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A Comparative Economic Analysis of the Determinants of the Location of FDI in China

by Japanese, Korean and Taiwanese Enterprises.

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Introduction

China has received more foreign direct investment, maintaining the high growth rate since the affiliation in 2001 to WTO. The direct investment to China is sharply increasing now. When seeing from a contract basis, the total amount of direct investment by the foreigners was 6,095.7,600 million dollars, and the total number of investments was 189,057 cases from 2001 to 2005. From 1996 to 2000, it was 2799.8,400 million dollars and 104,621 cases. Therefore, it increased by 2 times and 1.8 times, respectively¹ However, when seeing separately the provinces and cities which accepted whole investments, there is a big difference between provinces and cities². Including Jiangsu and Zhejiang, mainly Shanghai area has occupied the 35% of all the amounts of direct investment. And when two provinces, Guangdong and Shandong, were added, the amount reached 61% of the whole. That is, the other 26 provinces of the whole 31 Chinese provinces were able to invite only about 40% ³. Thus, although the direct investment to China sharply increased after China joined in WTO, the tendency of concentration about location selection which many companies make inroads into Chinese market has not yet changed a lot.

There is the tendency which selection of location concentrates more about the direct investment by Japan (the 2nd place) and South Korea (the 5th place) and Taiwan (the 6th place), which occupy the higher rank of the investment, especially to China. Especially, when a trial calculation is made with Gini coefficient about the direct investment by Asian countries, Japan is 0.74 - 0.79, South Korea is 0.82 - 0.86, and Taiwan is 0.73 - 0.79. Therefore, all these degrees of concentration are higher than 0.63 of a numerical value of all the direct investment to China. However, there is a respectively characteristic tendency in selection of the location of many of these East Asia areas. The Japanese companies are concentrated to three areas of the the Shanghai-Jiangsu-Chang River delta, Beijing-Tianjin delta, and the Guangdong-The Pearl River delta. South Korean companies are concentrated on the Bohai Bay in Liaoning-Shandong. Taiwan companies are located in a north direction such as Jiangsu from Guangdong-Fujian, and central areas (provinces and cities). In

¹ The author calculated it according to the "General conditions of the used foreign direct investment" of the 2006 editions of "China Statistical Yearbook."

² "Provinces and cities" are the division of local Chinese administration. It is equivalent to the "all prefectures" in Japan.

³ Based on the database of the Chinese business-affairs department, it was calculated by the execution base of the amount of money of the direct investment to foreign countries.

consideration of what kind of factors are selections of the location of such companies of Japan, South Korea, and the Taiwan which make inroads into Chinese market?

The following arranges the precedence research which conducted positive analysis about location selection of FDI. First, in order to see a rough tendency, generally the regression analysis by the OSL model which uses a macroeconomic total value data is used frequently. As the example, the following one are given: Urata (1996), Cassidy and Anderosso (2004), He (1999) (2005) ,Wei • He • Wang (2002), and Mao • Wang (2005) etc. Urata (1996) carried out the comparative analysis of the factors of location decision of 'all the developing countries and Asian nations' vs. 'the direct investment from Japan' by using databases, such as "Balance for Payments Statistics Yearbook" by IMF and "World Tables, World Economic Indicators" by World Bank. Cassidy and Anderosso (2004) analyzed the factors of location of the amount of money of the direct investment to China in 1996 by Japan by the OSL model, using the database of "The Overseas Expansion Conspectus" of TOYO KEIZAI INC. and the data of the "China Statistical Yearbook", etc. He (1999) (2005) analyzed the difference of factors of location by dividing the form of the whole direct investment to China into companies such as partnership, collaboration, and independent capital. Mao • Wang(2005) had conducted positive analysis which limited to the Pearl River delta in China, focusing mainly on the accumulation effect of the whole direct investment to China. Moreover, while the positive analysis by a total value is used frequently, the direct investment to a foreign country is decision making by comapany level. That is, since it is selection by a discrete choice, generally, the analysis which uses a so-called Logit Model is also conducted. Especially many examples of analysis by the Conditional Logit Model which makes the attribute of a direct-investment-place-country an explaining variable are seen. The example is ① Fukao \cdot Cheng (1996) . They presume the determination type of an investment place based on the number of cases of the notification according to industrial classification and fiscal year classification and country classification of "Statistics of the notification of the direct investment to foreign countries" by the Japanese Ministry of Finance, by making GDP of direct-investment places, labor cost, the degree of safety, human capital, trade friction, economical accumulation, and others as an explanation variable. Furthermore, ② Fukao (1996) analyzes the selection factors of location places respectively by the almost same explaining variable when aiming at the overseas location, domestic location, and the whole overseas and domestic as a location place, by using the acquisition number of the industrial lot according to industrial classification and fiscal year classification and prefectural classification of the "Location trend survey" by the Ministry of Economy, Trade and Industry, besides "Statistics of the notification of the direct investment to foreign countries." ③Fukao (1997) calculates the overseas and domestic location number about an electrical equipment makers based on "Electric device and parts maker list" by TOYO KEIZAI INC. and "Electric devices and parts makers list" by Electronic Economic Research Institute, and when aiming at the overseas, and the whole overseas and domestic as a selection location, has also added accumulation factors, such as the location accumulation number of Japanese electrical equipment makers, and an output of industrial classification etc, to the explaining variable, besides the above-mentioned attribute according to country. ④ Urata and Kawai (1999) consider the importance and data availability as a direct investment place to overseas about Japanese small and medium-sized companies, and analyze about four industries such as fiber, general machines, electronic and electrical machinery, and transportation machines by selecting 117 countries as an investment place. (5) Wakasugi (2005) conducts positive analysis for the factors of location of the direct investment to China in the 90s (1989-1998) about human capital, administrative services, the infrastructure, and the accumulation effect by dividing Japanese companies into six industries. 6 Narisawa, Hirai, and Kitami (2003) verify the factors of the location according to countries of the overseas of Japanese companies and the factors of the location of each industry according to domestic all prefectures by calculating the overseas and domestic location number based on "the track record of the direct investment to overseas" by the Ministry of Finance, and "the research of the trend of industrial locations" by the Ministry of Economy, Trade and Industry.

