ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

Publisher
http://jssidoi.org/esc/home

STUDY ON THE SPATIAL DISTRIBUTION OF CHINA'S OUTWARD FOREIGN DIRECT INVESTMENT IN EU AND ITS INFLUENCING FACTORS *

Li Shuyan[1], Michal Fabuš[2]

[1]Zhejiang University of Technology, Hangzhou, P.R.China

[1]Ningbo Dahongying University, Ningbo, P.R.China

[2] School of Economics and Management in Public Administration in Bratislava, Furdekova 16, Bratislava, 851 04, Slovak Republic

E-mails:[1] 365412788@qq.com; [2]michal.fabus@vsemvs.sk

Received 10 September 2018; accepted 15 December 2018; published 30 March 2019

Abstract. Since 2000s China's outward foreign direct investment (OFDI) in developed economies has grown rapidly, boosting the technological advancement of Chinese companies and the advancement of global value chains. In the context of the United States continuing to impose investment restrictions on China, the EU has an important position in the OFDI pattern in China. Although China's OFDI in the EU has maintained rapid growth overall, the location distribution is not balanced. This paper uses spatial measurement method to test China's spatial pattern change of OFDI in EU member states and finds that there are spatial agglomeration effects and spatial spillover effects. The spatial panel analysis method is used to test the factors affecting the spatial distribution China's OFDI in EU. It is found that the market size, technology level and investment freedom of the host country have positive effects on the location selection of China's OFDI in EU.

Keywords: outward foreign direct investment (OFDI); spatial distribution; influencing factors

Reference to this paper should be made as follows: Shuyan, L.; Fabuš, M. 2019. Study on the spatial distribution of China's Outward Foreign Direct Investment in EU and its influencing factors, *Entrepreneurship and Sustainability Issues* 6(3):1280-1296. http://doi.org/10.9770/jesi.2019.6.3(16)

JEL Classifications: F21, F22

* *This research was supported by the project, which has received funding from The Chinese Ministry of education of Humanities and Social Science project（Grant No.17YJC790077）*
The paper is the output of an international scientific project IGA no. 2/2018 - M „Problems and Suggestions - Comparison of Commercial Enviroment between China - Slovakia and Facilitation of Trade and Investment". (Funder: VSEMvs IGA VSEMvs, i.e. School of Economics and Management in Public Administration)

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

1. Introduction

In recent years, unilateralism and counter-globalization have grown stronger, causing a greater impact on global economic growth, trade and investment. In this context, global foreign direct investment (FDI) fell by 23% in 2017 to $1.43 trillion. According to the “2017 China Foreign Direct Investment Statistics Bulletin” issued by the Ministry of Commerce, China’s outward foreign direct investment (OFDI) in 2017 was US$158.3 billion, down 19% year-on-year. There are two reasons for this. On the one hand, investment protectionism in some countries is prevalent, and Chinese multinationals have encountered more obstacles in foreign investment, especially cross-border mergers and acquisitions. For example, due to the US government security review, China’s direct investment in the United States fell by 62% in 2017, only $6.4 billion. On the other hand, the Chinese government has taken the initiative to strengthen the control over capital outflows and issued a series of policies such as the "Notice on Further Guiding and Regulating the Direction of Overseas Investment Directions", so that irrational foreign investment has been contained.

However, in stark contrast to the shrinking global direct investment, 2017 China's OFDI to Europe reached US$18.5 billion, a year-on-year increase of 73%, a record high, which was nearly three times that of China's OFDI to US.In terms of investment flows, Europe has surpassed Asia (except HongKong) for the second consecutive year in 2016-2017 to become the largest destination for China's OFDI. Europe has become the preferred destination for China's OFDI. On the one hand, the main reason is the attractiveness of Europe's developed economy and advanced technology, and on the other hand it is also inseparable from the open economic environment in Europe. However, from the perspective of China's spatial distribution of OFDI in Europe, there is a big difference in investment flows and stocks in different countries. The spatial agglomeration feature of China's OFDI in Europe is definitely not a random distribution but implies a profound economic mechanism. Based on the study of China's evolution of the spatial and temporal distribution of OFDI in the EU, this paper uses spatial economic statistics to analyze its factors.

In the following sections, after reviewing the literature on basic issues, a detailed analysis of China's growth in OFDI in Europe and changes in spatial distribution over time will be conducted. Subsequently, we used spatial measurement methods to test whether there is a significant spatial correlation between China's OFDI in Europe. Finally, using the panel data of China's OFDI in various countries from 2007 to 2016, an empirical analysis model is established to deeply study the factors affecting the distribution of China's OFDI in Europe.

2. Literature review

In this part, we will briefly review the development of FDI theory, focus on the motives and behaviors of developing countries' direct investment in developed countries, and analyze the different motives and location choices of developing countries such as China to invest in developed countries and regions.

FDI are a global phenomenon whose share in international business is steadily rising and generates large capital injections. FDI has been and continues to be an important factor in the development of transition countries. They help create new jobs, which can lead to an influx of new technologies, and in total they provide the necessary capital to restore a successful transition to the market economy (Fabus, M., Csabay, M., 2015, 2018, Tancosova, 2013, 2014). Dudas, deals with the significance of workforce (Dudas, T; Dudasova, M., 2016).

The core of OFDI theory is to explain the motivation of OFDI and the conditions for its realization (Wen, X., Liyun, L. 2015). The FDI theory that emerged in the 1960s believed that the motivation of the enterprise OFDI was that the developed countries had the advantages of ownership, location and internalization, and realized global benefits through FDI. But these theories mainly explain the phenomenon that FDI flows from developed

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

countries to developing countries. With the development of practice and the deepening of research, many scholars have explored the motivations and methods of FDI from the perspective of developing countries, and have produced many FDI theoretical results.These theories include Theory of Small Scale Technology (Wells, 1977), State on Localized Technological Capacities (Lall, 1983), Investment development cycle theory (Dunning, 1988), Technical innovation and industry upgrading theory (Buckley, P.J.; Casson, M,A., 1981) etc. In the theory of FDI motivation of multinational corporations, Dunning creatively divides FDI into resource motive, efficiency seeking, market seeking and strategic asset seeking four motives (Dunning,1993), which becomes the basic paradigm for studying OFDI motivation and behavior.

