

Spatial Layout and Influencing Factors of China's OFDI in One Belt and One Road Countries

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Abstract

Sixty-five countries and regions along the "One Belt and One Road" route were selected as research units. Based on the natural break point classification method and global spatial autocorrelation, the spatial layout of "One Belt and One Road" OFDI in China was explored, and its influencing factors were further discussed. The results show that: (1) The average level of One Belt and One Road OFDI in China is the highest in Southeast Asia, with Singapore at the core and showing obvious regional radiation characteristics. The investment stock in Central Asia is relatively high, and Russia and Kazakhstan are at the leading level in the region. However, China's OFDI level to the European continent is lagging behind in the whole "One Belt and One Road" region. (2) Natural resource endowment and institutional distance are the main factors affecting the spatial differentiation of OFDI in China. Based on this, tapping the resource endowment and seeking the win-win system can greatly attract the inflow of "One Belt and One Road" OFDI from China.

Keywords

The Natural Break Point Classification; Spatial Layout; OFDI; Influencing Factors.

1. Introduction

Will of the fifth plenary session of the party's 19 "higher level system of the open economy new basic form included in the difference economic and social development during the period of the main target, put forward comprehensively improve the level of opening to the outside world, promote trade and investment liberalization and facilitation, and promote the innovation in trade development, promote the development of all the way to build 'area' high quality, actively participate in global economic governance system reform, It is obvious that China's OFDI (Outward Foreign Direct Investment, hereinafter referred to as "OFDI") is an important part of a country's going out in the new era. The Belt and Road Initiative is short for the "New Silk Road Economic Belt" and "21st Century Maritime Silk Road" proposed by General Secretary Xi Jinping in 2013. The Silk Road Fund and the Asian Infrastructure Investment Bank have been successively established. It shows that overseas direct investment is a more important and core area of economic cooperation between China and countries along the "One Belt and One Road". China is stepping into a new era of participating in the reform of the international economic order by means of OFDI. According to the 2018 China OFDI Statistical Bulletin, China's OFDI traffic reached \$143.04 billion in 2018, ranking second in the world. Among them, China's OFDI traffic to "One Belt and One Road" was 17.89 billion US dollars, accounting for 12.5% of China's OFDI traffic in that year. China's OFDI for "One Belt and One Road" is an important strategic location choice for China to participate in international economic order activities through OFDI.

2. Literature Review

With the acceleration of China's "going out", China's OFDI location choice has become a frontier and hot issue explored by academic circles in recent years [1]. Through case analysis and descriptive summary, Cai believes that China's OFDI is often accompanied by market seeking, resource seeking, strategic seeking and financial seeking [2]. To be specific, some scholars focus their research perspectives on market search and resource search, and empirical studies show that market search and resource search are important driving forces of China's OFDI [2-3]. At the same time, there are also studies on China's OFDI from the perspective of strategic seeking, including advanced technology, management experience, financial assets, etc. Through empirical research and analysis on the investment distribution of China's OFDI, strategic seeking and financial seeking have gradually become the important motives of China's OFDI [1,4]. In addition, the introduction of the new factors such as research proves that the bilateral trade, cultural proximity, host countries inflation is positively related with China's OFDI, and host country institutional quality criterion for negative correlation, the exchange rate, the distance between countries and the role of the host country strategic assets is not significant, this may be due to the China in the period when the OFDI is in its infancy, It is more inclined to seek motivation from the host country market [1]. Kolstad et al. further analyzed the OFDI cross-section data of 104 countries in China from 2003 to 2006 and found that China's OFDI favored countries with imperfect systems [5]. So far, in addition to the traditional motives, institutional quality, social culture and other reasons have been gradually explored and analyzed by scholars [6-9].

To sum up, there have been abundant studies on OFDI motivation and influencing factors at home and abroad, especially the exploration on the influencing factors of "One Belt and One Road" OFDI in China, which is of great reference significance for the study of this paper. However, there are few literature studies focusing on the spatial distribution of "One Belt and One Road" OFDI in China, focusing on the distribution pattern of a single spatial dimension, and the research on its layout is relatively scarce. With the increasingly prominent spatial interaction, the natural breaking point method and spatial autocorrelation are comprehensively used to depict the spatiotemporal differentiation of "One Belt and One Road" OFDI in China, and then the core driving force of spatiotemporal differentiation of OFDI is analyzed more objectively and truly. It is of great significance to promote balanced and healthy investment relationship between China and "One Belt and One Road" countries and regions.

