



Article

Chinese Industrial Outward FDI Location Choice in ASEAN Countries

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Abstract: This paper examined the location choices of Chinese outward FDI (OFDI) from 2005–2016 with a particular focus on the Association of Southeast Asian Nations (ASEAN) countries. It was found that Chinese OFDI in ASEAN countries was generally focused on areas that had large potential markets and low tax rates. Unlike previous studies, it was found that primary and secondary industry labor costs were the main motivators rather than resource-seeking. The business environment in the host countries was also found to have positive and significant effects on Chinese OFDI location choice for the agricultural, mining, construction, and information industries. The insights in this paper could provide useful suggestions for both governments and investors.

Keywords: industry; location choice; outward FDI; China; ASEAN countries

1. Introduction

The world economy recovered slowly after the international financial crisis in 2008, with the past few years seeing a rise in de-globalization and trade protectionism. To pursue sustainable development in this new normal state, the "One Belt and One Road" (OBOR) initiative was proposed by the Chinese government in 2013. ASEAN countries except for Hong Kong have been a key focus for Chinese outward FDI (OFDI), with Chinese OFDI stocks in ASEAN countries increasing year-on-year to \$ 71.554 billion by the end of 2016; however, the share of total Chinese OFDI stocks was only 5.3 percent and was declining. Therefore, to improve the efficiency of Chinese OFDI in ASEAN countries, a reasonable industrial system needs to be established across ASEAN countries based on Chinese OFDI industrial layout policies. Under the OBOR initiative [1], investment promotion research singled out and encouraged several key industries to invest in OBOR countries based on the strategic development demands of both China and the OBOR countries. Therefore, understanding Chinese OFDI location choices in specific industries can lead to meaningful policy suggestions for both the host countries and the home country. Home country investors (in this case China) can understand the various factors affecting the OFDI in each industry and select the most appropriate OFDI host countries, and in the host countries, the government can work on providing the specific factors needed to attract more Chinese OFDI to particular industry. With appropriate Chinese investor decisions and a favorable business environment in the host countries, the efficiency of Chinese OFDI could be significantly improved [2]. However, as most existing studies have analyzed Chinese OFDI location choice determinants based on aggregate OFDI data [3–9], the specific determinants in each industry have not been distinguished. Further, because of potential extreme values, aggregate OFDI data can suffer from skewed data structures, which may adversely affect model fit and estimations [10]. To disentangle the impact of the different factors on the various sectors and reveal the motivations of Chinese FDI firms, Amighini et al. [11] used a bilateral greenfield FDI dataset separated by sector

and found that Chinese manufacturing sector firms tended to be located in countries that had large markets, and resource-intensive sector firms preferred countries with lower GDP. Using outward direct investment (ODI) Chinese industry data from 2003–2009, it was confirmed that traditional variables such as market size, production costs and legal environment had no impact on ODI location choice [12]. Amighini and Franco [13] analyzed the Chinese OFDI automotive sector drivers from 2006–2011 and found that it was driven mostly by host country market size and targeted lower income countries.

This paper analyzed the Chinese OFDI location choice determinants for eleven key industries within the primary, secondary, and tertiary industry sectors from 2005–2016, none of which had been examined in our previous research on OBOR country research.

The remainder of this paper is organized as follows. Section 2 provides the literature review and hypotheses development, Section 3 introduces the data and model used to estimate the Chinese OFDI determining factors in ASEAN countries, Section 4 discusses the results of the empirical study, and assesses the robustness of the results, and Section 5 concludes the paper.

2. Literature Review and Hypotheses Development

This section gives a literature review and hypotheses on how the motivations of Chinese OFDI industries and host country institutions collectively shape location choice.

2.1. Location Choice Motivations

Location choice is one of the most crucial OFDI decisions as it can have a profound impact on overseas investment efficiency [14,15]. Mainstream theory on location choice identified four key OFDI motivations: market-seeking, natural resource-seeking, efficiency-seeking, and strategic asset-seeking [16,17].

Market size, which is used to analyze OFDI location choices, has been a popular variable in previous research and has proven to be positively related to OFDI [3,4,18]. Market size expansion stimulates market demand, decreases marginal costs for foreign investors, and assists in achieving better economies of scale [19]. However, the significance of the market size as an OFDI location choice motivator has fallen in recent years. For example, Kolstad and Wiig [6] split a sample into OECD and non-OECD countries and found that Chinese OFDI was attracted only to larger non-OECD country markets, and Ramasamy et al. [10] found that except for state-owned enterprises affiliated with local governments (SOELGs), which were attracted to smaller rich economies, the OFDI in private firms and other state-owned firms was significantly and positively correlated with the market size of the host economies.

