

## DISPARITY OF INVESTMENT INFLOWS AMONG REGIONS IN INDONESIA

Muhammad Firdaus

Faculty of Economics and Management, Institut Pertanian Bogor

e-mail: firdausfemipb@yahoo.com

### Abstract

Regions in Indonesia have been receiving investment inflows from other countries, with some regions absorb much more than the others do. This study identifies factors that influence foreign investors to come to provinces in Indonesia using a dynamic panel data approach. It investigates data on investment inflows and regional economic development indicators in each province from 1983 until 2009. The estimation results show that the General Methods of Moment system estimators are unbiased, consistent and valid. This study finds some determinants of spatial foreign investment inflows, namely market size, level of economic development, infrastructure, and education level attainment.

**Keywords:** Disparity, investment inflows, dynamic panel data

**JEL classification number:** F21, F23

### Abstrak

Berbagai daerah di Indonesia telah menerima arus investasi dari negara-negara lain, dimana beberapa daerah mendapatkan investasi lebih banyak dari yang lain. Penelitian ini mengidentifikasi faktor-faktor yang mempengaruhi investor asing untuk datang ke provinsi di Indonesia dengan menggunakan pendekatan data panel dinamis. Data yang digunakan adalah data arus investasi asing dan indikator pembangunan ekonomi regional di setiap provinsi dari tahun 1983 hingga 2009. Hasil estimasi menunjukkan bahwa *General Methods of Moment* memberikan estimator sistem yang tidak bias, konsisten dan valid. Penelitian ini menemukan beberapa faktor penentu arus investasi asing spasial, yaitu ukuran pasar, tingkat pembangunan ekonomi, infrastruktur, dan pencapaian tingkat pendidikan.

**Keywords:** Disparitas, arus masuk investasi, data panel dinamis

**JEL classification number:** F21, F23

### INTRODUCTION

Since its independence day in 1945, Indonesian central government has been politically and economically focused on Java, with the other islands outside Java has been somewhat neglected. Early in the industrialization period in 1950s, spatial dispersion of manufacturing industries was highly skewed with the excessive predominance of Java as opposed to the other islands. West Java accommodated 30 percent of all large and medium-size firms in manufacturing such as footwear, tobacco, textiles and food

products, whereas Central Java and East Java accommodated 25 percent each. By the time, for outside Java, it was only North Sumatra that housed a significant number of manufacturing establishments. The pro-Java policy distressed the outer islands and induced regional separation movements in the late 1950s. In 2001, the Government started to apply the decentralization program. However, the significant inequality of regional development still is found.

The problem of economic disparity across Indonesia will still exist. An economic underlay of unequal natural endow-

ment between the regions continually challenges economic progress. The unequal distribution of natural resources, especially oil and natural gas, and the uneven development of trade and industrial centres that are concentrated in a few regions, have created growth enclaves. It is therefore important to analyze the results achieved by regional policies intended to reduce the disparity, mainly through empirical observation on regional economies.

The important element that widens the disparities among regions is investment inflows, as an engine of growth. In today's Indonesian economy, regions are increasingly varying with each other for greater amount of investment inflows. Some provinces or regions absorbed much more than other did. Some policies had been designed to attract foreign investors to come to remote areas. For instance, the October 1993 deregulation package was designed to encourage new industrial investment. On one hand, it allowed foreigners a period 10 years to hold on to their 100 percent equity before divesting for investments in the eastern provinces and remote areas such as Jambi and Bengkulu. However, up to 2009, investment inflows in Indonesia were strikingly skewed. The Java Island attracts almost 65 percent of accumulative foreign investment and 55 percent of accumulative domestic investment from 1983 until 2009. While the other regions, for instance the Borneo Island invites for a mere 4.5 percent and 11.5 percent.