The distribution of OFDI flows in different countries (regions) can reflect the motivation of host countries' transnational investment as a whole (Buckley, 2007). According to the flow of OFDI, investment in developing countries can be defined as“gradual gradient” OFDI, and investment in developed countries is defined as“inverse gradient”OFDI (Kolstad, I., Wiig, A. 2012).The motivation for “gradual gradient” OFDI is mainly resource seeking and efficiency seeking, while the purpose of “anti-gradient” OFDI is mainly market seeking, technology seeking and acquiring strategic assets such as technology and brand (Xianming, W. Chuntao, H. 2016).When an emerging economy is in the catch-up phase, it often has Binary feature: both the forward gradient OFDI flowing to developing countries and the inverse gradient OFDI flowing to developed countries (Yamakawa, 2010).Taking the OFDI distribution in Japan in the 1980s as an example, the OFDI flowing to developed regions such as North America and Europe is mainly based on market seeking, technology seeking, information acquisition and avoidance of trade friction, while OFDI mainly flows to developing countries and regions. Motivation is the pursuit of low production costs (Lee, 2015). At present, the motivation and location choice of China’s OFDI also has duality. In developed countries, the main purpose of OFDI is market seeking and technology seekinge (Brada, J. C., Drabek, Z., & Perez, M. F., 2012). In developing countries, OFDI is mainly aimed at resource seeking and political relations (Buckley, 2007). More specifically, China's OFDI flows can also be divided into three types of countries or regions: countries or regions with abundant natural resources, developing countries with cheap labor and advanced countries, and technologically advanced developed countries (Dudas, 2016).

In recent years, under the “Belt and Road Initiative” initiative, the OFDI flowing to developing countries in China and the OFDI flowing to developed countries in Europe and America are growing rapidly. The issue of location selection of OFDI in China has aroused widespread concern in the academic circles. The research on the location distribution of China's OFDI basically follows the same lines as foreign scholars. The research perspective is mainly based on market size（Guanhong, J., Dianchun, J., 2012), geographic distance（Lu, 2014), resource endowment（Guanhong, J., Dianchun, J., 2012）and strategic asset motives（Cheung, 2011, Tvaronavičienė 2018).

From the perspective of market seeking motivation, the market size is undoubtedly an important factor affecting the choice of OFDI location. The larger the size of the host country market, the greater the potential for FDI to achieve economies of scale in local investment operations, and therefore proportional to the inflow of FDI (Bevan, Estrin&Meyer, 2004). A lot of research on China's OFDI also confirmed that market seeking is an important consideration for Chinese companies' cross-border investment（Jia, Y., Zhang C., 2012). The geographical distance is related to the cost of transportation and the communication efficiency between the parent company and the subsidiary company (Stopford, J. M., 2008). Therefore, FDI is more inclined to start in close proximity countries. With the development of China's economy, the demand for natural resources such as oil and ore are increasing. Therefore, acquiring the resources of the host country has become an important purpose and means of OFDI in China (Song W., Xu, H., 2012).In addition, many scholars have tried to interpret the location choice of China's OFDI from the perspective of the host country system, and further enrich the connotation of China's OFDI location selection theory (Deng Ming, 2012; Jia Yucheng, 2017).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

From the perspective of investment flows, China's OFDI to Europe belongs to the "inverse gradient" OFDI. Europe's developed economic level, perfect institutional environment and huge integrated market are important reasons for attracting China's direct investment in Europe (Chovanova Supekova, S., Szwajca, D., 2018). In particular, the EU has developed into the region with the highest degree of economic integration in the world. Despite this, the natural conditions, technical level and economic freedom of the 28-member states of the European Union are still very different. (Blanc-Brude, F., Cookson, G., Piesse, J., & Strange, R., 2014) Chinese enterprises based on different investment motives must have certain preferences in the distribution of OFDI in Europe. This is one of the focuses of this paper. This paper intends to conduct a detailed investigation of the spatial distribution of OFDI in Europe, and then through empirical tests, analyze the main factors affecting the distribution of OFDI in Europe and propose corresponding countermeasures.

3. Growth of China's OFDI in EU

From China's reform and opening up to the WTO accession in 2001, China and the EU's bilateral investment is mainly based on EU's FDI in China. China has only a small amount of FDI in Europe, and the EU's FDI flows and stocks in China far exceed China's The amount of China's investment in the EU. After China's accession to the WTO in 2001, China's OFDI began to show a significant growth trend, but due to the relatively low base, China's OFDI to the EU is still far lower than the EU's OFDI to China. However, since 2008, under the in-depth promotion of the "going out" strategy, China's OFDI has begun to explode and has become the fastest growing country in the world. In particular, the financial crisis of 2007-2009 and the European debt crisis provided a rare opportunity for China to acquire developed-country enterprises. The growth rate of China's OFDI in developed countries is particularly obvious. In this context, China's OFDI traffic to the EU has grown rapidly. In 2010, China's OFDI traffic to the EU exceeded the EU's OFDI traffic to China for the first time (Figure 1).

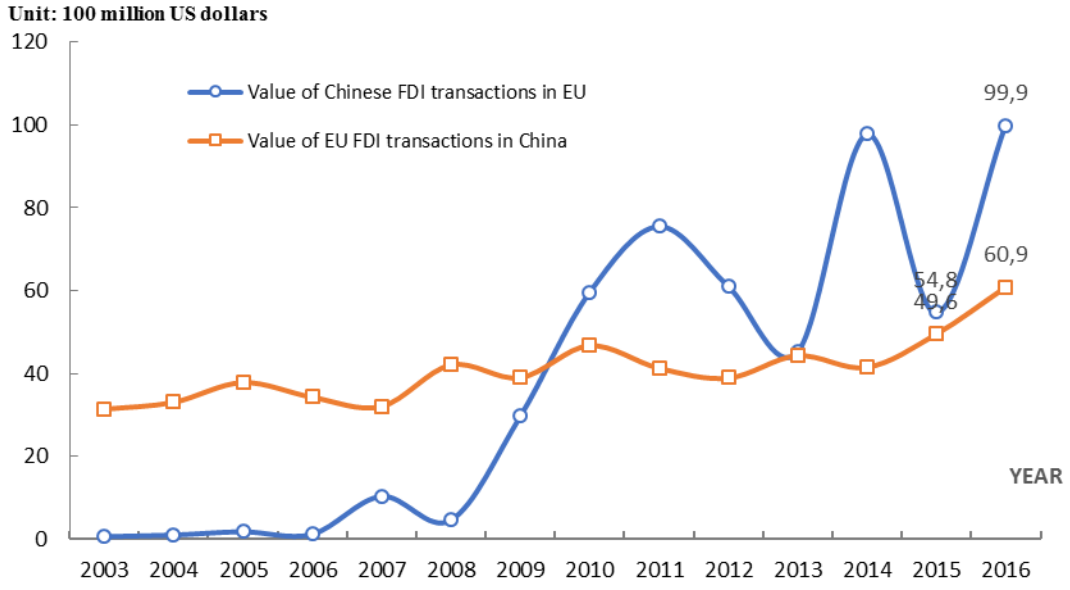

Fig.1. Value of FDI flows between China and EU

Source: China's foreign direct investment Yearbook（2003-2016）

In the decade of 2007-2016, China's OFDI traffic to the EU increased by 8.5 times. By the end of 2016, China's stock of OFDI to the EU reached US$68.94 billion, accounting for 36.5% of China's OFDI stock in developed

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

economies, surpassing China's OFDI stock in the US (US$60.56 billion, 31.7%), in China's OFDI in developed economies. Ranked first (Table 2). Under the Sino-US trade dispute and the increasingly severe restrictions on US investment in China, it is a general trend for China's OFDI to accelerate its transition from North America to Europe.