Given the confusion in previous studies, this paper tested the attraction of market size by hypothesizing that:

Hypothesis 1 (H1). *Chinese OFDI is attracted to countries with a large market size.*

The procurement of natural resources has been found to be a key motivator in vertical FDI activities that need scarce or cheaper resources for the downstream production chain. Some empirical Chinese OFDI studies have found that Chinese OFDI was motivated by growing demands for primary resources [3–6]; however, other studies have had conflicting results on the significance of natural resources as an OFDI pull factor. For example, Bhaumik and Co [20] concluded that although there was a positive relationship with OFDI, the coefficient for natural resources was too small to make much economic sense. Combinations of abundant natural resources and weak institutions seem to attract Chinese OFDI. For example, Kolstad and Wiig [6] found that in countries in poor institutions, Chinese investment was attracted by natural resources, but in countries with good institutions, Chinese investment was discouraged by natural resources. Therefore, this paper hypothesizes that:

Hypothesis 2 (H2). Chinese OFDI is attracted to countries that have a combination of abundant natural resources and small institutional distance.

This paper tested this hypothesis using the interaction between political stability and natural resource variables as the independent variable.

Cheap labor has been an important comparative advantage in China. Buckley et al. [3] found that efficiency-seeking FDI was unlikely in China due to China's comparatively low labor cost levels. However, as the Chinese demographic dividend is gradually decreasing, labor costs are expected to increase in the medium to long term. Therefore, this paper retained labor costs as an independent variable and hypothesized that:

Hypothesis 3 (H3). *Chinese OFDI is more inclined to seek a lower labor cost.*

2.2. Institutions and Industries

Institutional legitimacy is also required for investing firms to survive and succeed in challenging foreign environments [21]. Dunning and Lundan [22] proposed that it was necessary to incorporate institutional factors in an extension to the eclectic paradigm. Traditional FDI theory was established based on the developed country experiences, all of which had market-based institutions as the primary investment activity criteria. However, as developing countries generally lack formal market-based institutions and are characterized by significant government interference [23], Chinese multinational enterprises (MNEs) are generally more tolerant of weak institutional environments because they have developed within riskier economic and political environments [3,24]; therefore, the institutional distance between the home country and host country plays an important role in OFDI location choice; that is, the greater the level of institutional risk in the home country, the less sensitive to institutional risk the MNEs tend to be. Further, as different industries are driven by different motivations and attracted to different institutions in the host countries, this paper hypothesizes that:

Hypothesis 4 (H4). Chinese OFDI is attracted to countries that have a smaller institutional distance.

Hypothesis 5 (H5). Chinese industrial OFDI is influenced by different motivational and institutional factors.

3. Data and Methodology

Based on location choice theory and the hypotheses, the empirical specifications included the motivations, the institutions, and their interactions as the independent variables.

3.1. Dependent Variable and Descriptive Statistics

The dependent variable data: the Chinese total and industrial OFDI stocks in the host country data for each year from 2005–2016: were extracted from the Statistical Bulletin of Chinese Foreign Direct Investment, which was edited by the Ministry of Commerce of China, the National Bureau of Statistics of China, and the State Administration of Foreign Exchange.

The industrial distribution for the total Chinese OFDI stocks is presented in Table 1. The top five Chinese investment industries in the ASEAN countries were manufacturing, leasing and business services, wholesale and retail trade, mining, and finance, which respectively accounted for 15.30%, 13.55%, 13.28%, 11.11%, and 9.72% of total OFDI on average from 2007 to 2016. However, the finance industry OFDI, which accounted for 17.8% of total OFDI in 2007, had dropped to 6.4% by 2016. Despite media reports, the transportation industry also had a dramatic decline trend over this period. The ODFI industries that were gaining momentum were leasing and business services and real estate.

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	Distribution of Total OFDI Stock (%)										
Year -	Manu	Busi	Whol	Mini	Fina	Cons	Tran	Agri	Scie	Real	Info
2007	23.5	11.3	15.2	5.0	17.8	7.8	6.4	3.7	2.5	-	-
2008	17.5	13.4	10.9	6.7	6.9	7.6	9.3	3.0	1.9	0.4	0.5
2009	15.5	10.9	17.1	9.5	7.0	7.1	7.0	3.6	1.4	0.6	0.4
2010	13.3	8.2	13.1	12.8	12.3	8.1	5.9	3.7	2.1	0.8	0.1
2011	12.0	12.9	12.6	11.1	10.6	7.6	9.0	3.3	1.9	0.7	0.1
2012	11.9	12.0	12.6	14.3	9.1	7.9	7.4	3.5	1.6	0.6	0.4
2013	13.1	11.0	13.4	14.8	7.9	8.2	3.9	4.5	1.5	3.7	0.4
2014	12.9	14.4	12.4	12.7	12.3	7.0	3.1	5.1	1.4	2.4	0.3
2015	14.9	25.7	12.0	10.0	6.9	6.2	2.8	3.7	1.2	1.9	0.4
2016	18.4	15.7	13.5	14.2	6.4	6.4	2.5	4.4	1.0	2.8	0.8
Average	15.30	13.55	13.28	11.11	9.72	7.39	5.73	3.85	1.65	1.54	0.38

Table 1. China's OFDI industrial distribution, 2007–2016.

