Location Determinants of Foreign Direct Investment in Real Estate: Evidence from China

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CHULALONGKORN UNIVERSITY

An Independent Study Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts in International Economics and Finance
Field of Study of International Economics
FACULTY OF ECONOMICS
Chulalongkorn University
Academic Year 2019

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น.ส.อี้ ถัง

Independent Study Title   Location Determinants of Foreign Direct Investment in
Real Estate: Evidence from China
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Field of Study   International Economics and Finance
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Accepted by the FACULTY OF ECONOMICS, Chulalongkorn University in Partial Fulfillment of the Requirement for the Master of Arts

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อี้ ถัง : Location Determinants of Foreign Direct Investment in Real Estate: Evidence from China. (Location Determinants of Foreign Direct Investment in Real Estate: Evidence from China) อ.ที่ปรึกษาหลัก : สินีนาฎ เสริมชีพ

บทความนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่มีผลต่อการเลือกทำเลที่ตั้งสำหรับการลงทุนโดยตรงจากต่างประเทศใน ตลาดอสังหาริมทรัพย์ในประเทศจีน โดยกลุ่มตัวอย่างที่ใช้ในการวิเคราะห์มาจาก 32 จังหวัดของประเทศจีน ในช่วงปีพ.ศ. 2546 ถึง 2560 ผลการวิจัยพบว่าผลิตภัณฑ์มวลรวมในประเทศต่อประชากร จำนวนประชากร และอัตราเงินกู้ เป็นปัจจัย สำคัญที่ส่งผลต่อการลงทุนโดยตรงในตลาดอสังหาริมทรัพย์ของจีน ซึ่งสะท้อนให้เห็นว่าการเติบโตทางเศรษฐกิจของจีนมีส่วน สำคัญต่อการเติบโตของการลงทุนโดยตรงจากต่างประเทศในตลาดอสังหาริมทรัพย์ อย่างไรก็ตาม การลงทุนของนักพัฒนา อสังหาริมทรัพย์ต่างชาติในภาคตะวันออก ภาคกลาง และภาคตะวันตกของจีนยังคงมีการกระจายตัวไม่สม่ำเสมอ ดังนั้นรัฐบาล จีนควรนำนโยบายที่เกี่ยวข้องมาปรับใช้เพื่อจัดการกับปัญหาดังกล่าว

คำสำคัญ:อสังหาริมทรัพย์,อัตราดอกเบี้ยเงินกู้,ผลิตภัณฑ์มวลรวมในประเทศต่อหัว,การลงทุนทางตรงใน ต่างประเทศด้านอสังหาริมทรัพย์

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สาขาวิชา	เศรษฐศาสตร์และการเงินระหว่าง ประเทศ	ลายมือชื่อนิสิต ....
ปีการศึกษา	2562	ลายมือชื่อ อ.ที่ปรึกษาหลัก ....

\# \# 6284088729 : MAJOR INTERNATIONAL ECONOMICS AND FINANCE

The objective of this paper is to examine factors affecting locational choice of foreign direct investment (FDI) in China's real estate. The panel data selected 32 provinces of China during 2003 to 2017 are used in the analysis. The results show that GDP per capita, population, and loan rate are important factors affecting FDI in China's real estate market. This reflects that China's economic growth made a significant contribution to the growing trend of FDI in the real estate market. However, the investment of foreign real estate developers in cities in the eastern, central and western parts of China is still unevenly distributed, so the Chinese government should implement relevant policies to deal with such issues.

Keywords: Real estate, loan rate, GDP per capita, foreign direct investment in real estate

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Field of Study:	International Economics and Finance	Student's Signature ....
Academic Year:	2019	Advisor's Signature ....

ACKNOWLEDGEMENTS

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Chapter 1

Introduction

Since China's reform and opening in 1978, China has begun to transform from a planned economy to a market economy. Foreign investment has begun to flow into China, which has become an important force in promoting China's economic development.

With the reform and transformation of China's economic system, the reform of the housing allocation system has achieved marketization. China has begun the reform of the housing allocation system since 1998. The housing allocation system has changed from welfare housing to monetization and commodification. Since then, China's real estate industry has developed rapidly, with large influx of domestic funds and foreign capital flowing into China's real estate market. Especially after joining the WTO in 2001, the open market policy attracted foreign direct investment, and China's foreign direct investment continued to grow rapidly.

According to data released by the National Bureau of Statistics, in 2018, China absorbed about US$134.89 billion in foreign direct investment, of which the real estate industry accounted for the third largest proportion of foreign investment, reaching 13%, so the real estate industry played an important role in attracting foreign investment.

Foreign investment is mainly concentrated in residential real estate and commercial real estate. Foreign investment in China's residential market is dominated by direct investment and development, and has shown a trend of slow growth in the past decade. According to FDI markets statistics, from 2006 to 2016, foreign investors invested 66 new projects in China's residential real estate, with a cumulative investment of US$20.64 billion and an average investment of US$313 million. In terms of target cities, the main cities where residential real estate attracts foreign direct investment include Beijing, Tianjin(Liaoning province), Shenyang (Liaoning province) and Dalian(Liaoning province) Shanghai, Changzhou(Jiangsu province), Changsha(Hubei province), Wuxi(Jiangsu province), Xiamen(Fujiang province), Guangzhou and Shenzhen(Guangdong province) in the eastern region. Xi'an(Shaanxi province) and Chengdu(Sichuan province) in the western region.

Commercial real estate, such as office buildings and shops, has the attributes of commodities. Commercial real estate investment, construction and operation require a high degree of expertise and technology. Compared with continuous regulation to curb excessive growth in residential housing prices, the state has relatively few restrictions on foreign investment in commercial real estate and is encouraged.

Over the past ten years, foreign-invested commercial real estate activities have maintained steady growth overall. Between 2006 and 2016, 125 new projects were invested, with a total investment of US$49.23 billion and an average investment of US$394 million. As a first-tier financial and business center, Shanghai has attracted a total of US$2.1 billion in foreign investment over the past decade. It is the earliest city for overseas investment funds and real estate developers to enter; Wuhan (Hubei

province), Beijing, Chongqing and Tianjin belong to the second-tier hotspot cities attracted a total of US$900 million in investment. Other cities such as Shenyang, Dalian (Liaoning province), Suzhou (Jiangsu Province), and Chengdu (Sichuan Province) have gradually become the focus of foreign investment in second-tier cities in recent years.

Therefore, this article focuses on the real estate industry on the basis of previous literature .According to the characteristics of the real estate industry, this paper uses 32 provinces' panel data of China from 2003 to 2017 to analyze the influencing factors of real estate entry though the analysis methods from the entire country and eastern, central and west ern regions.

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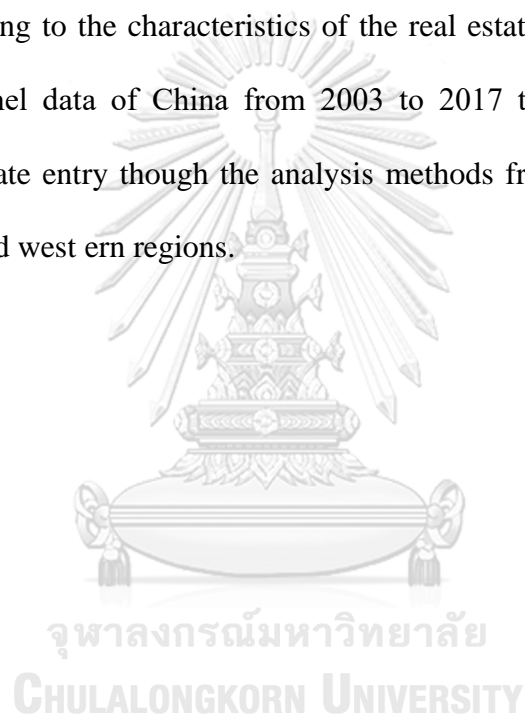
Chapter 2

Foreign Direct Investment in Real Estate (FDIRE)

This chapter presents the overview of FDI in real estate in China. It covers the regional and provincial distribution of FDI and the entry modes.

