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Regional Characteristics and Foreign Direct Investment Location Choice: Evidence from Indonesia

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地域特性と外国直接投資立地の選択
― インドネシアに関する分析 ―

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Abstract

Using extensive and unique provincial-level data, this study investigated the impact of regional characteristics on foreign direct investment (FDI) location selection. The role of FDI in the economic growth of each country has been widely discussed in prior studies. Therefore, it is not surprising that all countries, especially developing countries, compete to attract FDI. As a result, FDI is not evenly distributed among countries or among provinces in the same country. This study adopted a discrete choice model to empirically investigate 3,670 cases of Japanese FDI projects located in 25 Indonesian provinces during the period of 2005-2014. It was found that market size, infrastructure, labour cost and the presence of previous FDI had a significant effect on increasing the probability that a province would be chosen. However, education, which was used as a proxy for labour quality, had a positive impact only in the tertiary sector. Moreover, the geographical location as a control variable confirmed that province location, either on the island of Java or outside of Java, matters for investor selection decisions. Although the findings of this study are mostly consistent with the results of prior studies, further studies can be conducted to expand this research.

Key Words : FDI, location choice, regional characteristics, Indonesia

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1. Introduction

Over the past few years, economic partnerships between Indonesia and other countries have strengthened and have developed rapidly. In contrast to other Asian countries, Japan has become one of the largest investors in Indonesia's economy. According to the Indonesian Investment Coordinating Board (BKPM), both the number of projects and the value of Japanese FDI in Indonesia have significantly increased. In 2000, there were 33 FDI projects, with an investment value of approximately US$0.3 million. As of 2018, the number of projects has increased almost a hundredfold to 3,166, with an estimated investment value of US$4.9 billion. The level of FDI fluctuations is more prevalent in the value of the investment, while the number of projects shows an increasing trend. However, FDI has not been evenly distributed among Indonesian provinces.

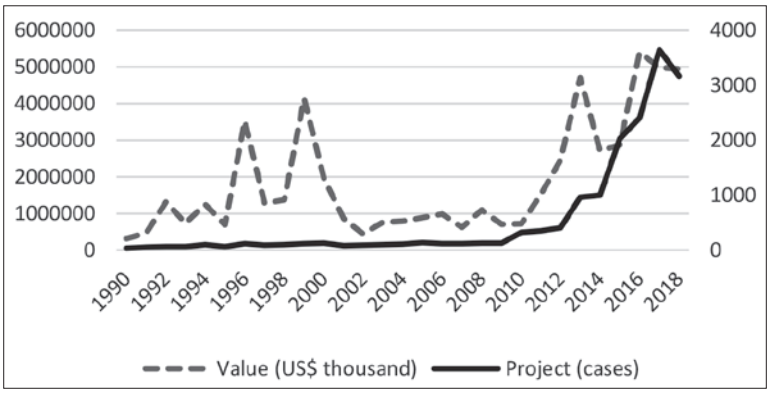

Figure 1. Japanese FDI in Indonesia (1990-2018)
Source: Indonesian Investment Coordinating Board website

Previous theories have explained why firms provide FDI and where firms should locate their FDI. Some previous empirical studies have revealed that the distribution of FDI is largely affected by home firm characteristics factors and host country factors such as economic factors, institutions, or agglomeration (Nielsen et al, 2017). A large number of studies have examined FDI in Indonesia; however, there are few studies on foreign investors' location decisions at the province level, particularly studies that use disaggregate discrete choice analysis. Therefore, by using provincial data obtained from the Indonesian Central Bureau of Statistics (BPS) and BKPM, this study intends to empirically analyse the factors that attract Multinational Enterprises (MNEs) to invest in certain Indonesian provinces. One research question is "are regional characteristics the main determinants for MNEs in choosing their FDI location in Indonesia?. The results show that the market size, labour cost, infrastructure, and agglomeration of previous FDI had a significant effect on increasing the probability that a province would be chosen. However, labour quality had a negative impact on Japanese FDI in the tertiary sector, which is inconsistent with its expected sign.