However, some problems are pointed out in these precedence researches. For example:

- 1. The positive analysis of accumulation economy, information cost, and the location decision by direct investment are inadequate.
- 2. There is very little analysis of the location decision of FDI to China from the viewpoint of Asia. There are few actual proofs about the locations of direct investment to China by Japan, and empirical study about South Korea and Taiwan has not performed yet. And, Comparison between this three countries and areas has not performed.
- 3. There is no analysis of the relation of the culture and local communities which are the special location factors of Asia.
- 4. The periods of analysis are mainly in the 90s. After China joined in WTO, the

actual proof analysis using a measurement model is rare.

5. Although there is much analysis of the number of cases, there is little analysis of the amount of money for execution.

In this paper, the fundamental factors of location decision are analyzed by measuring the location decision factors of the companies which make inroads into Chinese market according to province. And also the accumulation effect which thinks an international production network as important, the relation between special culture and local communities in Asia, the existence of regional gap in China, and the grade of the influence of it and others are verified. The period of analyses shall be from 2002 to 2005 (after the affiliation to WTO). In this paper, based on the database of the Chinese business-affairs department, positive analysis will be conducted by the following models: The OLS model by macro data and the Conditional Logit Model which shows decision-making of a micro date. Moreover, as an explained variable, in the regression analysis of OLS model, it presumes by using the amount of foreign direct investmet, and the number of cases. The Conditional Logit Model presumes by using location inroads selection. In both models, an explaining variable utilizes the index of GDP, infrastructures, human capital, labor cost, (labor) productivity, and agglomeration effects, which are an attribute in each year of each Chinese province. A dummy variable is also used in consideration of the location gap of an area, and the influence of culture and local communities. About the source of data, each year version, such as the "China Statistical Yearbook," the "China External Economic Statistical Yearbook," and the "China Labor Statistics Yearbook," is used.

Thus, it seems that comparing and analyzing Japan, South Korea, and Taiwan by using both models of the analysis by a total value, and the analysis by selection of decision making by comapany level, the determinant of location can be caught concretely and more certainly. It seems that performing an economic analysis and an elucidation about the determinant of the location of the companies of Japan, South Korea, and Taiwan in China has an important meaning in the situation which the economy of the East Asia area enhances. And it is expected that it is provided also for the attraction policy of Chinese foreign direct investment or the reduction of a regional gap.

Section 1 Positive Analysis by Total Value - OLS Model

1-1 Introduction of Variable and Model

Based on the database of the Chinese business-affairs department, about the direct investment of each year in 2002-2005 (after the affiliation to WTO) to Chinese each province from the companies of Japan, South Korea, and Taiwan which exist in East Asia, the determination formula for an investment place shall be the following models.

OLS Model:

 $LnFDI_{it} = \alpha + \beta_1 LnGDP_{it} + \beta_2 Load_{it} + \beta_3 Edu_{it} + \beta_4 LnWage_{it} + B_5 LnLabpro_{it} + \beta_6 LnAgglo_{it} + D_1 + D_2 + D_3 + u_{it}$ (1.1.)

	Dependent variable	EDI	FDI from Japan (1,Realized amount 2,The number of cases)
		FDI	FDI from Korea (1,Realized amount 2,The number of cases)
			FDI from Taiwan(1,Realized amount 2,The number of cases)
		it	_i Provinces of China($_{i}=1\sim31$) t Year (2002~2005) (t=1~4)
	Independent variable		
1	Market size	LnGDP	Real GDP
2	Infrastructure	Road	Highway density of one unit(Km/Km2)
3	Human capital	Edu	The ratio of the primary education graduation
4	Labor costs	LnWage	Average wage
5	Labor Productivity	Ln(Labpro)	Labor Productivity (Real GDP/ The working Population)
6	Agglomeration	Ln(Agglo)	the cumulative amount of FDI from all of coutries
7	Dummy of regional gaps	D ₁	Dummy of middle province of China
8	Dummy of regional gaps	D ₂	Dummy of west province of China
9	Dummy of connetion	D ₃	Dummy of conetion of culture and geography with Japan(Korea, or
		u	Error Term

Table 1 List of explained variable and explaining variable

Source: made by the author

Moreover, as an explained variable, it presumes by using the amount of money for execution, and the number of cases, respectively. As an attribute of each year of each province in China, the index of GDP, infrastructure, human capital, labor cost, productivity (labor), and the accumulation effect is made, and a dummy variable is added in consideration of the location gap of an area, and the influence of culture and local community. About the source of data, each year version, such as the "China Statistical Yearbook," the "China External Economic Statistical Yearbook," and the "China Labor Statistics Yearbook," was used.

1-2 results and conclusion

The presumed results of location decision analysis of the direct investment to China from the three countries and areas are synthetically summarized from a point in common as follows first, and each difference is explained below.

