The Determinant of Foreign Direct Investment Across Provinces in Indonesia: The Role of Market Size, Resources, and Competitiveness
(*Penentu Pelaburan Langsung Asing Mengikut Daerah di Indonesia: Peranan Saiz Pasaran, Sumber, dan Daya Saing*)

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ABSTRACT

The paper aims to analyze the determinants of foreign direct investment (FDI) in Indonesia for the period of 1990-2014, before and after the implementation of the regional autonomy policy. This study used a panel data regression technique throughout 26 province analysis units. Several important factors affecting the FDI across the provinces are considered such as market size indicators (GDP and population), resource indicators (labor force and human resources), and competitiveness indicators (electricity, road length, wages, and export). The results show that only two indicators, namely resources and competitiveness, are statistically significant in influencing the FDI inflow across the provinces. The results of this study have several important implications on public policies aimed at attracting foreign direct investments to the provinces in Indonesia. The government must pay more attention to developing and improving the infrastructure, improving the quality of human resources both in formal and non-formal education through training and skills enhancement at productive age (workforce), and determining regional wage through agreement (deliberation) between the regional governments, employers and trade unions. There is also the need for regional governments to facilitate regional exports through export promotion and export training policies for regional entrepreneurs.

Keywords: *Foreign direct investment; market size; resources; competitiveness; regional autonomy*

ABSTRAK

Kertas ini bertujuan untuk menganalisis penentu pelaburan langsung asing (FDI) di Indonesia untuk tempoh 1990 hingga 2014, iaitu sebelum dan selepas pelaksanaan autonomi daerah. Kajian ini menggunakan teknik regresi data panel yang terdiri daripada 26 wilayah di Indonesia. Beberapa faktor penting yang mempengaruhi penentu FDI merentasi wilayah telah dianggarkan iaitu ukuran pasaran (KDNK wilayah dan penduduk wilayah), penunjuk sumber daya (tenaga buruh dan sumber manusia), dan indikator daya saing (elektrik, panjang jalan, upah, dan eksport). Keputusan kajian menunjukkan bahawa hanya dua indikator iaitu sumber dan daya saing secara statistik signifikan dalam mempengaruhi aliran masuk FDI. Hasil kajian ini mempunyai beberapa implikasi penting kepada kebijakan dasar untuk menarik FDI ke wilayah-wilayah di Indonesia. Kerajaan harus lebih memberikan perhatian kepada pembangunan dan peningkatan infrastruktur, meningkatkan kualiti sumber daya manusia dalam pendidikan formal dan tidak formal melalui peningkatan latihan dan kemahiran di usia produktif (tenaga kerja) dan penetapan upah antara wilayah yang ditentukan oleh persetujuan antara kerajaan daerah, majikan dan kesatuan sekerja. Terdapat juga keperluan bagi kerajaan wilayah untuk memudahkan eksport serantau melalui promosi eksport dan dasar latihan eksport untuk usahawan di rantau ini.

Kata kunci: Pelaburan langsung asing; saiz pasaran; sumber daya; daya saing; autonomi daerah

INTRODUCTION

Since the 1997 Asian financial crisis, many developing countries have been strongly advised to rely primarily on Foreign Direct Investment (FDI) inflow for the promotion of sustainable economic development. Indonesia has also attempted to attract FDI inflow through several institutional reforms under the decentralization policy because it needs a great number of funds to finance and accelerate its economic development (Fitriandi et al. 2014). With regard to the FDI locations in Indonesia, it is an interesting issue to study as there is currently an imbalance in their distribution (investment disparity). Due to the limited financial capacity of the governments (central, provincial and regional/city) as the main source of development, private investment is deemed highly necessary. The impacts created by the increased investment include the increased optimization in the use of sources for production activities, the development of trading activities among regions, and the creation of the greater added values. Investment can also accelerate the development of information and technology, telecommunication, and transportation. This acceleration will create a larger opportunity for the mobility of the sources (raw materials, capital assets, and labors), which can improve their accessibility and affordability. Such acceleration is also useful for the improvement of people's quality of life.

To create more qualified and sustainable growth, the local economy needs to be supported by investments in the productive sectors. Table 1 shows that the FDI inflow in Indonesia was vastly different among regions. Java Island attracted 57 percent of the accumulated foreign investments worth US$43542.23 million, a far higher amount compared to other areas such as Borneo with 14 percent valued at US$ 7987.94 million, Sumatera with 13 percent worth US$ 7733.98 million, and Sulawesi with only 5 percent or US$ 3424.38 million. These four provinces have contributed 89% of the accumulated FDI across Indonesia, indicating that there is a big disparity across provinces in Indonesia. Therefore, the understanding of the main factors affecting the FDI inflow across the provinces is pivotal to the policymakers in designing an appropriate policy in stimulating the FDI in the future to accelerate economic development.