This section starts by providing the detail of provinces in each region. This paper classifies the provinces into 3 groups according to the development level.

2.1 The description of FDIRE

Figure 1 .The distribution of FDI and FDIRE Unit: billion US$

The distribution of FDI and FDIRE
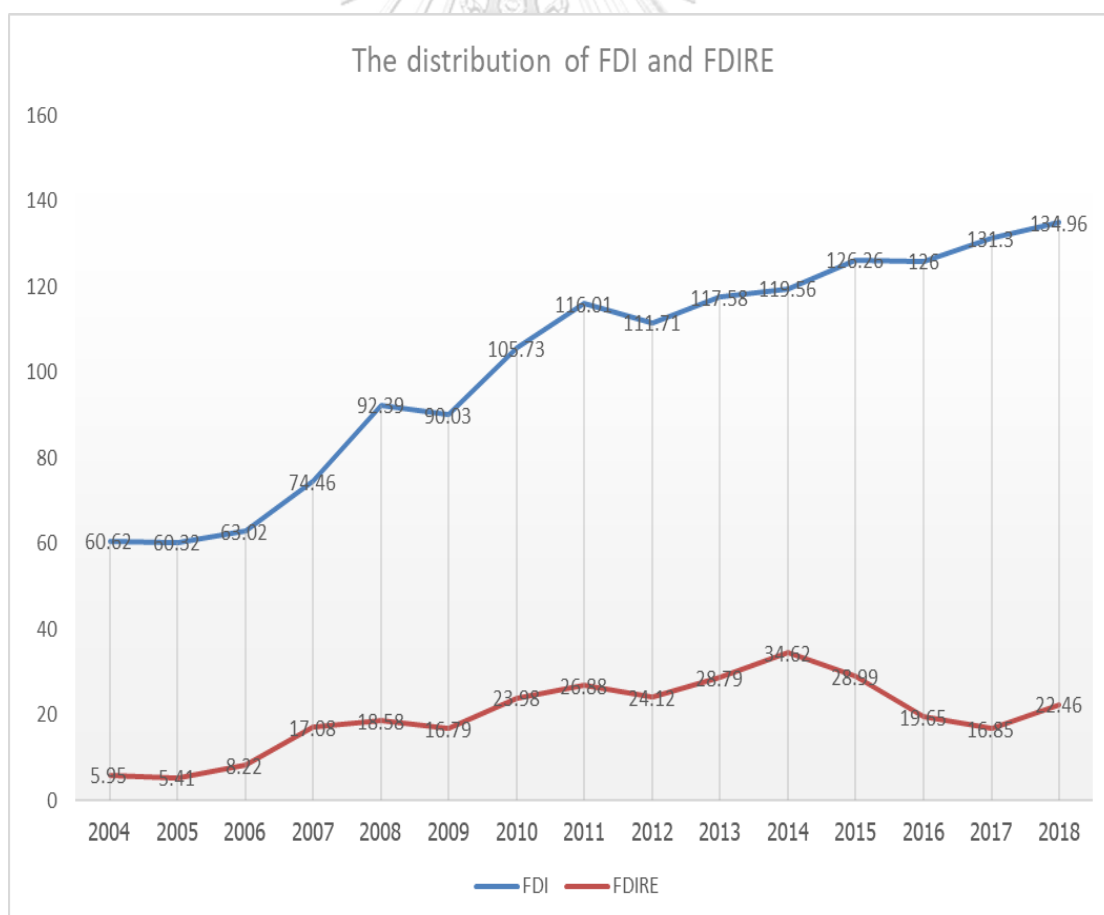
Data source:China Statistical Yearbook

From this figure, we can see that from 2004 to 2018, FDI and FDIRE increased steadily, but in 2015, while FDI increased, FDIRE showed a downward trend. This is because the housing prices in China's first-tier cities were increased so quickly from 2012 to 2014. As the housing prices in Beijing and Shanghai are even higher than those in some developed countries, foreign investors have to consider the cost, so some real estate developers choose to leave China market and move to other foreign markets. In order to solve this problem, the government implement the Notice on Policies Relating to Foreign Investment Admission and Management in the Real Estate Market in 2015, but it seems not effect.

In 2004, FDI was only US$60.62 billion, but by 2018, FDI was US$134.96 billion, an increase of about 2 times. But FDIRE is only US$5.95 billion, but it was US$22.46 billion in 2018, an increase of nearly 4 times. From this, we can reach a conclusion that the growth rate of FDIRE is very quickly.

Figure 2 .China FDI Inflows by industry Unit: billion US$

China FDI Inflows by industry

27%

17%

13%

13%

9%

6%

6%

4%

3%

2%

- Manufacturing
- Information transmission, computer services and software
- Real estate
- Leasing and business services
- Wholesale and retail trade
- Financial intermediation
- Scientific research, technical service and geologic prospecting
- Transport, storage and post
- Production and supply of electricity, gas and water
- Construction
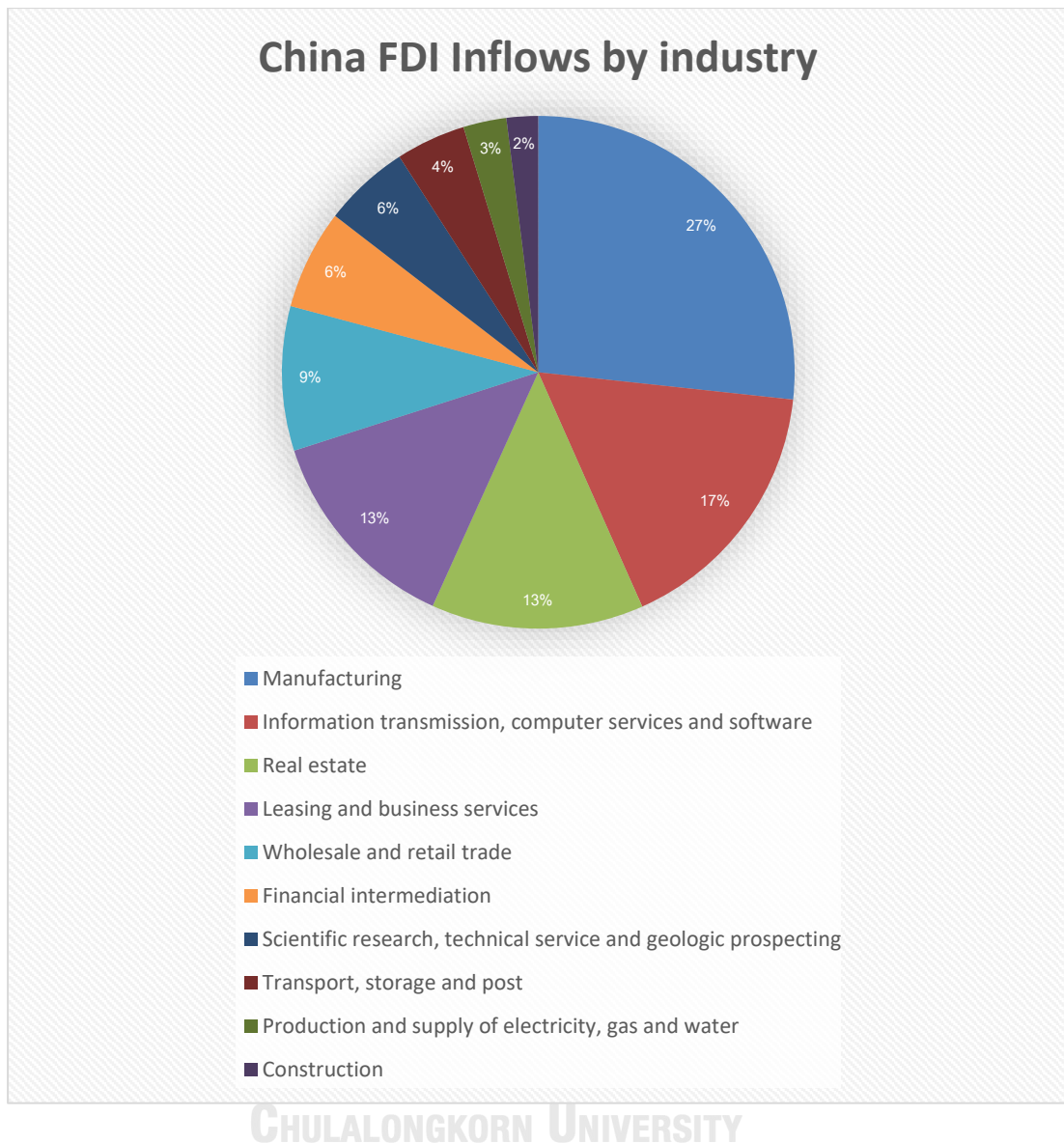
Data source:China Statistical Yearbook