[Insert Tabel 1, Tabel 2 and Table 3]

• Common features

It was confirmed that the location by the direct investment from Japan, South Korea, and Taiwan increases as the area where an economic scale is large. About the factors of economic magnitude, the importance was confirmed in the both models. (In the case of Taiwan, this tendency is slightly weak.)

Some regional gap exists in the locations of direct investment to China. In an area of distribution of China, as it shifts from the east to the west, it was confirmed that negative influence is so strong to the locations of the companies of Japan, South Korea, and Taiwan. It was confirmed that fundamental factors of location, such as an infrastructure, human capital, and labor productivity, becomes a secondary factor compared with economic scale and the agglomeration effects. About such fundamental factors of location, the mark of the coefficient of a presumed result may reverse +/ - by the combination of a variable. And in many cases, a significant level brings an unstable result compared with economic scale and the accumulation effect.

• Difference

It was confirmed that the selection of the location of direct investment to China by Japan, South Korea, and Taiwan which exist in Asia differs considerably. About the agglomeration effects, although Japan and Taiwan were similar, the characteristic result came out of South Korea. About the effects of relation of culture and local communities, although Japan and South Korea were similar, the characteristic result came out of Taiwan.

Section 2 Conditional Logit Model

As a presumed result, about fundamental factors of location, such as labor cost, infrastructure, human capital, and labor productivity, since the degree of significance was low in the regression analysis by the total value, it was not verified well. Since the total value totaled all the data of each company, it can see a rough tendency. However, since individual information on a company level is lost, it has the fault which cannot perform detailed analysis. Since it was geographic division data of 31 provinces of China, it had only about 120 samples or less in four years after 2002.

In order to support insufficiency of the positive analysis by the above total value, in this chapter, positive analysis by selection of decision-making is conducted from a company level viewpoint. It is verified again like many prior researches by using the Conditional Logit Model. It seems that the Conditional Logit Model, which can display decision-making by 31 options for every company, can analyze the factors of more detailed location selection including the selection information of each company. Therefore, by analysis of decision-making of direct investment to China from a company level viewpoint, obtaining more detailed presumed results is expected.

2-1 Explanation of Conditional Logit Model

The location selection of the company belonging to a certain industry in t (years) is considered. There shall be M (number) countries which are the targets of selection. Namely, if logarithm value of the profit function is expressed as $\ln \Pi$ s,t, when choosing s (country) as t (year), this company should choose m (country) which fills the following formulas:

$$\ln \prod_{m,t} = Max \left\{ \ln \prod_{s,t} : S = 1, \dots, M \right\}$$

$$(1.2)$$

Here, logarithm value of a profit function shall be expressed as follows:

$$\ln \prod_{s,t} = \beta' \chi_{s,t} + \varepsilon_{s,t} \tag{1.3}$$

However, x s,t express the vector of an attribute of the country 3 in t (year). β is a coefficient vector to presume about this industry. ϵ s,t, express an attribute of the area that cannot be observed, and the characteristics peculiar to this company which cannot be observed.

As Mc Fadden (1973) showed, when a residual ϵ s,t, independently follows

extreme-value distribution of the same type I, the probability of this company which chooses m (country) in t (year) is given in the following formulas:

$$P_{m,t} = \frac{\exp(\beta' x_{m,t})}{\sum_{s=1}^{M} \exp(\beta' x_{s,t})}$$
(1.4)

Therefore, if expressing the number of times from which s (country) was chosen in the industry concerned in t as W s,t, ($s=1, \dots, M$, $t=1, \dots, T$) and a residual becomes independent mutually in all the location selections, the probability that a location pattern {W s,t: $s = 1, \dots, M$, $t= 1, \dots, T$ } will be observed is acquired in the following formulas:

$$L = \prod_{t=1}^{T} \prod_{s=1}^{M} P_{s,t} W_{s,t}$$
(1.5)

This type's model is called Conditional Logit Model⁴ β was chosen in order to make the above-mentioned formulas into the maximum in presumption (maximum likelihood method).

The prior researches which conducted location analysis of direct investment by using the above Conditional Logit Model are as follows: Fukao (1996), Fukao \cdot Cheng (1997), Hisatake and Nawata (2003), Urata and Kawai (1999), Wakasugi (2005), Narisawa, Hirai, Kitami (2003), etc. It is thought that Conditional Logit Model is an effective method frequently used in this field. The features of the areas of the investment place (China), which explain the location selection, is set as x, and in order to perform introduction about the variable which is used by presumption together with the OSL model by a total value, it shall be omitted here.

2 - 2 Results and Conclusion

The presumed results of location decision analysis of the direct investment to China from the three countries and areas are simply summarized as follows.

[Insert Tabel 4, Tabel 5 and Table 6]

1. The direct investment to China by Japan, South Korea, and Taiwan is decision making by comapany level. That is, since it is selection from dispersed options, and there are 31 provinces in China, it is set to 31 as a choice in this case. By the

⁴ The details about Conditional Logit Model please see Maddala (1983) and Cramer (1991).

Conditional Logit Model which can express decision-making by 31 options for every company, the factors of more detailed location selection including the selection information for every (number of inroads: Japan: 12,722 cases, South Korea: 20,668 cases, Taiwan: 17,256 cases) company were able to be analyzed. Therefore, analysis of decision-making of direct investment to China from the viewpoint of a company level was also able to obtain the more exact presumed results. Log likelihood and Pseudo R 2 of the whole model which presumed Japan, South Korea, and Taiwan are good. z value of each variable of each model is high. And the significant level has resulted in about 1% (both-sides' examination).