Investigation on relationship between investment inflow and regional economy performance has significant role in economic development. This means that regional economic growth can be treated as a catalyst in attracting investment inflow, also investment inflow stimulates economic growth (Borensztein, 1998). Assessing empirically why there is such an unequal pattern is almost non-existent, from either analysts or policy makers. This study attempts to shed light on this issue to identify some

factors that influence foreign investors to come to a province. Some hypotheses center on economic dimensions and infrastructure development are tested to answer what the determinants of the spatial distribution of investment inflows are.

The most influential theory that explains the importance of foreign investment is industrial organization explanations. This theory originates from Hymer's celebrated 1960 doctoral thesis. In his thesis, Hymer (1967) first distinguished the difference between portfolio investment and direct investment, and then argued that the capital arbitrage hypothesis explaining international capital movements was inconsistent with several obvious patterns in the behavior of multinational enterprises (MNEs) and was unable to explain the causes of foreign investment. In particular, he gave three reasons for his arguments. First, Hymer argued that once risk and uncertainty, volatile exchange rates and the cost of acquiring information and making transactions were incorporated into portfolio capital arbitrage theory, many of its predictions, for example, with respect to the cross-border movements of money capital in response to interest rate changes, became invalid. This was because such market imperfections altered the behavioral parameters affecting the conduct and performance of firms and, in particular, their strategy in serving foreign markets. Second, Hymer asserted that foreign investment involved the transfer of a package of resources including not only capital but also technology, management skills, and entrepreneurship. As a result, MNEs were motivated to produce abroad by the expectation of earning an economic rent on the totality of their resources. Third, unlike portfolio investment, the most fundamental characteristic of foreign investment was that it involved no change in the ownership of resources or rights transferred. Applying industrial organization theory, Hymer pointed out that if foreign MNEs are exactly identical to

domestic firms, their subsidiary could replace exports from the parent company or even export back to the home country. The product cycle hypothesis was the first dynamic interpretation of the determinants of, and relationship between international trade and foreign production.

Basically, the location choice of foreign investment is determined by relative profitability. If the goods are produced for export, the costs producing the goods and the cost of transporting them to the world market are most crucial. If the goods and services were produced for the local market, then the local demand factor would also matter. Theoretically, to explain the spatial distribution of foreign direct investment (FDI), this study uses an approach proposed by Dunning (1981). The author synthesized the main elements of various possess ownership advantages, the greater the incentive they have to internalize rather than externalize their use, the more they find it in their interest to exploit them from a foreign location, then the more they are likely to engage in foreign production. The framework also can be expressed in a dynamic form. Changes in the outward or inward direct investment position of a particular country can be explained in terms of changes in the *ownership* advantages of its enterprises relative to those of other nations, changes in its location advantages relative to those of other countries, and changes in the extent to which firms perceive that these assets are best organized internally rather than by the market. These factors are also known as the OLI theoretical framework.

From Hymer's seminal work to Dunning's OLI paradigm above, scholars have made great contributions to the theory of foreign direct investment. Among them, Dunning's OLI framework has been the most ambitious and comprehensive explanation of foreign investment. It is a very useful theoretical framework for the present study. According to Dunning's eclectic

OLI paradigm, which synthesizes the main elements of the various explanations for foreign investment, the determinants of foreign investment can be classified into two groups, supply-side factors and demand-side factors. The supply-side factors are ownership advantages and the internalization advantages, and the demand-side factors are location advantages. In terms of the supply-side factors, the investment potential and investment patterns of enterprises are determined by the nature and extent of their possession of ownership advantages and the incentive to internalize the use of their ownership advantages. However, the creation and development of the ownership advantages of enterprises are closely related to their home countries' technological and innovative capabilities and the overall economic development levels.

In terms of the demand-side factors, a host country's overall attractiveness to foreign investment is determined by the location advantages it possesses. Because resource endowments are not evenly distributed among countries and social and economic factors as well as government policies are also different among countries, the attractiveness of host countries to foreign investment is different. This implies that given the supply-side factors the differences in location advantages of host countries are very crucial in determining the distribution of foreign investment inflows into host countries.