The findings of this study contribute to the literature. First, this study complements previous studies concerning the effects of regional characteristics on the FDI location choice. Unlike a large

number of previous studies that use data on China (Wakasugi, 2005; Bellkhodja and Mohiuddin, 2017), this study uses a panel dataset for Indonesia's provinces, which are used as the research sample. The choice of Indonesia is motivated by the fact that Indonesia is one of the largest democracies among developing countries, covers a vast geographical area, and has rich natural resources. Second, this study provides new evidence for the determinants of foreign investors' location choice by considering the characteristics of Indonesia's provinces. In addition, this study builds on previous studies on the determinants of FDI inflow in Indonesia by using discrete choice analysis through introducing the quantitative indicators of market size, labour quality, labour cost and the previous FDI as other potential determinants of FDI location choice at the provincial level.

The rest of this study is organized as follows. Section 2 briefly discusses several relevant studies. Section 3 explains the spatial distribution of FDI in Indonesia. Section 4 describes the model specifications and data used in this study. Section 5 presents and discusses the empirical results. Finally, section 6 presents the conclusions of this study.

2. Literature Review

Some theoretical explanations have been put forward in the Literature to interpret the empirical phenomenon of FDI in the literature concerning a diverse array of topics, such as international trade, urban and labour economics, strategic management, economic geography, and international business[i]. Dunning (1977) developed the comprehensive Ownership, Location, Internalisation (OLI) paradigm by considering the FDI determinants associated with location dimensions such as infrastructure, human capital, economic stability and production cost. Moreover, an alternative analytical framework led to the development of a new theory on trade that considers the advantages of ownership, location and technology and factor endowment. This new theory extends Dunning's eclectic paradigm to correlate OLI with technology and a country's characteristics in a coherent manner (Markusen, 2002).

A large number of studies on FDI location selection have emphasized the role of regional characteristics, such as infrastructure (Kang & Lee, 2007), demand factors (Belderbos & Carree, 2002), supply factors (Cheng & Kwan, 2000), policy incentives (Coughlin & Segev, 2000; Zhou et al., 2002) and agglomeration (Head & Mayer, 2004; Chang et al., 2011). Some studies have examined the characteristics that attract FDI to the United States (Head et al., 1995), to countries and regions within the European Union (Billington, 1999; Cieslik, 2005), to the Asian region (Kang & Jiang, 2012; Fitriandi et al., 2014), and to regions and cities within China (Cheng & Stough, 2006; Sharma et al., 2014).

In terms of the studies that focus on Japanese FDI, Urata & Kawai (2000) discuss the importance of low-wage labour, a well-developed infrastructure, good governance, and the presence of sizable local markets for FDI location choice. Moreover, Head and Mayer (2004) show that Japanese MNEs tend to be concentrated in industries and regions that have strong business group ties in order to reduce entry and operating costs. Furthermore, Chang et al. (2011) reveal that less-productive

Japanese firms tend to choose locations close to larger agglomerations of other Japanese firms. In addition, Lee & Hwang (2016) show that the location choice of Japanese manufacturing investors demonstrates different patterns of finding locations based on the technology level of industries. In the case of the low-tech industries, the location pattern followed the previous pattern of foreign agglomeration, whereas in the high-tech industries, the location pattern followed both domestic and foreign agglomeration Patterns.

Only a few studies, however, have focused on the important role of the empirical investigation of FDI's spatial distribution across provinces in Indonesia. One study by Deichmann et al. (2005) examines the aggregate and sector factors that influence the location choice made at the firm level. Using survey data on industries, they estimate a location choice model to illustrate the potential effects of transport improvements on the relocation of firms, particularly in the lagging eastern part of Indonesia. They also simulate the effects of upgrading the road density in peripheral eastern Indonesia to a level similar to the level of the country's major agglomeration areas. The findings show that improvements in transport infrastructure have only limited effects in attracting industry to secondary industrial centres outside of Java, especially in the sectors that are already established in leading regions. Fitriandi et al. (2014) examine the infrastructure development and FDI in Indonesian provinces. Using ordinary least squares (OLS) and random effects models on the panel data of 30 Indonesian provinces over the period of 2000-2009, they find that provinces with a well-developed physical infrastructure attract more FDI projects.

As mentioned above, there are a limited number of studies on the FDI location choice in Indonesia. Therefore, this study intends to fill this the gap and build on the previous studies (Deichmann et al., 2005; Fitriandi et al., 2014) that focused on infrastructure as a determinant of FDI location choice in Indonesia by introducing other regional characteristics as alternative potential determinants of FDI and applying a discrete choice analysis.