- 2. About the fundamental factors of location, it was well unverifiable with analysis by a total value. However, an infrastructure, human capital, labor cost, and labor productivity were certainly checked in Japan, South Korea, and Taiwan by analysis by Conditional Logit Model. By this, not the analysis with rough analysis of the determinant of the location of direct investment to China by Japan, South Korea, and Taiwan, but the comparison of Japan, South Korea, and Taiwan about the determinant of each location was realized. This is considered to be the analysis by the Conditional Logit Model which shows decision making by comapany level has a meaning. Moreover, each feature appeared about these variables in Japan, South Korea, and Taiwan. About this, difference is described in detail later.
- 3. About local dummy, agglomeration effects, and culture and local community dummy, the presumed results in Japan, South Korea, and Taiwan are almost the same as the tendency of an OLS model. About the above three factors of location, that the tendency in an OLS model is the same was reconfirmed by analysis by the Conditional Logit Model. This is also considered to be the contribution of the decision-making analysis of the company level by the Conditional Logit Model.

Section 3 Comparison of Both Models

This chapter simply discusses about the common features and difference of the factors of location selection of direct investment to China by Japan, South Korea, and Taiwan, comparing the selection of decision-making of the OLS model regression analysis by a total value and the presumed results by Conditional Logit Model which expresses decision making by comapany level. And the features of the location of the above three countries and local companies are summarized in conclusion.

3-1 Comparison of Both Models

The OLS model regression analysis by a total value and the presumed results by Conditional Logit Model which expresses decision making by comapany level were summarized as table 5-1. About the common features and difference of factors of location selection of direct investment to China by Japan, South Korea, and Taiwan are simply discussed, comparing a table as follows. In order to be understandable, the sequence shall be the same as "the introduction of factors of location and the proxy variable." First, let me begin the explanation about the first group as a factor of fundamental location.

Table 8	Comparison of a total value and the presumed results by selection of
	decision making by comapany level

			OLS mo	del			Logit m	odel	
	A	mount		N	Number			lumber	
	Japan	Korea	Taiwan	Japan	Korea	Taiwan	Japan	Korea	Taiwan
LN_GDP	(+) (+	}	. (+) (+)) (+]	(+)) (+)	(+
_	* * * *	* * *		* * *	* * *	*	***	***	***
LN_ROAD						(+	(+)	(-)) (+)
						* *	akaka	***	****
EDU3			(-)			(-)	(+)	(+)	(-)
			*			* * *	akaka	**	***
LN_WAGE2							(-)) (-)	(-,+)
							yeyey	: Akaka	: yaka
LN_LABPRO				(+) (+)		(+)	(+)) (+)
				* *	* *		***	: ***	***
LN_AGGLO1	(+))	(+)	(+)	(+)	(+)) (-)	(+
	* *		* * * :	* * *		* * *	***	: ***	***
DWEST		(-) (-)	(-) (-)) (-)	(-)) (T) (-)
		* * *	* * *	* *	*	*	***	: ****	· ,****
DMID				(-)		(-)) (-)) (-)
				* * *			***	: ****	****
D3	(+) (+	}	(+) (+)		(+)) (+)	(-)
	*	* * *		* * *	* * *		***	***	***

Source: made by author

1. Market size

As shown in Table 8, in this paper, like many prior researches, as a result, it was checked that economic magnitude works positively to the location of direct investment to China by Japan, South Korea, and Taiwan. It is thought that if (the scale of a country or its area) itself is large, market size is also so large, and there are many promising investment opportunities.

2. Labor cost

The direct investment to China of the Asian companies is considered to be the big cause of deciding the location of inroads, demanding the environment of cheap Chinese labor wages in order to make profits into the maximum, since it centers on the labor concentration-type-manufacturing-industry. In this paper, as expected, labor cost has resulted in minus about the location of direct investment to China. However, the presumed result of Taiwan is slightly weak.

3. Infrastructure

It is thought that the maintenance situation of public capital is also a factor of important location selection. Although maintenance of the infrastructure has increased the locations by investment of Japanese and the Taiwanese companies, it was checked that the advance of South Korean companies is the minus effect.

4. Human capital

About labor investment, not only labor cost but its quality is important. Although Japanese and South Korean companies had the tendency to be located to the area which owns higher human capital, it was checked that Taiwanese companies have the opposite tendency.

5. Labor productivity

When a foreign firm makes inroads into China, it not only thinks about labor cost as important, but it seems that the efficiency of labor is also taken into consideration. The index which measures the added value which per worker produces should be the measure which shows the efficiency of labor. Therefore, in some area, if labor productivity is high, it lures more direct investment. About this point, Japan, South Korea, and Taiwan have brought a result as expected.

Next, the presumed results of the second group of an explaining variable are explained.

6. Accumulation effect

If the economic activity of a certain area is generally active, the possibility

that a company can find a customer and the supplier of raw materials in the neighborhood will increase. Therefore, it is thought that it works in favor of location. In this paper, when the Asian companies, such as Japan, South Korea, and Taiwan, make inroad into China on the same conditions, which they invested in other countries, it is verified whether they make the same decision or whether they expect the same accumulation effect. As a result, in the companies of Japan and Taiwan, both models have this tendency. However, South Korea is the contrary.

7. Regional gap

It is a well-known fact that the regional gap of economic development exists in China. In order to correct a regional gap, the direct investment to the Midwest is promoted. Also in this paper, the almost same result has been found in both models. And it was checked that the regional difference of the locations of direct investment to China by Japan, South Korea, and Taiwan exists, and if the geographical distribution in China shifts from the east to the west, the influence of minus is so strong on the location of the companies of Japan, South Korea, and Taiwan.