It can be seen from this **Figure 2** that the real estate industry accounts for 13% of foreign investment, which ranks third. First rank is manufacturing (27%), and second rank is Information transmission, computer services and software (17%), so it can be concluded that real estate plays an important role in attracting foreign investment.

2.2 The regional distribution of FDIRE in China

Figure 3 The region of China

Source: National Bureau of Statistics

The country divides the country into three major economic regions in the eastern region, central region, and western region based on the economic development of all parts of the country and the location of land and sea.

Eastern region

The Eastern region includes 12 provinces including Liaoning, Hebei, Tianjin, Beijing, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, Guangxi and Hainan. It is a coastal area with developed international trade, dense population, and convenient

transportation. The total economic volume of the eastern region occupies a huge share of the total economic volume of China, and it is also the most economically developed region, which is mainly focus on technology-intensive industries.

At the same time, the economic zone has the capital city Beijing, the economic center Shanghai, and 5 special economic zones, including Shenzhen, Zhuhai and Shantou in Guangzhou province, Xiamen in Fujian province, and Hainan province.

Eastern region is a base for international trade, a base for training and sending high-level technical and managerial talents to the whole country, and a base for delivering new technologies, consulting and information to the whole country, which can promote and help the development of the central and western regions.

Central region

The central region includes 9 provinces including Heilongjiang, Jilin, Inner Mongolia, Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan. The Central region belongs to the inland area of China, located between the eastern region and the western region. Therefore, the biggest feature of this region is a transitional economic region. Its economic better than the western area, but not as good as the eastern region. The central region is rich in resources, and the proven reserves of coal, petroleum, copper, and aluminum. Therefore, economic development is dominated by those industries. Especially the production of raw materials occupies a prominent position in China.

Western region

The Western region includes 10 provinces, including Shaanxi, Gansu, Ningxia, Qinghai, Xinjiang, Chongqing, Sichuan, Yunnan, Guizhou and Xizang. It belongs to

deep inland of China, and the population is relatively small. The natural resources are the most abundant in all three regions, but the economic foundation, scientific and technological strength, transportation, and other conditions are not as good as other regions. The economic development of the Western region is mainly agriculture. Therefore, since 2000, China has implemented the Western Development Policy and invested a large amount of funds in the western region to drive economic development. In recent years, the economy of the western region has begun to develop rapidly, especially for Chongqing and Sichuan province.

The distribution of FDIRE in China in eastern, central, and western parts is show in Figure 4.

Figure 4 Regional distribution of FDIRE in China from 2003 to 2017, Unit:10,000 RMB
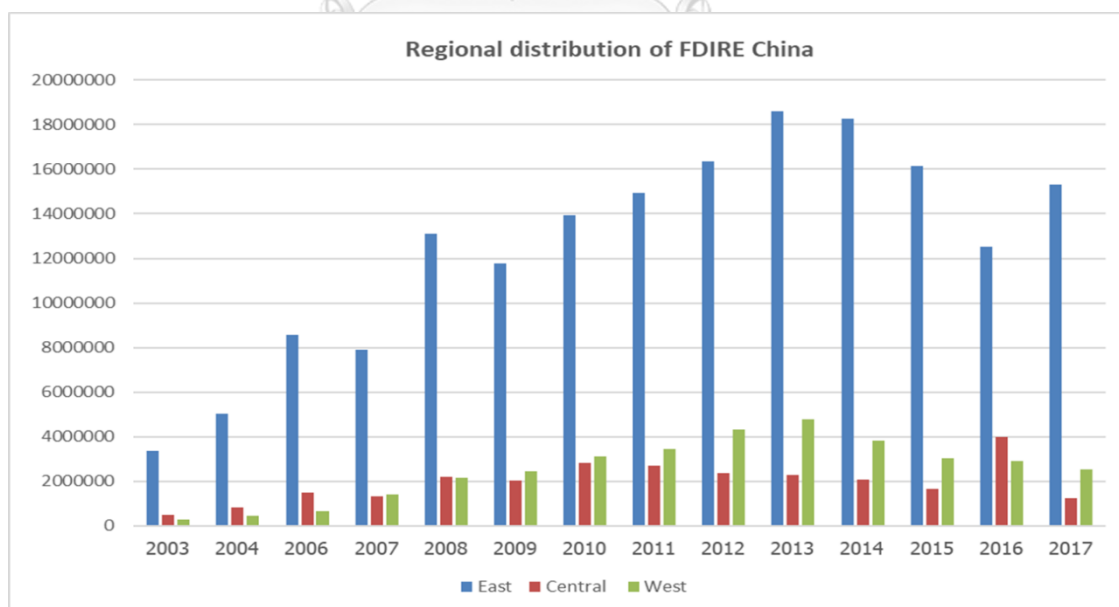
Source: China Real Estate Yearbook

According to the available data from China Real Estate Yearbook, we plotted the distribution of FDIRE inflows to 32 provinces in China from 2003 to 2017. We can find that the overall investment is in a growing trend, because but most of the investment is concentrated in the eastern region, and western region and central region less.

In 2003, the western region received less investment than the eastern region, but as time goes by, due to the Western Development Policy, the western region received more investment than the central region. Especially in 2016, we can see that compared with 2015, the western region of 2016 regional investment has increased rapidly, while the amount of investment in the eastern region is decreasing, which means that with the development of the western region, foreign real estate investors have begun to turn to the western region.