Some authors have explored the role of investment inflows in accelerating economic growth. Some empirical observations are consistent with this accelerator effect and show that high output growth is associated with high investment rates (Martin, 1997; Fielding, 1997; Greene and Villanueva, 1991). Frankel (1997) found that the strongest determinants of countries' long-term growth are investment in physical and human capital, openness with respect to international trade and foreign investment. In principle, the unequal distribu-

tion of investment inflows should enlarge the regional economic differences (Zhang, 2001). The study conducted by Borensztein and Lee (1998) suggests that foreign investment as an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. Sjöholm (1998) used micro data of manufacturing sector in Indonesia and also found the similar result.

A large volume of theoretical and empirical literature is devoted to the determinants of the spatial distribution of foreign investment, but usually in the *inter* country context (Broadman, 2001). The theories include, among other approaches, the early Hechsher-Ohlin model and trade models, which emphasize foreign investment emanating from differentials in the endowments of capital and labor between countries and foreign investment as a response to overcome barriers to imports, the industrial organization theory of foreign investment, which focuses on foreign investment as the natural outcome of international oligopolistic rivalry, including a follow-the-leader type of game. In the main, building on these theoretical paradigms, the empirical studies, using either cross-country regression analysis or interviews of foreign investors among host countries, generally show that various economic development characteristics such as market size, labor costs, access to raw materials and infrastructure development, are the major inter-country determinants of foreign investment. Consistent with those theoretical considerations, the existing literature has pointed to the most important set variables that influence the distribution of foreign investment intra country. Most of the studies of location of foreign investment have focused on experience in developed countries. This is not surprising since the end of World War II, many industrialized countries have developed special areas, such as export processing zones, free

trade zones and a special economic zones (Kumar and Chadee, 2002).

Most of the studies propose that the probability that a foreign firm locates in a particular region depends on how the characteristics of such province affects profits relative to the characteristics of all other regions. Therefore, the independent variables to be considered are those specific to the region believed to have an impact on the expected profits of the firm from both the cost and revenue sides. The evidence concerning the impact of factor costs on location of foreign investment is mixed. Some authors found that labor costs deter foreign investment (Coughlin et al., 1991; Coughlin and Segev, 2000), while some found an insignificant relationship between labor cost and foreign investment (Woodward, 1992, Guimaraes et al., 2000). The other factor costs that are usually considered are land and capital costs. Some studies use population density as a proxy for industrial land costs. However some later regional studies found that population density is not a good proxy for land cost variations (Guimaraes et al., 2000). Capital cost, with the interest rate serving as a proxy, is usually invariant across provinces during the period observed. Thus, in this study also does not include it as an independent variable in the model directly. On the revenue side, regional per capita income is commonly used as independent variable to account for differences in market size. Many previous empirical researches found the positive impact of this variable on the location of foreign investment (Wheat, 1986; Friedman et. al, 1992; Woodward, 1992; Coughlin et al. 1991, 2000; Broadman, 2001). Empirical studies on the distribution of foreign investment within country also employed some supporting variables such as infrastructure. They found that more developed infrastructure tends to attract more foreign investment (Friedman et al., 1992; Coughlin et al. 1991 and 2000; Guimaraes et al., 2000; and Broadman,

2001). Some authors also used the level of education attainment as a proxy for the quality and skills of the work force. They found that the higher level has positive impact on the foreign investment (Woodward, 1992; Coughlin et al. 1991; 2000, Guimaraes et al., 2000; Cheng and Kwan, 2000).