8. Relation of culture and local communities

About the effect of the relation between culture and local communities, when the companies of Japan and South Korea decide the location of direct investment to China, it has checked that they have been influenced by the relation of culture and local communities. About the Taiwanese companies, it was not checked by the OLS model contrary to anticipation. However, it was checked by the Conditional Logit Model that the Taiwanese companies perform location which exceeds culture and local communities for making inroads into China, unlike the companies of Japan or South Korea.

As mentioned above, the portion of the factor variable which was not able to be well verified by an OLS model in the first group has been mostly checked now by 1% of high significance level of a two-side examination by the Conditional Logit Model. In the part II group, the OLS model regression analysis by a total value and the positive analysis by the Conditional Logit Model which shows selection of decision making by company level have become almost the same results. Thus, the result of "the factors of the location "to China by Japan, South Korea, and Taiwan" which was analyzed by the two measurement methods in Chapter 3 and Chapter 4 can be explained as an accurate one.

3-2 Features of Location choice by Japanese, South Korean, and Taiwanese companies in china

The result of "the factors of the location to China by Japan, South Korea, and Taiwan" was shown in Table 5-2 as below. Let's look at comparison of the determinant of the location of the companies which makes inroads into China from Japan, South Korea, and Taiwan, by country.

Table-9Comparison of the determinant of the location of the companies which
makes inroads into China from Japan, South Korea, and Taiwan

\square									
	LN_GDP	LN_ROAD	EDU3	LN_WAGE2	LN_LABPR	DN_AGGLO	DWEST	DMID	D3
Japan	(+)	(+)	(+)	(-)	(+)	(+)	(-)	(-)	(+)
Korea	(+)	(-)	(+)	(-)	(+)	(-)	(-)	(-)	(+)
Taiwan	(+)	(+)	(-)	(-、+)	(+)	(+)	(-)	(-)	(-)

Notes: The above symbols and bold letters were checked by both models. Others were checked by the Conditional Logit Model.

Source: Made by author.

Japan

In order to win competition, Japanese companies have decided the location of making inroad into three provinces and Shandong of the northeast in China by utilizing relation of culture and local communities, while they decide the location of direct investment to make inroad into China which is similar to the whole and search for the whole agglomeration effects. And, according to geographical distribution, there is a tendency that the making inroads into China by Japan decrease if it is shifted from the east to the west. The number of cases and the amount of money for execution of Japanese companies correspond with being mostly located by the eastern area in China.

Moreover, infrastructure buildings, such as a road construction, have a plus effect in attraction of making inroads into China by Japanese companies. While the area in which an academic level is higher and talented people with advanced technique have gathered is not attractive for Japanese small and medium-sized enterprises, the point is considered as a factor of attractive inroads for the major companies of Japan. The small and medium-sized enterprises from Japan which made inroad into China in order to seek a cheap labor cost have concentrated on the labor concentration type industry which performs simple processing and assembly. For this reason, it is because the employment of talented people with the high school education and high skill in which a high salary is required is recognized as a risk of cost going up rather than attractive for them. It is thought that in a sense this agrees with the result of minus of labor cost.

South Korea

In the decision of the location of South Korean companies, the influence from accumulation of the location of the whole direct investment to China is weak, and a decision of peculiar location has been made. There is the feature which South Korean companies concentrate. Here, it agrees with the location of direct investment from other countries. And it clearly differs from the companies of Japan or Taiwan which search for the effects of the whole accumulation. However, it was checked that relation of culture and local communities exists like Japanese companies. Especially, the influence on South Korean companies is strong. It is because South Korean companies have the short history of the direct investment to China and they don't have experience as rich as Japanese companies and Taiwanese companies have. But, they have utilized human resource of the domestic Korean-Chinese people now, and have developed the domestic business which employs the cultural and geographical advantage of Liaoning province and Shandong province efficiently. The inroad into China of these South Korean companies agrees the data in which 70% of the number of cases and 65% of the amount of money for execution are concentrating on Shandong and Liaoning province.

Moreover, there is clearly a tendency that the location of direct investment to China by South Korea is decided on the following places: the size is large, labor productivity is high, and labor cost is low. About this point, there is the almost same tendency as Japanese companies.

Taiwan

Taiwanese companies agree with the location of direct investment from other countries. And it has the same tendency as the Japanese companies which search for the effect of the accumulation in the whole. However, it is expected that they are easily receive more influences of the location of direct investment by other countries than Japanese companies. This is also connected with the fact that the Taiwanese companies have much outsourcing production from the West. Since the outsourcing production thinks the accumulation effect as important more, many Taiwanese companies perform the same location as European and American companies. Originally, the hypothesis that the direct investment to China by Asian countries has harnessed the profit of culture and local communities had been set up. However, about the direct investment by Taiwan, it became clear that they have not decided the location of inroads into China by taking advantage of the profit of culture and local communities like Japan or South Korea. The causes seem as follows: Taiwanese companies have the long history of the direct investment to China. They have accumulated experiences and management know-how of inroads. They have predominancy (understanding to the language, culture, and a custom in the Chinese continent,) as an overseas Chinese. Therefore, Taiwanese companies were able to decide the location of the inroads into China beyond culture and local communities unlike Japanese and the South Korean companies. This location to China by Taiwan differs from Japan and South Korea. Moreover, the number of cases and the amount of money for execution of location of the Taiwanese companies which stated in Chapter 1 correspond also with the fact that they have shifted to a western part than the companies of Japan and South Korea. Furthermore, the tendency for the location of direct investment to China by Taiwanese companies to flow into the place where the labor cost is low, which is putting a lot of energy into the infrastructure building, was also seen.

