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Agglomeration Effects and Foreign Direct Investment Location Choice: Cross-country Evidence from Asia*

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Abstract

Purpose – This study examines the determinants of foreign direct investment (FDI) location choice for Chinese firms, focusing on the agglomeration effect for firms of the same nationality.

Design/methodology – The empirical data are China's inward FDI from the top 19 economies (excluding tax havens and Taiwan) in terms of FDI during 1997–2015 and China's outward FDI from the top 18 economies (excluding tax havens). This study uses a random effects generalized least squares model for panel data analysis.

Findings – The results confirm that both host countries' costs and market conditions and the degree of agglomeration affect these countries' attractiveness for FDI inflows. Specifically, agglomeration has a significant effect on China's inward and outward FDI. This study confirms that the agglomeration of firms of the same nationality has predictive power for multinational enterprises' FDI location choices. The host countries' real GDP and trade openness also positively affect FDI inflows. Interestingly, however, China's production cost has a positive effect. Thus, inward FDI aimed at entering the Chinese market is increasing in recent years relative to the previous efficiency-seeking FDI. Inward FDI in China is therefore the market-entry type, whereas outward FDI by Chinese firms is the market-oriented type.

Originality/value – These results suggest that the effects of the potential determinants of Chinese outward FDI are similar to those of inward FDI as China's trade liberalization progresses.

Keywords: Agglomeration Effect, Foreign Direct Investment
JEL Classifications: F30, F40

1. Introduction

As regional investments and agglomerations create various positive externalities, multinational firms tend to undertake cross-border endeavors in countries and regions where such activities are prevalent. Their decision-making processes take into account not only the amount of investment but also the investment location. The literature has studied many

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decision factors regarding firms' foreign direct investment (FDI). However, not all of these diverse factors may perfectly apply to the present economic system.

Many studies have developed methods to analyze vertical and horizontal FDI. In the horizontal factor proportions FDI model developed by Helpman (1984/1987) and advanced by Helpman and Krugman (1985), firms choose outward FDI based on the low-cost production factors of the host country. Representative studies on horizontal market access to FDI theoretically assert that similarities in the degree of economic development impact FDI between countries (Markusen, 1995). Specifically, firms undertake horizontal FDI to decrease transaction costs by providing local production and goods to target countries with similar economic development levels. However, in practice, horizontal and vertical FDI often occur simultaneously rather than separately. According to prior studies, horizontally equivalent countries and the determinants of FDI depend on the timing of the host country analysis (Braconier, Norback and Urban, 2005; Demirhan and Masca, 2008; Lipsey et al., 1999).

After adopting the "reform and opening-up" policy, China has made significant efforts to attract inward FDI, and it became a member of the World Trade Organization (WTO) on December 11, 2001. Subsequently, foreign direct investors were attracted to China, and FDI from multinational firms played a vital role in its rapid economic development (Kim Sang-Wook, 2014). Active FDI in China has led to increased employment, knowledge transfers, and technology diffusion. Geographic location is a crucial factor in foreign direct investors' decision to enter China. As the regions compete to attract FDI, the most successful ones contribute significantly to countries' GDP growth owing to expanding exports. Thus far, FDI in China is more concentrated in the eastern coastal region, and, not surprisingly, this region is more economically developed than the central and western regions. Conversely, given its accumulated technology and enormous capital, China has become a powerhouse of global factories in search of markets worldwide. Consequently, it is also important for China to choose the location of its outward FDI strategically.

This study investigates two main research topics. The first is identifying the determinants of FDI location choice for Chinese firms, focusing on the agglomeration effect for firms of the same nationality, and the second is understanding the other factors that affect the geographic location decisions of foreign direct investors. Little systematic research on these topics exists despite the rapid increases in FDI in China every year. Thus, this study aims to verify whether foreign direct investors' geographic location decisions and investment decisions are significantly related. Traditionally, multinational firms invest abroad to obtain more profits, and FDI tends to flow toward host countries where other existing investors already have direct experience, knowledge, and manufacturing activities. Several studies demonstrate that foreign firms tend to invest directly in regions with existing manufacturing activities because of the advantages of potential markets and the proximity to established manufacturing industries (Coughlin, Terza and Arromdee, 1991; Head, Ries and Swenson, 1995; Woodward and Rolfe, 1993). According to Lee Min-Hwan and Yeo Taek-Dong (2008), China's inward FDI is market-seeking rather than efficiency-seeking. They find very strong agglomeration effects from investments in regions with many foreign enterprises but no impact of China's industrial structure on FDI inflows. Kim Hyuk-Hwang, Lee Hong-Sik and Chen (2012) present similar results.

Our findings show that that not only host countries' costs and market conditions but also agglomeration affect a country's attractiveness for FDI inflows. Specifically, agglomeration has a significantly positive effect on China's inward and outward FDI. We confirm that the agglomeration of firms of the same nationality can predict multinational enterprises' FDI location choices. Furthermore, productivity in the local markets is important for both FDI inflows and outflows, and inward FDI in China seems to be the market-entry type, whereas

outward FDI by Chinese firms is the market-oriented type. Overall, these results suggest that the effects of the potential determinants of Chinese outward FDI are not necessarily similar to those of inward FDI in China. This study differs from prior research in the following ways. First, it analyzes the direct factors that impact the decisions of foreign direct investors. In the traditional decision-making process, multinational corporations investigate cost and market size variables along with the accumulated competencies of local firms in the target country. Such analyses demonstrate the importance that multinational corporations ascribe to the agglomeration model when choosing a specific region within a given country for FDI. Here, the accumulated effects refer to the accrued detailed scale of the FDI fulfillment by multinational enterprises within the given country. Second, this study verifies the differences in decision-making for FDI outflows and inflows. It investigates the vital factors for inward and outward FDI with respect to China and verifies them using statistical tests. The analysis focuses on the 20 economies with the most FDI in China. Third, to analyze the decision factors related to FDI in China after the 2008 global financial crisis, this study uses data on FDI from 1997 to 2015. The dependent variable is the amount of investment in the host country, and the independent variables are the accumulated effects, cost conditions, demand conditions, and factors related to firm conditions. The explanatory variables are lagged by one unit of time to mitigate the simultaneity problem. Direct investment, unlike indirect investment, usually requires a long-term plan. Thus, direct investment decisions likely require one unit of time to be implemented. This practice is consistent with prior studies (e.g., Boudier-Bensenaa, 2005; Kang Tae-Koo, 2012; Lee Min-Hwan and Yeo Taek-Dong, 2008). This study empirically analyzes the decision factors for FDI in China based on a panel that combines cross-sectional and time-series data. We choose random effects models based on the Hausman test.

The remainder of the paper is structured as follows. The next chapter reviews the theoretical and empirical literature on FDI. Chapter 3 reviews the main features and trends of Chinese FDI inflows and outflows. Chapter 4 describes the empirical data and the analytical model and provides the empirical results. Chapter 5 concludes.