Manu = Manufacturing, Busi = Leasing and business services, Mini = Mining, Whol = Wholesale and retail trade, Fina = Finance, Cons = Construction, Agri = Agriculture, forestry, animal husbandry and fishery, Real = Real estate, Tran = Transportation, warehousing and postal services, Scie = Scientific research and technical services, Info = Information transmission, software and information services.

3.2. Independent Variables

When accounting for the different Chinese OFDI location choices in ASEAN countries by industry, this paper followed recent research directions and sorted the independent variables into three categories: motivational, institutional and control.

3.2.1. Motivational Variables

Traditional Dunning investment motivation theory informed the selection of the following motivational variables.

Previous literature has not had any definitive results on the market-seeking motivations of Chinese OFDI, probably because the industrial distribution of Chinese OFDI was not considered in previous studies [13]. Therefore, GDP (gdp), GDP growth (gdpg), and market openness (openness) were selected to reflect the host country's market conditions: GDP (gdp) captures the market size of the host country with adjusted PPP rates allowing the GDP of the different countries to be compared with a standard measure; GDP growth (gdpg) captures the market potential of the host country and was measured by the annual GDP growth rate at market prices based on the constant local currency; and market openness (openness) captures the openness level of the host country and was measured using the ratio of total exports and imports of goods and service over GDP. The data for these three variables were taken from the World Bank National Accounts data and the OECD National Accounts data.

Labor costs (*labor*) capture efficiency-seeking motivations and was measured by the pay level of the employee relative to employee productivity in the host country. The data for labor costs (*labor*) were collected from the Global Competitiveness Report.

Natural resources (*resource*) was used to identify the resource-seeking motivation and was measured by the ratio of fuels, ores and metal exports to the GDP of the host country. The natural resources (*resource*) data were taken from the World Bank National Accounts data.

3.2.2. Institutional Variables

This paper introduces three variables that capture different institutional dimensions to assess the role of institutions. Political stability measured the political stability and the absence of violence/terrorism in the host country and was taken to be positively correlated with quality: the higher the score, the more stable the political situation in the host country. The rule of law (*law*) measured the host country's legal system, with higher scores indicating a more perfect legal system; however, as it is the institutional distance between the host and home country that influences location choice [25],

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the political stability distance (*politicsdis*) and the rule of law distance (*lawdis*) were calculated and used in the estimations.

Trade facilitation (*facilitation*) was selected to evaluate the investment environment in the host country. Following [26] and [27], this paper chose eighteen secondary indicators and then used principal component analysis to calculate the ASEAN countries' trade facilitation index from 2005 to 2016, with the higher the score, the better the investment environment.

3.2.3. Control Variables

Several control variables [28,29] that were found to be important to OFDI location choice were added to the model, with the main control variables being exchange rate (*exchangerate*), inflation (*inflation*), unemployment (*unemployment*), and tax (*tax*). Although the empirical results on the relationship between exchange rates and OFDI is inconclusive, it is generally understood that host country currency appreciation lowers the expected nominal return in the home currency; therefore, the real exchange rate has been used to remove inflationary effects. Inflation (inflation) has been commonly used as a measure of macroeconomic stability in the host country. For example, Buckley et al. [3] and Amighini and Franco [13] found that inflation may have a positive and significant impact on FDI; however, other results on this variable have been mixed. Countries with high unemployment could indicate to foreign investors that the country's economy was in trouble, which could directly hinder foreign investment. Amighini and Franco [13] described the tax rate as a type of financial pressure and indicated that the expected symbol for this index could be negative. Therefore, this paper took the total tax rate for commercial profits (*tax*) as the measurement standard.

A detailed description of the variables is given in Table 2, and the summary statistics are provided in Table 3.