2.3 FDIRE in Chinese province

Figure 5 FDIRE in Chinese province 2003 vs 2017, Unit :10,000 RMB
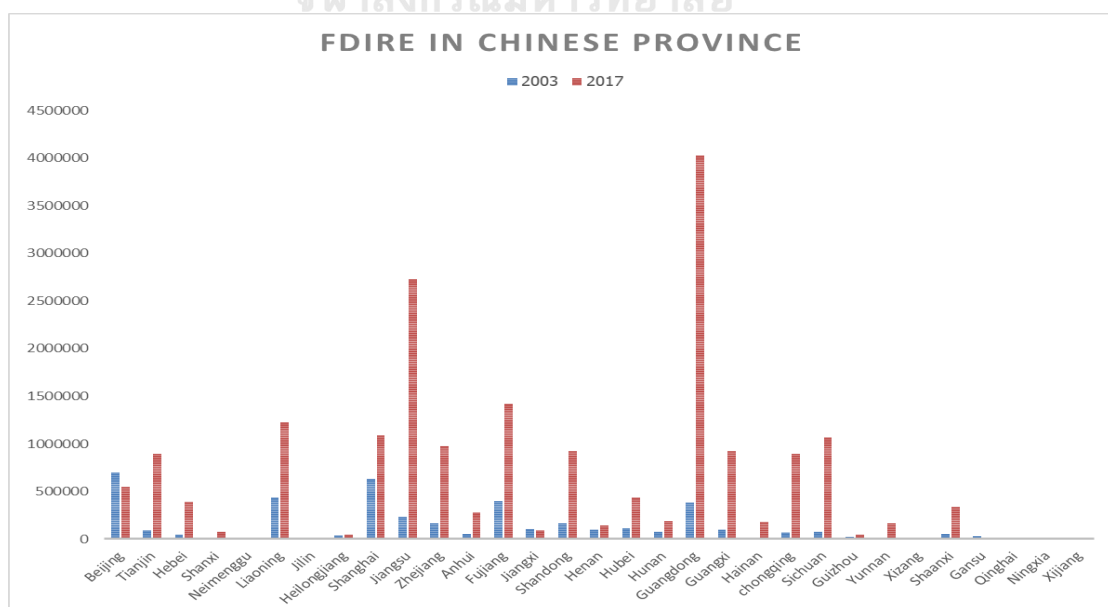
Source: China Real Estate Yearbook

It can be seen from **Figure 5** that in 2003, the capital city Beijing and the economic center Shanghai in eastern region became the most attractive cities for foreign real estate investors, followed by Liaoning(Eastern region) , Guangdong(Eastern region), Fujiang (Eastern region), which are close to Hong Kong and Taiwan, attracting a large number of foreigners. Beijing is a capital city of China, and Shanghai is national economic center, and provide huge market potential for foreign investors. However, in 2017, coastal cities in Guangdong, Jiangsu and Fujiang became the most attractive provinces for foreign real estate investors with the fast grow speed, but Beijing and Shanghai just grow little bit, because for those two cities, The investment costs of these two cities are higher than most parts of China. Foreign companies choose to open up new markets to diversify risk.

Compared with 2003, western provinces such as Chongqing and Sichuan have also become more attractive for foreign real estate investors with a fast growth rate in 2017. Firstly, because in recent years, the Chinese government has increased its economic development in those emerging and fast-growing regions, and opened up the real estate market in these regions to foreign developers to absorb more investment. Secondly, compared with other western provinces, Chongqing and Sichuan have made faster economic reforms, so they have a relatively developed real estate market and favorable institutions and governance. Compared with 2003 with 2017, the growth rate of Beijing and Shanghai in the eastern region is relatively small, which also proves that real estate foreign capital has been transferred from the east to the west to diversify risk.

2.4 Entry modes

Table 1. Number of Foreign Enterprises in Real Estate Development in Chinese Provinces by Entry Mode, 2017

Foreign enterprises						
Province	Total	JDV	CJV	WFOE	EJV	Others
	1223	472	99	568	40	44
Beijing	82	36	25	19	2	
Tianjin	40	12	3	16	4	5
Hebei	21	6	1	12	1	1
Liaoning	87	50	1	33	2	1
Shanghai	116	34	6	71	5	
Jiangsu	165	70	8	84	1	2
Zhejiang	95	47	1	38	2	7
Fujiang	87	20		56	6	5
Shandong	62	29	10	22		1
Guangdong	183	47	28	92	6	10
Guangxi	35	15		15	2	3
Hainan	14	4	2	7		1
Shanxi	5	2		3		
Neimenggu	2	1		1		
Jilin	5	5				
Heilongjiang	9	3	1	5		
Anhui	17	4	1	10	2	
Jiangxi	17	9		5	1	2
Henan	24	9	2	12		1
Hubei	27	15		9		3
Hunan	21	12	1	6	1	1
Chongqing	29	10	3	13	2	1
Sichuan	44	17	2	24	1	
Guizhou	9	4	3	2		
Yunnan	6	2	1	2	1	
Xizang						
Shaanxi	14	5		8	1	
Gansu	4	2		2		
Qinghai	1	1				
Ningxia	2	1		1		
Xijiang						

Source: China Real Estate Yearbook

There are four types of entry methods for foreign investment in real estate: Wholly foreign-owned enterprise (WFOE), Equity joint venture (EJV), Cooperative joint venture (CJV), Joint development venture (JDV).

It can be seen from the **Table 1** that foreign real estate investors enter the Chinese market through WFOE (Wholly foreign-owned enterprise) and Joint development venture (JDV), but in the eastern region, Beijing, foreign real estate investors prefer to choose the JDV method, because foreign investors can share risks and responsibilities with Chinese partners. Beijing have high operational risks and is subject to more restrictions, but Beijing's real estate industry is developed, and foreign investors have established social and commercial networks here, which let them find easy to find local partners. In good commercial locations, such as the eastern coast of China (Shanghai, Guangdong, Fujiang) and other places, these provinces are subject to fewer restrictions and market uncertainties, so foreign investors prefer to set up WFOE.

Chapter 3

Review of Literature

3.1 Locational Theory

Isard (1949) Weber believes that labor costs, transportation costs, and agglomeration are the three factors that make up the location factors. Firstly, the industrial location factor is determined by the cost of transportation, and then further modified by the cost of labor, which is wages. Finally, use aggregation factor to determine. He also cited factors such as land, transportation and fuel costs, wages, and interest rates as relatively important factors, and he also recognized that division of labor, economies of scale, environmental and transportation issues are all part of the aggregation factors.

3.2 New Economic Geography

Krugman (1991) referred New economic geography emphasizes the role of agglomeration in corporate location. It is believed that agglomeration can save transportation costs, expand market demand, strengthen forward-backward relationships between enterprises, and promote innovation through the spillover effect of agglomeration. This can be seen that agglomeration factors are one of the important factors affecting the distribution of economic activities.

3.3 The Eclectic Paradigm

Dunning (1998) proposed an OLI framework that integrated monopoly advantages (O), location advantages (L), and internal advantages (I) to analyze the choices that companies enter the international market. He believes that both the ownership advantage and the internalization advantage are in terms of the supply side, that is, the multinational company, and the location advantage is considered in terms of the host

country of the demand side. Among them, the location advantage is the key factor that determines where FDI occurs. In his article, he classified the host country's location factors into four categories: market factors, trade barriers, cost factors, and investment environment.

(1) Market factors, including market size, market growth, degree of close contact with customers, and market layout.

(2) Trade barriers, including the degree of trade barriers, the degree to which local customers love domestic products, and foreign consumption Consumers' psychological distance to domestic products, etc.

(3) Cost factors, including proximity to supply sources, labor costs, raw material costs, and transportation costs.

(4) Investment environment, including policies and regulations on foreign investment and the degree of political stability.

Subsequently, Dunning further summarized the location characteristic variables as:

(1) The distribution of natural and man-made resources and the spatial distribution of the market.

(2) The price, quality and productivity of labor, energy, raw materials, parts, semi-finished products, and other inputs.

(3) International transportation and communication costs.

(4) Investment preferences or investment obstacles.

(5) Artificial barriers to trade in products and services (such as import controls).

(6)Commercial, legal, educational, transportation and communications infrastructure conditions.

(7) Psychological distance between regions, such as differences in language, culture, habits, etc.

(8)Economics brought by research and development, production and marketing concentration.

(9) Institutional framework of economic system, government policy, and resource allocation.

Determinants of FDI in the ownership, location and internalization (OLI) advantage framework.