3. Study Area and Data Sources

This paper selects 65 countries along the "One Belt and One Road" and their subordinate regions. The 65 countries along the "One Belt and One Road" are as follows: Mongolia, Iran, Iraq, Turkey, Syria, Jordan, Lebanon, Israel, Palestine, Saudi Arabia, Yemen, Oman, united Arab emirates, Qatar, Kuwait, Bahrain, Greece, Cyprus, Egypt's Sinai peninsula, India, Pakistan, Bangladesh, Afghanistan, Sri Lanka, Maldives, Nepal, Bhutan, Kazakhstan, Uzbekistan Stan, Tajikistan, Turkmenistan, Kyrgyzstan, Singapore, Malaysia, Indonesia, Myanmar, Thailand, Laos, Cambodia, Vietnam, Brunei, Philippines, Russia, Ukraine, Belarus, Georgia, Azerbaijan, Armenia, Moldova, Poland, Lithuania, Estonia, Latvia, the Czech republic, Slovakia and Hungary Liberia, Slovenia, Croatia, Bosnia-Herzegovina, Montenegro, Serbia, Albania, Romania, Bulgaria, Macedonia.

The main sources of selected data are as follows: China's OFDI stock data of "One Belt and One Road" comes from China OFDI Statistical Bulletin. The raw data of natural resource endowment, labor resource, market size and inflation rate of the host country are from the WDI database of the World Bank.

4. Methodology

The natural break point classification method based on Jenks' natural break point classification method can identify the classification interval through the natural grouping inherent in the data, which can group the similar values the most appropriate, and maximize the difference between each class. Elements are divided into classes, for which the boundaries are set at places where the data values are relatively different. The method is an iterative process. Different breaking points were used in the data set for multiple calculations to find a group of breaking points so as to minimize the sum of squares of deviation within the group [10]. The natural discontinuous point classification method is an important part of ArcGIS symbolic rendering, and the data classification processing will also be used in the geographic detector. The calculation formula is as follows:

$$SSD_{i..j} = \sum_{k=i}^j (A[K] - \text{mean}_{i..j})^2 \quad (1)$$

Global spatial autocorrelation index is an important tool to describe the characteristics of attribute values in the whole region [11]. There are many indicators and methods to express global autocorrelation, including global Moran 'i' index and global Getis-Ord G index, which measure global spatial autocorrelation by comparing the similarity degree of observed values in adjacent space positions. The global Moran 'i' index can explore the spatial agglomeration pattern of economy, population and natural resources in general, and its calculation formula is as follows:

$$I = \frac{n \sum_i \sum_{j \neq i} w_{ij} (X_i - \bar{X}_i)(X_j - \bar{X}_j)}{S_0 \sum_j (X_i - \bar{X})^2} \quad (2)$$

5. Spatial Layout

In general, China's OFDI traffic reached \$68.81 billion in 2010, and with the trend of increasing year by year, China's OFDI traffic exceeded \$100 billion for the first time in 2013 and reached the peak of \$196.15 billion in 2016. Subsequently, the world economic growth began to slow down, the total amount of foreign direct investment in the world shrank, and China's OFDI flow also showed a slowing phenomenon during 2016-2018. To be specific, China's total OFDI traffic exceeded \$143.04 billion in 2018, ranking second in the world, down 9.6% year on year. Among them, China's stock of "One Belt and One Road" OFDI reached 173.69 billion dollars in 2018, an increase of 18.57 billion dollars compared with 2017, and a year-on-year increase of 12.0%. China's stock of direct investment in Singapore has reached \$50.9bn, which is the country with the highest stock of "One Belt and One Road" OFDI. It occupies a core position in the whole Southeast Asia region and shows obvious regional radiation characteristics. Malaysia, Indonesia and Laos all have quite high stock of China's OFDI investment. Second, China's investment stock in Central Asia is also high, with Russia and Kazakhstan leading the way in the region. However, China's OFDI stock to the European continent is relatively low, which is a backward region in the whole "One Belt and One Road" region.