Thus, common features and differences became clear by sorting of the location of direct investment to China by the companies of Japan, South Korea, and Taiwan which exist in East Asia.

Conclusion

Concentration of the locations of direct investment to China has a close relation to a Chinese economic development process. From the first, "The Chinese economic reform" by Deng Xiaoping is not only the first stage that becomes rich first from the area which obtained the opportunity to be able to become rich. It includes the second stage that shifts the development to inland by offering the necessary support of the government and others local area after the Chinese coast area which has a special economic zone has realized to becoming rich first. Surely, the "Economic reform in the People's Republic of China" policy from the area along the shore in the eastern part of China attracted capital from the foreign countries including the capital of oversea Chinese people of Southeast Asia. Thereby, the reform of foreign trade system has progressed from the second half of the 1980s, and an export-oriented type direct investment increased. Although China was deficient in the capital elements in which the maximum use is possible, it became an exporting country of the industrial products that centers on the labor-intensive products by utilizing the predominance of abundant factors of production by introduction of foreign direct investment. As a result, China achieved big economic growth. Especially the economic growth in an eastern area has been astonishing. Thus, the process of the economic growth by the introduction of foreign capital was successful in the eastern area of China.

While Deng Xiaoping's "The Chinese economic reform" has achieved the first stage that becomes rich first from the area which obtained the opportunity to be able to become rich, it also expanded the Chinese regional gap. After 2001, it went into the second stage which shifts from an eastern area to the Midwest area. Therefore, the Chinese government plans a "Midwest area large development" project and a "northeast promotion" project, provides the infrastructure of the areas, and is preparing the investment environment. Moreover, although the abundant labor forces were used as a powerful weapon and achievement of the economic growth process by the introduction of foreign capital was again expected like an eastern area, actually the direct investment to China by foreign direct investment companies has not been shifted from an eastern area to the Midwest area as expected.

Furthermore, that the influence of following factors (except ④ for Taiwanese company) are strong has been checked by the both a macro analysis of total value and a micro analysis of decision making by comapany level from the positive analysis of the location of direct investment to China by the companies of Japan, South Korea, and Taiwan:

- 1. Economic magnitude
- 2. Accumulation effect
- 3. Regional gap
- 4. Relation of culture and local communities

Since the tendency concentrated according to the above four factors was strong, it was proved that it is difficult to shift the location of investment to the Midwest area.

So, while the economic growth process by investing foreign direct investment to the eastern area of China was achieved well on the first stage, why does the economic growth process by investing the foreign direct investment to the Midwest area of China not be achieved well on the second stage? The following reasons are considered:

- 1. Asian production network in the eastern area of China has already been formed.
- 2. The direct investment to China is mainly manufacturing industry.

- 3. Modular production is increasing.
- 4. Re-export by processing trade is performed.
- • •

In conclusion, from the results of this positive analysis, the location of direct investment to China by the companies of Japan, South Korea, and Taiwan have a strong tendency which concentrates further. And the economic growth process which increases by the introduction of foreign direct investment like an eastern part in the Midwest of China seems difficult. Rather, probably, concentration of the location of direct investment to China has a high possibility of accelerating a Chinese regional gap.

Japan	1	2	3	4	5	6	Ī)	8
	_nNumber	LnAmount	LnNumber	LnAmount	LnNumber	LnAmount	LnNumber	LnAmount
	Coefficient•t va	lue						
定数	3.243 (0.641)	1.747 <i>(0.224)</i>	-3.908 <i>(-0.836)</i>	-3.015 <i>(-0.375)</i>	-1.684 <i>(-0.309)</i>	-3.710 <i>(-0.416)</i>	-5.237 (-1.080)	-6.003 (-0.674)
LnGDP	0.297 <i>(2.001)</i> * *	0.828 <i>(3.634)</i> * * *	0.238 <i>(1.798)</i> * *	0.783 <i>(3.473)</i> * * *	0.371 <i>(2.474)</i> * *	0.838 <i>(3.444)</i> * * *	0.363 <i>(2.747)</i> * * *	0.830 <i>(3.446)</i> * * *
Road	0.081 <i>(0.161)</i>	0.833 <i>(1.056)</i>	1.042 <i>(2.179)</i> * *	1.484 (<i>1.763</i>) *	-0.575 (-1.079)	0.273 (0.310)	0.701 (<i>1.348</i>)	1.061 (<i>1.091</i>)
Edu	-2.148 <i>(-1.362)</i>	0.522 <i>(0.212)</i>	-2.684 (-1.910) *	0.164 (<i>0.067</i>)	-0.088 (<i>-0.054)</i>	1.891 <i>(0.716)</i>	-1.036 <i>(-0.724)</i>	1.343 (0.511)
LnWage	-1.054 (<i>-2.265)</i> * *	-1.021 (- <i>1.404)</i>	-0.232 (-0.529)	-0.479 <i>(-0.626)</i>	-0.381 <i>(-0.708)</i>	-0.334 <i>(-0.374)</i>	0.024 <i>(0.051)</i>	-0.077 (<i>-0.086)</i>
Ln (Labpro		1.508 <i>(2.257)</i> * *	1.455 <i>(3.763)</i> * * *	1.095 <i>(1.588)</i>	1.194 <i>(2.474)</i> * *	0.838 <i>(1.038)</i>	0.899 <i>(2.097)</i> * *	0.621 <i>(0.769)</i>
Ln (Agglo)	0.543 (4.142) * * *	0.596 <i>(2.857)</i> * * *	0.507 (<i>4.349</i>) * * *	0.579 <i>(2.817)</i> * * *	0.441 <i>(3.367)</i> * * *	0.550 (<i>2.510</i>) * *	0.382 <i>(3.301)</i> * * *	0.520 (<i>2.391</i>) * *
D1					-0.862 <i>(-3.321)</i> * * *	-0.453 <i>(-1.066)</i>	-0.878 (<i>-3.840)</i> * * *	-0.472 (-1.121)
D2					-1.069 <i>(-3.250)</i> * * *	-0.796 <i>(-1.478)</i>	-0.723 <i>(-2.444)</i> * *	-0.601 (-1.107)
D3			1.241 <i>(5.534)</i> * * *	0.793 (<i>2.027)</i> * *			1.262 (<i>5.695</i>) * * *	0.747 <i>(1.828)</i> *
simple	117	113	117	113	117	113	117	113
AdjR	0.815	0.739	0.854	0.747	0.832	0.740	0.869	0.746
Value	87.122	54.455	98.983	48.620	73.317	41.188	87.570	37.800

