectiveness to carry out manufacturing and marketing, and jointly help the host country to expand its export market share. In certain contexts, FDI also shows the phenomenon of import substitution, in which foreign companies tend to localize the production of goods that used to be imported, especially in industries with high tariffs or high logistics costs, which helps to reduce dependence on external imports and promote the robust growth of local value chains.

3.2 Analysis of the relationship between FDI and trade patterns of host countries

Through the above mechanism analysis, it can be seen that FDI has many influences on the host country's international trade pattern. It can not only promote export diversification and increase the total volume of

exports, but also enhance the overall level of local industries through technology spillovers and competition effects. In addition, the import substitution effect helps to optimize the import structure and reduce unnecessary import expenses. However, it is important to note that these positive effects do not occur automatically and are constrained by a variety of factors, such as the absorptive capacity of the host country, the policy environment, and the size of the market. Hence, in practical terms, the government must create sensible strategies to steer and assist the positive growth of FDI and guarantee its beneficial influence on global trade trends.

4 Empirical analysis

4.1 Data sources and statistics

This research focused on China to analyze how foreign direct investment (FDI) affects the international trade patterns of host countries, gathering data from the last twenty years (2004-2023). These data mainly include macroeconomic indicators such as annual FDI inflows, total imports and exports, exports and imports of different industries. The data comes from official annual reports issued by the Chinese government, World Bank databases and statistics provided by other reliable research institutions.

Table 1. Changes of FDI inflow and total international trade in China from 2004 to 2023

A given year	FDI inflows (US \$100 million)	Total exports (US \$100 million)	Total imports (US \$100 million)	Total net exports (USD billion)
2004	606.4	5933,3	5612,9	320,4
2005	603.3	7619,7	6600,8	1018,9
.....				
.....				
2023	1496,9	76906,1	20563,1	6343,0

From Table 1, China's FDI inflow shows a fluctuating upward trend. For example, in 2004, China attracted about \$60.64 billion in FDI, and by 2023, this figure increased to \$149.69 billion, an increase of about 147 percent. At the same time, China's total imports and exports are also growing. In 2004, China's overall trade volume reached \$1,154.62 billion with exports totaling \$593.33 billion and imports totaling \$561.29 billion. In 2023, the combined import and export value amounted to 4,746.92 billion US dollars, with exports totaling 2,690.61 billion US dollars and imports totaling 2,056.31 billion US dollars, marking a rise of approximately 353% and 266% individually.

In addition, the changes of imports and exports in different industries also reflect the impact of FDI on China's trade structure. For example, the export value of the

manufacturing sector was 285.02 billion US dollars in 2004, and by 2023, the figure increased to 1,436.72 billion US dollars, an increase of about 397%. In contrast, the value of manufacturing imports was \$234.51 billion in 2004 and grew to \$1,021.83 billion in 2023, an increase of about 335%. These data show that FDI has not only boosted China's overall trade volume, but also played an important role in boosting export capacity and import substitution capacity in key industries such as manufacturing.

Table 2. Changes in FDI inflows and Exports in the manufacturing Sector (2004-2023)

A given year	Exports (\$100 million)	Imports (US \$100 million)
2004	2850,2	2345,1
2023	14367,2	10218, 3
Rate of increase	397%	335%

As can be seen from Table 2, FDI has an all-round impact on China's international trade pattern, which not only promotes the growth of the overall trade volume, but also optimizes the trade structure, especially in key industries such as manufacturing. These changes reflect the important role of FDI in China's economic development and provide a solid data base for further analysis [6].

4.2 Design and explanation of empirical model

This research utilizes a panel data regression model to empirically assess the effects of foreign direct investment (FDI) on the international trade patterns of the host country. Panel data models can take into account both cross-sectional (different industries or regions) and time series (different years) data characteristics, thus improving the estimation accuracy and explanatory power of the model.

1. Model design: Two main regression models are designed in this study to analyze the impacts of FDI. The model design takes into account the following variables:

Dependent variable:

Eit: Total exports of the host country's second industry in year tt.

Iit: Overall imports of the second sector of the host nation in the year tt.

NEit: The tt year net exports (total exports minus total imports) of the host country's second industry.

Independent variable:

FDLit: FDI inflow in the second industry of the host country in year tt, which is used to measure the scale of FDI inflow.

Control variables:

PCGDPit: GDP per capita of the second industry in the host country in year tt, reflecting the economic growth.

LFSit: The labor force size of the second industry in the host country in year tt, reflecting the human resources situation.

ELit: The average level of education in the second sector of the host country in year tt , reflecting the quality of human capital.

IDit: The level of infrastructure construction in the second sector of the host country in year tt , measuring the quality of logistics, transportation and other support facilities.

2. Model setting

$$E_{it} = b_0 + b_1 FDI_{it} + b_2 PCGDP_{it} + b_3 LFS_{it} + b_4 EL_{it} + b_5 ID_{it} + e_{it}$$

$$I_{it} = a_0 + a_1 FDI_{it} + a_2 PCGDP_{it} + a_3 LFS_{it} + a_4 EL_{it} + a_5 ID_{it} + u_{it}$$

Among them,

b_1 and a_1 represent the impact of FDI on export and import, respectively.

e_{it} and u_{it} are random error terms, assuming that they are independently equally distributed and the mean is zero.

i indicates the industry or region, and t indicates the time point.

3. Model interpretation

Export model: By estimating b_1 , we can know the impact of FDI inflows on the total export of the host country. If $b_1 > 0$, it indicates that FDI has a positive promoting effect on export. If $b_1 < 0$, it indicates that FDI has a negative inhibitory effect on export.