Table 1. China's OFDI flows to major developed economies in 2016

Name of country, economy	Values of OFDI stock (100 million US dollars)	Proportion
EU	698.4	36.5%
US	605.8	31.7%
Australia	333.5	17.4%
Canada	127.3	6.6%
Israel	42.3	2.2%
Japan	31.8	1.7%
Norway	26.4	1.4%
Bermuda	21.7	1.1%
New Zealand	21.0	1.1%
Switzerland	5.8	0.3%
amount to	1914.0	100%

Source: China's foreign direct investment Yearbook (2003-2016)

4. Changes in the spatial distribution of China's OFDI in the EU

In this part, we analyze the imbalance of China's OFDI distribution in the EU and its trend with time from the two aspects of flow and stock.

First of all, we pay attention to the time and space changes of China's OFDI stocks in the EU countries. Through ArcGIS10.1 software, this paper obtains the distribution map of OFDI flows from China to EU countries at four different times in 2004, 2008, 2012 and 2016 (as shown in Figure 2). From the perspective of overall flow changes, China's OFDI flows to the EU show an accelerating growth trend, with almost all countries showing significant growth. China's investment coverage in the EU has also expanded, from about 60% in 2004 to nearly 90% in 2016.

From the perspective of China's distribution of EU's OFDI flows, it presents a pattern of "western high base" (Figure 2). In 2004, China's OFDI flow to the EU was only US$73 million, and the flow of more than US$10 million was only in the United Kingdom ($294.4 billion), Germany ($275 billion), and France ($103.1 billion). At that time, China's "going out" strategy was in its infancy, and its ability to internationalize was low. In 2008, China's OFDI traffic to the EU increased to 470 million US dollars, and the number of countries with investment flows exceeding 10 million US dollars reached 10, of which direct investment in Germany reached 180 million

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

US dollars, ranking first among EU member states. Although it is nearly six times more than in 2004, due to the low base, China's OFDI traffic to the EU is still far below the EU's FDI flows to China ($4.21 billion in 2008). In 2012, China's OFDI traffic to the EU soared to US$7.04 billion, far exceeding the EU's FDI of US$3.9 billion.

However, from the perspective of regional distribution, the United Kingdom, Germany, and France are still the main destinations for China's OFDI. China's investment flows to Central and Eastern Europe are still relatively small, and the imbalance in regional distribution is further aggravated.

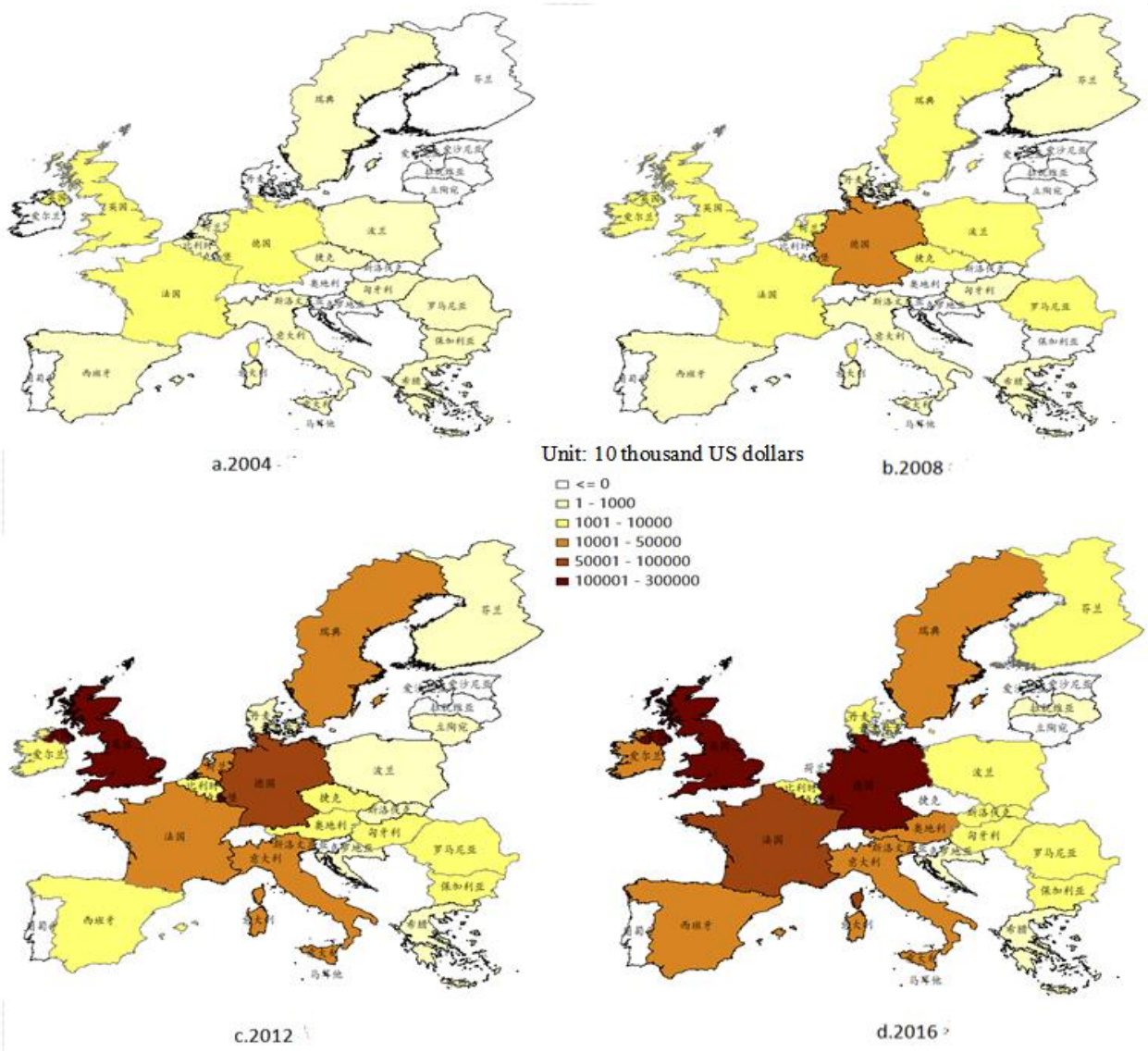

Fig.2. Time and space characteristics of China's EU's OFDI traffic
Source: China's foreign direct investment Yearbook （2003-2016, organized by ArcGIS10.1 software