3. Spatial Distribution of FDI in Indonesia

Regarding the distribution of the FDI location, most FDI projects from 2005-2014 were concentrated in the provinces on the island of Java . On Java, FDI is distributed in the provinces of West Java and Jakarta; outside of Java, FDI is generally distributed in the Bali, Nusa Tenggara, and Sumatra provinces. Approximately 88% of Japanese FDI projects are concentrated on Java, and only 12% are located outside of Java. The distribution map in Figure 2 shows the locations of Japanese FDI in 2005 and 2014, reflecting that the number of the projects increased from 140 to 2,020 cases, respectively. According to BKPM (2018), the FDI projects flowed primarily to the manufacturing sector (63.5%), followed by the services (34.0%), and primary sectors (2.5%).

The trend of the world and Japanese FDI inflows to Indonesia are displayed in Table 1. From 2005 to 2007, most Japanese FDI inflows occurred in the secondary sector, with a total of 215 projects (58.27%) and an investment value of US$6,796 million (93.61%). FDI in the tertiary sector amounted to only US$336 million (4.63%) from 145 projects, while the primary sector had only 9 projects

valued at US$126 million (1.74%). Moreover, in 2008-2009 shows a significant decline in the value of the investments but an increase in the number of projects. The number of projects continued to increase in the period of 2010-2014, to approximately 1,641 projects (60.24%) valued at US$10,42 million (91.47%) almost five times the level of investments in 2008-2009.

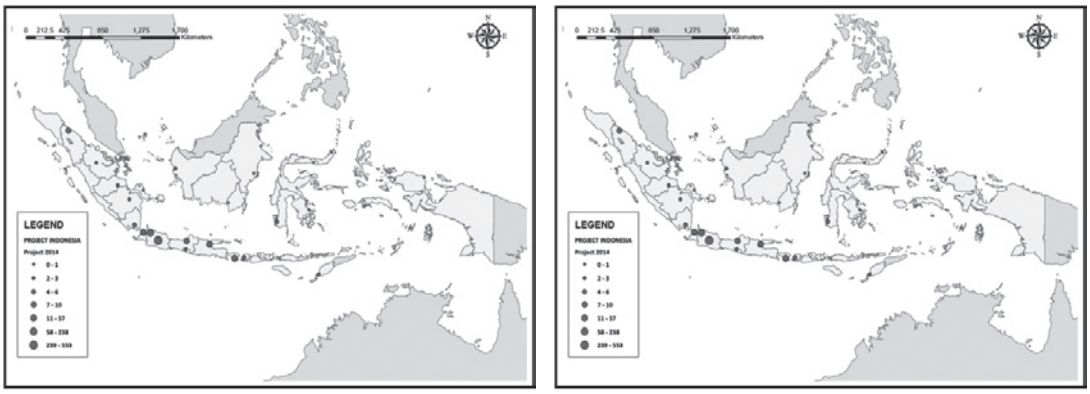

Figure 2. Distribution of Japanese FDI in 2005 and 2014
Source: Author's illustration

This increase suggests that the secondary sector (i.e. manufacturing) is highly competitive in Indonesia. Indonesia's manufacturing sector, which is generally characterized as labour intensive with low labour costs (the average wage of Indonesia is US$5,027), successfully compete against the manufacturing sectors of other countries that have higher labour costs, such as China (US$10.520), Thailand (US$7,846), and Malaysia (US$7,210) (JETRO, 2018).