 $Tabel \ 2 \quad OLS \ model - Estimation \ results - Japan$

Tabel 3 $OLS \mod - Estimation results - Korea$

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orea	1	2	3	(4)	(5)	6	(7)	(8)
	LnNumber	LnAmount	LnNumber	LnAmount	LnNumber	LnAmount	LnNumber	LnAmount
	Coefficient.	t value						
定数	18.189	27.758	13.213	20.711	7.125	3.773	3.597	-3.223
	(2.351)	(2.515)	(1.943)	(1.989)	(0.842)	(0.308)	(0.487)	(-0.282)
	**	**	*	**				
LnGDP	0.940	1.633	0.935	1.587	0.907	1.460	0.805	1.292
	(4.207)	(5,154)	(4,798)	(5.380)	(3,960)	(4.520)	(4.028)	(4,290)
	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
Road	0.273	2.120	1.125	2.954	-0.809	0.145	0.387	1.238
	(0.349)	(1.959)	(1.614)	(2.877)	(-0.955)	(0.126)	(0.507)	(1.137)
		*		* * *				
Edu	-0.524	3.671	0.160	3.521	1.695	6.166	0.994	4.731
	(-0.208)	(1.012)	(0.072)	(1.043)	(0.643)	(1.712)	(0.433)	(1.415)
						*		
LnWage	-2.587	-4.100	-1.867	-3.052	-1.236	-1.079	-0.740	-0.099
5	(-3.634)	(-3.850)	(-2.952)	(-2.984)	(-1.480)	(-0.841)	(-1.012)	(-0.082)
	***	***	***	***				
Ln (Laboro	2.676	1.632	2.151	1.153	1.503	-0.481	1.440	-0.636
	(4.077)	(1.756)	(3,714)	(1.323)	(1.965)	(-0.461)	(2.165)	(-0.660)
	***	*	***		**		**	
Ln (Agglo)	0.093	0.226	-0.083	0.009	0.054	0.134	-0.041	0.015
	(0.457)	(0,740)	(-0.461)	(0.031)	(0,264)	(0.448)	(-0.228)	(0,054)
D1					-0.514	-0.934	0.160	-0.274
					(-1.244)	(-1.700)	(0.426)	(-0.516)
						*		-
D2					-1.429	-2.622	-0.851	-2.195
					(-2.774)	(-3.714)	(-1.858)	(-3.326)
					* * *	* * *	*	* * *
D3			2.606	2.623			2.658	2.670
			(5.989)	(4.123)			(6.021)	(4.280)
			* * *	* * *			* * *	* * *
simple	117	109	117	109	117	109	117	109
AdjR ²	0.655	0.603	0.737	0.657	0.674	0.647	0.754	0.699
Value	38.008	28.615	47.938	30,765	31.226	25.965	40.759	29.072

Taiwan	1	2	3	4	5	6	Ø	8
	LnNumber	LnAmount	LnNumber	LnAmount	LnNumber	LnAmount	LnNumber	LnAmount
Coe	fficient•t value							
定数	-4.936	8.749	-4.891	8.434	-8.803	-5.503	-8.758	-5.829
化蚁	(-1.027)	(1.063)		(1.022)	(-1.637)	(-0.614)	(-1.620)	(-0.649)
	(-1.027)	(1.063)	<i>(-1.012)</i>	(1.022)	(-1.037)	(-0.014)	(-1.020)	(-0.049)
LnGDP	0.214	0.148	0.220	0.107	0.242	0.002	0.248	-0.041
	(1.564)	(0.628)	(1.557)	(0.438)	(1.683)	(0.009)	(1.676)	(-0.165)
					* *		*	
Road	1.621	1.803	1.640	1.674	1.188	0.574	1.208	0.443
	(3.364)	(2.181)	(3.307)	(1.975)	(2.232)	(0.647)	(2.215)	(0.490)
	* * *	* *	* * *	*	* * *		* *	
Edu	-6.977	-6.706	-6.895	-7.275	-5.816	-4.821	-5.732	-5.403
	(-4.566)	(<i>-2.576)</i>	(-4.306)	(-2.671)	(-3.584)	(-1.803)	(<i>-3.389)</i>	(-1.941)
	* * *	* *	* * *	* * *			* * *	*
LnWage	-0.264	-1.984	-0.264	-1.988	0.231	-0.285	0.231	-0.287
	(-0.597)	(<i>-2.597)</i>	(-0.594)	(<i>-2.596)</i>	(0.434)	(-0.318)	(0.432)	(-0.321)
		* *		* *				
Ln (Labpro)	0.623	0.501	0.611	0.576	0.095	-0.757	0.083	-0.679
	(1.551)	(0.727)	(1.496)	(0.825)	(0.197)	(-0.952)	(0.170)	(-0.846)
Ln (Agglo)	0.746	1.266	0.737	1.330	0.699	1.292	0.690	1.358
	(6.024)	(5.892)	(5.505)	(5.716)	(5.454)	(5.982)	(5.006)	(5.836)
	* * *	* * *	* * *	* * *	* * *	* * *	* * *	* * *
D1					-0.418	-0.195	-0.418	-0.192
					(-1.616)	(-0.456)	(-1.609)	(-0.448)
D2					-0.651	-1.499	-0.651	-1.498
52					(-1.980)	(-2.756)	(-1.971)	(-
					(1.300)	***	*	2.748)*
D3			0.063	-0.428			0.064	-0.434
55			(0,181)	(-0.727)			(0.185)	(-0.768)
			(0.101)				(01100)	
simple	119	115	119	115	119	115	119	115
AdjR ²	0.808	0.698	0.806	0.696	0.811	0.722	0.810	0.721
Aujn Value	84.359	45.250	71.693	38.693	64.920	38.304	57.208	33.983