3.4 Demand theory

He and Zhu (2010) In a transition economy like China, profits depend not only on local market conditions, but also on favorable institutions, such as the commercialization of land and housing, effective law enforcement, and good areas governance. Return on capital and favorable institutions are the pressure for foreign investors to enter the Chinese real estate industry. Rising real estate prices in the host country will encourage foreign investment in the real estate sector in these countries.

Chen (2005) Researchers have identified the main reasons for entering the Shanghai real estate market. Through a survey of 12 foreign real estate developers in Shanghai, FIDRE will be attracted to the possibility Regions that produce higher rates of return

on capital. The main reasons for foreign real estate investors and developers to conduct business in the Shanghai real estate market are market potential, the company's development strategy, accumulated market experience, geographic location, tax incentives provided by the city where they are located, and investment diversification.

Rodríguez and Bustillo (2010) Taking the real estate market of Spain as an example, it is found that per capita GDP, expected capital income, tourism cost, tourism agglomeration and housing price are important factors for foreign real estate investment. The main factors are the impact of house prices, GDP per capita and the number of tourists. It also believes that the case study could be applied to other countries with similar flows of foreign real estate investment.

3.5 Empirical Evidence

Hui and Chan (2014) use the panel model to test of the determinants of foreign direct investment in China's real estate market. Per capita GDP and foreign investment enterprise quantity are the most important factors. Foreign direct investment in China's real estate market is still concentrated in coastal areas, and writer still suspect that foreign investment may make China's property market overheating.

Cheng and Kwan (2000) find that wage cost has a negative effect on FDI. Good infrastructure attracted FDI as measured by the density of all roads, but the positive impact of educational variables was not statistically significant. Major policies such as special economic zones, coastal open cities, economic and technological development zones, and coastal open areas have had a positive impact on FDI.

Belkhodja, Mohiuddin et al. (2017) use 1218 observations in the analysis results show that intellectual property protection, agglomeration economy, education investment and regional GDP will influence China's FDI regional choices. In addition, the results clarified the impact of the country of origin of the foreign investor on the choice of FDI location and the impact of the activity sector on foreign investor behavior.

Fereidouni and Masron (2013) use data from survey of foreign investors investing in Taiwan to examine the factors of foreign investor selection criteria. They find that operational risks, market size, land costs, national competitiveness, national competitiveness, political stability, language exchange, economic development, and government restrictions on real estate market investment are the most important criteria for investors to make real estate investments.

He and Zhu (2010) use data from major Chinese cities, and concludes that FDI in China's real estate sector is more common in large cities with large populations, foreign investment and tourist.

He, Wang et al. (2011) use the data of China Real Estate Statistical Yearbook, FDI in real estate development is highly concentrated in coastal areas, especially in Guangdong, Shanghai and Beijing. Meanwhile, FDI has spread to inland provinces, including Sichuan, Chongqing, Hubei and Anhui. Compared with total FDI, FDI is more geographically dispersed and relatively concentrated in inland provinces. Foreign investors in the real estate industry tend to gravitate towards provinces with relatively developed land and housing markets, while provinces with good local

governance and strong law enforcement are also attractive to foreign investment. They are attracted to the real estate sector with great potential, which pushes up prices.

Hanh (2012) based on the study of the determinants FDI inflow into China from 1980 to 1998, and it finds that FDI is influenced by wage level, economic openness, and exchange rate.

Chapter 4

Data and Methodology

After China joined the WTO in 2001, a large number of real estate investments entered China. We selected 32 Provincial panel data in China from 2003 to 2017 to analyze the influencing factors of the location choice of foreign investment in real estate-China by the panel data model.

Table 2. Variables and Their Definitions

Type	Variable	Definition	Expceted sign	Source
Local and external demand	**POP**	Popluation per province	+	China Statistical Yearbook
	TOURIST	International tourism revenue per province	+	China Statistical Yearbook
Costs of production factors	**WAGE**	Wage per person for one year per province	-	China Statistical Yearbook
	LOAN	Domestic loans to total investment per province	+	China Statistical Yearbook

Market factor	**RINVEST**	Ratio of realized real estate investments to total fixed-asset real estate investments per province	+	China Statistical Yearbook
	AGGLO	The number of foreign Real estate development enterprise to The number of Real estate development enterprise per province	+	China Statistical Yearbook
	TRANS	Railway operating mileage to province area	+	China Statistical Yearbook
	GDPper	GDP per person for one year per province	+	China Statistical Yearbook
Enviroment factor	**SO2**	Total SO2 in each province	-	China Statistical Yearbook
Education factor	**UNI**	The number of university	+	China Statistical Yearbook

Data source:China Statistical Yearbook

Model:

The location choice of foreign direct investment in China's real estate industry will not only be affected by the differences in the investment environment of each region in China, but also change with the changes in the country's economic policy and economic environment in different periods. This study uses panel data to analyze the

main influencing factors of the location difference of foreign direct investment in China's real estate industry from both time and space. Therefore, this paper will use a panel data model to test the various influencing factors of the location selection of foreign direct investment in China's real estate industry, and strive to be more scientific and practical.

Based on the analysis of the previous paper, we design a model to analyze the influence of variables on the location choice of foreign direct investment in China's real estate industry. In order to eliminate the effect of heteroscedasticity, the logarithm of the variable with a larger value is taken. The regression coefficient in the logarithmic model can also be used to measure the elasticity of the relevant explanatory variable to the explained variable.

$$LnFDIRE_{it}=\alpha+\beta_1 LnGDPper_{it}+\beta_2 LnWAGE_{it}+\beta_3 LnPOP_{it}+\beta_4 AGGLO_{it}+$$

$$\beta_5 LnTRANS_{it}+\beta_6 LnTOURIST_{it}+\beta_7 LOAN_{it}+\beta_8 RINVEST_{it}+\beta_9 SO2_{it}+\beta_{10} Uni_{it}+ +\mu_{it}$$

In the equation, i represents the province, t represents the time, and it represents the actual situation of the province i in the period $t.\alpha$ is the constant term of the model and μ is the random error term. The parameters $\beta 1, \beta 2, \beta 3, \beta 4, \beta 5, \beta 6, \beta 7, \beta 8, \beta 9, \beta_{10},$ represent 10 interpretation coefficients, which are used to measure the sensitivity of the explanatory variable to the explained variable.

Panel data from provinces in China from 2003 to 2017 were selected for estimation analysis. Firstly, we need to choose the suitable model, and the panel model can be divided into 3 types, pooled regression model, fixed effects regression model and random effects regression. We can do Breusch-Pagan test to choose random effects

regression or pooled regression model, and also we can do Hausman test to choose fixed effects regression model or random effects regression.

Independent variable

GDPper

Economic development level and market potential are important factors to consider when making location choices. In 1997, Dunning proposed that entry activities must have internal advantages, ownership advantages, and location advantages. The three are indispensable. Subsequently, Dunning and others proposed a development level theory based on this.

The theory mainly believes that per capita GDP play the most important role in foreign investment attraction, and this two have a positive relationship. **Wan, Zhang et al. (2009)**believe that when the per capita GDP is higher, the real estate demand is more, while more local demand and a larger market size can create higher income for foreign real estate investors, so that can attract more foreign direct investment. In real estate, previous researchers often used GDP per capita as a measure in most previous studies. Therefore, we expect it to have a positive impact on foreign investment.

WAGE

Wage is another important factor that affects foreign investment. **Dunning (1998)** believes that foreign direct investment favors countries with relatively high labor costs because higher labor costs represent higher labor quality, and high-quality labor is obviously more attractive to foreign investment.