2. Literature Review

2.1. Theoretical Background

Hymer (1976) first introduced the term "FDI," highlighting managerial rights and degrees of control to conceptually differentiate it from foreign indirect investment. In this process, product quality, technology, R&D, patents, managerial capability, and managerial control are all part of the transfer. In other words, FDI is a management system in the form of international transfers that includes overall business resources, such as capital, technology, and business knowledge, for direct participation in earning operational profits. FDI generally takes the form of acquiring shares in newly established or existing local businesses to secure management control and attain assets, such as plants and real estate. The FDI company is the parent, or multinational, company that establishes a dependent relationship with the local subsidiary and obtains management control.

According to traditional FDI theories, companies providing FDI have two main motivations. First, they use FDI to achieve production efficiency by saving production costs, such as wages and taxes. Second, companies choose FDI to avoid entry barriers, such as trade barriers and transfer costs. Many previous studies have established the determinants of FDI (e.g., Buckley and Casson, 2016; Coase, 1937; Dunning, 1980; Hymer, 1976; Rugman, 1980). Specifically, traditional FDI theories follow Hymer's (1976) monopolistic advantage theory

and the theory of internalization (Buckley and Casson, 2016; Coase, 1937; Rugman, 1980), and these theories are different from the eclectic theory of Dunning (1980). Hymer's (1976) monopolistic advantage theory is a necessary condition for FDI. Foreign firms have disadvantages compared to local firms with respect to knowledge of local politics, language, economics, and law. Foreign firms try to alleviate the costs of these liabilities through monopolistic advantages. Thus, foreign investment firms try to gain such advantages to decrease their costs in target investment countries.

The theory of internalization is based on the research of Coase (1937) and is systematically furthered by Buckley and Casson (2016). Rugman (1980) applies this theory to FDI. Coase (1937) asserts that English factories transacting with foreign firms in other markets are not cost-efficient and, thus, should make investments in other markets to decrease transaction costs. Ultimately, internalization can cope with market imperfections and decrease transaction costs. Dunning (1980) develops the eclectic theory, stating that firms undertaking FDI have unique owner-specific, internationalization, and locational advantages compared with firms abroad. Firms with intangible resources can both gain competitive advantages and offset foreign costs and earn more profits than domestic firms can. He asserts that firms using owner-specific advantages directly earn more profits than those leasing or selling the advantages earn.

Location-specific advantages are the result of finding a globally optimal location for local production, and firms try to utilize the unique production factors of each country, such as labor, technology, capital, raw materials, and resources, owing to locational competitiveness. Countries with competitive costs are labor-oriented, financially affluent countries are capital-oriented, and countries with their own technology and resources utilize these factors. Based on the location-specific advantage theory, the input factors and the market spread affect FDI first, followed by energy, labor, parts and raw materials, quality, and price. Transportation costs and communication facilities and costs come third in importance, and inducement policies, taxes, tariffs, political stability, and investment conditions come fourth.

Helpman (1984) and Markusen (1984) define the difference between vertical and horizontal FDI in their theoretical model, which is further developed in more detail. Helpman (1984) distinguishes between headquarter services and the assembly line in the production process owing to differences in production processes based on factor intensities and geographic aspects. Thus, the production process is categorized based on national boundaries, and production, sales, and logistics are considered in the value chain of each type of foreign activity under horizontal FDI (Markusen, 2002). Most horizontal FDI therefore aims to decrease production costs across the home and host countries (Helpman, 1984; Helpman and Krugman, 1985). Horizontal FDI refers to the production of goods and services in the value chain undertaken by the parent company but transferred to a local subsidiary (Markusen, 1984). Finally, according to Dunning (1993), most FDI can be classified as resource-seeking, efficiency-seeking, or market-seeking. Furthermore, agglomeration economies, beginning with Marshall (1920), play an important role in explaining industry locations. Specifically, proponents of new economic geography and the economic growth studies of Griliches (1992), Krugman (1991) and Venables (1996) emphasize the importance of agglomeration externalities.

2.2. Previous Empirical Literature

Studies on industry agglomeration focus on either local firm location decisions or multinational corporations. Early empirical case studies on the agglomeration effect include those of Bagchi-Sen and Wheeler (1989), Friedman, Gerlowski and Silberman (1992) and

Henderson (1986). Henderson (1986) finds statistical significance in analyzing mid-level manufacturing industries in Brazil and the US, except in urban areas. The effects of specialized local industries particularly decrease when the city scale increases. Additionally, Henderson (1986) categorizes traditional and high-tech industries and finds that traditional industries support local rural economies and that both industries have significant positive impacts on urban economies.

Bagchi-Sen and Wheeler (1989) assert that in US cities, population scale, population growth, and per capita consumption are factors in location decisions. Friedman, Gerlowski and Silberman (1992) argues that accessibility in foreign markets, slowly increasing wages, and the human resource scale, among others, are factors in FDI location decisions. In this study, the external effects of the aggregate economy facilitate technological development in diverse industries and increase the employment growth rate, unlike the old static view. Combes (2000) analyzes employment growth under industry agglomeration in the manufacturing and service industries and finds no significant effect of manufacturing but a significant effect of service in urban economies.

Many prior studies investigate FDI location decisions (Coughlin, Terza and Arromdee, 1991; Culem, 1988; Dunning, 1973; Lipsey et al., 1999; Woodward and Rolfe, 1993). Coughlin, Terza and Arromdee (1991) assert that market accessibility, roads, airports, railroads, ports, labor markets, shipbuilding, government investment, taxable usable land, and the local industrial structure are important for location decisions. According to Dunning (1973), the factors that affect the location decisions of multinational companies are the resources of the target country, human resources, market location, production costs, product quality, transport costs, and government support policies. Lipsey et al. (1999) analyzes the factors in the location decisions when US multinational companies made direct investments in ten Asian companies. Although GDP and the actual GDP growth rate had positive effects, the effects became more negative as the distance between the US and the investment target countries increased. Culem (1988) asserts that from 1968 to 1982, European and US companies considered the market size of the investment target country, labor costs, and market growth rates when choosing FDI amounts and locations.

Recent studies emphasize agglomeration effects on FDI location decisions (Combes, 2000; Henderson, 2003; Milner, Reed and Talerngsri, 2006; Wagner and Timmins, 2009; Woodward and Rolfe, 1993). Woodward and Rolfe (1993) analyze foreign location decision factors for the manufacturing industry. They assert that per capita GDP, tax exemption, political stability, devaluations of the exchange rate, the size of the free-trade zone, and the intensiveness of the manufacturing business have positive effects, whereas wages, regulations, inflation, transportation costs, and labor unions negatively affect location decisions. Wagner and Timmins (2009) find that externalities associated with FDI agglomeration can bias estimates away from finding a pollution haven effect if they are omitted from the analysis. They use the stock of inward FDI as a proxy for agglomeration.

Kim Dae-Young and Lee Shi-Young (2015) show positive agglomeration effects on vertical FDI and negative effects on horizontal FDI. They assert that a greater percentage of Korean companies use vertical FDI with lower production costs rather than horizontal FDI targeting the Chinese market. However, they indicate that vertical FDI occurs after worldwide multinational companies position themselves, and, thus, vertical FDI can likely be used to increase access to new markets and reduce agglomeration effects. Many studies show that FDI decision factors are diverse (Chung Meong-Ki, 2005; Lu, 1997; Yang, 2004; Yu Seung-Hoon, 2014). Per capita GDP and special economic zones positively affect FDI inflow decision factors by investigating foreign companies in 28 provinces and cities in

China from 1986 to 1996.