Variable	Description	Source
ofdi	Total Chinese and industrial OFDI stock, by region and economy	Statistical Bulletin of Chinese Foreign Direct Investment
ofdi_prim	Chinese OFDI to host country primary industry	Author's computations
ofdi_seco	Chinese OFDI to host country secondary industry	Author's computations
ofdi_tert	Chinese OFDI to host country tertiary industry	Author's computations
gdp	Host country GDP at purchasing power parity (PPP) (current international price)	World Bank National Accounts data
gdp_prim	Host country primary industry value added (% of GDP)	World Bank National Accounts data
gdp_seco	Host country secondary industry value added (% of GDP)	World Bank National Accounts data
gdp_tert	Host country tertiary industry value added (% of GDP)	World Bank National Accounts data
gdpg	Host country GDP growth (annual %), annual percentage growth rate of GDP at market prices based on a constant local currency	World Bank National Accounts data, and OECD National Accounts data files
openness	Trade (% of GDP), the sum of exports and imports of goods and services measured as a share of GDP	World Bank National Accounts data, and OECD National Accounts data files
labor	Pay and productivity, the pay level in the host country relative to employee productivity, [1 = not related to worker productivity- 7 = strongly related to worker productivity]	World Economic Forum, Global Competitiveness Report
resource	Fuel, ore and metal exports as a share of GDP	World Bank national accounts data
politicsdis	Distance of political stability and absence of violence/terrorism between home country and host country (percentile rank)	Worldwide Governance Indicators, author's computations
lawdis	Distance of the rule of law between home country	Worldwide Governance Indicators,

author's computations

and host country (percentile rank)

Table 2. Variable description and sources.

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Table 2. Cont.

Variable	Description	Source
facilitation	Host country trade and investment facilitation	Global Competitiveness Report, Global Information Technology Network Development Report and Corruption Perceptions Index
exchangerate	Change in real exchange rate	International Monetary Fund, World Bank National Accounts data, author's computations
inflation	Host country GDP deflator (annual %)	World Bank World Development Indicators
unemployment	Host country total (% of total labor force), share of the labor force without work but available for and seeking employment	International Labor Organization, ILOSTAT database
tax	Host country total tax rate (% of commercial profits)	World Bank, Doing Business project

Table 3. Summary statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
ofdi	120	248,203.5	465,949.9	190	3,200,000
agri	90	13.62264	10.03194	1.9143	31.3845
busi	100	47.75829	49.38087	4.4635	160.885
fina	100	26.06263	17.55891	4.54	58.7937
manu	100	44.68687	38.40705	9.3	131.497
whol	100	38.96174	29.02213	6.004	96.8975
mini	100	37.53252	30.51787	1.975	101.692
real	90	6.868633	6.925185	0.2445	19.8793
cons	100	21.13948	14.26261	3.081	45.0678
info	90	1.547133	1.743596	0.1764	6.0017
scie	100	4.17765	2.377753	0.9875	7.4361
tran	100	12.86224	6.179689	2.528	20.9815
ofdi_prim	100	103.3589	82.09525	14.356	278.2568
ofdi_seco	90	13.62264	10.03194	1.9143	31.3845
ofdi_tert	115	45.78026	10.77098	25.25113	70.75979
gdp	120	21891.62	28245.72	1754.17	91452.04
gdp_prim	120	36.57551	12.94652	17.51221	74.11302
gdp_seco	120	15.22155	11.38918	0.0309277	46.68724
gdp_tert	115	45.78026	10.77098	25.25113	70.75979
gdpg	120	5.564818	3.382741	-2.5258	15.2404
openness	120	2.908925	7.874405	0.167418	47.36
labor	103	4.699029	0.494578	3.7	5.7
resource	110	0.148053	0.171578	0.0001	0.6542
politicsdis	120	15.59488	26.36169	-22.8155	61.1374
lawdis	120	4.410939	28.66661	-61.6114	51.6746
facilitation	111	0.454801	0.121422	0.23	0.7698
interaction	120	3.114841	5.162064	-3.383539	19.46929
exchangerate	120	1.0113	10.98360	-0.2179	120.8260
inflation	120	4.787629	4.903804	-0.9002	24.9972
unmployment	120	2.745667	2.070641	0.16	8.06
Tax	113	31.75799	8.949009	8	49.1

Source: Author's computations.

3.3. Methodology

Unlike scenarios in which only a firm's OFDI motivations are considered as affecting location choice, this paper examined the effects that firm motivations, country institutions and macroeconomic characteristics collectively had on OFDI location choices in different industries, which were determined based on a dataset with 31 variables from 10 ASEAN host countries from 2005 to 2016.

As missing data for some important variables and listwise deletion could cause biased parameter estimates, the multiple imputation method was used to handle missing data. Derived using the Bayesian paradigm, multiple imputation has been found to be statistically valid from a randomization perspective. Estimation using multiple imputation has two steps: first, the imputations are generated under the chosen imputation model, then, the multiplied imputed data are analyzed using panel data regression. The basic estimation equation is as follows:

$$lnofdi_{i,t}^{j} = \alpha + \beta_{1}^{j} lngdp_{i,t} + \beta_{2}^{j} lnlabor_{i,t} + \beta_{3}^{j} resource_{i,t} + \beta_{4}^{j} politicsdis_{i,t} + \beta_{5}^{j} lawdis_{i,t} + \beta_{6}^{j} facilitation_{i,t} + \gamma_{i}^{j} control_{i,t} + \varepsilon_{i,t}^{j}$$

$$(1)$$

where i is the country, j is the total and industrial OFDI, and t is the year. To reduce the heteroscedasticity, the logarithmic forms for the non-ratio and non-negative variables were taken.