TABLE 1. Development of Foreign Direct Investment Realization by Island in 2011-2015 (US$ Million)

No	Region	2011	2012	2013	2014	2015	Total FDI across the region
1	Sumatera	2 076.56	3 729.29	3 395.35	3 844.6	3 732.8	7 733.98
2	Jawa	12 324.54	13 659.92	17 326.38	15 436.7	15 433.0	43 542.23
3	Bali dan Nusa Tenggara	952.65	1 126.55	888.87	993.4	1 265.1	3 513.87
4	Kalimantan	1 918.85	3 208.65	2 773.4	4 673.6	5 842.9	7 987.94
5	Sulawesi	715.26	1 507.03	1 498.16	2 055.7	1 560.4	3 424.38
6	Maluku	141.54	98.77	321.23	111.8	286.2	583.2
7	Papua	1 345.14	1 234.47	2 414.16	1 414.0	1 155.7	3 080.37
	Total FDI	19 474.53	24 564.67	28 617.55	28 529.7	29 275.94	69 865.97

Source: Indonesia Statistics during 2011- 2015, reprocessed

The Java domination of foreign direct investment is interesting because after regional autonomy was implemented, only less than a quarter of existing regions are economically capable of being independent because of their different natural resources availability. The rest are still experiencing difficulties in meeting capital and investment needs to advance economic development in their regions (Kurniawan 2002). The implementation of regional autonomy, which began in 2001, and the change from the new order to the reform order regimes, has provided much hope that changes would occur and become a turning point to change the pattern of relations from *dominant-dependent* to *balanced-interdependent*. The enthusiasm to change the pattern of relations among regions must be built by the central and regional governments, accompanied by systematic and real efforts to achieve it. If the pattern of relations has changed to *balanced-interdependent*, all regions will optimally contribute to economic development and national economic growth while minimizing economic disparity among regions.

However, after more than seventeen years of regional autonomy, development equality has not yet been achieved. One of the main causes is uneven investments among provinces in Indonesia. Based on this argument, this study contributes to the literature by verifying the relationship between regional economic conditions and provincial FDI inflow in Indonesia. First, this study used three regional economic condition proxies, namely market size (provincial GDP and population), resources (provincial labor force and human resources), and competitiveness (provincial electricity, road length, minimum wages, and net exports). Second, this study also includes the regional autonomy policy as a dummy variable. The implementation of regional autonomy policy is important because the purpose of granting regional autonomy is to enable the region concerned to regulate and manage its own households to improve the effectiveness and results of government administration (Kuncoro 2004). Third,

a better understanding of the role of regional economic conditions as a determinant of foreign investments also can help policymakers to design effective policies to better attract foreign investments into the provinces where such investments are urgently needed. There have been many studies on the determinants of FDI in Indonesia but only a few have included government policy (dummy variable of regional autonomy) as a research variable. This paper will be organized into five sections consisting of the introduction, literature review, data and methodology, empirical results and summary and conclusion.

LITERATURE REVIEW

Foreign Direct Investment (FDI) is defined as a long-term investment directly conducted by foreign investors in a business unit of domestic citizens. FDI is a relatively stable, long-term investment and thus will help economic recovery requiring a vast sum of funds and large labor absorption. In addition, FDI is also a sign of trust from foreign investors to conduct their economic activities in Indonesia and thus, it can stimulate later capital inflow (Kurniatiet al. 2007).

The Ownership-Location-Internalization (O-L-I) theory explains the FDI existence in a country (Dunning 2001; Petri 2012; Masron 2013). The O-L-I theory is known as an eclectic approach because this theory explains the reasons why a company chooses FDI among various other alternatives.

Phonesavanh et al. (2015) describes each element of the O-L-I theory. First, ownership-specific defines the competitive advantages possessed by a company that encourages the company to be involved in production activities outside its home country. These advantages include capital, technology, marketing, managerial and organizational capabilities and excellence in economies of scale. Second, location-specific refers to the specific superiority possessed by a country that creates an attraction for foreign companies to enter the country (host country). This superiority is reflected in the endowment resources, large market potential, supporting infrastructure, labor market conditions, competitive wage rates, and other investment facilities provided by the government to foreign investors. Third, internalization-specific outlines the advantages gained by companies if they choose to open production facilities rather than other alternatives such as exporting or joint-ventures.

In addition to the purposes of seeking the market and expecting a higher profit, there are a number of reasons why investors are willing to invest in foreign countries (Deutsche Bundesbank 2003 in Kurniati et al. 2007). The O-L-I paradigm above is closely related to the FDI classification based on the characteristics identified by Miroudot and Ragoussis (2009). They group FDI into two dimensions, namely horizontal FDI and vertical FDI. Horizontal FDI is a foreign investment that aims to build a production base in other countries with the aim of pursuing market potential. In other words, it will build production facilities in the target country. Meanwhile, vertical FDI is a foreign investment that aims to build part of production facilities in other countries in order to pursue efficiency related to the supply chain of the production process.

Kurniati et al. (2007) state that the decision of the foreign investors to invest in the form of FDI is influenced by the country conditions as the FDI receivers (pull factor) including the conditions of the market, resources, competitiveness, and the FDI policies. The decision is also influenced by the conditions and the strategies of foreign investors (push factors). Kurniawan (2002) argues that the main determinant of location selection for FDI in Java is market accessibility, rather than labor and infrastructure. In other words, FDI entering Java is classified as market-seeking FDI. Sarwedi (2002) reveals that the FDI growth in Indonesia is influenced by macroeconomic variables (GDP, economic growth, and exports). A recent study by Karim et al. (2018) using panel data analysis found that larger market size and less corrupted countries would attract more FDI in ASEAN-5 economies (Indonesia, Malaysia, Thailand, Vietnam, and Singapore).