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

Then we analyze the distribution of China's OFDI in EU countries from stock data. Judging from China's stock of OFDI in the EU, the concentration of investment in Europe is relatively high. As shown in Figure 3, before 2014, Luxembourg was once the country with the largest stock of OFDI in the EU, followed by the United Kingdom, France, Germany and the Netherlands. Luxembourg is a European tax haven with a geographical advantage in Europe, a flexible legal and regulatory environment, and extensive bilateral tax treaties that attract investment from around the world, including Chinese companies. However, most of China's investment in Luxembourg is financial and commercial trade investment, and it is less invested in manufacturing. As China's direct investment in Europe is increasingly flowing to high-end manufacturing, Luxembourg's position in China's direct investment in Europe tends to decline. China's stock of OFDI in Luxembourg fell from a record high of $15.7 billion in 2014 to 2016. 8.8 billion US dollars, ranking fourth in Europe. In addition, the Netherlands is more special. Before 2014, China's OFDI to the Netherlands has been lower than that of the UK, France, Germany and other countries. Due to the occurrence of the company's acquisition of the Philips Lighting business in the Netherlands and the RF Power Division of NXP Semiconductors in 2015. Business, China's OFDI stock in the Netherlands surged from US$4.2 billion in 2014 to US$20.6 billion in 2015. The Netherlands jumped to the country with the largest OFDI stock in Europe. By the end of 2016, the countries with the most stocks of investment in Europe were the Netherlands, the United Kingdom, Luxembourg, Germany and France.

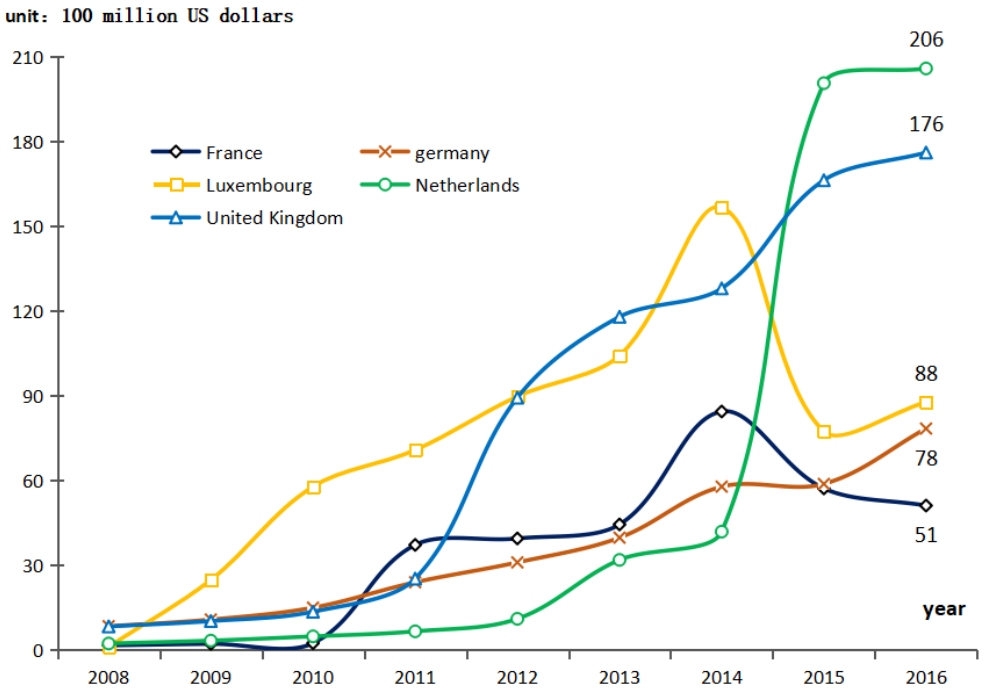

Fig.3 Top 5 states of China's OFDI stock in EU
Source: China's foreign direct investment Yearbook（2003-2016）

From the perspective of the European subregion, China's OFDI to Europe is mainly concentrated in Western Europe, accounting for 51.2% of China's OFDI traffic to Europe in 2016. Followed by nine countries in Central and Eastern Europe, accounting for 27.6% in 2016, but Germany accounted for 23.2%, other countries only accounted for only 4.4%. It can be seen that although China has vigorously developed economic and trade cooperation with Central and Eastern Europe under the "One Belt, One Road" initiative, the OFDI for Central and Eastern Europe is still relatively small. China's OFDI stocks in the three Nordic countries are not high in the EU, and mainly concentrated in Sweden. China's stock of OFDI in Finland and Denmark is very small. China's EUDI

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

is less distributed in 10 countries in southern Europe, mainly concentrated in economically developed countries such as Italy and Spain (Figure 4).

We can easily find that although China's OFDI in EU has grown rapidly in recent years, the spatial distribution is extremely uneven, showing the heterogeneity of geospatial space and the space of contiguous accumulation. The pattern suggests that there may be spatial associations in neighboring countries. Under the background of the deepening of EU integration, the policy environment and factor endowments of member states tend to be the same, but why are there such big differences? It is of practical significance to clarify the main factors affecting the spatial distribution of OFDI in China.

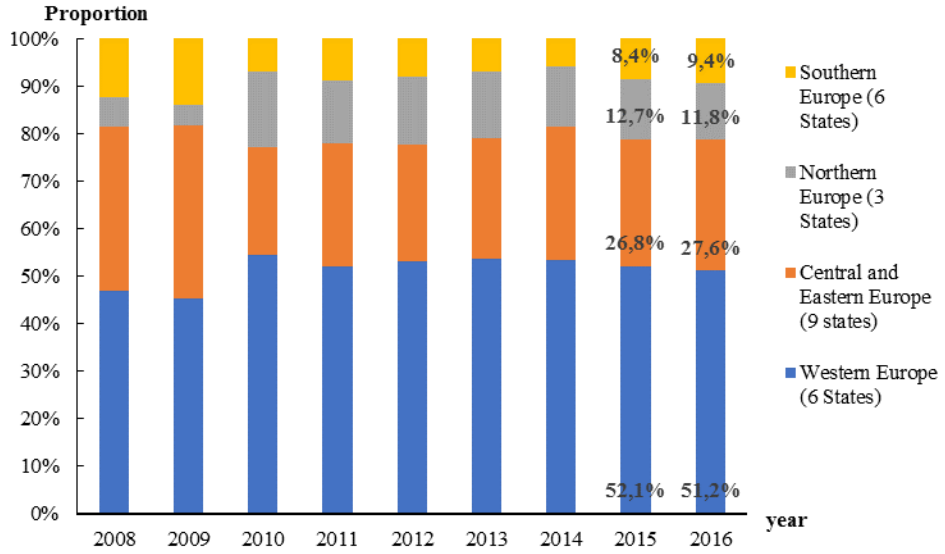

Fig.4. Proportions of China's OFDI stock in Different regions of the EU
Source: China's foreign direct investment Yearbook（2008-2016）

5. Methods, models and data sources

In the last chapter, we analyze the distribution of China's OFDI in the EU through ArcGIS software, and graph the overall time and space characteristics of China's OFDI in EU countries. In this chapter, we will further analyze the data and explore how to establish an econometric model to examine the factors affecting the distribution of China's OFDI in the EU.