Later, a few empirical studies are conducted within developing countries. Most of them observed the disparity problem in China. Using modified gravity model, Chunlai (1997a) suggests that the provinces with higher GDP, per capita income, level of accumulated foreign investment stock, more intensive transportation infrastructure attract relatively more foreign investment inflows. Author again observed that the location advantages of host countries are very important in determining the distribution of the magnitude of foreign investment inflows. To reduce the inequalities of foreign investment distribution, some policies actions are imposed. (i) To shift the preferential policies for foreign investment from regional priority to industrial priority, namely to encourage those foreign investment projects engaged in export-oriented, technologically advanced and raw materials industries. (ii) To adjust its regional development strategy by offering special economic and industrial development policies to the central and western regions. (iii) To encourage coastal areas to transfer managerial skills and technology accumulated and obtained from attracting and utilizing foreign investment to the inland regions in order to benefit fully from foreign investment nationwide. Chen and Fleisher (1996) also conducted a study in China and found that wage cost did not affect foreign investment. In contrast Cheng and Kwan (2000) found that regional income, good infrastructures (roads) had positive effect, but wage cost had a negative effect on foreign investment and also found that level of economic development had a positive impact on the distribution of foreign investment. Furthermore Kim (1999)

estimated regression to show that a consistent set of factor endowments explain a significant amount of the geographic distribution manufacturing activities over time. Later a study also was conducted in Malaysia (Ghani, 2002) to answer what factors those attract foreign investments into a particular state. Author found that the quality of labor plays a positive role in attracting foreign investment to a particular region.

The studies of disparity of investment inflows are still limited for the case of Indonesia. Kawagoe (1997) conducted a study of spatial distribution of private investment across provinces. Hence, the private investment represents market base resource transfer while government expenditure represents government base resource transfer. The authors found that the private investment plays a key role in driving force for industrialization. Hence, rate of industrialization is measured in term of the manufacturing sectors' contribution on total regional domestic product. Mulyono et al. (2002) conducted a study of attractiveness of regencies/cities to investment in Indonesia. The authors employed the analytical hierarchy process to find the factors that attract the investors. The study shows such factors are institutional factor, economic development human resource and infrastructure. The study also finds that there is no single regency that is to be qualified for the top 10 of all 5 factors of rating.

## METHODS

Following Chow (1967), let  $I_{it}$  be the stock of foreign investment in region  $i$  at time  $t$  and  $I_{it}^*$  the corresponding equilibrium or desired stock. This study concentrates on capital stock because the profitability of investment depends on the marginal return to capital, which is generally a decreasing function of the stock of capital and due to the availability of data. Assume that the flow of investment serves to adjust  $I_{it}$  towards  $I_{it}^*$  according to the following process:

$$d \ln I_{it} / dt = \alpha (\ln I_{it}^* - \ln I_{it}), 0 < \alpha < 1 \quad (1)$$

Equation (1) says that the percentage change of the foreign investment stock is proportional to the gap between  $\ln I_{it}$  and  $\ln i_{it}^*$ . Since  $d \ln I_{it} = dI_{it} / I_{it}$ , the equation says that the rate of change of the foreign investment stock is proportional the existing stock, holding the gap constant, and vice versa:

$$dI_{it} / dt = \alpha I_{it} (\ln I_{it}^* - \ln I_{it}) \quad (2)$$

The term on the right hand-side of (2) represents a self-reinforcing or 'positive feedback' effect. This effect is localization with the agglomeration effect-positive externalities generated by localization of industry-emphasized by Smith and Florida (1994) in their studies of foreign investment location in Japan and Head and Ries (1996) in the case of China. It said that foreign investment attracts further foreign investment.

If agglomeration effect means that  $I_{it}^*$  is a positive function of  $I_{it}$  and if the positive feedback effect remains strong regardless of the level  $I_{it}$ , then in the absence of general equilibrium constraints such as resource constraints and bounded external economies, the steady-state  $I_{it}^*$  will be either zero or infinity. In our partial equilibrium model, however,  $I_{it}$  is taken to affect its own future value but not  $I_{it}^*$ . Moreover, the term  $(\ln I_{it}^* - \ln I_{it})$  implies that the self-reinforcing effect of  $I_{it}$  diminishes as the actual stock approaches the equilibrium stock. It captures a process of gradual adjustment toward the equilibrium stock and is in line with the investment literature, which argues that convex adjustment costs for changing the stock of productive capacity imply that the desired capital stock is attained gradually rather than instantaneously.