Lu (1997) finds that GDP, infrastructure, and government policies aimed at attracting FDI had positive effects on FDI between 1988 and 1995. However, wage increases negatively affected FDI inflows. Additionally, a positive relationship between the GDP growth rate and the degree of foreign openness is found for FDI inflows (Yang, 2004). Yang (2004) reveals that the GDP growth rate and foreign openness are positively related to Chinese FDI inflows. Chung Meong-Ki (2005) finds that the decision factors in South Korean FDI in China between 1990 and 2002 were China's domestic market size and infrastructure. However, the quality of labor was not vital, and South Korean FDI in China was based on low-cost labor.

Clegg et al. (2007) provide one of the first statistical analyses of the determinants of China's outward FDI. Importantly, they show that the determinants of Chinese FDI vary over time. For example, although lower political risk in the host country is positively related to Chinese investment between 1982 and 1991, this result disappears from 1992 to 2001. The impact of geographic proximity to China is negative and significant from 1984 to 1991 but not from 1992 to 2001. They also find that, among OECD countries, Chinese FDI is attracted by market size, but among non-OECD countries, it is attracted by strong trade relations with China. Cost minimization is an important factor in FDI location decisions, as are market factors, production costs, institutional factors, and cultural differences. Furthermore, agglomeration effects also affect FDI. The factors determining FDI into China are market factors, the level of infrastructure, human resources, geographic location, and government regulations. The distribution of FDI in China is imbalanced, as it is concentrated in the eastern region owing to infrastructure, production costs, labor, and agglomeration effects.

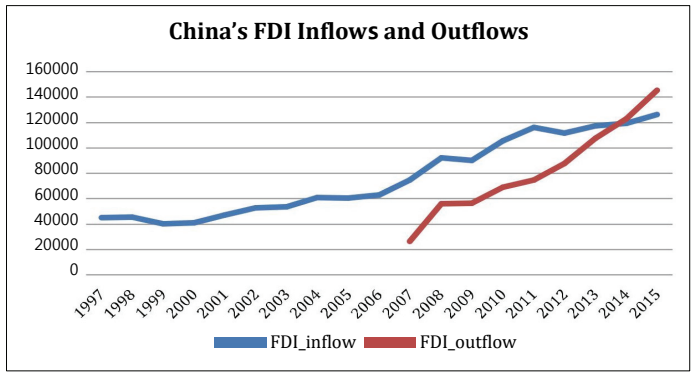
Yu Seung-Hoon (2014) analyzes whether FDI inflows have been excessive by empirically analyzing location decisions and comparing developing countries and China over the past 20 years. The analytical results show that the market size of the host country, level of economic development, economic growth rate, quality of human capital, openness, and attractiveness of the local market can explain the amount of FDI. The determinants of the FDI location choices of Chinese private enterprises. They hypothesize differences between two FDI types and examine their hypotheses through statistical analysis based on secondary data using such decision factors as natural resources, strategic assets, risk, and local Chinese networks. They find more active investment in firms for more natural resources and strategic assets and a smaller Chinese network.

3. Trends in China's FDI

3.1. China's Inward FDI

After the economic reform and opening up of the market to FDI in 1978, China passed the Chinese Partnership Business Law. This law worked to improve the investment environment to attract FDI. Foreign investment in China can be divided into three stages. The first stage was from 1982 to 1991. After the retrenchment financial strategy in the 1980s, FDI decreased, but it increased after 1991. In the early stages of the reform and opening up of the market, weaknesses arose owing to the lack of capital despite the market-oriented policies. The second stage was from 1992 to 2003, during which FDI significantly increased. After China's initiation into the WTO, FDI inflows rapidly increased. The third stage began in 2004, during which FDI grew significantly. Specifically, FDI grew from 46.88 billion US dollars in 2001 to 126.20 billion US dollars in 2015. During this time, China achieved FDI growth, whereas other countries' FDI growth rates decreased due to the 2009 global financial crisis.

Fig. 1. Value of FDI Actually Utilized by China



Source: National Bureau of Statistics (2016).

China's FDI inflows decreased during the late 1980s under the retrenchment policy and increased after 1991. This trend slowed in the late 1990s owing to the East Asian financial crisis. Then, when China joined the WTO in 2001, FDI inflows rapidly increased. The growth rate has steadily trended up except in 2009 after the global financial crisis (based on the value of FDI actually utilized by China based on data from the National Bureau of Statistics).

Immediately after China's reform and opening up to FDI, the labor-intense industries of Hong Kong and Macao received the most investments. From 1987 to 1991, when China's economic growth stabilized, investments expanded to the eastern region, and investments from Taiwan increased. During this period, investments were mostly concentrated in export-oriented manufacturing. From 1992 to 2000, development expanded quickly, investment inflows from FDI companies were large, and the range of industries expanded. From 2001 to the present, FDI has entered a stable, mature stage.

Table 1 shows the magnitude of FDI of 27 economies from 1997 to 2015. In 2015, the economy that invested the most in China was Hong Kong, a special administrative region of China, accounting for 68%, or 86.387 billion US dollars. Hong Kong was followed by the Virgin Islands (tax avoidance territories) and Singapore. There are differences among the economies, but the overall amount of FDI has steadily grown. FDI from the US, Macao, the Netherlands, and France has decreased, perhaps owing to horizontal FDI in labor-intense industries. As shown in Table 2, from 1997 to 2005, investments into China were concentrated in labor-intense industries. However, owing to the drastic increase in GDP per capita, FDI is moving from labor-intense industries to knowledge-based industries and, specifically, to leasing and business services; financial intermediation; scientific research; technical services and geologic prospecting; culture, sports and entertainment; and health, social security, and social welfare. These data strongly indicate that investment is shifting from horizontal to vertical FDI.

Table 1. Major Economies Providing FDI Inflows into China

Economy	1997	2000	2005	2010	2015	Total
Hong Kong	20,632	15,500	17,949	60,567	86,387	732,957
Virgin Islands	1,717	3,833	9,022	10,447	7,388	147,757
Singapore	4,439	4,765	5,643	5,922	6,897	101,159
Korea Rep	3,688	4,786	3,730	4,014	3,043	74,328

Table 1. (Continued)

Economy	1997	2000	2005	2010	2015	Total
Japan	2,606	2,172	2,204	5,428	6,904	72,851
United States	3,289	2,297	2,152	2,476	1,537	47,536
Germany	158	624	1,948	2,499	1,444	30,064
Cayman Is	993	1,041	1,530	888	1,556	23,734
France	82	288	1,071	1,280	585	17,056
Macao	1,858	1,164	965	710	496	16,164
Netherlands	414	789	1,044	914	752	14,937
Luxembourg	46	853	908	1,238	346	13,239
Sweden	344	265	454	929	224	8,793
United Kingdom	105	280	214	635	710	7,504
Malaysia	314	122	401	360	307	7085
Ireland	382	309	361	325	480	6146
Mauritius	215	203	322	294	245	5,709
Australia	216	210	206	396	219	5483
Italy	43	194	111	261	527	3461
Canada	1	159	142	161	630	3,077
Switzerland	17	23	100	246	105	2,919
Indonesia	2	49	4	365	226	2,176
Thailand	18	0	82	228	13	787
Russia	4	16	57	35	0	266
Nigeria	0	8	8	4	1	110
South Africa	1	1	5	6	0	87
Algeria	0	0	0	3	0	14
Total	45,257	40,715	60,325	105,735	126,266	1,462,926

Source: Foreign Trade and Economic Cooperation (2016) and National Bureau of Statistics (2016).