Spatial autocorrelation test is one of the most important methods in Exploratory Spatial Data Analysis (ESDA) research, reflecting the degree of correlation between a certain geographical phenomenon or an attribute on a regional unit and the same phenomenon or attribute on a neighboring regional unit. Is a measure of the degree of aggregation in the spatial domain (Wang Qian, Jin Xiaobin, Zhou Yikang, 2011), the commonly used spatial autocorrelation indicator is the Moran's I. This paper uses Moran's I to test whether there is a global spatial correlation between China's EU and OFDI stocks. The formula for this index is as below:

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

$$\text{Moran's I}=\frac{n\sum_{i=1}^{n}\sum_{j=1}^{n}\omega_{ij}(x_i-\bar{x})(x_j-\bar{x})}{\sum_{i=1}^{n}\sum_{j=1}^{n}\omega_{ij}\sum_{i=1}^{n}(x_i-\bar{x})^2}=\frac{\sum_{i=1}^{n}\sum_{j\neq}^{n}\omega_{ij}(x_i-\bar{x})(x_j-\bar{x})}{s^2\sum_{i=1}^{n}\sum_{j=1}^{n}\omega_{ij}} \quad (1)$$

In the formula (1), n is the number of individuals in the study area; x_i and x_j are the values of the monitored variables of the region i and the region j, respectively. $\bar{x}=\frac{1}{n}\sum_{i=1}^{n}x_i$ is the average of the monitored variables in each region; $S^2=\frac{1}{n}\sum_i(x_i-\bar{x})^2$ is the variance of the monitored variable i and ω_{ij} is the spatial weight matrix.

According to the meaning of the Moran's I index, the calculation results are distributed between -1 and 1. An index greater than 0 indicates that the monitored variables exhibit a positive correlation. The closer to 1 indicates that the regions with similar properties are clustered together; the smaller than 0 indicates that the monitored variables between the regions exhibit a negative correlation, and the closer to -1 indicates that they are different. The areas of the attribute are significantly clustered together. If the Moran's I index is close to 0, it means that the monitored variables are in a randomly distributed state. According to the results of the spatial correlation test, it is decided to adopt a spatial econometric model or a non-spatial econometric model to measure various factors affecting the spatial distribution of China's OFDI in the EU. With the stock data of China' OFDI in EU countries from 2007 to 2016, we obtains the results of Moran's I index over the years through ARCGIS10.1 software and listed in Table 1.The data shows that the Moran's I index for in 2007-2016 has the following characteristics: In 2007-2012, the Moran's I index was close to zero, but the P value was > 0.05, and did not pass the significance test. It shows that during this period, the distribution of China's OFDI in EU did not show a significant agglomeration. However, the data from 2013 to 2016 show that Moran's I is greater than zero, and gradually increased, and the P value is <0.05. After passing the remarkableness, China's OFDI stock in the EU has begun to show a significant agglomeration state. Not randomly distributed. And since 2012, Moran's I index has been increasing.

Table 2 Values of Moran's I index (2007-2016)

Year	Moran's I	Values of Z	Values of P
2007	-0.020328	0.203725	0.838568
2008	0.026327	0.708342	0.474833
2009	0.052806	1.116248	0.264316
2010	-0.016816	0.309115	0.757234
2011	0.119725	1.795893	0.072511
2012	0.08219	1.27632	0.201935
2013	0.136899	1.855273	0.063557
2014	0.182298	2.287816	0.022148
2015	0.231121	2.874808	0.004043
2016	0.238919	2.917965	0.003523

Source: The data in this table is calculated by ARCGIS10.1 software.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

Since the Moran's I index for most years did not pass the significance test, the paper uses the panel data from 2007-2016 to establish a non-spatial measurement model to examine the factors affecting China's EUDI location selection.

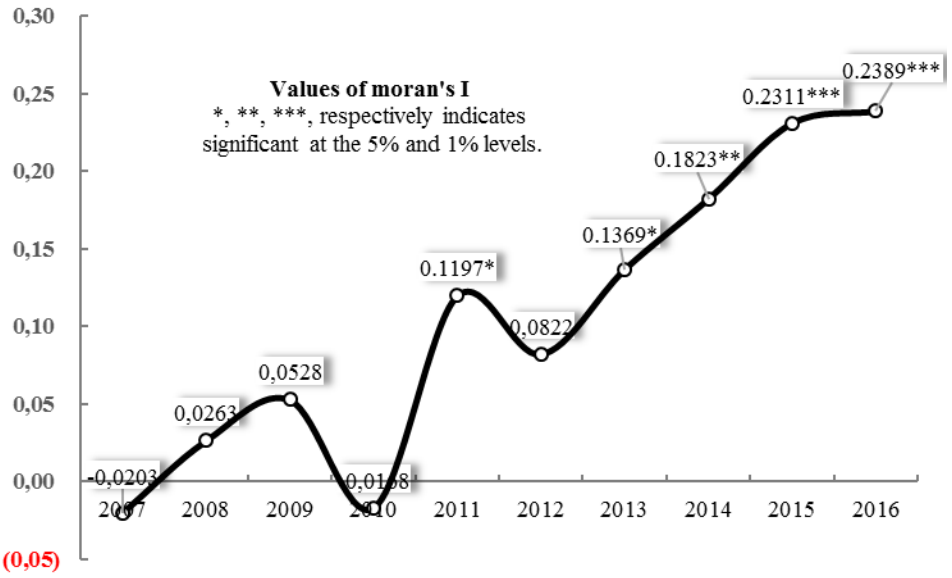

Fig.5. Changes of Moran's I index
Source: The data in this table is calculated by ARCGIS10.1 software.