Another study by Liu et al. (2012a) in China offers various descriptions. For example, they find that market size becomes a priority factor for the FDI inflow to the coastal areas and eastern coastal area, whereas the level of the openness becomes the most important factor for the FDI inflow in the middle-land areas. Liu et al. (2012a) produce a further result informing that market size, quality of labor, and government incentive to attract FDI significantly and positively influence the FDI inflow. A study by Kayam et al. (2012) in Russia shows that firstly the diversity of regional FDI in Russia is the result of variation in market size and resource availability. Considering the market size in each region, factors supporting production activities could increase the FDI inflow, but such an increase shows no effects on FDI received by neighboring areas. The areas rich in natural resources attract FDI from other regions. Secondly, foreign investors come to Russia with a very limited motivation (i.e. market or resources), and this fact has limited the maneuver of the local governments to develop a strategy that will attract more FDI.

A study by Wahid et al. (2009) in Africa reveals that the abundance of natural resources becomes positive and significant aspects (to support the presence of resource seeking FDI). It is in line with the studies by Asiedu (2002) and Campos and Kinoshita (2008). This result has an important implication for the stakeholders and the regional policy makers as it can help them identify the types of industries that respond accordingly and identify the characteristics of local socioeconomics that can attract the FDI inflow. Liu et al. (2013) find that regional disparities in terms of FDI inflow have an important policy implication as there is a correlation between the FDI inflow and the economic growth in China. This study also discloses that the location factor in the coastal areas and northeast areas is relatively similar. Further results reveal that the labor quality and government incentive

to attract the FDI significantly and positively influence the FDI inflow and the high cost of labor does not seem to decrease the attraction of an area. The physical infrastructure in the central areas, meanwhile, is an important factor to attract FDI.

A study by Sun et al. (2002) in China reveals the importance of FDI determiners to change by following the current trends. Wage had a positive correlation with the FDI prior to 1991, but a negative one in the following year. This shows that the nature of FDI before and after 1991 is different. The quality of labor and infrastructure also becomes an important factor for FDI distribution. The high-quality labor and excellent infrastructure are attractive to foreign investors. The issues of political stability and openness towards foreign countries may become other important dimensions to attract foreign investment. Chiang (2010) carried out a case study in China and the results confirm the consistency with the theory, i.e. the presence of the positive effect of economic infrastructure and agglomeration on FDI, which is in line with the literature. The measurement of infrastructure (transport and human resources) shows a positive and significant effect in attracting FDI inflows. The initial empirical results confirm the positive effects of infrastructure and agglomeration on the FDI inflow. The econometric models indicate that the political capacity of the provincial government can be important to influence the FDI inflow in China.

A study by Babatunde (2011) in Sub Saharan Africa (SSA) recommends that developing countries in SSA should not only develop macroeconomic policies and structural reform programs that will encourage economic openness, infrastructure, and development and reduce inflation rates, but they must also ensure that these policies are properly implemented to attract foreign investment for sustainable growth. Sethi et al. (2011) in China find that the FDI location, which was previously attractive, eventually becomes unattractive for investment due to the increase of competitive intensity and escalation of the real-estate prices and wages in the location. In some cases, the national or provincial governments create a disincentive for the location and this has encouraged FDI to move to the less developed provinces. Also, the FDI locations have recently become more available as a result of measures taken by the national and provincial governments to improve the infrastructure and provide investment incentives. Fitriandi et al. (2014) suggest a number of important implications towards the public policies aimed at attracting foreign investment in several provinces in Indonesia. The development of hard infrastructure is required to increase the FDI inflow, and the government must be more concerned with the quality of the infrastructure development for foreign companies. In addition, as the vast amount of government expenditure has caused the decline of the FDI inflow due to the crowding-out effect, the government must limit its intervention and promote private investment as well as private economic activities.

Conceptually, the choice of foreign investors to invest in FDI, compared to other forms of capital in a country, is influenced by the conditions of recipient FDI countries (pull factors) as well as the conditions and strategies of foreign investors (push factors). The pull factors include market conditions, resource availability, competitiveness, trade, and industry policies, and FDI liberalization policies (in the form of investment incentives). So far there have not been many FDI studies in Indonesia that include all these elements of the pull factors (Kurniati et al. 2007).

Given this background, this study attempts to fill the gaps by including market indicators, resources and competitiveness, and government policies (regional autonomy) in influencing foreign direct investment in Indonesia. Government policy in this case the regional autonomy variable is important in Indonesia because this policy allows autonomous regions to be given the authority and opportunity to develop ideas and apply them in their respective regions with all their natural and human resources.

DATA AND METHODOLOGY

The dependent variable in this study is the value of FDI realization in a region/province. Meanwhile, the independent variables include market size indicators (regional/province GDP and population), resource indicators (labor force and human resources), competitiveness indicators (electricity, road length, minimum wages, and export (level of economic openness or net export). Dummy of regional autonomy is used to control the difference in autonomy policy across provinces. Most of the data used in this study are obtained from various issues of Indonesia's Statistical Yearbook. Table 2 summarizes the definition of the dependent and independent variables used in this paper.