However, in most previous studies, scholars hold the opposite view. They believe that there is a negative relationship between wage and foreign direct investment. The level of wage directly determines the level of production costs. The level of costs directly affects the level of manufacturers' profits. Therefore, multinational companies will try to choose lower cost locations for investment when making investments. So it means when the labor cost is higher, it will become less attractive to foreign investment. But at the same time, higher labor costs also mean higher labor quality, and higher labor quality will have a positive impact on the attraction of foreign capital. **Kerr and Peter (2001)** found a negative relationship with wage and FDI. **Zhao and Zhu (2000)** found a negative impact on FDIRE .But in most of previous researches, there is a negative relationship between wage and FDIRE. So as the previous studies, we expect negative relationship between wage and FDIRE.

POP

Market size has become a decisive factor for direct foreign investment. In order to effectively utilize resources and economies of scale, there must be a huge market. **Chakrabarti (2001)**Population is crucial for FDI, which has a positive relationship with FDI, because population is concerned with the size of market in the developing countries. **Akin (2009)** Local market conditions are an important factor in determining foreign investment in real estate. The market demand for real estate development determines the capital reporting pursued by foreign real estate developers. From the research, the POP coefficient is positive and very significant, indicating that foreign developers are more inclined to choose large cities with large

populations, which also guarantees the huge local demand for real estate. **He and Zhu (2010)** So we expect positive relationship between population and FDIRE.

AGGLO

Agglomeration is another important variable that affects foreign capital entry. Weber was the first person to systematically discuss industrial location. He divided the factors affecting industrial location into two categories: regional factors and agglomeration factors. The distribution in industrial areas is affected by agglomeration factors. Krugman is a representative for new economic geography, and he emphasizes the role of agglomeration in the location of enterprises. Krugman believed that agglomeration can save transportation costs, expand market demand, strengthen forward and backward associations between enterprises, and promote innovation through the spillover effect of agglomeration.

China has a large population, and foreign investors are not familiar with many regions. Therefore, when foreign capital enters, they tend to choose regions that already have more foreign capital. At the same time, foreign direct investment in the early stage will also attract the inflow of foreign capital in the later stage through the demonstration effect and the promotion effect, and will increase the investment in related industries. These newly increased investments will further attract more capital inflows, thus forming a virtuous circle. **Braunerhjelm and Svensson (1996)**found agglomeration have positive effect on FDI. Agglomeration effects are present, predominantly in technologically advanced industries by combining unique data on Swedish multinationals with industry data for 18 countries. So we expect positive relationship between agglomeration and FDIRE.

TRANS

Infrastructure construction is one of the main factors that attract foreign investors enter into the real estate sector. The convenience of transportation in a place is higher, and as the travel time decreases, the motivation of foreign investors to invest in the place is also getting stronger. This saves time and money. **Chin, Dent et al. (2006)** found reliable infrastructure is one of the main criteria for long-term investors to evaluate any potential real estate transaction in Southeast Asian cities. Most studies have found that transport infrastructure has a significant positive impact on foreign direct investment. So we expect positive relationship between transportation and FDIRE.

TOURIST

This represents International tourism revenue during the year. **Sanford Jr and Dong (2000)**found international tourism enables potential investors to experience the environment of the country they are visiting, and get information about available investment. By experiencing the country's goods and services, they can find investment opportunities, which can promote the expansion of foreign direct investment. **Rodríguez and Bustillo (2010)**find that foreigners' investment in real estate in the host country is affected by the host country's role as a resort. So we expect positive relationship between tourist and FDIRE.

LOAN

LOAN ratio represents domestic loans to total investment. **He and Zhu (2010)** used Loan ratio to quantify loan availability and capital costs. We expect that foreign

investors in real estate development will avoid cities with higher production costs. So we expect positive relationship between Loan and FDIRE.

RINVEST

He and Zhu (2010) foreign investors in real estate development will avoid cities with higher production costs. In addition to modeling demand and costs, we also introduced the ratio of realized real estate investment to total fixed asset investment (RINVEST) in the city to quantify market opportunities in the real estate industry. More opportunities should attract foreign investment to real estate development. So we expect positive relationship between RINVEST and FDIRE.

SO2

Zheng, Kahn et al. (2010) referred that uncomfortable temperature and air pollution have a negative impact on housing prices in major cities in China. Their findings indicate that physical amenities indirectly affect the attractiveness of FDIRE through intermediary housing prices. So we expect negative relationship between Loan and FDIRE.

UNI

University is one of physical and human amenities factors. The number of universities represents the importance of higher education. Good educational facilities are conducive to attracting investment from foreign real estate companies**. He and Zhu (2010)** In order to seek a better educational environment, provinces with a better educational environment will be more attractive for local consumers, thereby stimulating local demand. The increase in local demand can attract more foreign real

estate developers to enter the market to a certain extent, so we expect the UNI have a positive relationship with FIDRE.

Chapter 5

Empirical Results

This paper analyzes the location choice of foreign investment in real estate in China through panel data from 32 provinces and cities in China from 2003 to 2017. First, we need to perform pooled model, fixed effect model, and random effect model, and then conduct Breusch-Pagan test and Hausman test to determine the final form of the model. Based on the final test results, we decide to choose random effect model for the scenario of 32 provinces nationwide.

Table 3. National panel data regression results for FDIRE

	All PROVINCE		
	FE	RE	POOLED
lnGDPper	2.217***	1.430***	2.217***
	(-0.399)	(-0.346)	(-0.399)
lnWAGE	-2.006***	-1.052***	-2.006***
	(-0.432)	(-0.337)	(-0.432)
lnPop	1.863**	0.0962	1.863**
	(-0.764)	(-0.277)	(-0.764)
AGGLO	2.188*	2.131*	2.188*
	(-1.227)	(-1.221)	(-1.227)
lnTRANS	0.0645	0.0661	0.0645
	(-0.277)	(-0.177)	(-0.277)
lnTOURIST	0.116	0.128	0.116
	(-0.0921)	(-0.08)	(-0.0921)
LOAN	2.742**	2.872**	2.742**
	(-1.226)	(-1.135)	(-1.226)
RINVEST	4.700***	4.758***	4.700***
	(-0.932)	(-0.854)	(-0.932)
SO2	0.00599***	0.00510**	0.00599***
	(-0.0022)	(-0.00201)	(-0.0022)
UNI	0.0270***	0.0232***	0.0270***
	(-0.005)	(-0.0044)	(-0.005)
Constant	-3.855	9.147***	-4.153

	(-5.817)	(-2.205)	(-5.396)
Observations	404	404	404
R-squared	0.527	0.5161	0.883

***p<0.01,**p<0.05,*p<0.1

From the above analysis and measurement results, we get result for the 32 provinces,

GDPper, has a positive and significant coefficient, which is consistent with the previous analysis. The higher the economic level, the higher the per capita purchasing power, the greater the market potential, and the more foreign investment is more willing to enter.

WAGE, has a negative and significant coefficient, which is consistent with the previous analysis. Because wage is a relatively important locational factor, and also wage is one of the key costs for foreign investor. If the worker wage is higher, it means that foreign investor will cost more than before.

AGGLO, has a positive and significant coefficient, which is consistent with the previous analysis. Because if one region has more foreign investors, which will guide other foreign investors to follow their steps .

TRANS and TOURIST has insignificant coefficient, which is inconsistent with the previous analysis. It means no effect on FDIRE.

LOAN , domestic loans to total investment, has a positive and significant coefficient, which is consistent with the previous analysis, which means that the loan and investment are positively correlated, the more easier to get the loan , the more attractive for the foreign investment.

RINVEST, the ratio of realized real estate investments to total fixed asset investments, has a positive and significant coefficient ,which is consistent with the previous analysis, further confirming that foreign investor pursue local market opportunities and concentrate in cities in which real estate development is considered important.

SO2 , has a positive and significant coefficient, which is inconsistent with the previous analysis. But the coefficient is very small, which is contrary to the previous analysis. This is because heavy industry is relatively developed in developed regions of China. Although the government spends a lot of money to govern the environment, environmental problems remain exist.