Table 1. Trends of World and Japanese FDI in Indonesia by Sectors

	2005-2007				2008-2009				2010-2014			
	World		Japan		World		Japan		World		Japan	
Projects (cases)												
Primary	148	(5.24)	9	(2.44)	538	(9.85)	18	(3.12)	3,748	(14.04)	60	(2.20)
Secondary	1,128	(39.93)	215	(58.27)	2,072	(37.95)	383	(66.38)	9,487	(35.55)	1,641	(60.24)
Tertiary	1,549	(54.83)	145	(39.30)	2,850	(52.20)	176	(30.50)	13,455	(50.41)	1,023	(37.55)
Total	2,825	(100)	369	(100)	5,460	(100)	577	(100)	26,690	(100)	2,724	(100)
Value (US$ million)												
Primary	1,599	(6.27)	126	(1.74)	3,884	(8.38)	17	(0.67)	24,279	(24.00)	111	(0.97)
Secondary	11,912	(46.72)	6,796	(93.61)	13,867	(29.92)	2,234	(88.65)	47,408	(46.87)	10,418	(91.47)
Tertiary	11,982	(47.00)	336	(4.63)	28,596	(61.70)	268	(10.63)	29,466	(29.13)	860	(7.55)
Total	25,494	(100)	7,260	(100)	46,347	(100)	2520	(100)	101,154	(100)	11,390	(100)

Source: Indonesian Investment Coordinating Board website

4. Methodology

4.1 Conditional Logit Model

Depending on the properties of the dataset, various modelling approaches and econometric procedures have been used for studying FDI location determinants. In previous empirical studies on FDI; the OLS, Logit, Tobit, Poisson and Negative Binomial models have been extensively employed. One of the discrete choice models that has been widely used (Urata & Kawai, 2000; Belderbos & Carree, 2002; Cheng & Stough, 2006; Lee & Hwang, 2016) is the conditional logit model (CLM), which was developed by McFadden (1974). According to Bresslein et al. (2019), the main advantage of CLM is that it considers the individual investor choice as an outcome rather than the total number of investment choices per region. Following previous studies, it is assumed that a rational investor *i* selects province *j* for their new investment based only on the fact that this province will maximize the profits. The estimated profits of foreign investors *i* in province *j* can be expressed as follows:

$$\pi_{ij} = \mathrm{X}_{ij}\beta_i + \varepsilon_{ij} \quad \cdots\cdots (1)$$

where X_{ij} refers to the vector of observable location characteristics of province *j*, β is the vector of the estimated coefficients, and ε is the disturbance term that represents the unobserved characteristics of each alternative. Therefore, province *j* is selected by a foreign investor *i* if and only if:

$$\pi_{ij} > \pi_{is}\,, for\ j \neq s \quad \cdots\cdots (2)$$

The stochastic nature of the profit function implies that the probability that location *j* is selected by the investor *i* equals:

$$P_{ij} = \mathrm{Prob}\left(\pi_{ij} > \pi_{is}\right), for\ j \neq s \quad \cdots\cdots (3)$$

It is assumed that the *i*th investor will choose province j if $\pi_{ij} > \pi_{is}$ for all *s*, where *s* is an index of all the possible location choices of the *i*th investor. The probability of investor *i* choosing to select a particular province *j* out of *s* potential provinces can be mathematically expressed as follows:

$$\mathrm{P(ij)} = \frac{\exp\left(X_{ij}\beta_i\right)}{\sum_{s=1}^{s} \exp\ \left(X_{is}\beta_i\right)} \quad \cdots\cdots (4)$$

The implementation of the CLM model with a large set of spatial alternatives is very complicated[ii]. First, the independent and identically distributed (IID) unobserved utility ε implies that the model has an important property called independence from irrelevant alternatives (IIA). Consequently, the ratio of the logit probabilities for any two alternatives *j* and *s* does not depend on any alternatives other than *j* and *s*. Therefore, for any investor, the probability ratio of any two alternatives depends only on the attributes of the two alternatives and is independent of other available alternatives. Second, the independent variables of the CLM should capture all of the observable characteristics,

thus making the disturbance terms ε independent across individuals and choices, which means that all locations are symmetric substitutes after controlling for the observable characteristics. To solve this problem, following previous studies, first, a geographical location dummy variable is included to control for similar unobserved location characteristics (Coughlin & Segev, 2000; Cheng, 2008). Second, the attributes of the two alternatives are assumed to be independent in the eyes of investors (Long & Freese, 2006) [iii].

4.2 Data and Variables Construction

This study primarily focuses on Japanese FDI and its location preference by focusing on Indonesia to eliminate the country effect. All data are at the province level, which is the unit of analysis. The sample for the estimation consists of 3,670 (as the number of ID projects) cases of Japanese FDI projects in Indonesian provinces over the 10-year period of 2005-2014, with a total of 91,750 observations. Because the CLM requires that all choices be selected at least once (Head et al., 1995; Cheng, 2008), several provinces that did not receive Japanese investment were removed from the choice set [iv]. The choice set was further reduced by removing North Kalimantan, which was separated from East Kalimantan in 2012. The empirical analysis involved FDI projects in a total of 25 Indonesian provinces.