TABLE 2. Definitions and Expected Sign of Independent Variables

Indicators	Variables Name	Expected sign
Market Size	Gross Regional Domestic Product (GRDP) in a region/province (million rupiah)	+
	Population (Pop) is the number of citizens in a region/province (million people)	+
	Labor Force (LF) is the number of workforce in a region/province (million people)	+
Resources	Human Resources (HR) is the number of High School graduates in a region/province (million people)	+
	Electricity is the installed capacity of electricity in a region/province (Kwh)	+
	Road Length (RL) is the total length of road in a region/province (km)	+
Competitiveness	Wage (W) is the provincial minimum wages (rupiah)	+/-
	Export (E) is the level of economic openness (net export) in a region/province (million rupiahs)	+
Policy-related	(D regional autonomy) is the dummy for regional autonomy policy	+

Source: Indonesia's Statistical Yearbook.

ESTIMATION MODEL

In modeling the FDI determinants across provinces in Indonesia, this study used the static panel data and the translog model (Sun et al. 2002). Based on Benoit (2011) transformation using logarithms is used in situations where there is a non-linear relationship between independent and dependent variables. Logarithmic transformation allows the non-linear relationship to be used in a linear model. In addition, it can transform data that was originally distributed abnormally into or close to normally distributed. The baseline model can be written as follows:

$$LogFDI_{it} = \beta_0 + \beta_1 LogGDP_{it} + \beta_2 LogPop_{it} + \beta_3 LogLF_{it} + \beta_4 LogHR_{it} + \beta_5 LogElectricity_{it} + \beta_6 LogRoadLength_{it} + \beta_7 LogW_{it} + \beta_8 LogE_{it} + \beta_9 DRegionalAutonomy_{it} + \varepsilon_{it} \quad (1)$$

Where, ε_{it} is error or disturbance which is a random variable (stochastic), which describes all the variables that affect the dependent variables but are excluded in the model, i is region/province (26 provinces), t is time series spanning from 1990-2014, *Log FDI* is the log value of FDI realization, *Log GDP* is log of Gross Regional Domestic Product (GDP) in a region/province, β_1 is the GDP elasticity on FDI, *log population* is the number of citizens in a region/province, β_2 is the population elasticity on FDI, in which the expected signs are positive. *LogLF* refers to the log of the labor force, the number of workforce in a region/province, which is expected to be positive. LogHR is a log of the number of high school graduates in a region/province, which is expected to make a positive contribution towards the FDI. The competitiveness factors of electricity installed capacity and road length in a region/province, are also expected to make a positive contribution and thus β_5 and β_6 are expected to be positive. Meanwhile, the provincial minimum wage has an ambiguous effect on FDI, $\beta_7 \neq 0$. The coefficient mark on the actual wage variable is debatable. Several studies conducted by Smith et al. (1994) found that Japanese automotive companies tend to choose locations with higher wage rates. The research conducted by Kuncoro (2002) in Indonesia from 1976-1996 found that wage levels were positively related to FDI. Therefore, it is possible that the variable explained by wages does not only cover the cost effects but also the skill effects. Furthermore, the economic indicator of the net export (logE) is expected to be positive ($\beta_8 > 0$). The baseline model in equation [1] will be re-estimated by splitting the sample size into the period before the autonomy (1990-2000) and after the autonomy (2001-2014). Splitting the sample can help to identify the different effects of the explanatory variables on FDI before and after the local autonomy policy implementation. The policy is important because the purpose of granting regional autonomy is to enable the region concerned to regulate and manage its own households to increase the effectiveness and results of its government administration (Kuncoro 2004).

According to Hsiao (2003), panel data analysis has several benefits such as increasing reliability regardless of the sample size, boosting the degree of freedom, coping with multicollinearity among independent variables, reducing the effects of variable bias even with unbalanced panel data, and providing more complex analysis in comparison to stand-alone time-series or cross-sectional data analysis. Panel data analysis does not only capture the behavior of the variables but also provides a more efficient estimation and information of the variables (Greene 2012; Hsiao 2003). Further, it also allows greater flexibility in modeling behavior differences across individuals within a group compared to the ordinary least square (OLS) regression analysis. However, the heterogeneity and selection bias may occur if the panel data analysis model is not chosen correctly (Greene 2012; Gujarati & Porter 2009; Hsiao 2003).

There are three important models for panel data analysis, namely pooled OLS regression, fixed effect model, and random effect model. The first model, which is also known as a common constant model, represents a dataset where there is no difference among the data matrices of the cross-sectional dimension, treating each object within a group as similar or one unit (Asterious & Hall 2006; Gujarati & Porter 2009). The second model, which is also known as the least-squares dummy variables

(LSDV) model, is a panel data analysis where each entity controls variables that are constant over time but differ across entities (Stock & Watson 2015). Furthermore, the model allows different constants for each group, which allows a dummy variable to be included in the group. The third model is a panel data analysis model that handles the constants for each section as random rather than fixed parameters (Asterious & Hall 2006; Greene 2012).