To test the significance of the market size in the OFDI location choice in the primary, secondary and tertiary industry sectors, the estimation equation was expressed as follows:

$$lnofdi_prim_{i,t}^{j} = \alpha + \beta_{1}^{j}lngdp_prim_{i,t} + \beta_{2}^{j}lngdp_{i,t} + \beta_{3}^{j}lnlabor_{i,t} + \beta_{4}^{j}resource_{i,t} + \beta_{5}^{j}politicsdis_{i,t} + \beta_{6}^{j}lawdis_{i,t} + \beta_{7}^{j}facilitation_{i,t} + \gamma_{i}^{j}control_{i,t} + \varepsilon_{i,t}^{j}$$

$$(2)$$

$$lnofdi_seco_{i,t}^{j} = \alpha + \beta_{1}^{j}lngdp_seco_{i,t} + \beta_{2}^{j}lngdp_{i,t} + \beta_{3}^{j}lnlabor_{i,t} + \beta_{4}^{j}resource_{i,t} + \beta_{5}^{j}politicsdis_{i,t} + \beta_{6}^{j}lawdis_{i,t} + \beta_{7}^{j}facilitation_{i,t} + \gamma_{i}^{j}control_{i,t} + \varepsilon_{i,t}^{j}$$

$$(3)$$

$$lnofdi_tert_{i,t}^{j} = \alpha + \beta_{1}^{j}lngdp_tert_{i,t} + \beta_{2}^{j}lngdp_{i,t} + \beta_{3}^{j}lnlabor_{i,t} + \beta_{4}^{j}resource_{i,t} + \beta_{5}^{j}politicsdis_{i,t} + \beta_{6}^{j}lawdis_{i,t} + \beta_{7}^{j}facilitation_{i,t} + \gamma_{i}^{j}control_{i,t} + \varepsilon_{i,t}^{j}$$

$$(4)$$

4. Results of Analysis and Discussion

4.1. Basic Mode Estimation Results

The estimation results for the basic model for eleven industries and the primary, secondary and tertiary industry sectors are shown in Tables 4 and 5.

In Table 4, the first column of the table shows the model estimation results with total OFDI as the dependent variable, and in the other columns, the total OFDI is divided into the 11 industrial OFDIs: agriculture (agri), leasing and business (busi), finance (fina), manufacturing (manu), wholesale and retail (whol), mining (mini), real estate (real), construction (cons), information (info), scientific research (scie), and transportation (tran).

The motivational variables, which were statistically significantly correlated for Chinese OFDI in previous studies, were not found to significantly affect the total or industrial Chinese OFDI in ASEAN countries. The most significant motivational variable was found to be GDP (*lngdp*), with *lngdp* being statistically positive at the 1% level in all models, which supported the strong Chinese OFDI seeking motivation found in previous studies [3,30]. In other words, Chinese OFDI was attracted to countries that had larger market sizes. *Lnlabor* had a negative relationship with OFDI in the agriculture, manufacturing, wholesale, mining, construction, and information industries, which indicated that lower labor costs could attract greater OFDI to these industries. In recent years, because of China's rapidly aging population, the population benefit of ASEAN countries could be exploited; that is, the comparative advantage of cheaper labor costs in ASEAN countries could reduce production costs in Chinese OFDI firms. Business, finance, real estate, science, and transportation industries, all of which belong to the service/tertiary industry were not found to be sensitive to labor costs, possibly because demand for labor in the service industry was relatively higher than in other industries.

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Table 4. Basic model panel regression results for the total OFDI and the eleven industries.