The dependent variable (chosen) used in this study is a binary choice, which was measured by the presence of a Japanese FDI project in a province. The value of this variable is one if the investors choose to invest in the province and is zero otherwise. The data on Japanese FDI projects in each province were obtained from the BKPM website. According to this dataset, during the period of analysis, 3,232 projects were located in the provinces on Java island, and 438 projects were located in other provinces.

The independent variables were selected based on the previous literature as discussed above. One of the most important location determinants of FDI is the market size (GRDP), which is expected to have a positive sign because when the economic size of a province is larger, it is more likely to attract FDI. Following previous studies (Coughlin & Segev, 2000; Belderbos & Carree, 2002), this study assumes that market size matters for attracting FDI into a province and measures market size as the natural logarithm of the gross regional domestic product (lnGRDP). Two variables are used as proxies for the labour cost. The first proxy is wages (lnWAGE), which are measured as the natural logarithm of the minimum wage of each province. The second proxy used is the natural logarithm of the gross regional domestic product per capita (LnGRDPP). The signs of both variables are expected to be negative.

Roads, seaports, and airports are used as proxies for the availability and quality of the provinces' infrastructure. Roads are measured as the natural logarithm of the total length of roads, while seaports and airports are measured as one if the province has a container seaport or commercial airports, and is zero otherwise. The coefficient of the estimated proxies for all types of infrastructure are expected to be positive because a well-developed transportation infrastructure reduces the

costs of importing components or distributing firm output (Deichmann et al., 2005; Fitriandi et al., 2014). Secondary education is used as a proxy of labour quality which is measured by the enrolment index for those aged 16-18 years. Higher education implies higher skills which foreign investors are seeking. This value is expected to have a positive sign.

Following Urata (2015), the number of cumulative previous Japanese FDI projects (CFDI) in each province was used as an indicator of the agglomeration of Japanese firms. This association is expected to be positive because firms tend to invest in provinces where firms from the same country agglomerate (Chang et al., 2011; Hayakawa & Tsubota, 2014). Furthermore, a geographical location dummy variable that represents the projects located on Java or outside of Java was added[v]. The main purpose of the introduction of this geographic dummy is to reduce the likelihood that the IIA assumption will be violated (Head et al., 1999; Cheng, 2008). The sign of this variable is uncertain because of the nature of the unobservable regional attributes. All the data for the independent variables were obtained from BPS unpublished data with various sources. A detailed description of the variables and their expected signs is provided in Table 2.

Table 2. Variable Description and Expected Sign

Variables	Description	Detail	Expected Sign
Dependent variable			
Chosen (Y)	The presence of a Japanese FDI project in a province	If the province is chosen =1, otherwise=0	
Independent variables			
Market Size			
LnGRDP	Gross regional domestic product per province (billion IDR)	Natural log of GRDP at 2000 constant market prices	Positive
Agglomeration			
CFDI	The number of FDI projects per provinces (cases)	Cumulative number of Japanese FDI cases (t-1) per province	Positive
Labour Quality			
Education	Secondary school enrolment rate of those aged 16-18 years (%)	School enrolment rate of those aged 16-18 years	Positive
Labour Cost			
LnWage	Minimum wage per month by province (thousand IDR)	Natural log of the minimum wage per month by province	Negative
LnGRDPP	Gross domestic regional product per capita (thousand IDR)	Natural log of the gross domestic regional product per capita at 2000 constant market prices	Negative
Infrastructure			
LnRoads	Total length of state, provincial and regency roads per province (km/km^2)	Natural log of the total length of state, provincial and regency roads per province	Positive
Airport	The presence of commercial airports per province	If province has a commercial airport = 1, otherwise = 0	Positive
Seaport	The presence of container seaport per province	If province has a container port = 1, otherwise = 0	Positive
Geo_Loc	Geographical location of the projects	If province located on Java island =1, otherwise = 0	Cannot be a priori determined

Sources: Author's description

The summary statistics and the correlations between the variables are shown in Tables 3 and 4, respectively[vi]. Table 3 shows the mean and standard deviation of the variables, while Table 4 shows the correlations between all variables that are used in this study. Some variables are transformed by taking the natural logarithm. The correlation coefficient between education and wages is 0.579, which is fairly high, while the correlations between geographical location and GRDP and roads are high at -0.606 and -0.589, respectively. Therefore, these variables need to be further analysed.