The advantage of the random effect model is that there are fewer restrictions in comparison to the fixed effect model. It also reduces inconsistencies and biases in favor of coping better with dataset even with missing values (unbalanced data set). The model also permits additional explanatory variables that have equal value for all observations within a group, or in other words, the model allows using dummies (Asterious & Hall 2006). On the other hand, the disadvantage of the random effects model is that a specific hypothesis needs to be made about the distribution of the random element as well as if the unobserved group-specific effects are related to the explanatory variable, which might lead to biased and inconsistent estimates (Asterious & Hall 2006).

As previously decided, the pooled OLS model is not selected for this study. Consequently, the panel data analysis for this study will be between fixed effect and random effect models. Asterious and Hall (2006) state that the use of these two models needs to consider the difference between them. The fixed effect model accepts that each entity or object differs in its intercept term, while the random effect model accepts that each entity or object differs in its error term (Vijayakumar et al. 2010). Furthermore, in theories, the fixed effect model is preferred for balanced panel data, whereas the random effect model for unbalanced panel data. In choosing the most appropriate panel data analysis model, a Hausman test is a prerequisite for the exogeneity of the unobserved error component.

The use of the random effect method in the estimation requires a lot of care and must be employed only if it is necessary and meaningful in comparison to the fixed effect method. Generally, in the panel data analysis, the fixed effect model assumes that each country differs in its intercept term, whereas the random effect model assumes that each country differs in its error term. When the panel is balanced (i.e., contains all existing cross-sectional data), one might expect a fixed effect model to work well. Otherwise, the random effect method will be more appropriate when the sample contains limited observations of the existing cross-sectional units. However, the Hausman specification test (1978) can help select the appropriate panel data model either fixed or random effect model (Vijayakumar et al. 2010).

The Hausman statistic is viewed as a distance measure between the fixed and random effects estimators. Thus, we actually tested H_0, that random effect is consistent and efficient, versus H_1, that random effect is inconsistent (as the fixed effect will be always consistent). The hypothesis for Hausman specification test is formulated as follows (Greene 2012):

H_0 = Random effect model is appropriate (p-value > α)
H_1 = Fixed effect model is appropriate (p-value < α)

$$H = (\beta^{FE} - \beta^{RE}) \, [Var \, (\beta^{FE}) - Var \, (\beta^{RE})]^{-1} \, (\beta^{FE} - \beta^{RE}) \sim X^{2(k)} \qquad (2)$$

If the value of the statistic is large, then the difference between the estimates is significant, so we reject the null hypothesis that the random effect model is consistent and we use the fixed effect estimators. In contrast, a small value of the Hausman statistic implies that the random effect is a more appropriate estimator.

By using the method described earlier, it is hoped that this research can find results that show how much influence the size of the market size, resources and competitiveness in influencing foreign direct investment in Indonesia in 1990-2014, both before and after the implementation of autonomy area.

EMPIRICAL RESULTS

Empirical results in this study include the results of data descriptions, covariance matrices, chow tests, Hausman tests and the results of panel data regression analysis and their discussion, before and after autonomy for determinants of FDI in Indonesia.

TABLE 3. Descriptive Statistics

	LogFDI	LogGDP	LogPop	LogLF	LogHR	LogElectricity	LogRL	LogW	LogE
Mean	4.063430	13.43497	15.34407	14.57032	2.336074	4.376661	9.436380	5.703394	15.65582
Median	4.204693	15.36807	15.10639	14.37234	2.360854	5.209486	9.380421	5.652489	15.75636
Maximum	9.819774	19.56076	17.57722	16.82890	3.352707	7.278629	10.77042	7.643962	21.42036
Minimum	-0.916291	6.131009	13.96935	13.08445	0.615186	0.000000	7.824046	4.663439	9.412955
Std. Dev.	2.570690	4.047676	0.945444	0.915222	0.468666	2.198865	0.597548	0.804831	1.864064
Skewness	-0.062585	-0.196972	0.974168	1.094321	-0.550542	-1.203581	0.180596	0.252370	-0.118213
Kurtosis	2.019073	1.509629	3.096093	3.500689	3.523610	2.918668	2.116676	1.605558	2.915197
Jarque-Bera	24.32491	59.11290	94.65550	125.3910	36.97807	144.3010	22.65416	54.70590	1.569336
Probability	0.000005	0.000000	0.000000	0.000000	0.000000	0.000000	0.000012	0.000000	0.046271
Observations	625	625	625	625	625	625	625	625	625

Source: Secondary data (processed)

Table 3 above shows the descriptive statistics for all variables of interest in this study. It contains data for the 26 regions/provinces over the 1990-2014 period, giving rise to 625 observations. The values of the standard deviation of each data variable indicate a number that is relatively not too large. Furthermore, in Table 3, the values of skewness and kurtosis show the normality test. For a variable to be normally distributed, the skewness value should be equal to zero whereas the kurtosis value should be three. Specifically, skewness gives a measure of how symmetric the observations are about the meanwhile kurtosis gives a measure of the thickness in the tails of a probability density function. However, it is also important to note that the Jarque-Bera (JB) test for normality is the one that computes the skewness and kurtosis measures of the OLS residuals. Under the null hypothesis of the normal distribution, if the calculated p-value of the JB statistic is greater than 0.05, the null hypothesis cannot be rejected at a 5 percent level of significance. All these values indicate the two variables that are likely to be normally distributed.