Then we consider the choice of variables and the setting of the measurement model. The explanatory variables studied in this paper are China's OFDI to the EU. The statistics are divided into annual flow data and historical inventory data at the end of the year. This paper takes China's OFDI stock in EU countries as the explanatory variable. The reason for choosing the stock data, on the one hand, is that it is not only the incremental OFDI in the current year, but also the stock OFDI in the past years. It also considers the instability of China's traffic data to the EU, especially in recent years. Large-scale cross-border mergers and acquisitions will cause large fluctuations in OFDI traffic, affecting the measurement effect, while the stock data is relatively stable.

For the choice of explanatory variables, according to the FDI theory, there are many factors that influence the location selection of FDI. Drawing on Buckley's investment generalization model, the host country's influencing factors are divided into two categories: one is the investment motivation factor, and the other is the enterprise internalization advantage factor. The influencing factors of investment motivation mainly include market size, natural resources, strategic assets and labor resources; internalization factors mainly include cultural distance, geographical distance, openness to foreign investment, and trade links. In this paper, according to the actual situation of EU, choose the following variables:

Host country GDP. From the perspective of market seeking motivation, the market size is undoubtedly an important factor affecting the choice of OFDI location (Reiner, G., Demeter, K., Poiger, M., & Jenei, I., 2008). The larger the size of the host country market, the greater the potential for FDI to achieve economies of scale in local investment operations, and therefore proportional to the inflow of FDI. A large number of studies on China's OFDI have also confirmed that market seeking is an important consideration for Chinese companies' OFDI. This paper uses GDP as an indicator to measure the size of a country's market.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

Patent application volume PAT. According to the OFDI theory of developing countries, the EU as a developed economy, Chinese enterprises must also have strong technical seeking motives for EU OFDI. Therefore, this paper incorporates the total number of patent applications in the host country as indicators of the technical level.

Export scale EXP. Numerous studies have shown that there is a strong correlation between FDI and foreign trade. On the one hand, a country's OFDI will open up the host country market, reduce trade barriers, and drive the country's exports to the host country. On the other hand, maintaining long-term economic and trade exchanges with the host country will help to grasp the market trends of the host country and provide decision-making information to the country for its OFDI. Therefore, this paper incorporates China's export scale to EU countries into the measurement model.

Investment freedom FRD. The economic system, especially the management system for foreign capital, can reflect the difficulty of operating activities in the host country. The higher the quality of the host country system, the more attractive it is to FDI in China. This paper selects the sub-index of the national economic freedom index provided by the American Heritage Foundation over the years - the investment free score to measure the quality of the host country's foreign investment system.

Other variables, such as geographical distance, take into account the EU's most overall, China's geographical distance to the EU countries does not have large differences, it is also difficult to quantify its indicators, so this article does not incorporate geographic distance into the model. The same natural resources are not the main motives of OFDI in EU countries, so they are not included in the measurement model. Finally, this paper establishes the following measurement model:

$$LnOFDI_{it}=\alpha+\beta_1 LnGDP_{it}+\beta_2 LnPAT_{it}+\beta_3 LnEXP_{it}+\beta_4 LnFRD_{it}+\varepsilon_{it} \quad (2)$$

The subscript i indicates the i-th host country. This paper selects 28 EU member states for metrological analysis; t indicates the year, this paper selects 10 years of data from 2007 to 2016; α is the intercept term, ε_{it} is the random disturbance term, and the variable The description is shown in Table 2.

China's OFDI stock data for the 28-member states of the European Union comes from the wind database and the China Foreign Direct Investment Bulletin. The GDP data of EU member states comes from the Eurostat. Considering the fluctuations in the exchange rate between the euro and the US dollar in recent years, the euro calculation can more accurately reflect the GDP growth of each country. China's export data to EU member states is derived from the China Statistical Yearbook. The investment freedom index of EU member states is derived from the annual report issued by The Wall Street Journal and the American Heritage Foundation. The technical level indicators of EU member states adopt the number of patent applications from various countries, and the data comes from the “National Five IP Office Statistical Reports (IP5SR)”.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

Table 3. Value of FDI flows between China and EU

Variable nature	Variable name	Indicator selection	Economic significance	expected
Explained variable	OFDI	Stock of OFDI		
Explanatory variables	GDP	National GDP	market size of Host country	Positive correlation
	PAT	patent applications of Host country	technology level, strategic assets of Host country	Positive correlation
	EXP	China's exports to the host country	Close ties between China and the host country	Positive correlation
	FRD	Investment freedom	Degree of facilitation of host country investment	Positive correlation

Source: own processing.

6. Data Treatment and the Empirical Results

With the panel data of China's OFDI in 28 EU member states in 2007-2016, we conduct regression analysis.
In order to prevent the occurrence of pseudo-regression, before the panel regression model is analyzed, the stability test of each variable data listed in Table 2 is performed. Then determine whether there is a long-term cointegration relationship. If it exists, a cointegration analysis is performed. This panel data uses LLC, ADF-fisher and PP-fisher methods comprehensively to judge whether the variable data is stable. The results of unit root test are shown in Table 4.

The test results show that except for the variable LNPAT which is a horizontal stationary variable, the others are horizontal non-stationary variables. However, all variables are stationary variables after the first-order difference. This judge whether there is a long-term relationship between variables. Therefore, it can be considered that the sequence is stable after the difference, that is, all variables are non-stationary first-order single-integration process, and we can do long-term cointegration analysis to determine whether there is a long-term relationship between variables.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

Table 4. Results of Unit Root Test (ADF)

Variable	Difference	Test Type (C, T, L)	LLC	Breitung	ADF-Fisher	PP-Fisher	Conclusion
LNOFDI	0	(C,T,1)	-8.11261 (0.0000) **	2.53786 (0.9944)	55.8351 (0.3328)	57.1421 (0.2900)	unstable
	1	(C,0,1)	-11.8083 (0.000)**	—	122.133 (0.0000) **	141.840 (0.0000) **	stable
LNGDP	0	(C,T,1)	-37.6174 (0.000)**	0.92213 (0.8218)	217.978 (0.0000) **	87.1051 (0.0016) **	unstable
	1	(C,0,1)	-42.6768 (0.000)**	—	254.259 (0.0000) **	206.936 (0.0000) **	stable
LNPAT	0	(C,0,1)	-6.49732 (0.000)**	—	83.2498 (0.0038) **	88.6163 (0.0012) **	stable
	1	(C,0,1)	-14.8437 (0.000)**	—	159.243 (0.000 0) **	203.690 (0.0012) **	stable
LNFRD	0	(C,T,1)	-7.75317 (0.000)**	-0.38270 (0.3510)	60.1894 (0.078 1)	82.9823 (0.0007) **	unstable
	1	(C,T,1)	-24.4429 (0.000)**	-2.78789 (0.0027)	138.998 (0.000)**	168.976 (0.000)**	stable
LNEXP	0	(C,T,1)	-16.8697 (0.000)**	-1.50294 (0.0664)	90.8843 (0.000 71)	101.951 (0.0000) **	unstable
	1	(C,T,1)	-123.489 (0.000)**	-5.78981 (0.000)**	153.320 (0.000)**	212.617 (0.000 7) **	stable

Source: The data in this table is calculated by eviews6.0 software.Test types C, T, and L respectively indicate that the unit root test equation includes a constant term, a time trend term, and a lag order, with 0 indicating no time trend term or lag order.The data in parentheses is the P value of the variable; - indicates no existence; *, **, respectively indicates significant at the 5% and 1% levels.