Table 3. Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Chosen	91,750	0.0399891	0.1959347	0	1
GRDPP	91,750	11070.56	9820.705	2166	50256
GRDP	91,750	92489.51	124638.3	2028	505329
Wage	91,750	1147.743	400.037	340	2441
Roads	91,750	0.932853	1.989125	0.025	10.684
Seaport	91,750	0.96	0.1959602	0	1
Airport	91,750	0.7414714	0.4378283	0	1
Education	91,750	64.45874	8.713482	42.62	86.44
CFDI	91,750	73.18318	212.6464	0	1473
Geo_Loc	91,750	0.76	0.4270855	0	1

Source: Author's calculation

Table 4. Correlation Matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) LnGRDP	1.000								
(2) LnGRDPP	0.575	1.000							
(3) LnWage	0.112	0.454	1.000						
(4) LnRoad	0.449	0.217	0.013	1.000					
(5) Seaport	0.105	0.079	0.149	-0.228	1.000				
(6) Airport	0.406	0.202	-0.030	0.263	-0.121	1.000			
(7) Education	0.010	0.253	0.579	0.131	-0.361	0.134	1.000		
(8) CFDI	0.502	0.202	0.031	0.371	0.062	0.195	-0.017	1.000	
(9) Geo_Loc	-0.606	-0.172	0.232	-0.589	0.363	-0.332	0.028	-0.503	-1.000

Source: Author's calculation

5. Results and Analysis

The estimation results of the impact of regional characteristics on investor location decisions are presented in Table 5. The value of the prob. > chi2 statistic for the overall model shows a test of the joint null hypothesis that all the regression coefficients (other than the constant term) are zero can be rejected. The goodness of fit of the overall model is tested using a pseudo R-square test. The value of the pseudo R-square of all models is between 0.35 and 0.46, which indicates that the models have a good fit[vii].

The results of the six specification models used are explained below. Similar to previous empirical studies, the results clearly prove that market size is a key determinant of investors' investment location decisions. The coefficient of market size is positive and significant in all regressions. This result indicates the probability that Japanese MNEs will choose a location increases as market size increases. The positive sign of market size also supports the argument of the market-seeking motive of Japanese FDI. This result is consistent with Cheng & Kwan's (2000) study which indicates that provinces with large market sizes are more likely to attract and receive FDI. Models (1) and (2) show that both LnWage and LnGRDPP are statistically significant with a negative coefficient, which is consistent with the expected sign. The negative sign of LnWage confirms that the lower the wage rate is, the more FDI will be attracted; however, the negative sign of GRDPP[viii] supports the argument of an efficiency-seeking motive for Japanese FDI[ix]. This result is consistent with the results of Farrel et al. (2004) who found that labour costs are negatively correlated with Japanese FDI in Europe. Moreover, Deichmann et al. (2005) show that in the case of Indonesia, firms appeared to be attracted to areas with lower wages. In model (3), all types of physical infrastructure have a positive and statistically significant effect on investors' location decisions. The result is consistent with the result found by Fitriandi et al. (2014), who argued that infrastructure development plays an important role in attracting FDI into Indonesian provinces. In addition, Belderbos & Carree (2002) found that the firms that focus on export production are more likely to establish businesses in areas close to seaports or airports. They emphasize that if the province has good infrastructure, it will attract FDI. Furthermore, the results of model (4) show that secondary education seems to negatively affect FDI. This finding suggests that higher-educated labour means higher salary costs at MNEs.