Table 2. Contracted FDI Projects in China

Indicators	1997	2000	2003	2006	2009	2012	2015
Wholesale and Retail Trades				4,664	5,100	7,029	9,156
Manufacturing	14,716	15,988	29,281	24,790	9,767	8,970	4,507
Leasing and Business Services				2,885	2,864	3,229	4,465
Financial Intermediation			23	52	52	282	2,003
Scientific Research, Technical Service, and Geologic Prospecting				1,035	1,066	1,287	1,970
Information Transmission, Computer Services, and Software				1,378	1,081	926	1,311

Table 2. (Continued)

Indicators	1997	2000	2003	2006	2009	2012	2015
Hotels and Catering Services				1,060	502	505	611
Agriculture, Forestry, Animal Husbandry, and Fishery	814	821	1,116	951	896	882	609
Transport, Storage, and Post	279	306	506	665	395	397	449
Real Estate	862	684	1,553	2,398	569	472	387
Production and Supply of Electricity, Gas, and Water	156	107	333	375	238	187	264
Culture, Sports, and Entertainment				241	158	145	238
Services to Households and Other Services	1,400	2,679		236	207	192	217
Construction	455	233	396	352	220	209	176
Management of Water Conservancy, Environment, and Public Facilities				132	183	122	84
Health, Social Security, and Social Welfare				20	18	24	51
Education				27	20	11	38
Mining	154	162	211	208	99	53	34
Public Management and Social Organizations						2	
Total	21,001	22,347	41,081	41,473	23,435	24,925	26,575

Source: National Bureau of Statistics (2016).

3.2. China's Outward FDI

China is developing with the help of FDI and is emerging as a capital exporting country with rapidly increasing outward direct investment, and Table 3 indicates the top destinations of China's FDI outflows, and Fig. 2 and Table 4 indicate outflows by sector. In 2015, direct investment mostly went to Hong Kong, followed by the Cayman Islands, the Virgin Islands, the US, Singapore, Australia, England, and Russia (the Cayman Islands and the Virgin Islands are tax avoidance territories).

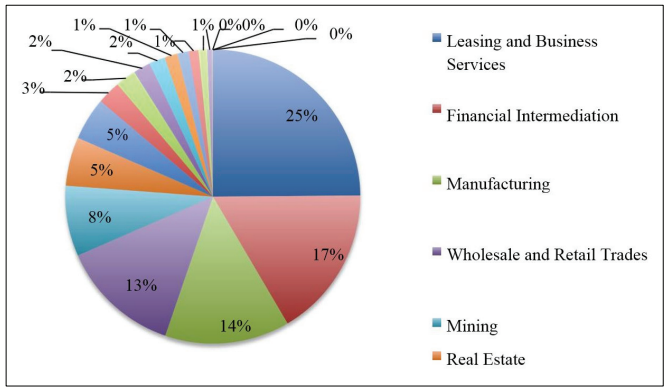
Table 3. China's Overseas Direct Investment Stock

(Unit: USD billion)

Economy	2000	2008	2012	2014	2015
Hong Kong	199,056	115,845	306,372	509,920	656,855
Cayman Islands	17,256	20,327	30,072	44,237	62,404
Virgin Islands	23,243	10,477	30,851	49,320	51,672
United States	4,874	2,390	17,080	38,011	40,802
Singapore	6,069	3,335	12,383	20,640	31,985
Australia	7,868	3,355	13,873	23,882	28,374
United Kingdom	1,358	838	8,934	12,805	16,632
Russia	2,788	1,838	4,888	8,695	14,020
Canada	2,603	1,268	5,051	7,789	8,516
Indonesia	1,150	543	3,098	6,794	8,125
Germany	1,502	846	3,104	5,786	5,882
Macao, China	2,229	1,561	2,929	3,931	5,739
France	244	167	3,951	8,445	5,724
South Africa	4,153	3,049	4,775	5,954	4,723
Rep. of Korea	637	850	3,082	2,772	3,698
Thailand	1,080	437	2,127	3,079	3,440
Vietnam	987	522	1,604	2,866	3,374
Japan	1,106	510	1,620	2,547	3,038
Algeria	937	509	1,305	2,452	2,532
Nigeria	1,211	796	1,950	2,323	2,377
Sudan	613	528	1,237	1,747	1,809
New Zealand	159	70	274	962	1,209
Mexico	153	173	368	541	525
Guinea	136	96	235	419	383
Madagascar	230	147	275	353	348
Total	317,211	183,971	531,941	882,642	1,097,865

Sources: Foreign Trade and Economic Cooperation (2016) and National Bureau of Statistics (2016).

Fig. 2. Overseas Direct Investment by Sector



Source: National Bureau of Statistics, Number of Projects of Contracted Foreign Direct Investment.

Table 4. China's Overseas Direct Investment by Sector

Sector	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Agriculture, Forestry, Animal Husbandry, and Fishery	18,504	27,171	17,183	34,279	53,398	79,775	146,138	181,313	203,543	257,208
Mining	853,951	406,277	582,351	1,334,309	571,486	1,444,595	1,354,380	2,480,779	1,654,939	1,125,261
Manufacturing	90,661	212,650	176,603	224,097	466,417	704,118	866,741	719,715	958,360	1,998,629
Production and Supply of Electricity, Heat, Gas, and Water	11,874	15,138	131,349	46,807	100,643	187,543	193,534	68,043	176,463	213,507
Construction	3,323	32,943	73,299	36,022	162,826	164,817	324,536	436,430	339,600	373,501
Wholesale and Retail Trades	111,391	660,418	651,413	613,575	672,878	1,032,412	1,304,854	146,482	1,829,071	1,921,785
Transport, Storage, and Post	137,639	406,548	265,574	206,752	565,545	256,392	298,814	330,723	417,472	272,682
Hotels and Catering Services	251	955	2,950		21,820	11,693	13,663	8,216	24,474	72,319
Information Transmission, Software, and Information Technology	4,802	30,384	29,875	27,813	50,612	77,646	124,014	140,088	316,965	682,037
Financial Intermediation		166,780	1,404,800	873,374	862,739	607,050	1,007,084	1,510,532	1,591,782	2,424,553
Real Estate	38,376	90,852	33,901	93,814	161,308	197,442	201,813	395,251	660,457	778,656
Leasing and Business Services	452,166	560,734	2,171,723	2,047,378	3,028,070	2,559,726	2,674,080	2,705,617	3,683,059	3,625,788
Scientific Research and Technical Services	28,161	30,390	16,681	77,573	101,886	70,658	147,850	179,221	166,879	334,549
Management of Water Conservancy, Environment, and Public Facilities	825	271	14,145	434	7,198	25,529	3,357	14,489	55,139	136,773
Service to Households, Repairs, and Other Services	11,151	7,621	16,536	26,773	32,105	32,863	89,040	112,918	165,175	159,948
Education	228	892	154	245	200	2,008	10,283	3,566	1,355	6,229
Health and Social Service	18	75		191	3,352	639	538	1,703	15,338	8,387
Culture, Sports, and Entertainment	76	510	2,180	1,976	18,648	10,498	19,634	31,085	51,915	174,751
Total	1,763,397	2,650,609	5,590,717	5,652,899	6,881,131	7,465,404	8,780,353	1,078,371	12,311,986	14,566,715

Sources: Foreign Trade and Economic Cooperation (2016) and National Bureau of Statistics (2016).