Cointegration tests were performed on the model using Kao Residual Cointegration. The test results t statistic was -3.100932 and Prob. was 0.001. Therefore, there is a cointegration relationship between the variables of the equation. Then, using the F test and determining whether to use the invariant coefficient model or the variable intercept model based on the F test results. The fixed effect model and the random effect model were selected according to the Hausmann test results. Based on the above tests of the model, we finally establish a fixed effect variable intercept model, the model is as follows:

$$LnOFDI_{it} = -52.45 + 3.33LnGDP_{it} + 0.79LnPAT_{it} + 0.35LnEXP_{it} + 2.89LnFRD_{it} + \varepsilon_{it} \quad (3)$$

(-6.8070**) (5.3107**) (4.3658**) (1.7279*) (4.667423**)

*The values in the brackets are t, and ** and * indicate significant at the level of significance of 1% and 10%, respectively. R2=0.869064, F-statistic=52.87994, Prob (F-statistic)=0.000.*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

According to the t value in formula (3), China's stock Value of OFDI in EU has a co-integration relationship with host country GDP, patent application amount PAT, investment freedom FRD and foreign trade export volume EXP. At the high level, the significance test is passed, and there is a long-term correlation equation; the goodness of fit of the coefficient equation is as high as 0.857, and the equation is statistically significant.

The cointegration equation shows that there is a long-term equilibrium relationship between the distribution of OFDI in EU countries and the host country's economic scale (GDP), technology level (PAT), investment freedom (FRD) and export scale (EXP). But the four factors have different effects on the increase of OFDI. Overall, the host country's economic scale (GDP) plays the most important role in China's OFDI. The correlation coefficient between the two countries is the highest, the marginal output elasticity reaches 3.33, that is, the host country's GDP growth is 1%, and China's OFDI growth for the country is 3.33%. Secondly, the correlation coefficient between the host country's investment freedom (FRD) and China's OFD reaches 2.896, and the host country's investment freedom increases by 1%. China's OFDI growth for the country is 2.896%. The third is the technical level (PAT) of the host country. For every 1% increase in the number of patent applications on behalf of the technical level, China's OFDI for the country is up 0.79%. Finally, for every 1% increase in China's export volume (EXP) to the host country, China's OFDI for the country increased by 0.35%.

Conclusions

As the world's second largest economy, China's rising position in global cross-border investment in recent years has caused widespread concern. This paper makes a comparative analysis of the growth and location distribution characteristics of China's OFDI in the EU and explains the imbalance of China's OFDI distribution in different regions of the EU. China's investment in the EU has obvious regional differences between "Western High East" and "Northern Strong South"; China's OFDI concentration on the EU is very high, and the UK, Germany and France are very stable top three, the Netherlands is super M&A has leapt to the top in recent years, and Luxembourg has a place in the special status of tax havens. However, with the increase of China's cross-border mergers and acquisitions in the EU, Luxembourg's intermediary role is rapidly declining. From the perspective of development trends, as China's economic transformation and upgrading and the strength of multinational companies improve, China's OFDI will continue to flow into Europe and play an important role in the European economy.

The location of China's OFDI in Europe reflects China's motivation for EU OFDI. Market size and investment freedom are the two most important factors. This shows that Chinese companies invest in Europe, the most important purpose is market development. The EU has a population of 510 million, and its per capita income of 32,000 US dollars is four times that of China. It is a huge integrated market favored by Chinese companies. At the same time, compared with the United States, the EU is relatively open to foreign investment, especially to China, which is also an important reason for attracting Chinese companies to invest in Europe. In the context of the Sino-US trade war and the strategic containment of the United States against China, the free and open market in Europe is becoming more and more important in China's foreign investment.

As a developing country, China's OFDI in developed countries such as EU, also has an important goal of obtaining strategic assets, especially technology assets. The empirical research in this paper finds that Chinese companies prefer to countries with advanced technology. In recent years, Chinese companies have favored small and medium-sized enterprises with mature technology in Europe and are willing to conduct cross-border mergers and acquisitions at a higher price. This may sound uncomfortable, but from a resource allocation perspective, it is a win-win situation rather than a hostile act. Chinese capital, combined with European technology, has revitalized technological assets and promoted technological advances in China through reverse technology spillovers.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

The research on China's OFDI is an area of great theoretical and practical value. This paper focuses on the time and space changes of China's OFDI in the EU, and empirically tests its influencing factors. In addition, a more in-depth study of China's OFDI in the EU's operating methods, cultural integration and business performance will be more challenging and valuable.

References

Bevan, A., Estrin, S., & Meyer, K. (2004, February). Foreign investment location and institutional development in transition economies. *International Business Review*, 13(1), 43-64. Retrieved from http://www.sciencedirect.com/science/article/pii/S0969593103001082

Blanc-Brude, F., Cookson, G., Piesse, J., & Strange, R. (2014). The FDI location decision: distance and the effects of spatial dependence. *International Business Review*, 23(4), 797-810. https://doi.org/10.1016/j.ibusrev.2013.12.002

Brada, J. C., Drabek, Z., & Perez, M. F. (2012). The effect of home-country and host-country corruption on foreign direct investment. *Review of Development Economics*, 16(4), 640–663. https://doi.org/10.1111/rode.12009

Buckley, P.J.; Casson, M.A. (1981). The optimal timing of Foreign Direct Investment. *Economics Journal* (99)：75-87.