Conditional on a particular level of the equilibrium stock,  $I_{it} = I_{it}^*$  for all  $t$ , (1) can be solved as a differential equation to yield to Gompertz growth curve

$$I_{it} = \exp(i_{it}^* - \exp(-\alpha t)) \quad (3)$$

where  $i = \ln I$ . Equation (3) describes the natural growth of the foreign investment stock. Therefore combines two elements that account for the observed accumulation of foreign investment. First, the self-reinforcing effect and the adjustment effect drive the foreign investment stock to reach an equilibrium level, and second, the equilibrium level itself shifts as a result of changes in the environment.

In empirical applications, (3) is replaced by its discrete version

$$i_{it} - i_{it-1} = \alpha(i_{it}^* - i_{it-1}) \quad (4)$$

which, after collecting terms, becomes

$$i_{it} = (1 - \alpha)i_{it-1} + \alpha i_{it}^* \quad (5)$$

For the adjustment process described by Equation (5) to be stable and non-fluctuating,  $(1 - \alpha)$  must be a positive fraction. Estimation of such needs specification the determinants of  $I_{it}^*$ .

Collecting the determinants variables in a vector  $x_{it}$ , panel formulation for the equilibrium stock can be written as follow

$$i_{it}^* = \pi' x_{it} + \lambda_t + \gamma_t + \varepsilon_{it} \quad (6)$$

where  $\pi$  is a vector of parameters,  $\lambda_t$  and  $\gamma_t$  are unobserved, region-specific and time-specific effects respectively, and  $\varepsilon_{it}$  is a random disturbance. That is,  $\lambda_t$  captures time-invariant, regional effects such as geographic location, whereas  $\gamma_t$  represents

factors that affect all regions at the same time such as national policy towards foreign investment.

Substituting (6) into (4) will result a dynamic panel regression model ready for empirical implementation,

$$\begin{aligned} I_{it} &= (1 - \alpha)I_{it-1} + \beta' x_{it} + D_j + u_{it}, \\ u_{it} &= \eta_i + \omega_t + v_{it}, i = 1, 2, \dots, N, t = 2, \dots, T \end{aligned} \quad (7)$$

where  $\beta = \alpha\pi$ ,  $\eta_i = \alpha\lambda_i$ ,  $\omega = \alpha\gamma_t$ , and  $v_{it} = \alpha\varepsilon_{it}$ .

In this case  $i_{it}$  is total approved foreign investment and  $x_{it}$  consists of hypothesized determinants. They are regional GDP, trade development, agriculture's share, electric supply, education level and policy variable (dummy). Electric supply is measured by the proportion of household which access to electric power in each province. Education level is measured by the proportion of people which finish the senior high school in each province.

Equation (7) can be used to test the effectiveness of regional policy in attracting the foreign investors to come. As mentioned above, the greater incentives are designed to encourage new foreign investment to locate on remote areas. In this study the effectiveness of the October 1993 deregulation package is also tested by the use of a dummy added to the equation (7). In this case  $D_j = 1$  for  $i^{th}$  provinces within eastern part of Indonesia and some remote areas in western part of Indonesia: Jambi and Bengkulu.

Equation (7) is estimated using both static (fixed-effects and random-effects model), and dynamic panel data approach. For dynamic approach, the most commonly used estimator in the literature is the General Methods of Moment (GMM estimator (Arellano, 1993). In this paper, application of the GMM first differences estimator requires Equation (6).

$$\begin{aligned} \Delta \ln I_{it} &= \gamma \Delta \ln I_{i,t-1} + \beta \ln \Delta x_{it} + \Delta \mu_t \\ &+ \Delta \eta_t + \Delta v_{it} \end{aligned} \quad (8)$$

where  $I_{i,t-2}$  and all previous lags are used as instruments for  $\Delta I_{i,t-2}$  assuming that  $E[v_{it}v_{is}] = 0$  for  $i=1, \dots, N$  and  $t \neq s$  and exploiting the moment conditions that denoted by  $E[y_{it-s}v_{is}] = 0$  for  $t = 3, \dots, T$  and  $s \geq 2$ .