TABLE 4. Correlation Matrices

	LogGDP	LogPop	LogLF	LogHC	LogElectricity	LogRL	LogW	LogE
LogGDP	1.000000	0.262659	0.266155	0.184707	-0.175428	0.158361	-0.009905	0.435330
LogPop	0.262659	1.000000	0.735397	-0.012940	-0.596104	0.667731	0.061813	0.628081
LogLF	0.266155	0.735397	1.000000	-0.056242	-0.641606	0.667148	0.029970	0.631344
LogHC	0.184707	-0.012940	-0.056242	1.000000	-0.098926	-0.112149	0.721638	0.434337
LogElectricity	-0.175428	-0.596104	-0.641606	-0.098926	1.000000	-0.238082	-0.080144	-0.476478
LogRL	0.158361	0.667731	0.667148	-0.112149	-0.238082	1.000000	0.123908	0.462749
LogW	-0.009905	0.061813	0.029970	0.721638	-0.080144	0.123908	1.000000	0.495269
LogE	0.435330	0.628081	0.631344	0.434337	-0.476478	0.462749	0.495269	1.000000

Source: Secondary data (processed)

As far as correlation is concerned, the results in Table 4 suggest that there is some correlation among the independent variables such as LogGDP, LogPop, LogLF, LogHC, LogElectricity, LogRL, LogW, and LogE. The correlation matrix shows low correlations among the explanatory variables for LogGDP, LogPop, LogLF, LogHC, LogElectricity, LogRL, LogW, and LogE. These variables have a correlation relationship of below 0.8, which means that the variables used in the model are free from multicollinearity problems

The Chow test results in Table 5 for the FDI equation model for the whole period (1990-2014), the pre-autonomy period (1990-2000), and the post-autonomy period (2001-2014) show that all FDI equation models have F-statistic probability value of <0.05, or significant and thus Ho is rejected. This means that the FDI equation for all periods shows that the fixed effects model is better than the common effects model.

TABLE 5. Chow Test (Fixed Effects Significance Test)

observation period	Effect Test	Statistic	d.f	Prob
All data (1990-2014)	Cross-section F	26.810062	(25,589)	0.0000
Pre-Autonomy (1990-2000)	Cross-section F	2.956019	(25,251)	0.0000
Post-Autonomy (2001-2014)	Cross-section F	5.313862	(25,329)	0.0000

Source: Secondary data (processed)

Table 5 shows that all foreign direct investment models had F-statistical probability value of < 0.05 or significant, which means that Ho is rejected. This means that the fixed effect model is better than the common effect. Based on Table 6, the Hausmann test for three periods shows that the chi-square from regression is larger than its critical value, so Ho is rejected. Thus, the fixed effect is a better approach to use than the random effect. This means that there are differences among units that can be seen through the differences in the constant terms. In the fixed effect model, it is assumed that there is no time-specific effect and it only focuses on the individual-specific-effect.

TABLE 6. Hausman Test

Period of Observation	χ^2 Statistic	Prob.
All Data (1990-2014)	642.700***	0.0000
Pre-Autonomy (1990-2000)	58.953***	0.0000
Post Autonomy (2001-2014)	233.452***	0.0000

Source: Secondary data (processed)
Remark: *** significant at $\alpha = 0.01$

According to Gujarati and Porter (2009), equations that meet classical assumptions are only equations that use the Generalized Least Square (GLS) method. The only estimation model that uses the GLS method is the random effect model, as the fixed effect and common effect use Ordinary Least Square (OLS). Thus, the need for testing whether the classical assumptions are met in this study depends on the results of the selection method estimation. If the estimation method that is appropriate for the regression equation is the random effect, then there is no need to conduct a classical assumption test. Therefore, to overcome this, the equation model will use the GLS (Generalized Least Square) model. By using the GLS model, the assumptions that must be met are normality and non-multicollinearity because the GLS can accommodate heteroscedasticity and autocorrelation problems in the model.

TABLE 7. The Result of the GLS Estimation of the Regression Equation of Fixed Effect

Variable	Period of 1990-2014 (All data)	Period 1990-2000 (Pre-Autonomy)	Period of 2001-2014 (Post Autonomy)
Log GDP	-0.079853***	-0.236454	0.204318*
	(-4.194953)	(-6.886019)	(6.224780)
Log Population	0.059261***	0.090947***	0.057132***
	(1.083666)	(0.217148)	(1.514089)
Log Wage	1.062600**	0.215041***	0.107095*
	(5.814903)	(0.485145)	(0.437331)
Log Labor Force	0.209850***	11.08271	0.029475***
	(0.727772)	(3.640437)	(0.137732)
Log Export	0.020913***	0.070853**	0.038431
	(0.660399)	(0.467725)	(1.738515)
Log Electricity	0.035756	0.049951**	0.063745*
	(1.019487)	(0.479475)	(2.127947)
Log Road Length	0.110884***	-0.020197	0.046277***
	(0.627069)	(-0.098862)	(0.296869)
Log Human R	0.017474***	0.007208***	0.039543
	(1.107631)	(0.264438)	(1.524744)
Dummy Autonomy	0.718181***		
	(6.223598)		
F statistic	47.02367	22.29065	58.31382
R Square (R^2)	0.707159	0.711419	0.839351