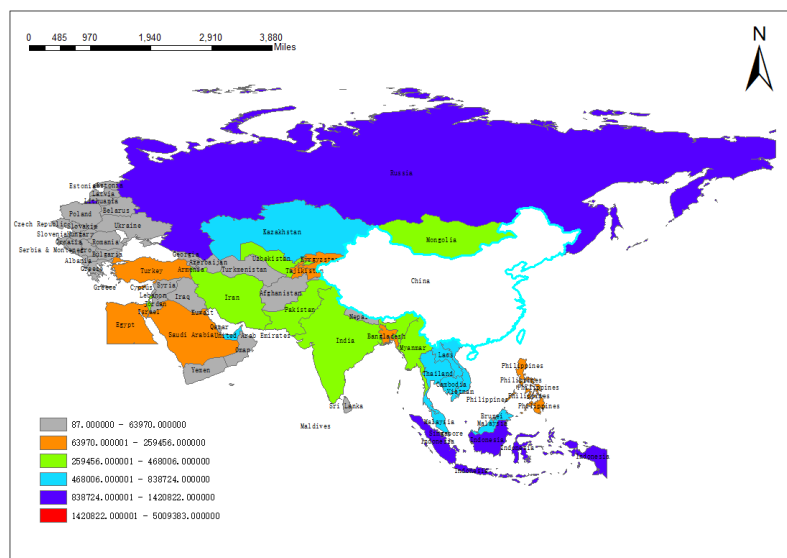


Figure 1. Spatial layout of China's OFDI in One Belt and One Road Countries in 2018

The natural break point classification method is used to classify the stock of "One Belt and One Road" OFDI in China, and then ArcGIS10.2 is used to visually express it (Fig. 1). In the whole temporal and spatial interval from 2010 to 2018, China's OFDI stock spatial distribution of "One Belt, One Road" has little change. From the spatial distribution, it can be seen that China's OFDI stock level of "One Belt and One Road" completely conforms to the distribution of the two main routes of "Silk Road Economic Belt" and "21st Century Maritime Silk Road".

In addition, Singapore, Malaysia, Indonesia and other Southeast Asian countries absorb the proportion of China's OFDI gradually increasing, while the proportion of India, Pakistan, Iran and other Central Asian countries has a downward trend. Focusing on 2018, China's OFDI stock of Russia, Kazakhstan and Uzbekistan was \$14.21 billion, \$7.34 billion and \$3.69 billion, accounting for 14.5% of China's OFDI stock of "One Belt and One Road". Countries and regions affected by "Silk Road Economic Belt" include: Mongolia, Kyrgyzstan, Turkmenistan, Tajikistan, Afghanistan, Pakistan, Iran, Azerbaijan, Armenia, Georgia, Belarus, etc. Singapore, Indonesia, Malaysia, Laos, India and the United Arab Emirates are the top countries and regions in the direction of "21st Century Maritime Silk Road" in terms of China's current direct investment stock, accounting for 52.2% of China's "One Belt and One Road" OFDI stock. It can be seen that, China prefers countries and regions along the "21st Century Maritime Silk Road" for "One Belt and One Road" OFDI.

In contrast, the European continent radiated by "One Belt and One Road" currently has a relatively low stock of Chinese investment, which is a backward region in the whole investment map of "One Belt and One Road" OFDI in China. In 2018, China's direct investment in the 28 European Union countries fell by about 40 percent to \$20.66 billion, the lowest since 2014. Tighter controls on cross-border mergers and acquisitions in Europe in recent years have made it more difficult for Chinese companies to make international acquisitions and even blocked some investment projects. At the same time, facing the current turbulent international political and economic environment, more countries have set up more stringent investment management programs for sensitive high-tech fields and key infrastructure, which may also be a major reason for China's investment in the European continent to be hindered.

6. Spatial Relevance

In order to explore the spatial agglomeration characteristics of "One Belt and One Road" OFDI in China, the global Moran's I index of "One Belt and One Road" OFDI stock in China from 2010

to 2018 was calculated (see Table 1). Moran's I index and Z value are greater than 0 in all years except 2015, and P value has passed the 99.9% confidence level test, indicating that there is a significant positive correlation between "One Belt and One Road" OFDI in China. In other words, countries along the "One Belt and One Road" routes attract China's OFDI to be "adjacent to countries with high stock and adjacent to countries with low stock". From 2010 to 2018, the Moran I index showed a fluctuating downward trend, with the index value decreasing from 0.24 to 0.19. Indices are weakening and regional disparities are narrowing. In 2015, Moran's I index began to bottom out at 0.146, indicating the lowest agglomeration of "One Belt and One Road" OFDI in China. Since 2016, China's One Belt and One Road policy has focused on in-depth cooperation with domestic and foreign regions. In March 2016, One Belt and One Road was listed as a major goal and major measure during the 13th Five-Year Plan period. From 2016 to 2018, the value of the Moran I index showed an increasing trend, which was slightly higher than that of the 2010 Moran I index.