Tabel 4 OLS model – Estimation results – Taiwan

Tabel 5 Logit model– Estimation results

Tabel 6 Logit model– Estimation results

Tabel 7 Logit model– Estimation results -Taiwan

-Japan model1 mode|2 mode|4 model3 ln_gdp 0. 5008824 1.196198 0.9282679 0.901731 (31.11) (15.75) (48.02) (31.08) *** *** *** *** roaddensity 0.5262875 0.1869365 1.26011 0.027891 (7.56) (0.37) (2.49) (15.60) *** *** ** edu3 1.076145 4.182953 4. 816752 0. 2555191 (4.65) (13.85) (16.07) (0.78) *** *** *** -1.056529 -5.262947 -4. 42037 ln_wage2 -5.636968 (-42.88) (-32.28) (-6.01) (-46.11) *** *** *** *** ln_labpro 4.50657 3.346127 2. 380875 1.02788 (7.33) (47.42) (29.00) (18.13) *** *** *** *** 0. 4294775 0.3880673 0.4067561 ln_agglo1 (15.93) (14.55) (15.12) *** *** *** -0.4885559 dwest -0.402273 (-5.06) (-5.66) *** *** -1.036782 -0.9501109 dmid (-17.55) (-16.08) *** *** 1.11528 djapan (29.07) *** Log likelihood Pseudo R2 -30762. 271 0. 2958 -31390. 611 0. 2814 -31217.234 0.2854 -31518.017 0.2785 対象省数: 投資件数 : 31 31 31 31 12722 12722 12722 12722 -Korea

	model1	mode 2	mode 3	model4	
ln_gdp	2.350305		2. 229548		
	, ,	,	(84.43)		
	***	***	***	***	
roaddensity	-0.8008996		-0. 7237217		
	(-11.65)	((-10.24)		
	***	***	***		
edu3	11.69615		11.02354		
			(37.33)		
	***	***		***	
ln_wage2			-13. 29611		
	(-107.17)	,,	(-87.22)	()	
	***	***	***	***	
ln_labpro		8. 294325			
			(51.74)		
	***	***	***	***	
In_agglo1			-0. 1245525		
		(-3.90)	,,	(-23.47)	
		***	***	***	
dwest			-0.4884666		
				(-10.92)	
			***	***	
dmid				-0.38881	
			(-21.44)	(-7.90)	
			***	***	
dkorea				2.152753	
				(67.68)	

Log likelihood	-42706. 222		-42454. 375		
Pseudo R2	0. 3983	0. 3984	0. 4018	0. 4404	
対象省数:	31	31	31	31	
投資件数:	20668	20668	20668	20668	
 ()内はz値。z値の下での 					

	model1	model2	mode 3	model4	
In gdp	0.7493797	0. 3920548	0.3578269	0. 1070848	
III_gup	(38.30)		(14.69)		
	(00.00 /	(70.25)	(/ 4.00 /	***	
roaddensitv		1.907619			
rouddonorej	(41.72)				
	***	***	***	***	
edu3	-10.87719	-7.349399	-6.474032	-6.854744	
	(-49.97)	(-28.68)	(-24.20)	(-26.10)	
	***	***	***	***	
ln_wage2	-1.453134	-0.9739392	-0. 1759619	0. 613134	
	(-18.52)	(-12.13)	(-1.75)	(5.79)	
	***	***	*	***	
ln_labpro	2.354227			-0. 0998491	
	(37.69)	(13.82)	(3.02)	(-0.98)	
	***	***	***		
n_agglo1			0. 5370366		
			(24.79)		
		***	***	***	
dwest				-0.8608158	
			(-12.71)	(-13.94)	
			***	***	
dmid				-0.1938152	
			(-8.74) ***	(-4.64) ***	
dtaiwan			ጙጙጙ	-0.6211279	
utaiwari				(-24.94)	
				(<i>-24.94)</i> ***	
				detet	
og likelihood	-43892.55	-43597.909	-43512.7	-43201.553	
Pseudo R2	0. 2593	0. 2642	0. 2657	0. 2709	
対象省数:	31	31	31	31	
投資件数:	17256	17256	17256	17256	

()内はz値。z値の下での*、**、***はそれぞれ、10%、5%、1%有意(両側検定)であることを表す。

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