Unlike FDI inflows, which are gradual, FDI outflows are rapid and aggressive, as shown in Figure 1. According to UNCTAD, China ranked fourth among FDI outflow countries after the US, Hong Kong, and Japan in 2014 and ranked third after the US and Japan in 2015.

China's FDI outflows changed from manufacturing (45%) in 2006 to leasing and business services (25%) and financial intermediation (17%) in 2015, with manufacturing still accounting for 14% of outflows. China is in the process of changing from horizontal to vertical FDI and has made various recent FDI efforts. Government-owned companies participate actively in FDI. Investments from China to the US increased 30% in 2015 compared with 2014, and, according to the Korea Trade-Investment Promotion Agency, China's worldwide FDI increased 15%. Although China's economic development rate is slowing and reached its lowest level over the past 30 years of 6.9%, the continuous growth of FDI from China to the US indicates that China's FDI pattern is shifting from that of a developing country to that of a developed country. Moreover, in January 2016, it was reported that foreign mergers and acquisitions (M&As) of Chinese companies exceeded 70 billion US dollars. Chinese investment institutions actively invest in foreign real estate. These investments are mostly made in the US, England, Australia, and Japan, and they comprise 70% of foreign real estate. According to statistics from ING, although elephant deals are recently decreasing, small and medium M&As are still common.

3.3. Characteristics of China's FDI

FDI into China is shifting from manufacturing to wholesale/retail trade, leasing/business services, and financial mediation owing to changes in the business environment, and, currently, investment firms and their scale are diversifying. From 1997 to 2005, FDI was concentrated in manufacturing industries, which are labor-intensive. However, owing to the increase in per capita GDP, preferences have shifted from labor-intensive industries to service industries and high value-add high-tech manufacturing industries. Investment in the service industry has increased 17.3% to 772 billion dollars. Currently, high-tech firms in China are working toward obtaining investments from advanced countries, such as Germany, or making joint development plans. Moreover, despite the decrease in economic growth, agglomeration is occurring in the fields of education, finance, and culture. The majority of inflows into China are chemically specialized and high-tech manufacturing-oriented. China is the second country, after the US, to invest in the newly industrialized country of Indonesia. After the decrease of inward investment into China, China has increased its outward investments into Indonesia, focusing on construction materials, new renewable energy, rubber, and electronic parts.

4. Empirics

4.1. Empirical Model and Data

Previous research regarding the agglomeration effects of FDI into China finds concentrations in specific regions. It is believed that local firms similarly create a positive reciprocal effect, and research suggests that agglomeration has a significant effect on the investments of both home and host countries in terms of relative labor costs, differences in real interest rates, real exchange rates, the scale of the target investment country, the stability of the factor market, the openness of the market, market barriers, and the distance between the home and host country.

Furthermore, industrial agglomeration creates externalities, such as knowledge spillovers, decreases in transaction costs between firms, and reductions in inefficiencies due to competi-

tion. Thus, agglomeration effects can arise owing to the externality effects of country-related agglomeration in specific regions. Agglomeration effects are therefore among the factors in the decision to attract FDI from multinational corporations and are similar across countries. This study aims to investigate the decision factors for inflows and outflows comparatively with other countries based on agglomeration factors. The analysis utilizes the agglomeration and traditional FDI theories considering cost, demand, and business environment conditions simultaneously to compare firms that undertake FDI in a given country.

4.1.1. Agglomeration Effect

The empirical literature on firm location choice suggests that agglomeration externalities are an important factor and that multinational firms obtain potential benefits from being close to firms of other nationalities. Thus, multinational companies tend to invest in countries in which they already have endeavors. Several studies empirically show that foreign firms invest in countries in which they are already active (Coughlin, Terza and Arromdee, 1991; He, 2002; Head, Ries and Swenson, 1995; Lee Min-Hwan and Yeo Taek-Dong, 2008; Woodward, 1992). To account for agglomeration effects, this study includes the aggregate value of FDI stock actually utilized previously by firms of the same nationality.

An economic model of location choice should contain self-reinforcing mechanisms leading to agglomeration. Many theoretical and empirical studies suggest that the clustering of economic activities in geographic space results in cost savings and productivity gains for firms by generating agglomeration externalities, which further enhance the attractiveness of a location. Thus, firms in the same industry tend to agglomerate in a particular region to enjoy the positive externalities of proximity.

4.1.2. Cost Conditions

Cost conditions are related to labor and capital costs. According to FDI theories, multinational enterprises (MNEs) invest in countries with low-cost labor and high rates of returns. Friedman, Gerlowski and Silberman (1992) empirically show that high labor costs negatively affect FDI inflows. Furthermore, when firms need high productivity from skilled labor, they tend to choose high-wage countries. Relatedly, Head, Ries and Swenson (1999) state that when labor-cost advantages and skilled labor occur simultaneously, the labor cost effect is insignificant or positive. In this study, total factor productivity is used to reflect labor costs.

This study uses annual data to analyze FDI from and to China. It is challenging to acquire a sufficiently long time series for analysis. Thus, this study addresses this issue by using panel data analysis of direct investments into countries over a certain period of time. Equation (1) gives a basic formula or panel regression analysis:

$$y_{i,t} = \beta_1 X_{1,i,t} + \beta_2 X_{2,i,t} + \ldots + \beta_k X_{k,i,t} + \varepsilon_{i,t},$$

where i is the observed value ($i = 1,2, \ldots, N$), t is time ($t = 1,2, \ldots, T$). $y_{i,t}$ is the dependent variable, where t is the year and i is FDI into China or the amount that China invests in other countries. A is a scalar, $\beta_1 \sim \beta_k$ is a $K \times 1$ vector of coefficients, $X_{1,i,t}, \cdots, X_{\mathrm{k},i,t}$ are the K explanatory variables, and $\varepsilon_{i,t}$ is the disturbance term.

FDI accompanies the movement of capital. This study considers the difference in the interest rates of the home and host countries. A high real interest rate in the FDI host country might have a positive effect on investments. This study uses capital costs as a proxy for the difference in China's and the host country's interest rates. Thus, when China's relative real interest rate is high, the effect on FDI inflows should be positive, and when the relative real interest rate is low, the effect on outflows should be positive.

The exchange rate is vital: A strong domestic currency of the target investment country decreases exports. Thus, when FDI into the target country is for low-cost production and exports to other countries, a high currency value of the target investment country has a negative effect on FDI inflows. Alternatively, a currency value increase in the investment target country can promote FDI inflows because it increases consumers' purchasing power. Thus, the home country tends to avoid making investments. In this study, the Chinese yuan is the real exchange rate index used, and it can have a positive or negative effect on FDI depending on the investment objective.