Table 1. Moran I index 2010-2018

Year	Moran I index	Z Value	P Value
2010	0.236	3.470	0.001
2011	0.170	2.944	0.003
2012	0.199	2.925	0.003
2013	0.231	3.239	0.001
2014	0.196	2.954	0.003
2015	0.146	2.580	0.010
2016	0.177	3.031	0.002
2017	0.152	2.935	0.003
2018	0.187	3.608	0.000

7. Influencing Factors

China's OFDI spatial evolution of the Belt and Road Initiative is a process of comprehensive action of multiple factors. In the early stage, traditional investment theories mainly focused on the research of Ohlin, Hymer and others. Since Dunning proposed the eclectic theory of international production, the market characteristics of the host country were considered as an important consideration criterion, and later, more investment theories focused on the research of developing countries. The specific advantages and market similarities at the national level have been gradually incorporated into the influencing factors of OFDI. Since the 1990s, the global value chain model has gradually become the dominant model of international division of labor, and investment theories under different and traditional division of labor have become a new research hotspot. Therefore, in the evaluation of a country's ability to attract direct investment, this paper comprehensively considers three dimensions, namely, the host country's own market characteristics, its position in the global value chain and the multi-dimensional distance between countries and constructs an indicator system of driving forces for the spatial evolution of "One Belt and One Road" OFDI in China. Based on this, a total of 10 detection factors were set up from the three aspects of market characteristics of the host country, global value chain status, and multi-dimensional distance between countries, and an index system for detecting the influence factors of China on "One Belt and One Road" OFDI was constructed (Table 2).

Table 2. The Influence Factors of China on "One Belt and One Road" OFDI

Level 1 diameter	Level 2 diameter
Market Characteristics of Host Country	Natural resource endowment (%)
	Labor resources(One thousand people)
	The size of the market (dollar)
	Rate of inflation (%)
Global value chain position	Upstream index
	Global value chain position
Multidimensional distance between countries	Geographic distance
	Economic distance
	Cultural distance
	Institutional distance

Natural resource endowment. Seeking natural resources is regarded as the main reason for OFDI of enterprises in the early traditional industrial mode. Controlling the natural resources and technological monopoly of host countries is the main means for most transnational corporations to obtain monopoly profits. Visible, the reason most of countries along the way "area" for developing countries, the current is not mature R&D skills, knowledge resources, etc., so seeking natural resources is China's enterprises to "neighborhood" all the way along the direct investment the important motivation of countries and regions, from abroad for domestic supply the lack of basic raw materials and energy, In order to meet the increasing consumption needs of domestic residents.

Institutional distance. Under the division of labor model of global value chain, the production links of products are distributed in various countries and regions in the world, which further tests the resource allocation ability of enterprises in the global economic and trade environment. With the flow of intermediate products in space, different countries and regions are responsible for different value-added links. Since the increased trading links and production links of intermediate products greatly increase the transaction risks of enterprises, the gap of institutional distance will weaken the transaction risks and transaction frictions under the political systems of different countries.

8. Conclusion

The proportion of "One Belt and One Road" OFDI in the whole OFDI of China is increasing day by day, but the internal differentiation is obvious. Singapore is the country with the highest existing stock of "One Belt and One Road" OFDI in China, and occupies the core position in the whole Southeast Asia region, showing obvious regional radiation characteristics. Malaysia, Indonesia and Laos all have quite high stock of China's OFDI. Secondly, China's OFDI stock level in Central Asia is also high, and Russia and Kazakhstan are in the leading position in the region. However, China's OFDI stock to the European continent is relatively low, which is a backward region in the whole "One Belt and One Road" region. By calculating the global Moran's I index of " One Belt and One Road " OFDI stock in China from 2010 to 2015, it shows that there is a significant positive correlation between China and "One Belt and One Road" OFDI, that is, countries along the "One Belt and One Road" routes attract China's OFDI to be "adjacent to countries with high OFDI stock and adjacent to countries with low OFDI stock".

To sum up, the overall development trend of "One Belt and One Road" OFDI in China is good, but it still needs to strengthen the OFDI intensity of corresponding European countries and make up for the deficiency of low OFDI stock through certain policy encouragement and financial support in the region. At the same time, from the perspective of combining economics and geography, the analysis path of influencing factors of "One Belt and One Road" OFDI

location distribution in China is supplemented to a certain extent. China's search for "One Belt and One Road" OFDI resources is still the main motivation. Considering that both natural resource endowments and labor resources will reduce its ability to attract investment over time, it should shift its vision to integrating into the global value chain division of labor and cooperation.

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