Import model: Similarly, by estimating a_1 , we can understand the impact of FDI on the host country's total imports. If $a_1 > 0$, it indicates that FDI promotes import; If $a_1 < 0$, it indicates that FDI inhibits imports.

Control variables: By introducing control variables, the independent effects of FDI on exports and imports can be better isolated. For example, if $b_2 > 0$, it indicates that the growth of per capita GDP has a positive impact on exports. If $a_3 < 0$, it indicates that an increase in the size of the labor force is likely to suppress imports.

4.3 Variable selection and description

FDI Inflow: A measure of the intensity of foreign capital activity.

Per Capita GDP: indicates the degree of economic advancement. There is a widespread belief that trade activities become more vigorous as economic development levels increase.

Labor Force Size: A large labor force base means a higher production potential.

A highly qualified workforce can better absorb new technologies and promote technological innovation.

Good Infrastructure Development can help reduce transaction costs and promote trade.

4.4 Empirical result analysis

From the estimates of the above model, we make a series of important findings:

The impact of FDI on the export structure of host countries: The results show that FDI significantly impacts the total export volume of host countries, especially in manufacturing and high-tech

industries. This indicates that FDI enhances the export capacity of host countries through technology spillover and export creation effects.

The impact of FDI on the import structure of host countries: The impact of FDI on imports is relatively small compared to exports, but in some industries (such as machine building and electronic equipment), FDI inflows do facilitate import substitution processes, reducing import dependence on certain key components and technologies.

The impact of FDI on the host country's trade balance: Comprehensive analysis shows that with the increase of FDI, the host country's net exports show an improvement trend, especially for those industries and regions that have established strong local industrial chains.

These empirical results support the theoretical mechanism mentioned above and further confirm the positive effect of FDI on the host country's international trade pattern. However, we also note significant differences between different sectors and regions, which suggests that we should consider specific circumstances when formulating relevant policies.

5 Case study

5.1 Case standards and analysis methods

In order to reveal the subtle effects of foreign direct investment (FDI) on recipient countries' international trade patterns, this chapter will conduct a detailed examination of a select set of countries and regions. The case selection criteria include the following principles. Priority will be given to model economies that have significant FDI intake over a given time span and have a profound impact on the global trade structure. The research sample takes into account the multi-stage and diversity of development evolution to highlight the diverse effects of FDI in various economic contexts. At the same time, ensure that the data for all selected cases are available and reliable, in order to support the analysis of a hybrid approach, that is, quantitative and qualitative studies complement each other.

For selected cases, we will use a combination of qualitative and quantitative methods for research. Quantitative analysis mainly relies on statistical software to process historical data, and presents the changes of the host country's international trade pattern before and after FDI inflow in the form of charts. Qualitative analysis through literature review, expert interviews and other ways, to deeply explore the reasons behind the mechanism.

5.2 Result presentation

China's manufacturing sector is among the highest recipients of FDI globally. Over the past few years, China has seen a substantial increase in foreign investment, resulting in a quick expansion of its manufacturing sector. Through comparative analysis, it is found that with the increase of FDI, the export structure of China's manufacturing

industry has undergone significant changes, and the proportion of high-end manufacturing products exports has gradually increased, while the proportion of low-end processing trade has declined. This indicates that FDI has promoted the transformation of China's manufacturing industry to a higher value-added direction through technology spillover and industrial upgrading effect. This change reflects China's rising position in the global value chain, but it also raises questions about the lack of innovation capacity of local enterprises, and the need to strengthen the building of independent innovation capacity in the future.

In recent years, as China's labor costs have risen, many labor-intensive industries have begun to migrate to Southeast Asia. The data show that with the increase of FDI, the export volume of textiles and electronic products in the emerging market country has increased significantly. This is mainly because foreign-funded enterprises have brought advanced production equipment and technology, which has improved the production efficiency of local enterprises. While these countries benefit from increased exports in the short term, over-reliance on foreign capital may limit their ability to develop on their own in the long run if they fail to foster local industries in a timely manner.

Case 3: A developed country in Europe: Considering the different development stages, we also choose a developed country in Europe as a case, which has long been one of the important sources of FDI. The study found that despite the country's role as an FDI exporter, the FDI it attracts also has a positive impact on its international trade patterns. Especially in the field of high-tech, the entry of foreign capital has promoted local enterprises to integrate with the international community and enhanced their competitiveness in the global market. This shows that even for developed countries, attracting FDI can bring new development opportunities, especially in promoting technological innovation and industrial upgrading.

6 Conclusion

Through theoretical analysis, empirical examination and in-depth interactive study of specific cases, we find that foreign direct investment (FDI) is crucial in introducing cutting-edge technology and governance wisdom, significantly boosting the industrial and management level of recipient countries, especially in the manufacturing and high-tech industrial sectors, and further leading to fundamental improvements in the quality and efficiency of their export portfolios. In addition, FDI also plays a role in helping recipient countries implement effective import substitution to adjust trade deficits, while upgrading their global value chains. In view of this, we believe that policy makers should optimize foreign investment introduction strategies, streamline approval procedures, create a favorable tax environment, and strengthen intellectual property protection. At the same time, it encourages local enterprises to establish symbiotic relationships with international partners, and promotes technology dissemination. In order to improve the adaptability of

the workforce, investment in education and vocational training is essential to improve the quality of human capital. In addition, the construction of good infrastructure to reduce the obstacles to business operations, while guiding FDI to less developed regions, in order to achieve a balanced geographical distribution. However, this research is constrained by limitations in data collection and the inadequacy of understanding of how FDI is reshaping international trade patterns, future work could deepen industry-specific investigations, extend time horizons, and conduct cross-country empirical comparisons. These insights can form the basis for policies to further safeguard the sound prosperity of recipient countries.

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