Sample (Model) Variable	lnofdi	agri	busi	fina	manu	whol
1 1	3.5827 ***	3.9943 ***	5.7639 ***	3.0533 ***	4.2174 ***	3.8169 ***
lngdp	(0.4050)	(0.3540)	(0.3981)	(0.4190)	(0.2326)	(0.3194)
1 1 1	-1.5052*	-1.4127 **	,	` ,	-1.3173 ***	-1.5677 **
lnlabor	(0.8784)	(0.6940)			(0.4839)	(0.6644)
resource						
politicsdis						
lawdis	-0.0276 ***			0.0212 **		
	(0.0087)			(0.0094)		
facilitation	3.3603 **	2.4498 **				
juestimien	(1.4876)	(1.1418)	4 5540 44			
exchangerate			1.5548 **			
_			(0.6330)			
inflation		0.1246 *	0.1050 **		0.1872 ***	
unemployment		(0.1312)	0.1850 ** (.0792)			
	-0.0786 ***	-0.0412 ***	-0.0529 ***	-0.0423 ***	(0463) -0.0370 ***	-0.0421 ***
tax	(.0153)			(0.0110)		(.0084)
	-80.4155 ***	(0.0088) -101.2277	(0.0105) -145.6212	-76.7542 ***	(0.061) -105.3151	-94.5273 **
_cons	(10.5520)	*** (9.4116)	*** (10.5069)	(1.058)	*** (6.1393)	(8.4294)
N	103	79	87	87	(0.13 <i>)</i> 3) 87	87
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Within R-sq	0.9288	0.9383	0.9333	0.8705	0.9606	0.9337
-						
Sample (model) variable	mini	real	cons	info	scie	tran
,	4.4505 ***	6.8493 ***	3.6328 ***	5.2351 ***	3.0608 ***	2.4345 ***
lngdp	(.5469)	(0.8108)	(0.3189)	(0.7641)	(.3064)	(0.4869)
	-2.6097 **	(0.0100)	-1.5111 **	-2.9567 *	(.5001)	(0.100))
lnlabor	(1.1377)		(0.6633)	(1.4981)		
resource	()		(0.0000)	()		
maliticadia					0.0095 *	
politicsdis					(0.0057)	
lawdis						
facilitation	4.2348 ** (1.8747)		2.1324 *	4.5293 *		
exchangerate	(1.0/4/)		(1.0930)	(2.4648)		
inflation						
injuiton				.4700 ***		
unemployment				(.1603)		
	-0.0585 ***	-0.0713 ***	-0.0446 ***	(.1003)	-0.0433 ***	-0.0368 ***
tax	(.0144)	(.0203)	(.0084)		(.0081)	(.0128)
	-111.0138	-175.6907	-90.8882 ***	-136.8798	-77.9690 ***	-59.6412 **
_cons	*** (14.4344)	*** (21.5589)	(8.8461)	*** (20.3169)	(8.0858)	(12.8487)
N	87	79	87	79	87	87
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.8926	0.8790	0.9309	0.8024	0.9089	0.7009

Standard errors in parentheses. * Indicates significance at the 10% level. ** Indicates significance at the 5% level. *** Indicates significance at the 1% level.

Table 5. Basic model panel regression results for the primary, secondary and tertiary industry sectors.

Sample (Model) Variable	lnofdi_prim	lnofdi_seco	lnofdi_tert
lngdp_prim	0.1000 *** (0.0338)		
lngdp_seco		-0.0441 *** (0.0127)	
lngdp_tert			0.0307 *** (0.0115)
lngdp	5.0416 *** (0.4765)	4.1509 *** (0.2624)	3.9480 *** (0.2847)
lnlabor	-1.2831 * (0.6729)	-1.0552 * (0.5758)	, ,
resource politicsdis	, ,	,	
lawdis			0125 ** (0.9446)
facilitation		-1.6090 * (0.5219)	
exchangerate inflation		, ,	
unemployment	0.1993 *** (0.0740)		
tax	-0.0381 *** (0.0085)	-0.0354 *** (0.0074)	-0.0371 *** (0.0073)
_cons	-130.2317 *** (132.9081)	-102.1936 *** (6.9354)	-99.1968 *** (7.4911)
N	76	84	77
Prob>F	0.0000	0.0000	0.0000
Within R-sq	0.8947	0.9296	09081

Standard errors in parentheses. * Indicates significance at the 10% level. ** Indicates significance at the 5% level. *** Indicates significance at the 1% level.

For the institutional variables, *politicsdis* was found to be statistically insignificant, indicating that the political stability distance between the host and home countries did not affect OFDI. *Lawdis* was found to be statistically significantly correlated with OFDI in the finance industry, indicating that the smaller the legal distance between host and home countries, the greater the OFDI flows into the finance industry. *Facilitation* was found to be a more significant variable and had a positive relationship with OFDI, indicating that increasing the host country facilitation could attract greater OFDI in the agricultural, mining, construction, and information industries.

Tax was the most significant variable for the macroeconomic variables and was found to have a negative relationship with OFDI, indicating that lower taxes in host countries could attract greater Chinese OFDI. A change in the real exchange rate in the host countries was found to have a positive relationship with OFDI for business, indicating that currency appreciation in the ASEAN countries could attract greater Chinese OFDI, which was consistent with the findings in [31] study based on imperfect capital markets theory, which found that in countries with a lower internal cost of capital, an appreciation in the host country currency leads to an increase in the foreign firms' wealth and provides them with greater access to low-cost funds.