4.1.3. Demand Condition

The market size of the target investment country can be an important factor in location choice, especially when a firm wants to enter another market to avoid trade barriers. Agarwal (1980) and Hymer (1976) show that the domestic demand market scale and economic growth of the target investment country are vital in location choice. This study, like prior studies, uses real GDP, which should have a positive effect on FDI inflows.

4.1.4. Business Environment

The target investment country's business management environment, which is captured by trade and economic liberalization, affects FDI location choice. Numerous studies demonstrate the importance of trade openness for FDI flows (Bénassy-Quéré, Coupet and Mayer, 2006). Nevertheless, it is unclear whether trade openness affects FDI because a high degree of trade openness in the target investment country may induce FDI when the purpose of direct investment is avoiding trade barriers. This study uses the trade scale, which is the amount of imports and exports as a percentage of GDP, as a proxy for trade openness. Numerous empirical studies show that host country policies to attract FDI can attract investment from foreign firms (Dunning, 1973/1980/1993). In this study, the proxy variable for business activity regulations and FDI friendly policies is the overall economic liberation index. Liberalizing economic activity should have a positive effect on FDI inflows.

Finally, the impact of geographic distance on FDI is studied extensively in the empirical literature. Recent empirical studies find a significant negative impact of geographic distance on FDI (Bénassy-Quéré, Coupet and Mayer, 2006; Bevan and Estrin, 2004). Clegg et al. (2007), however, find no significant impact. Thus, the geographic distance between the home and host countries can have a positive or negative effect on FDI inflows. A longer distance may lead to communication difficulties between head and branch offices, causing weak FDI inflows. Nevertheless, the objective of FDI may be avoiding trade barriers and transportation costs, leading to a positive effect.

This study comparatively analyzes the decision factors for FDI inflows and outflows in China. This study uses inflows of FDI into China from Hong Kong, Japan, Singapore, South Korea, the US, Germany, the Netherlands, United Kingdom, Canada, France, Italy Macao, Ireland, Austria, Luxembourg, Malaysia, Belgium, Indonesia, Sweden, and Australia (of the top economies, those targeted for tax evasion are excluded, as is Taiwan owing to a lack of data). China's FDI outflows are defined as its FDI amounts in the US, Singapore, Australia, United Kingdom, Russia, Canada, Indonesia, Germany, Macao, France, South Africa, South Korea, Thailand, Vietnam, Japan, Algeria, and Nigeria from 2007 to 2015 (of the top 20 economies, those targeted for tax evasion are excluded, leaving 18 economies).

$$\ln FDI_{i,t} = \alpha_{i,t} + \beta_1 \ln AGG_{t-1} + \beta_2 \ln TFP_{t-1} + \beta_3 R_{t-1} + \beta_4 \ln REER_{t-1} + \beta_5 \ln RY_{t-1} + \beta_6 \ln OPEN_{t-1} + \beta_7 \ln FREE_{t-1} + \beta_8 D_t + \varepsilon_{i,t},$$

where i is the source economy and t is time. AGG is accumulated direct investment into the target country through the previous year. TPP is a proxy variable for labor costs based on China's total factor productivity level at current purchasing power parity (US=1). R is the difference between the real interest rates in China and the other economy. REER is the target economy's real exchange rate. RY is the target economy's real GDP. OPEN is the weight of trade in nominal GDP, which measures trade openness. FREE is the total economic liberation score. D is the geographic distance from Beijing and the capital city of the counterpart economy and serves as a proxy for transportation costs between the two economies. The variable specifications and sources are shown in Table 5.

Table 5. Variable Descriptions

Variable	Description	Source
Dependent		
FDI	Value of foreign direct investment actually utilized by China (million USD)	National Bureau of Statistics of China
Independent		
AGG	Net overseas direct investment (USD million), aggregate investment of the same nationality that had accumulated as of the previous year	National Bureau of Statistics of China
TFP	Total factor productivity level at current purchasing power parity for China (USA=1)	Federal Reserve Bank of St. Louis
R	Differences in the real interest rate between China and counterpart economies	World Bank
REER	Real effective exchange rate index (2010 = 100)	OECD
RY	Real GDP	IMF
OPEN	Trade openness [=(Imports+Exports)/GDP]	IMF
FREE	Index of economic freedom	Heritage
D	Geographic distance between the home and host economies	CEPII, France

Panel A of Table 6 provides basic statistics of the variables used to estimate China's FDI inflow and outflow models using equation (2). The variables are divided into those used in the equations of FDI outflows into and out of China. Panel B of Table 6 shows the correlations among the variables in the equation regarding FDI into China. FDI inflows in the previous year are highly correlated with investment from a given economy. FDI inflows have significant positive correlations with China's total factor productivity and real exchange rate. However, FDI inflows are negatively correlated with the geographic distance between China and the investing economy. We further decompose FDI into FDI inflows and outflows and conduct correlation analyses. We find show that the results for FDI are largely affected by FDI inflows.

Table 6. Descriptive Statistics and Correlation Coefficients

Panel A. Descriptive statistics

	ln FDI		ln AGG		ln TFP		R		ln REER		ln RY		ln OPEN		ln FREE		ln D	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
Mean	5.794	6.413	7.567	12.702	-0.987	-0.846	1.134	-0.936	4.598	4.689	8.070	6.665	3.820	4.083	3.968	4.214	8.615	8.520
St. Dev.	2.658	1.723	2.910	1.464	0.158	0.013	5.747	5.841	0.149	0.099	0.817	1.497	0.212	0.773	0.023	0.180	0.676	0.727

Panel B. Correlation coefficients

	ln FDI	ln AGG	ln TFP	R	ln REER	ln RY	ln OPEN	ln FREE	ln D
ln FDI	1								
ln AGG	0.932*	1							
ln TFP	0.112*	0.311*	1						
R	0.1	0.148*	0.095	1					
ln REER	0.145*	0.215*	0.1	0.205*	1				
ln RY	0.094	0.319*	0.917*	0.000	0.111*	1			
ln OPEN	0.064	0.059	0.590*	0.195*	-0.009	0.118*	1		
ln FREE	-0.056	-0.219*	-0.619*	-0.1	-0.1	-0.519*	-0.236*	1	
ln D	-0.441*	-0.456*	0	-0.025	-0.101	0	0	0	1
	ln FDI inflows	**ln AGG**	**ln TFP**	**R**	**ln REER**	**ln RY**	**ln OPEN**	**ln FREE**	**ln D**
ln FDI inflows	1								
ln AGG	0.989**	1							
ln TFP	0.231**	0.234*	1						
R	0.092	0.123*	0.078	1					
ln REER	0.203*	0.187*	0.091	0.097*	1				
ln RY	0.034	0.231	0.067*	0.000	0.223*	1			
ln OPEN	0.024	0.076	0.032*	0.232*	0.002	0.232*	1		
ln FREE	-0.08	-0.18	-0.26	-0.1	-0.23	-0.44	-0.12	1	
ln D	-0.21	-0.67	0	-0.02	-0.1	0	0	0	1
	ln FDI outflows	**ln AGG**	**ln TFP**	**R**	**ln REER**	**ln RY**	**ln OPEN**	**ln FREE**	**ln D**
ln FDI outflows	1								
ln AGG	0.831*	1							
ln TFP	0.101*	0.187*	1						
R	0.131	0.078	0.065	1					
ln REER	0.187	0.098*	0.015	0.193*	1				
ln RY	0.124	0.211*	0.752*	0.000	0.087	1			
ln OPEN	0.087	0.127	0.127*	0.173	-0.01	0.087*	1		
ln FREE	-0.06	-0.32	-0.65	-0.02	-0.02	-0.32	0.313	1	
ln D	-0.43	-0.23	0	-0.02	-0.23	0	0	0	1

Note: The total observations of FDI inflows and outflows are 360 and 140, respectively.