Buckley, P.J., Clegg, L.J., Cross, A.R., Liu, X., Voss, H., Zheng, P. (2007). The Determinants of Chinese Outward Foreign Direct Investment. *Journal of International Business Studies* 40(2), 353-354 http://doi.org/10.1057/jibs.2008.102

Guanhong, J., Dianchun, J., (2014). Outward Foreign Direct Investment in China's Industrial Enterprises and Enterprise Productivity Progress. *World Economy* 9, 53-76

Deng, P. (2009). Why do Chinese firms tend to acquire strategic assets in international expansion? *Journal of World Business*, 44(1), 74-84. https://doi.org/10.1016/j.jwb.2008.03.014

Deng, M. (2012). Institutional Distance, "Demonstration Effect" and Location Distribution of China's OFDI. *International Trade Issues*, (2):123-135

Dudas, T; Dudasova, M. (2016). Growth of Chinese investments in Europe after the global economic crisis of 2008-2009. *Economic Annals XXI*, 160(7-8), 9-13. https://doi.org/10.21003/ea.V160-02

Dunning, J.H. (1977) 'Trade, location of economic activity and the MNE: a search for an eclectic approach', in B. Ohlin, P.O. Hesselborn and P.M. Wijkmon (eds.) *The International Location of Economic Activity*, London: Macmillan, pp. 395-418.

Dunning, J.H. (1993) *Multinational Enterprises and the Global Economy*, Wokingham: Addison-Wesley.

Fabus, M. (2018). Business environment analysis based on the Global Competitiveness Index (GCI) and Doing Business (DB): case study Slovakia. *Journal of Security and Sustainability Issues*, 7(4), 831-839. http://doi.org/10.9770/jssi.2018.7.4(18)

Fabus, M.; Csabay, M. (2018). State aid and investment: case of Slovakia. *Entrepreneurship and Sustainability Issues*, 6(2), 480-488. http://doi.org/10.9770/jesi.2018.6.2(1)

Fabus, M. (2015). Impact of foreign direct investment on unemployment development in selected regions of Slovak Republic. *Economic Annals XXI*, 19(155), 63-66. http://soskin.info/userfiles/file/Economic-Annals-pdf/S155-0014(14)063.pdf

Chinese Outbound Investment in the European Union, European Chamber of Commerce in China, (2013), pp. 26-28

Cheung Yan-L. (2011). Does Corporate Governance Predict Future Performance? Evidence from Hong Kong. *Financial Management* 40(1):159-197 · http://doi.org/10.2307/41237900

Chovanova Supekova, S., Szwajca, D. (2018). Green Marketing as Part of Corporate Social Responsibility: IT Companies in the Slovak Republic. *Management and Finance in a "Flat World"* 79(2). http://doi.org/10.29119/1641-3466.2018.124.6

Reiner, G., Demeter, K., Poiger, M., & Jenei, I. (2008). The internationalization process in companies located at the borders of emerging and developed countries. *International Journal of Operations & Production Management*, 28(10), 918-940. http://dx.doi.org/10.1108/01443570810903096

Jia, Y., Zhang C. (2017). The Location Selection Characteristics of China's OFDI. A Preference Analysis of Host Country System under the Constraint of Investment Motivation. *Journal of Hebei University of Economics and Business*, 38(04), 51-59.

Kolstad, I., & Wiig, A. (2012). What determines Chinese outward FDI? *Journal of World Business*, 47(1), 26-34. https://doi.org/10.1016/j.jwb.2010.10.017

Lee, M., Yin, X., Lee, S., Weng, D. H., & Peng, M. (2015). The impact of home country institutions on new venture export: examining new ventures in transition economies. *International Entrepreneurship & Management Journal*, 11(4), 823-848. https://doi.org/10.1007/s11365-014-0316-5

Lu, J., Liu, X., Wright, M., & Filatotchev, I. (2014). International experience and fdi location choices of Chinese firms: the moderating effects of home country government support and host country institutions. *Journal of International Business Studies*, 45(4), 428-449. https://doi.org/10.1057/jibs.2013.68

Lall, S. (1983). The New Multinationals: The Spread of Third World Enterprises. New York: John Wiley&Sons, 250-268

Stopford, J. M. (2008). Multinational enterprises and the global economy. *Journal of International Business Studies,* 39(7), 1236-1238.

Song W., Xu, H. (2012). Research on Influencing Factors of Location Selection of Foreign Direct Investment. *Studies in Finance and Economics*, (10), 44-50.

Tancosova, J. (2013, September). Foreign direct investments and their influence on the economic development of Slovakia. *Economic Annals-XXI*, 3-4(1), 31-34. Retrieved from http://soskin.info/ea/2013/3-4/zmist.html

Tancosova, J. (2014, March). Investment attractiveness of Slovak republic and its determinants. Economic Annals-XXI, 3-4(1), 8-11. Retrieved from http://soskin.info/userfiles/file/2014/3-4_2014/1/Tancosova.pdf

Tvaronavičienė, M. (2018). Toward efficient policy making: forecasts of vulnerability to external global threats, *Journal of Security and Sustainability Issues*, 7(3), 591-600. https://doi.org/10.9770/jssi.2018.7.3(18)

Wells, L. T., Jr. (1977). The Internationalization of Firms from Developing Countries. Multinationals from Small Countries, Cambridge, MA: MIT Press

Wen, X., Liyun, L. (2015). Internationalization Of China's Privately Owned Enterprises: Determinants And Pattern Selection. World Scientific. ISBN 9789814641135

Xianming, W. Chuntao, H. (2016). The Motives of Foreign Direct Investments by Chinese Enterprises: A Comparative Study between Upstream and Downstream Investments. *China Industrial Economics*, 1, 99-113.

Yamakawa, Y., Peng, M. W., & Deeds, D. L. (2010). What drives new ventures to internationalize from emerging to developed economies? *Entrepreneurship Theory & Practice*, 32(1), 59-82.

Aknowledgements

This research was supported by the project, which has received funding from The Chinese Ministry of education of Humanities and Social Science project（Grant No.17YJC790077）
The paper is the output of an international scientific project IGA no. 2/2018 - M „Problems and Suggestions - Comparison of Commercial Enviroment between China - Slovakia and Facilitation of Trade and Investment". (Funder: VSEMvs IGA VSEMvs, i.e. School of Economics and Management in Public Administration)

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2019 Volume 6 Number 3 (March)
http://doi.org/10.9770/jesi.2019.6.3(16)

Li SHUYAN is a Ph.D. student in the School of Economics and Management of Zhejiang University of Technology in China and an associate professor at the School of Finance and Trade of Ningbo University of Finance and Economics. He is currently working on research of FDI and international trade between China and Europe. Research direction: China-EU international trade and investment; enterprise internationalization; sustainability.
ORCID ID: orcid.org/0000-0003-1381-011X

Michal FABUS PhD. in International Economics Relations, obtained at University of Economics in Bratislava, currently at Department of Economics and Finance as Head of department, School of Economics and Management in Public Administration in Bratislava (VSEMvs), Slovakia. Focused on research of FDI and international trade between China and EU.
ORCID ID: orcid.org/0000-0002-3792-179X