There were differences in the estimation results for total OFDI and industrial OFDI models. Market-seeking and efficiency-seeking were found to be the most significant motivational factors for Chinese OFDI in ASEAN countries, and tax was the most significant macroeconomic factor affecting location choice for Chinese OFDI activities. The effects of the institutional factors were heterogeneous for the different industrial OFDI.

Table 5 shows the results for the model for the primary, secondary and tertiary industry sectors, from which it can be seen that the GDP in each industry had a significant relationship with OFDI; the larger the primary and tertiary industries, the greater the OFDI flow. *lngdp*, *lnlabor*, and *tax* were observed to have the same effect as in the basic model.

4.2. Robustness Checks

Alternative variables were chosen for the robustness checks. The *lngdp* was substituted with *gdpg* and *openness*, which measured the market potential and the openness levels in the host country, and interaction (the interaction between *politicsdis* and *resource*) was introduced into the extended model.

The endogeneity problem was also considered in the robustness checks. Not only do the independent variables affect Chinese OFDI investment, but they are also changed by the Chinese OFDI inflows. As OFDI inflows in the current period have no impact on the independent variables in the previous period, the new model included a one period lag for all independent variables. The extended models were as follows:

$$lnofdi_{i,t}^{j} = \alpha + \beta_{1}^{j} gdpg_{i,t-1} + \beta_{2}^{j} openness_{i,t-1} + \beta_{3}^{j} lnlabor_{i,t-1}$$

$$+ \beta_{4}^{j} interaction_{i,t-1} + \beta_{5}^{j} lawdis_{i,t-1}$$

$$+ \beta_{6}^{j} facilitation_{i,t-1} + \gamma_{i}^{j} control_{i,t-1} + \varepsilon_{i,t}^{j}$$

$$(5)$$

$$lnofdi_prim_{i,t}^{j} = \alpha + \beta_{1}^{j}lngdp_prim_{i,t-1} + \beta_{2}^{j}gdpg_{i,t-1} + \beta_{3}^{j}openness_{i,t-1}$$

$$+ \beta_{4}^{j}lnlabor_{i,t-1} + \beta_{5}^{j}interaction_{i,t-1} + \beta_{6}^{j}lawdis_{i,t-1}$$

$$+ \beta_{7}^{j}facilitation_{i,t-1} + \gamma_{i}^{j}control_{i,t-1} + \varepsilon_{i,t}^{j}$$

$$(6)$$

$$lnofdi_seco^{j}_{i,t} = \alpha + \beta^{j}_{1}lngdp_seco_{i,t-1} + \beta^{j}_{2}gdpg_{i,t-1} + \beta^{j}_{3}openness_{i,t-1} + \beta^{j}_{4}lnlabor_{i,t-1} + \beta^{j}_{5}interaction_{i,t-1} + \beta^{j}_{6}lawdis_{i,t-1} + \beta^{j}_{7}facilitation_{i,t-1} + \gamma^{j}_{i}control_{i,t-1} + \varepsilon^{j}_{i,t}$$

$$(7)$$

$$lnofdi_tert_{i,t}^{j} = \alpha + \beta_{1}^{j}lngdp_tert_{i,t-1} + \beta_{2}^{j}gdpg_{i,t-1} + \beta_{3}^{j}openness_{i,t-1} + \beta_{4}^{j}lnlabor_{i,t-1} + \beta_{5}^{j}interaction_{i,t-1} + \beta_{6}^{j}lawdis_{i,t-1} + \beta_{7}^{j}facilitation_{i,t-1} + \gamma_{i}^{j}control_{i,t-1} + \varepsilon_{i,t}^{j}$$

$$(8)$$

Tables 6 and 7 show the robustness checks with the substituted variables and interaction variable to test the reliability of the previous results, from which it was found that *Inlabor*, *facilitation*, and *tax* were also statistically correlated with industrial OFDI, *gdpg* and *openness* were statistically insignificant, with Chinese OFDI only being affected by the host country GDP, and *inflation* was statistically significantly correlated with OFDI in four industries, but the coefficient was small.

Table 6. Extended model panel regression results for total OFDI and the eleven industries from the robustness checks.