In model (5), the main model in this study, the variable for the presence of previous FDI has a positive and significant sign, as expected. This results proves that the presence of previous Japanese FDI matters for investor decisions. The reason is that potential investors will consider a province with existing previous Japanese FDI to be a suitable location for investment, and they expect business opportunities with the existing Japanese investors. There have been many cases where Japanese investors have joined their business partners abroad (Urata, 2015). These results support Hayakawa & Tsubota's (2014) study, which found that Japanese MNEs invest in a province with a larger number of Japanese firms and better access to the market. In the last model, model (6), the geographic location dummy variable was added as a control variable. The results are mostly

Table 5. Estimation Results by Full Sample

Dependent variable: Japanese investor i choosing province j (chosen)						
Variable	(1)	(2)	(3)	(4)	(5)	(6)
lnGDRP	1.488***	1.625***	1.095***	0.920***	0.409***	0.274***
	(0.0225)	(0.024)	(0.0306)	(0.0338)	(0.0332)	(0.0416)
lnWAGE	-0.520***		-1.359***	-0.988***	-0.969***	-0.683***
	(0.0502)		(0.0825)	(0.0932)	(0.108)	(0.12)
lnROAD			0.348***	0.481***	0.583***	0.484***
			(0.0257)	(0.0316)	(0.0343)	(0.0391)
SEAPORT			0.904***	-0.646**	0.751***	1.318***
			(0.251)	(0.265)	(0.259)	(0.28)
AIRPORT			1.171***	1.200***	1.352***	1.289***
			(0.149)	(0.152)	(0.152)	(0.153)
lnGDRPP		-0.384***				
		(0.0253)				
EDUCATION				-0.104***	-0.0475***	-0.0358***
				(0.00514)	(0.00527)	(0.00575)
CFDI					0.00224***	0.00227***
					(0.0000602)	(0.0000604)
GEO_LOC	No	No	No	No	No	Yes
No. of Obs.	91,750	91,750	91,750	91,750	91,750	91,750
No. of ID project	3,670	3,670	3,670	3,670	3,670	3,670
Log-Likelihood	-7583.95	-7515.69	-7442.66	-7213.18	-6343.66	-6330.93
LR chi2	8,458.64	8,595.17	8,741.22	9,200.19	10,939.22	10,964.69
Prob.＞chi2	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.358	0.364	0.370	0.389	0.463	0.464

Note: Standard errors in parentheses, *, **, *** are significant at the 5%, 1%, and 10% levels, respectively.
Source: Author's estimation

similar to the results of the main model (5). All variables, except for the education variable, have the expected signs. It seems that the geographical location of the provinces in terms of whether they are located on Java or outside of Java seems to impact investment location choice.

To gain additional insights related to the previous results, separate estimations were conducted using different sectors, namely, the primary (agriculture) sector, secondary (manufacturing) sector, and tertiary (services) sectors. Table 6 shows that regional characteristics exert different impacts on FDI location choice in the primary, secondary and tertiary sectors.

Market size impacts investors' location decision differently across the three sectors: it has no impact on investors' location in the primary sector, a significant negative impact in the tertiary sectors, and a positive and statistically significant impact, as expected, in the secondary sector. The tendency to choose a location selected by previous FDI location appears only in the secondary and tertiary sectors. However, the difference in the findings on each sector confirm the inconsistent and unexpected estimated sign of the education variable, particularly in the tertiary sector.

Table 6. Estimation Results by Sectors

Dependent variable : Japanese investor i choosing province j (chosen)						
Variable	Primary Sector		Secondary Sector		Tertiary Sector	
	(1)	(2)	(3)	(4)	(5)	(6)
lnGDRP	0.104	0.171	1.057***	0.733***	-0.116**	-0.199***
	(0.106)	(0.143)	(0.0628)	(0.0682)	(0.0561)	(0.0757)
lnWAGE	-0.605	-0.821	-0.801***	0.410**	-0.968***	-0.888***
	(0.468)	(0.562)	(0.164)	(0.193)	(0.195)	(0.2)
lnROAD	0.348***	0.409***	0.0422	-0.379***	1.131***	1.097***
	(0.124)	(0.152)	(0.05)	(0.063)	(0.0651)	(0.0684)
SEAPORT	-1.415	-1.645*	-1.645***	-0.249	2.638***	3.015***
	(0.892)	(0.952)	(0.443)	(0.455)	(0.355)	(0.425)
AIRPORT	1.128***	1.134***	0.577***	-0.00868	1.993***	1.975***
	(0.333)	(0.331)	(0.214)	(0.234)	(0.345)	(0.346)
EDUCATION	-0.168***	-0.171***	-0.104***	-0.0725***	0.0349***	0.0432***
	(0.0249)	(0.0256)	(0.00835)	(0.00878)	(0.00924)	(0.0106)
CFDI	-8.70E-05	-8.61E-05	0.00195***	0.00199***	0.00269***	0.00269***
	(0.000411)	(0.00041)	(0.0000808)	(0.0000816)	(0.000127)	(0.000126)
GEO_LOC	No	Yes	No	Yes	No	Yes
No. of Obs.	3,425	3,425	54,775	54,775	33,550	33,550
No. of ID project	137	137	2,191	2,191	1,342	1,342
Log-Likelihood	-367.37322	-367.11533	-2857.2622	-2790.8923	-2162.3484	-2161.0784
LR chi2	147.23	147.74	8390.34	8523.08	4314.77	4317.31
Prob.>chi2	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.1669	0.1675	0.5949	0.6043	0.4994	0.4997