However, the GMM estimator in first differences has been criticized recently in the literature, as Bond and Blundell (1998) argue that in the case of persistent data, the lagged levels are likely to be poor instruments for first differences. Bond and Blundell (1998) suggest a system GMM estimator, where a system of equations is estimated in first differences and in levels. The  $(T-2)$  differences equations, given by (8) are supplemented by the following  $(T-1)$  levels equations.

This study uses the data of provincial gross domestic product for without and with oil and gas from 1983 up to 2009. All real variables are measured in 1993 prices. East Timor is excluded and some new provinces are integrated to their formerly provinces.

The hypothesis of determinants of spatial foreign investment inflows formulated as follows. This is analogous to similar study conducted by Kumar and Chadee, (2002). The selection of the independent variables is based on previous findings of foreign investment inflows studies as well as on theoretical advances of foreign investment inflows. The following factors are hypothesized as important determinants of foreign investment inflows into each of Indonesia's host regions and provinces:

### Market Size of Host Province

The provincial market size is a very important indicator of the overall capacity of the economic activities of a host province. The level of economic activities is expected to be greater the larger is the market of the host province. The larger economies can provide more opportunities for industries

and enterprises to benefit from external economies of scale and spillover effects. Thus the level of foreign investment inflows will be greater the larger is the market of the host (Wheat, 1986; Coughlin et al. 1991 and 2000; Friedman et al., 1992; Woodward, 1992; and Cheng and Kwan, 2000). The influence of provincial market size is hypothesized to have positive impact on the location of foreign investment inflows into host regions or provinces. There are two separately variables of measurement of market size used in this study. They are the real gross regional domestic product and the trade development that is measured from unloaded and loaded cargo at the port in each province.

### **Level of Economic Development**

The level of economic development is a comprehensive economic and social indicator of a province. A higher economic development level not only indicates good overall economic performance and higher purchasing power but also implies higher productivity associated with good labor quality and advanced technology and an overall better investment environment. The level of economic development is expected to have a positive impact on the provincial distribution of foreign investment inflows into Indonesia. Level of economic development is indicated by the changes in industrial structure. Some previous studies show that share of manufacturing output on the total output has important influence in attracting foreign investment inflows (Cheng and Kwan, 2000). In this study the share of agriculture sector output on total provincial real RGDP is used as a proxy for provincial level of economic development.

### **Infrastructure Facility**

Economic conditions are not the only factors considered by potential investors. The infrastructure development of a region is also important, since it indicates how diffi-

cult and costly it may be to access suppliers and distribute the products to markets. The more developed, the easier the access to markets and the lower the transportation costs, and, thus, the greater the incentive to invest in that region. Thus, better infrastructure facilities are hypothesized positively related to foreign investment inflows. Globerman (2002) divided the physical infrastructure into communication and transportation facilities. However in this study the proxy for infrastructure facilities is the percentage of households that accessed to electric power as some regions face the electric supply problem. Infrastructure facility in this study is hypothesized to have positive impact on the location of foreign investment inflows as found in some previous empirical studies (Coughlin et al., 1991 and 2000; Friedman et al., 1992; Chunlai, 1997b; Cheng and Kwan, 2000; Guimaraes et al., 2000; and Démurger, 2001).

### **Level of Education Attainment**

The quality of labor is expected to give positive impact on the location of foreign investment inflows as shown in previous studies (Guimaraes et al., 2000). High quality of labor not only renders labor more productive, but also provides multinational firms with more flexibility in the choice of technology. In this study, percentage of people that completed the senior high school education in each province is used as a proxy for level of education attainment.

### **Regional Policy Variable**

Government policies are hypothesized to have an impact on a location's attractiveness to foreign investors. In this study, the government policy of the October 1993 deregulation package is expected to give positive impact on the location of foreign investment inflows into provinces in eastern part of Indonesia.