Sample (Model) Variable	lnofdi	agri	busi	fina	manu	whol
gdpg openness						
lnlabor	-2.8602 ** (1.2432)	-3.4519 *** (1.2806)	-3.7789 ** (1.7115)	-2.1197 * (1.2100)	-3.1142 ** (1.2336)	-2.9637 ** (1.2061)
Interaction						
lawdis	0429 *** (0.0111)					
facilitation	13.4995 *** (1.3644)	11.3188 *** (1.5569)	13.6354 *** (1.9467)	9.5492 *** (1.3763)	10.6985 *** (1.4031)	10.7456 *** (1.3717)
exchangerate	, ,	, ,	` ,	,	,	,
inflation		0.0369 ** (.0165)		-0.0300 * (0.0158)		0.0371 ** (0.0158)
unemployment		, ,		, ,		, ,
tax	-0.0531 *** (0.0162)	-0.0442 ** (0.0185)		-0.0352 ** (0.0167)		-0.0350 ** (0.0166)
_cons	12.0993 *** (1.8091)	4.1474 ** (1.9358)		3.2714 * (1.7702)	4.4137 ** (1.8047)	4.6292 ** (1.7644)

Table 6. Cont.

Sample (Model) Variable	lnofdi	agri	busi	fina	manu	whol
N	103	79	87	87	87	70
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Within R-sq	0.8618	0.7934	0.7287	0.7625	0.7564	0.7919
Sample (model) variable	mini	real	cons	info	scie	tran
gdpg				1185 *** (0.0394)		
openness						
lnlabor	-4.0049 **	-4.2617 ***	-2.9228 **	-4.8304 ***	-2.2623 **	
	(1.6195)	(1.3846)	(1.1678)	(1.8958)	(1.0463)	
Interaction lawdis						
facilitation	15.1248 ***	8.7727 ***	11.0411***	17.6321 ***	8.4791 ***	6.4685 **
facilitation	(1.8419)	(1.9153)	(1.3281)	(2.3048)	(1.1899)	(1.3618)
exchangerate						
inflation		-0.0091 * (0.0192)				
unemployment		0.2171 * (0.1219)			-0.1671 * (0.0951)	-0.1967 (0.1089)
	-0.0526 **	-0.0453 **	-0.0376 **		-0.0356 **	-0.0299
tax	(0.0223)	(0.0176)	(0.0161)		(0.0144)	(0.0165)
	4.7774 **	-26.2509 ***	-3.7594 **		(0.0111)	3.7710 **
_cons	(2.3692)	(4.3658)	(0.0161)			(1.7517)
N	87	70	87	79	87	87
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Within R-sq	0.7928	0.7220	0.7961	0.6888	0.7663	0.6020

Standard errors in parentheses. * Indicates significance at the 10% level. ** Indicates significance at the 5% level. *** Indicates significance at the 1% level.

Table 7. Extended model panel regression results for the primary, secondary, and tertiary industry sectors from the robustness checks.

Sample (Model) Variable	lnofdi_prim	lnofdi_seco	lnofdi_ter
lngdp_prim			
lngdp_seco		-2.4071 ** (1.1767)	
lngdp_tert			
gdpg			
openness			
lnlabor	-3.4768 **	-2.5524 *	-2.8718 *
intuoor	(1.5940)	(1.4595)	(1.5016)
interaction			
lawdis			
facilitation	10.9239 ***	10.4446 ***	10.0621 **
juctitution	(1.6925)	(1.5354)	(1.5297)
exchangerate			
inflation			
unemployment			
tax	-0.0395 *		-0.0310 *
<i>tux</i>	(0.0200)		(0.0182)
_cons	4.6326 ***	12.9379 *	2.2523 ***
_	(2.6469)	(14.5007)	(4.4663)
N	78	86	79
Prob>F	0.0000	0.0000	0.0000
Within R-sq	0.7892	0.8117	0.7781

Standard errors in parentheses. * Indicates significance at the 10% level. ** Indicates significance at the 5% level. *** Indicates significance at the 1% level.

5. Conclusions

This paper investigated the location choice of Chinese industrial OFDI in ASEAN countries from 2005–2016, the results from which make several important contributions to theory and practice. First, as this paper studied Chinese OFDI location choice from an industry perspective rather than focusing on gross items, some useful insights were gained. The results of the empirical study found that motivations and especially institutional factors were different for the total and industrial OFDI. Using industrial OFDI, the data revealed the specific relationships between the independent variables and each industrial OFDI, which are often hidden when only using total OFDI data. Unlike previous studies, this paper found that labor cost was an important motivating factor in the primary and secondary industry sectors and that resource-seeking was not a motivator for Chinese OFDI in ASEAN countries. Facilitation in the business environment in host countries was found to have positive and significant effects on location choice in the agricultural, mining, construction, and information industries.

Second, the results from this study provide useful decision information for both governments and investors. For the investors, OFDI can be made more accurately by understanding the positive and negative factors. For countries, the ASEAN economies could improve their business environments to attract a greater share of OFDI by, for example, improving international investment facilitation and developing preferential tax reduction or tax preference policies. By allowing investors to make choices and providing a favorable business environment in the host countries, Chinese OFDI efficiency could be improved, which could assist in meeting the aims of the OBOR initiative.

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