4.2. Empirical Methods

This study investigates the impact of agglomeration on location choice. Because different variables may impact FDI decision factors, this study uses a cross-country analysis. Analyzing several countries makes it challenging to obtain a sufficiently long time series and to generalize results. To solve this problem, this study uses panel data, which are often utilized in studies of agglomeration effects.

4.2.1. Characteristics of Panel Data

Panel data can be classified as micro panel data, which are used to investigate many types of research subjects, such as individuals, households, businesses, cities, regions, and countries, or macro panel data, which are used to investigate cities, regions, and countries. Panel data can also be described as balanced or unbalanced. A balanced panel includes the same research subjects in the same time period, whereas an unbalanced panel includes the same research subjects but in different time periods. Panel data for cities, regions, and countries are obtained from national statistics offices or the other relevant central departments of each country, and country-level panel data are published quarterly by the OECD, World Bank, and St. Louis Federal Reserve, among others.

The panel data analytic method can more effectively use information to obtain accurate data. First, panel data can integrate differences and dynamics between individuals to allow regression analysis across time and space and improve the accuracy of inferences regarding the variables. Second, panel data are more effective for creating complex models and verifying hypotheses than simple cross-sectional and time series data are. Thus, inter- and intra-individual differences can be distinguished, and repetitive structures can be identified to create more precise models. Third, using this method, a researcher can control for the omitted variables that frequently appear in general regression analyses. Fourth, the biases that occur when obtaining data for micro units can be controlled.

The panel data analytic method assumes that the sample individual households, businesses, cities, regions, and countries are heterogeneous and that this heterogeneity can be controlled to make more effective deductions. In particular, if characteristics change over time, more effective analysis is possible. This study utilizes the panel data analytic method to estimate the impact of agglomeration on location choice for FDI.

4.2.2. Fixed and Random Effects Models

Individual time-invariant cross-sectional units are the same across time, but the variables of these units may differ. In this study, the unit is an economy. When unobserved heterogeneous effects are assumed to be temporary or random, the model is called a random effects model.

a) Fixed Effects Model

In the fixed effects model, subjects, such as countries, have time-invariant characteristics that affect the independent variable. The influence of these characteristics is controlled so that the net effect of the independent variable on the dependent variable can be accurately deduced. Thus, the FDI of N countries during period T is an $N \times T$ vector, and N individual regression equations can be set up. With a fixed effects model, unobserved omitted variables can be inferred from dummy variables. Thus, the model can deduce the effects of the subject characteristics directly through the variants. However, with fixed effects, as the number of dummy variables increases, the number of variants increases, leading to an enormous loss of

degrees of freedom. As a result, the coefficients of the independent variables may be relatively inaccurate.

b) Random Effects Model

In the random effects model, the variation based on inherent characteristics is considered random. Thus, this model investigates the effect of the subject characteristics as a random variable, and the errors are assumed to be independent and identically distributed. Unlike in the fixed effects model, in the random effects model, individual time-invariant effects have no correlations. Thus, the random effects model fragments the calculated error of the general regression model. This model is also called the error components model, as it categorizes errors into types that cannot be explained. If the unobserved individual heterogeneity, however formulated, is assumed to be uncorrelated with the included variables, then the model may be formulated as

$$\nu_{i,t} = (\alpha + \nu_t) + X_{i,t}^{'} + \varepsilon_{i,t}.$$

In other words, the model is a linear regression model with a compound disturbance that may be consistently, albeit inefficiently, estimated by least squares. This approach specifies that νt is a group-specific random element similar to $\varepsilon_{i,t}$ except that, for each group, there is only a single draw, which enters the regression identically in each period. Again, the crucial distinction between the fixed and random effects models is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic (Greene, 2008).

The strengths of the random effects model are as follows. 1) The number of variants is consistent even if the sample size increases, 2) inter- and intra-group variance are both used so that efficient deduction is possible, and 3) time-invariant effects can be deduced. This model addresses the limitations of the fixed effects model by reducing the loss of degrees of freedom. Although the error between subjects is independent in a random effects model, autocorrelation over time within subjects may occur. Assuming that independence within a time series does not hold, general ordinary least squares may be inefficient and may lead to inaccurate standard errors because of first-order autocorrelation. The random effects model should be independent of the explanatory variable. Thus, the generalized least squares (GLS) or feasible GLS method can solve this problem. According to Allison (2009), "In a random effects model, the unobserved variables are assumed to be uncorrelated with (or, more strongly, statistically independent of) all the observed variables." This assumption is often wrong, but, for the reasons described previously (i.e.., standard errors may be very high with fixed effects and random effects allow estimation for time invariant variables), a random effects model may still be desirable under some circumstances. Such models can be estimated via GLS.

4.3. Empirical Results

4.3.1. FDI Utilized by China

First, this study utilizes fixed effects and random effects models to analyze panel data of FDI into China. The Hausman test result is $\chi^{2(7)}$ = -9.3, suggesting that a model fitted to these data fails to meet the asymptotic assumptions of the Hausman test. However, the result of the Lagrangian multiplier test for random effects is $\chi^{2(1)}$ = 133.22 (prob. < 0.000), suggesting that an analysis utilizing a random effects model is suitable.

Model 1 of Table 7 shows the estimation results of random effects GLS regressions for China's FDI inflows. The amount of accumulated FDI through the previous year has a significantly positive effect. In other words, greater accumulated investment from an economy leads to higher FDI inflows. Additionally, China's total factor productivity, a proxy for its labor cost, has a positive effect on FDI. Higher total factor productivity therefore leads to higher FDI inflows. Thus, the purpose of recent FDI in China is not necessarily lowering production costs, as higher total factor productivity implies higher labor costs. This result provides indirect evidence for an increase in skilled labor-intensive investment in China, unlike in the past.