Note: Standard errors in parentheses, *, **, *** are significant at the 5%, 1%, and 10% levels, respectively.
Source: Author's estimation

6. Conclusion

This study explored the determinants of Japanese FDI location choices in Indonesian provinces over the period of 2005-2014 and focused on regional characteristics such as market size, labour costs, labour quality, infrastructure, and the agglomeration of previous FDI. This empirical analysis was performed by analysing 3,670 of Japanese FDI projects in 25 provinces in Indonesia by using a CLM to determine the role played by the characteristics of each province in Japanese investors' investment location choices in Indonesia.

The findings were broadly consistent with the results of previous literature on determinants of FDI location decisions at the province level, although several important differences were identified. First, market size, infrastructure, labour cost and the agglomeration of previous FDI play important roles. However, unlike previous studies' results, this study found an unexpected sign for the impact of labour quality on Japanese FDI decisions in the tertiary sector. Second, the results confirm that

geographical location, in terms of whether the provinces were located on Java or outside of Java, affected Japanese investors' location decisions. The results suggest that regional characteristics and the presence of previous FDI are the major reasons for choosing a province as FDI location.

Several limitations of this study, however, must be noted. First, due to data limitations, the FDI projects were not divided by the type of entry mode. Second, this paper considered the factors representing regional characteristics but other heterogeneous factors are also thought to influence investment location decisions. Third, this study considered only Japanese FDIs in Indonesia; it is necessary to compare these results with the results of FDI from other countries to obtain a deeper understanding. One direction for future research would be to extend the analysis by dealing with these limitations.

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Notes

[i] Faeth (2009) provide a detailed discussion of theoretical models on determinants of FDI.

[ii] Guimaraes, et al. (2003) provides an overview of these problems and how different researchers have attempted to address them in the past.

[iii] Long & Freese (2006, p.243) stated that the best advice regarding IIA is an early statement by McFadden (1974), who wrote that CLM should be used only in cases where the alternatives 'can plausibly be assumed to be distinct and weighted independently in the eyes of each decision-maker'.

[iv] Those provinces were Aceh, Bengkulu, Central Kalimantan, Central Sulawesi, West Sulawesi, West Sumatera, North Maluku, and Papua.

[v] The provinces located on the island of Java are Banten, Jakarta, West Java, Central Java, Yogyakarta, and East Java; The provinces located outside of Java island are West Kalimantan, East Kalimantan, South Kalimantan, Bali, West Nusa Tenggara, East Nusa Tenggara, Maluku, West Papua, North Sulawesi, Gorontalo, Southeast Sulawesi, South Sulawesi, North Sumatra, Riau, Riau Island, Jambi, Bangka Belitung, South Sumatra, and Lampung.

[vi] The preliminary test suggested that the correlation matrix showed the existence of high correlations between the variables of roads and electricity and between secondary education and college education. Since the VIF results showed that the VIF values for both roads and electricity and between secondary and college education were larger than 10, electricity and college education were excluded from the analysis.

[vii] A value of the pseudo R-square between 0.20 and 0.40 indicates that a model has be a very good fit (McFadden, 1977).

[viii] Since the negative effect of wages and GRDPP on location choice is similar, this paper excludes GRDPP in the analysis.

[ix] Efficiency seeking is designed to take advantage of differences in the availability and relative cost of traditional factor endowments in different countries. (Dunning, 1993, p.72)

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