UNI, has a positive and significant coefficient, which is consistent with the previous analysis. The more universities in the region, the better the level of education and the quality of education will have, it can attract more people into that area and then increase demand for housing, which will attract foreign investment.

Generally speaking, China's foreign direct investment in real estate tends to invest in a place with developed economies, convenient transportation, good infrastructure, and easy loan areas. A good education environment is more likely to attract foreign investment, but transportations is not a obvious factor to attract real estate investment. Because China got good transportations environment in most of provinces.

Analysis by region

Eastern region analysis

The above analysis is a nationwide analysis. Since China is a country with a vast territory and extremely uneven regional economic distribution, the overall analysis of

the whole country cannot reach the most effective conclusion. So we need to be divided into China into three regions, east, central and west, and then compare the results to get the most effective conclusion.

First, the final form of the model is determined according to the Breusch-Pagan test and Hausman test. Based on the test results, we chose to choose a fixed model for eastern region analysis.

Table 4. Eastern region panel data regression results for FDIRE

| | EAST | | |
	FE	RE	POOLED
lnGDPper	1.853***	1.546***	1.853***
	(-0.424)	(-0.403)	(-0.424)
lnWAGE	-1.328***	-0.741**	-1.328***
	(-0.42)	(-0.36)	(-0.42)
lnPop	0.307	0.000525	0.307
	(-0.663)	(-0.27)	(-0.663)
AGGLO	2.395***	1.757**	2.395***
	(-0.82)	(-0.832)	(-0.82)
lnTRANS	0.29	-0.208	0.29
	(-0.257)	(-0.195)	(-0.257)
lnTOURIST	0.306***	0.225**	0.306***
	(-0.115)	(-0.0997)	(-0.115)
LOAN	4.115***	2.471**	4.115***
	(-1.177)	(-1.056)	(-1.177)
RINVEST	2.601***	2.379***	2.601***
	(-0.753)	(-0.683)	(-0.753)
SO2	0.00287	0.0025	0.00287
	(-0.00211)	(-0.00202)	(-0.00211)
UNI	0.0177***	0.0132***	0.0177***
	(-0.00429)	(-0.004)	(-0.00429)
Constant	1.978	7.446***	0.596
	(-4.788)	(-2.3)	(-4.436)
Observations	168	168	168
R-squared	0.806	0.7943	0.908

***p<0.01,**p<0.05,*p<0.1

From the above table, we can reach a result that

It can be drawn from the above table that GDPper, AGGLO,TOURIST,LOAN, RINVEST and UNI, have significant and the keep positive relationships with FDIRE, and WAGE has significant and the keep negative relationships with FDIRE ,which is consistent with expectations. This is same with the whole analysis.

But for TOURIST, it is significant, which is different with the all province part. Because China's tourist attractions are unevenly distributed, and most of the famous tourist attractions are located in the eastern region.

Generally speaking, in eastern of China, China's foreign direct investment in real estate tends to invest in areas with developed economies, high loan rates, lower wage. A good educational environment, the level of aggregation of foreign real estate companies, tourism revenue can also attract foreign investment.

Central region analysis

Nine provinces in the central region (Heilongjiang, Jilin, Shanxi, Neimenggu, Anhui, Henan, Hubei, Hunan, Jiangxi) were selected to analyze to find out the main influencing factors for foreign real estate investment .According to Breusch-Pagan test and Hausman test to determine the final form of the model. Based on the final test results, we chose to choose a fixed model.

Table 5. Central region panel data regression results for FDIRE

	CENTRAL		
	FE	RE	POOLED
lnGDPper	1.535*	1.062**	1.535*
	(-0.85)	(-0.481)	(-0.85)
lnWAGE	-1.337	-1.059*	-1.337
	(-0.837)	(-0.559)	(-0.837)
lnPop	12.71***	0.976*	12.71***
	(-4.086)	(-0.511)	(-4.086)
AGGLO	1.502	9.583**	1.502
	(-4.226)	(-4.689)	(-4.226)
lnTRANS	-0.118	0.658**	-0.118
	(-0.851)	(-0.269)	(-0.851)
lnTOURIST	0.332*	0.278	0.332*
	(-0.195)	(-0.198)	(-0.195)
LOAN	0.755	-0.297	0.755
	(-2.964)	(-2.258)	(-2.964)
RINVEST	12.31***	9.461***	12.31***
	(-3.032)	(-2.735)	(-3.032)
SO2	0.0163***	-0.000226	0.0163***
	(-0.00437)	(-0.0022)	(-0.00437)
UNI	0.0118	0.0176*	0.0118
	(-0.012)	(-0.00979)	(-0.012)
Constant	-99.76***	-1.096	-97.31***
	(-34.55)	(-5.993)	(-33.41)
Observations	125	125	125
R-squared	0.58	0.4252	0.835

***p<0.01,**p<0.05,*p<0.1

It can be drawn from the table above that the effect of foreign investment in real estate investment GDPper,POP,TOURIST,REINVEST,SO2, in the central region are significant and positive which is consistent with the previous analysis.

POP has positive relationship with FDIRE, because the population distribution in the central region is particularly uneven, especially in Neimenggu province, where the land is sparsely populated, the population is small, the market demand is small, so foreign investors are not interested in such province, but the areas such as Hubei,

Anhui have a large population, so the large market demand will attract foreign investors, which makes this variable coefficient very significant reaches12.71.

TRANS, are not significant. This is mainly because the level of transportation in central part is all relatively low.

In general, in central region of China, China's foreign direct investment in real estate tends to be in an economically developed region, and a good education environment also can attract foreign investment. Lower Wages, and higher tourism revenue can also attract foreigners, but convenient transportation is not a key factor to attract real estate investment.

Western Region Analysis

This part we selects 10 provinces in the western region (Chongqing, Sichuan, Yunnan, Guizhou, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang) for analysis to find out the main influencing factors that affect the choice of real estate location in the western region.

According to Breusch-Pagan test and Hausman test , we choose to choose a fixed model for this part.

Table 6. West region panel data regression results for FDIRE

	WEST		
	FE	RE	POOLED
lnGDPper	4.132***	0.764	4.132***
	(-1.153)	(-0.567)	(-1.153)
lnWAGE	-4.151***	-0.259	-4.151***
	(-1.377)	(-0.577)	(-1.377)

lnPop	-6.286**	-0.281	-6.286**
	(-3.102)	(-0.367)	(-3.102)
AGGLO	18.98**	27.08***	18.98**
	(-7.82)	(-7.806)	(-7.82)
lnTRANS	0.0916	0.0363	0.0916
	(-0.555)	(-0.185)	(-0.555)
lnTOURIST	0.084	-0.169*	0.084
	(-0.189)	(-0.0901)	(-0.189)
LOAN	9.093***	9.294***	9.093***
	(-2.521)	(-2.549)	(-2.521)
RINVEST	0.0344	11.77***	0.0344
	(-3.235)	(-2.273)	(-3.235)
SO2	0.0131**	0.000427	0.0131**
	(-0.00585)	(-0.00461)	(-0.00585)
UNI	0.0624***	0.0624***	0.0624***
	(-0.0169)	(-0.00969)	(-0.0169)
Constant	62.42***	12.75***	63.24***
	(-21.98)	(-2.971)	(-22.32)
Observations	111	111	111
R-squared	0.543	0.3784	0.877

***p<0.01,**p<0.05,*p<0.1

From the above table, it can be concluded that foreign investment in real estate investment in Western China GDPper, POP, AGGLO, LOAN,SO2,UNI has a significant and positive coefficient, which is the same as our expectation.