Source: Secondary data (processed)
Remark: *** significant at $\alpha = 0, 01$; ** significant at $\alpha = 0, 05$; * significant at $\alpha = 0, 10$***
Numbers in brackets are calculated statistical values

Regional autonomy policy which was implemented since January 1, 2001, has given a greater role to the regional governments and regional economic actors in managing the development in their regions. The demand for regional autonomy arises because the development process in Indonesia had previously resulted in a development gap among regions in Indonesia. The gap occurs because of the inequality in investment allocation that has an effect on triggering and spurring growth imbalances among regions (Waluyo 2007). The implementation of regional autonomy is the appropriate momentum to give a greater role to regional governments and regional economic actors to manage their own regional development (Nugroho & Rochmin 2004; Riyadi & Deddy 2003).

The results of the fixed effect method indicate that market size, competitiveness, and resources were the significant indicators of FDI in Indonesia. Market size indicators represented by GDP and population variables were significant to FDI in Indonesia in the three observation periods: all data (1990-2014), before regional autonomy (1990-2000) and after autonomy (2001-2014). The statistical meaning is that if the GDP variable increase by 1%, the FDI decrease by 0.079853 % for the period of 1990-2014. Meanwhile, for the post-autonomy period (2001-2014), if the GDP increase by 1%, the FDI has increased by 0.204 percent. For the population variable, in the 1990-2014 period (all data) if the population increase by 1%, the FDI increased by 0.059 percent. Specifically, for the pre-autonomy period (1990-2000), the FDI variable will increase by 0.091 percent and for the post-autonomy period (2001-2014) the FDI variable will increase up to 0.057 percent.

This provides evidence that FDI in Indonesia aims for market seeking, both domestic-market oriented and export-market oriented. The results of this study are in line with the previous study conducted by Kayam et al. (2012) which found that the regional FDI in Russia is was influenced by the market size variation and resource availability. Considering the market size in each area, the factors that benefit the production can increase the FDI inflow. Castro (2007) argues that the presence of large market and vertical suppliers in the neighboring countries has a positive effect on the FDI location in the economy of the host country. Raluca (2010) in Romania conducted research showing the need for the policymakers to improve business services and create investment opportunities for foreign investors particularly in the provinces with potential market size and growth. The results of the study on various market sizes in Indonesia are inconsistent with the previous research, meaning that the aim of foreign investment in Indonesia primarily is to seek resources or assets. This is reasonable considering that Indonesia is rich in natural resources. Moreover, in this study, the foreign investment is not differentiated based on sectors; thus, it is not known which sector is the most dominant (only using the total foreign investment in each province).

In terms of resource indicators, the labor force showed a positive effect for the whole period (1990-2014) and the period after regional autonomy (2001-2014). The statistical meaning is that if the labor force variable increased by 1%, the FDI variable increased by 0.21 percent (all periods) and by 0.029 percent (post-autonomy). This is in line with the study on the existing investment stating that FDI or MNCs are more interested to invest in a country with available and affordable labor forces (Hayter, 2000). Similarly, the study conducted by Sun et al. (2002) in China has proven the importance of FDI to change by times. The quality of the labor and the infrastructure becomes the determining factor for the FDI distribution as they can attract foreign investors. Human resources also positively influenced FDI in provinces in Indonesia for the entire periods (1990-2014) and the period before regional autonomy (1990-2000). This means that if the human resources variable increase by 1%, then the FDI variable increased by 0.017 percent (all periods) and by 0.007 percent (pre-autonomy). This result is in line with the previous research by Liu et al. (2012b) stating that labor quality significantly and positively affects the FDI inflow. A similar study conducted by Raluca (2010) using the number of scientists as a variable showed a positive and significant correlation with the FDI. The significance of the human capital variable in this study has proven that graduates of senior high school can influence foreign investment in the provincial areas. This shows that foreign investment in Indonesia is related to labor availability.

For competitiveness indicators, the variable electricity and road length have different effects on FDI. The electricity variable influences the FDI for the pre-autonomy period (1990-2000) and post-autonomy (2001-2014). This means that if the electricity variable increased by 1%, the FDI variable increased by 0.05 percent for the 1990-2000 period and by 0.064 percent for the 2001-2014 period. The road length variable affects the FDI for the entire period (1990-2014) and the post-autonomy period (2001-2014). This means that if the road length variable increased by 1%, the FDI increased by 0.111 percent for the period of 1990-2014 and by 0.0463 percent for the period of 2001-2014. The results are not in line with the study by Fitriandi et al. (2014) conducted in Indonesia which found that supporting infrastructures such as electricity, road length, water distribution, and water capacity played an essential role in attracting the FDI to the provinces in Indonesia. For this, it can be stated that the insignificance of the infrastructure variable was due to the fact that the capacity of the electric power has not completely fulfilled the needs of the society in all provinces in Indonesia. In the period after autonomy (2001-2014), both electric power and road length positively affected FDI in Indonesia, indicating the importance of both infrastructure variables on the FDI inflows to the provinces in Indonesia. Therefore, infrastructure in the provinces needs to be developed by the local governments to attract investments to the regions.