Table 7. Regression Results

Variable	Model 1	Model 2
Intercept	16.395 ***	10.147 ***
	5.820	12.769
ln AGG	0.974 ***	0.782 ***
	0.043	0.092
ln TFP	2.215 **	8.116
	0.838	8.334
R	-0.014	-0.002
	0.012	0.010
ln REER	-0.453	-2.639 *
	0.545	1.350
ln RY	-1.179 ***	0.194 ***
	0.182	0.065
ln OPEN	-0.862 ***	0.367 ***
	0.321	0.100
ln FREE	-0.544	0.754
	1.499	0.632
ln D	0.136	-0.039
	0.131	0.114
Dependent	FDI inflows	FDI outflows
Sigma_u	0.265	0.157
Sigma_e	0.664	0.726
Rho	0.137	0.045
Wald X2	4,954.95 ***	652.29 ***
R^2	0.917	0.737
Obs.	316	121

Notes: 1. The dependent variables of Models 1 and 2 are FDI inflows and outflows, respectively. The numerical values below the coefficient estimates are t-statistics.
2. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

Furthermore, actual income and trade openness have negative effects on FDI inflows. This result can be interpreted as greater openness to trade leading to lower FDI. FDI inflows in China are mostly market entry-oriented for the purpose of avoiding trade barriers rather than domestic-oriented. Similarly, although it is not significant, the distance to the target investment company has a positive effect, which is further evidence that FDI inflows in China are mostly market entry-oriented. Nevertheless, the actual interest rate difference and the actual effective exchange rates of the two economies do not significantly affect FDI inflows into China. The r-squared (R^2) of the FDI analysis model is 0.917, which reflects high

adequacy. The Wald χ^2 and the result of an F test of whether the estimated coefficients are different from zero are statistically significant, implying that the model choice is adequate. The results for the model for Chinese FDI are similar, confirming the adequacy of the model.

4.3.2 Overseas Direct Investment

Model 2 of Table 7 shows the results for the analysis of China's FDI. In relation to the FDI location decision, the amount of accumulated investment through the previous year, which indicates the agglomeration effect, has a significant positive effect on FDI outflows. Thus, Chinese companies prefer direct investments in economies with more investments from Chinese companies. FDI occurs when more companies agglomerate in the same region, as other studies hypothesize. A higher amount of accumulated investment leads to higher FDI inflows. Thus, many Chinese companies make domestic market-oriented investments, contradicting the results of the analysis of Chinese FDI. The estimated coefficient on the actual effective exchange rate has a significant negative effect on Chinese FDI. Thus, an increase in the actual value of the currency of the target investment country leads to a decrease in Chinese FDI in the target economy, as expected. Nevertheless, the difference in actual interest rates and the composite freedom score have no significant effect on FDI outflows from China. The distance between economies is not a vital factor in the FDI location decisions of Chinese companies.

5. Conclusion

This study analyzes agglomeration effects as determinants of Chinese FDI by setting up a model that includes agglomeration of enterprises of the same nationality in addition to the traditional variables related to production costs and the host country's market size. To this end, this study uses the same analytical model to examine inflows and outflows of Chinese FDI. The empirical data for China's FDI inflows include 323 observations from 1997 to 2015 from the top 19 economies (excluding tax havens and Taiwan) in terms of FDI to China. This study uses existing aggregated FDI, total factor productivity, the real interest rate difference between China and the partner economy, the real effective exchange rate, real GDP, trade openness, the economic freedom score, and the geographic distance between the home and host economies as independent variables. In addition, in the case of China's overseas FDI, the analysis uses 126 observations from the top 18 economies (excluding tax havens) from 2007 to 2015. The empirical data structure is a panel of time series and cross-sectional data. The analysis uses the fixed and random effects models. A random effects GLS model is suitable for analyzing the Chinese FDI regression equations.

The results confirm a significant effect of agglomeration on FDI location choice, as in previous studies (e.g., Henderson, 2003). The effect of agglomeration is found to be important in the location choices for both inward and outward Chinese FDI. Specifically, aggregated investment from firms of the same nationality through the previous year has a significant positive impact at the 1% level. These results show that agglomerations of specific or various industries in specific regions bring additional externalities. Thus, gathering similar industries in specific regions can exert intangible positive effects through networking and interactions among companies (Lee Min-Hwan and Yeo Taek-Dong, 2007).

Thus, the agglomeration effect is the most important factor in Chinese FDI location choice. The results show that the external effects of firm agglomeration are very important considerations not only in choosing the location of an industry in an economy but also when MNEs select locations for FDI. Unexpectedly, China's real income has a negative effect on

FDI inflows. However, real income has a positive effect on China's FDI. This result occurs because the increase in China's real income should cause rising production costs, such as wages, but it creates more abundant capital for overseas direct investment.

According to Bénassy-Quéré, Coupet and Mayer (2006), the effect of trade openness on FDI in host economies may not be clear. Investment incentives are stronger for production efficiency-seeking FDI owing to the higher trade openness of the host economy, but investment incentives to avoid trade barriers may be weakened. The effects of trade openness on China's inward and outward FDI are therefore negative and positive, respectively.

This study uses China's total factor productivity as a proxy for labor cost. Thus, a positive effect is expected in the case of FDI requiring skilled labor in the host country, but a negative effect is expected for production efficiency-seeking FDI using low wages. Thus, the effect of total factor productivity on China's FDI inflows is positive, suggesting that recent inward FDI in China requires skilled labor. In the case of Chinese overseas FDI, the effect of total factor productivity is not significant. Thus, overseas FDI utilized by Chinese MNEs is not production efficiency-oriented investment.

The primary empirical results are summarized as follows. First, the results show that the agglomeration effect on FDI is significant, and its positive effect on FDI location choice is an important factor in both inward and outward FDI in China. Second, although China's production costs are increasing, FDI inflows are also significantly increasing. Thus, FDI entering the Chinese market has increased in recent years. Third, the effect of real income on FDI is found to have opposite effects on FDI inflows and outflows in China. These results indicate that China's inward FDI is aimed at entering markets, whereas its overseas FDI is market-oriented direct investment aiming to seek markets in the host economies.

The results confirm that both host economies' costs and market conditions and agglomeration affect the attractiveness of an economy for FDI inflows. Specifically, aggregate investments from firms of the same nationality, real GDP, and trade openness play crucial roles in determining Chinese FDI inflows and outflows. Nevertheless, the determinants of location choice are continuously changing with China's rapid changes. Until recently, FDI in China has been market entry-oriented to avoid trade barriers, whereas China's outward FDI shows strong tendencies toward domestic market-oriented investment. These results indicate that the determinants of FDI will have similar patterns to outward FDI as trade liberalization in China expands in the future. More in-depth studies on location determinants must be conducted to develop China's overseas direct investment. The study has the following limitations.

First, the study lacks detailed estimates of the agglomeration effects of FDI because it uses country-level rather than company-level variables. Second, the study does not consider the characteristics of different industries, although it does distinguish between the determinants of FDI and agglomeration effects in different industries. Thus, future studies must provide a detailed understanding of agglomeration effects in different industries by analyzing models that are expanded to include the characteristics of different industries. Third, endogeneity may be a problem. Several studies verify that when actual GDP is a dependent variable and economies initially enter investment targets with labor-intensive industries, actual GDP has a positive effect. However, the effect on actual GDP and the location determinants of outward FDI may be negative when it continuously increases and companies' profits can no longer be maximized. The variables should be precisely statistically measured in future studies, and the attractiveness for firms in specific industries, companies, economies, the existence of agglomeration, economic growth, the openness of trade, and regulations should be specifically researched in the future.

Examining the limitations of the study shows that in-depth research must be conducted by

taking into consideration various variables and segmented company-level variables. Significant results can be found when measuring variables more accurately and expanding the variables by region and year. Comparative research considering developing economies and emerging developing economies would be interesting as well.

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