TRANS and TOURIST are not significant. This is mainly due to in the western region, few international tourists and inconvenient transportation in most province of West region. In addition, there are very few foreign capitals entering the western region. Chongqing and Chengdu are the main areas for foreign investment, while other regions such as Gansu and Qinghai have less foreign investment.

Generally speaking, in the western region of China, China's foreign direct investment in real estate tends to be in an economically developed region with lower wage, higher agglomeration level and better education environment. However, TRANS, TOURIST, are not obvious factors in attracting real estate investment in western region.

Comparison of model results

This paper uses panel data from 32 provinces and cities in China from 2003 to 2017, and uses an econometric model to perform econometric analysis on the entire country and the three regions in the east, central, and west. Through the previous test results, we can see that the national overall study is suitable for random effect models, while the eastern region, central region, and western region are suitable for fixed effect models.

Table 7. Panel data regression results for FDIRE

	All PROVINCE	EAST	CENTRAL	WEST
	Model(1)	Model(2)	Model(3)	Model(4)
lnGDPper	1.430***	1.853***	1.535*	4.132***
	(-0.346)	(-0.424)	(-0.85)	(-1.153)
lnWAGE	-1.052***	-1.328***	-1.337	-4.151***
	(-0.337)	(-0.42)	(-0.837)	(-1.377)
lnPop	0.0962	0.307	12.71***	-6.286**
	(-0.277)	(-0.663)	(-4.086)	(-3.102)
AGGLO	2.131*	2.395***	1.502	18.98**

	(-1.221)	(-0.82)	(-4.226)	(-7.82)
lnTRANS	0.0661	0.29	-0.118	0.0916
	(-0.177)	(-0.257)	(-0.851)	(-0.555)
lnTOURIST	0.128	0.306***	0.332*	0.084
	(-0.08)	(-0.115)	(-0.195)	(-0.189)
LOAN	2.872**	4.115***	0.755	9.093***
	(-1.135)	(-1.177)	(-2.964)	(-2.521)
RINVEST	4.758***	2.601***	12.31***	0.0344
	(-0.854)	(-0.753)	(-3.032)	(-3.235)
SO2	0.00510**	0.00287	0.0163***	0.0131**
	(-0.00201)	(-0.00211)	(-0.00437)	(-0.00585)
UNI	0.0232***	0.0177***	0.0118	0.0624***
	(-0.0044)	(-0.00429)	(-0.012)	(-0.0169)
Constant	9.147***	1.978	-99.76***	62.42***
	(-2.205)	(-4.788)	(-34.55)	(-21.98)
Observations	404	168	125	111
R-squared	0.5161	0.806	0.58	0.543

***$p<0.01$,**$p<0.05$,*$p<0.1$

GDPper in the four models are positive, which is consistent with our hypothesis. Economic development is one of the main drivers of foreign investment growth in the Chinese real estate market in recent years. GDPper is an important factor to stimulate foreign capital to enter the Chinese real estate market. The rapid growth of the Chinese economy has accelerated the urbanization process, which has boosted

housing demand. This has attracted more foreign real estate developers to invest in China. The coefficient of the western region is more significant than other regions, we believes that this may be caused by the imbalance of foreign capital entering real estate, the economic development level of the provinces in the western region is different, and foreign investment in real estate in the western region is mostly enter into larger cities, but it is impossible to invest in towns or rural areas. In the eastern region, this possibility exists. So GDPper is still an important factor for foreign investor.

WAGE is negative relationship with FDIRE, which is consistent with hypothesis. This is because the real estate industry is closely related to the construction industry, and the industrial chain is very long. The wages of workers (including the wages of construction personnel, the wages of sales personnel, etc.) will be effect cost.

POP is consistent with our expectations. The larger the population, the more demand for houses, which means more opportunities in the market. In the real estate industry, this will attract more foreign investment. The western region is negatively correlated. This is because the population distribution in the western region is extremely uneven, and foreign investment in real estate will only enter large cities, but not small cities in the west. But our statistical data is provincial data, not cities' data , which may cause errors.

ALLGO has positive and significant, which is consistent with our expectations, which confirms agglomeration of China foreign real estate industry. The agglomeration effect attracts investors by reducing the average cost of the investment.

TRANS has no significant, which is not consistent with our expectations, because most of the foreign investment is concentrated in the eastern region, and the eastern region belongs to the developed region of China. The transportation of various cities is very well, so this factor not sensitive for foreign real estate investor in China.

TOURIST has a positive coefficient, because International tourism enables potential investors to experience the environment of the countries they visit and obtain information about available investments, and find investment opportunities, which can promote foreign direct investment. **Sanford Jr and Dong (2000)**The central region also has a positive correlation, but the western regions are not significant. This is because western region has fewer famous tourist attractions, and foreigner seldom to come here for travel.

LOAN has a positive coefficient in three models. When loan ratio is higher, the cost of borrowing money by foreign companies will be lower. As a result, it will be more attractive for foreign investors.

RINVEST is consistent with the forecast, and all of them have positively coefficients. RINVEST is relatively high, which further proves that foreign developers seek local market opportunities and concentrate on cities where real estate development is important.

SO2 is inconsistent with the prediction, and all four models are positively related. This is because in many developed cities in China have more heavy industry, more cars, which lead to air pollution, but foreign investment focus more on capital return but not the air environment.

UNI is consistent with the forecast, and the four models have positively coefficient, which means that the better the education environment, the more attractive the foreign investors to invest in the real estate industry in the region.

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Chapter 6

Conclusion and Policy suggestion

After China joined the World Trade Organization in 2001, China's real estate market has become more and more open, barriers to entering the Chinese market have gradually been eliminated, and more and more foreign real estate companies have entered the Chinese market. They not only brought advanced international management concepts, but also promoted the development of China's real estate industry. real estate industry is different from the manufacturing industry, the real estate industry refers to the investment and development, construction, intermediary services and property management of commercial housing. This requires understanding the local market demand. Through panel data, we find that most real estate investment in real estate is in eastern region of China, and the FDIRE in the central and western regions is relatively small. But in recent years, it has gradually moved from the east to the west, such as Chongqing and Sichuan. With the rapid development of real estate in China in recent years, housing prices have become more expensive, and housing prices in some cities such as Beijing and Shanghai are even higher than in some developed countries. Therefore, foreign investors have to consider the cost of investment, which means foreign investors are more inclined to invest in places where housing prices are slightly cheaper. Foreign investment in real estate development from east region cities expanded to west inland cities, this means that a certain degree of transfer of foreign investment in the real estate industry has occurred. A developed economy and a large population have become important determinants of foreign investment in the real estate industry, which shows that local

demand and the demand generated by foreigners attract foreign real estate investors. Local market opportunities play an important role in attracting foreign real estate investors. The degree of agglomeration is the decisive factor for foreign real estate investment. It determines the agglomeration of China's foreign real estate industry. Real estate foreign investors follow customers and competitors to enter the market. Because of the agglomeration effect, operating costs can be reduced to a certain extent. At the same time, foreign investors also think that borrowing costs are very important. They like to invest in provinces where bank loans are easier to obtain. For the natural environment, foreign investors don't pay much attention to it. Because for foreign investors, getting profits from real estate investment is more important than living environment. International tourism revenue is an important factor in the location choice of foreign direct investment in real estate. More foreign exchange income from tourism indicates that the local area has more international tourists. When more foreign tourists enter an area, it means tourists have more potential opportunity to know the invest opportunity. Therefore, government should strive to attract foreign tourists, such as relaxing the tourist visa policy, implementing landing visa or visa exemption. In the western and central regions, the backwardness of the economy is the biggest obstacle. Only by developing the economic can we attract more foreign investment. The government should devote itself to the economic development of the central and western regions to attract foreign investment.

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