The wage variable showed a positive and significant relationship with the FDI for the entire period of observation (1990-2014), the period before the regional autonomy (1990-2000), and the period after the regional autonomy (2001-2014). This means that if the wage variable increased by 1%, the FDI variable increased by 1.063 percent for the period of 1990-2014, by

0.215 percent for the period of 1990-2000, and by 0.107 percent for the period of 2001-2014. This positive correlation no longer concerns about the low wage but more about the efficiency of the production cost as an optimization in the productivity of the existing resources (Hayter 2000). A number of studies conducted by Smith et al. (1994) found that the automotive companies in Japan tended to choose the location with higher wages. Thus, it can be stated that the variable does not only have an effect on the cost but also on skills. This finding is in line with some studies by Kuncoro (2000), which found that the wage level had a positive correlation with FDI, and is also consistent with other studies such as Changwatchai (2010), and Sethi et al. (2003). Changwatchai (2010) states that FDI prefers low-cost labor as investment attraction, whereas according to Lee (1997) the companies in Korea at the end of 1980 decided to move their company location to Indonesia for low-cost labor and weak labor unions.

The export variable showed a positive and significant impact on FDI in the provinces for the entire period (1990-2014) and before regional autonomy (1990-2000). This shows that the greater the exports in the province, the greater the foreign investment will increase. This means that if the export variable increased by 1%, the FDI variable increased by 0.021 percent for the period of 1990-2014 and by 0.071 percent for the period of 1990-2000. This means that outside investors are starting to see foreign markets as destinations besides the domestic market. After the implementation of regional autonomy, the province's economic condition is increasingly stable so that the role of exports to economic growth is increasingly stronger. This is the choice of foreign investors to market their products abroad besides the domestic market so that foreign investment in Indonesia can be more market-oriented (market seeking). A similar result was found by Wahid et al. (2009) who revealed that openness had a positive impact on FDI and this is in line with the fact that an efficient environment supported with more openness towards trades might better attract foreign companies. Ang (2008) found a similar result, stating that openness in trade promotes the FDI. Sharma and Bandara (2010) argue that the open countries tend to become the larger domestic markets and that similar language and culture in Australia have attracted most of the foreign investment. A similar study by Liu et al. (2013) states that the level of openness could be measured with the total foreign trade per total local trade. The more open an economic market, the more it is correlated to the economic activities worldwide. Thus, the level of openness in an area is more interesting for the FDI inflow, particularly for the export-oriented FDI. This finding is in line with the study conducted by Asiedu (2002) and Fedderke and Romm (2003). Hence, the result indicates that the larger liberalization from the trade sector has proved to be conducive to FDI.

The dummy variable of government policy also affected FDI in Indonesia, indicating that the regional autonomy implementation in Indonesia has resulted in the FDI trend change. In the current Indonesian economy, regions are increasingly different from one another so as to attract a larger amount of investments, especially foreign direct investments. Several provinces or regions absorb more than others. Thus, an important element that widens economic disparity among regions is the inflow of investment as a growth engine. Data from 2011-2014 indicate that the FDI inflow in Indonesia was relatively striking, with Java attracting 57 percent of foreign direct investment (Badan Pusat Statistik, 2015).

SUMMARY AND CONCLUSION

This study aims to analyze the determinants of FDI in Indonesia for the period of 1990-2014, before and after the implementation of the regional autonomy policy. This study used a panel data regression technique throughout 26 province analysis units.

Based on the results of the analysis with the fixed effect method, there are three significant indicators of foreign investment in Indonesia: market size, resources, and competitiveness. Prior to the regional autonomy (1990-2000), the three indicators affected foreign direct investment, and for the period after autonomy (2001-2014) all indicators also affected foreign direct investment. This provides evidence that before and after the implementation of regional autonomy, foreign direct investment aims to find markets (market seeking), both domestic-oriented and export-oriented markets.

The results of this study have several important implications for public policymakers that aim to attract foreign direct investment to the provinces in Indonesia. With regard to the significance of infrastructure variables in this study, the government must pay more attention to both hard and soft infrastructure development and improvement. This needs to be pursued by considering the geographical aspects and more equitable regional to attract foreign investment inflows. In addition, local governments must pay more attention to improving the quality of human resources both in formal and non-formal education through training and skills enhancement at productive age (workforce), especially workforce skills and the opening of various formal and non-formal educational institutions that can be absorbed as labor (there are a link and match relationship between education and employment opportunities).

With regard to the minimum wage determination, it is very important because this variable affects foreign investment. So, there is a need for wages that are in accordance with the area. This regional wage is determined by an agreement (deliberation) between the regional governments, employers, and trade unions. With regards to exports, the regional governments and the related institutions, namely industry and trade, need to facilitate regional exports through export promotion policies and export training for the regional entrepreneurs.

Subsequent research needs to be carried out using other methods such as the spatial econometric method to analyze spatial elements in the research of determinants of foreign direct investment. Besides, it is also necessary to develop a dynamic research model so that the short-term and long-term impacts can be seen, and the analysis unit will be more precise if it is the district rather than the provincial level.

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