**RESULTS DISCUSSION**

The model of cumulative investment above contains a lagged dependent variable on right hand side of equation. In such model the panel data estimators actually are expected to suffer from an upward and downward bias in the presence of fixed-effects. Furthermore this bias cannot be ignored in small samples. Thus both first-difference and system generalized method of moments (FD-GMM and SYS-GMM) are employed in this study to find the determinants of foreign investment inflows.

Based on the specification tests, the dynamic panel data approach of SYS-GMM is selected as the most preferred model as the estimators of such method are unbiased, valid and consistent. For unbiased criteria, the most robust model should give the estimate, which lie between the fixed-effects and the OLS estimators. Where the simple pooled OLS provides an upper bound for the coefficient of the lagged independent and the fixed-effects estimates give the lower bound. The validity of instrumental variables used is indicated by the Sargan test

of over-identifying restrictions. The consistency of parameter estimates are shown by the  $m_1$  and  $m_2$  which indicate the serial-correlation problem.

The parameter estimates from both GMM models are presented in Table 2. For FD-GMM, most of all variables are statistically significant indicated by the p-values, which are less than .05. Theoretically the estimators from the FD-GMM may have a serious problem in the case of weak instruments. This is indicated by more downward biased estimates than the fixed-effects ones. Table 1 shows such problem in this study. The coefficient of lagged foreign investment from FD-GMM is 0.531, which is less than the coefficient from fixed-effects model of 0.572. Invalidity of instruments in FD-GMM is statistically verified by Sargan test. Application of such procedure suggests that the instrumental variables used in the FD-GMM are not valid. The Sargan test shows the rejection of null hypothesis of valid instruments indicated by upper tail area of zero.

**Table 1:** Estimation of Panel Data Approach

Parameters	OLS	Fixed	Random	GMM FD	GMM SYS
Lagged Foreign Investment	0.800*	0.572*	0.742*	0.531*	0.692*
Regional GDP	0.0176*	1.543*	0.2148	2.146*	0.214*
Agriculture's share	-0.0152	-0.962-E02	-0.020*	0 .010*	0.103*
Trade development	0.065*	-0.072	0.0861	-0.876-E02	0.054
Electric supply	0.213-E02	0.0152*	0.021*	0.031*	0.020*
Education level	-0.291-E02	0.421-E02	-0.312-E02	0.267-E-03	0.015*
Policy variable	0.276*	0.521*	0.427*	0.623*	0.468
LM-Tests	-	-	-		
$M_1$				4.214	-3.678
				<i>P</i> -value =	<i>P</i> -value =
$M_2$				[.0000] -	[.0012]
				2.100	.547
				<i>P</i> -value =	<i>P</i> -value =
				[.0412]	[.4558]
Sargan test statistics	-	-	-	290.726	12.917
				<i>P</i> -value =	<i>P</i> -value =
				[.000]	[.2781]

Note: \* indicates the *p*-value of less than 5%.

Source: Data estimation.

For SYS-GMM, the estimate of the coefficient on the lagged dependent variable lies comfortably above the corresponding fixed-effects estimate (lower bound), and below the corresponding OLS estimate (upper bound). It means that the estimate from SYS-GMM is really unbiased. The Sargan test gives the conclusion of no problem with instrument validity, which is indicated, by Sargan test upper tail area of .2781. Thus these instruments seem to be valid and highly informative. The estimates from SYS-GMM are also free of the serial correlation problem. The significant  $m_1$  statistic (.001) and insignificant  $m_2$  (.456) statistic indicate the lack of second order serial correlation in the residuals of the differenced specification. It means the SYS-GMM is consistent.

The coefficient of lagged foreign investment is 0.692, which lies between 0.531 (lower bound) and 0.8 (upper bound). The positive sign of lagged foreign investment means that the higher cumulative foreign investment approval in previous year will attract more foreign investment at current year. Thus foreign investors will prefer to invest in more excessive area. All other variables except trade development and regional policy are statistically significant and consistent with theory. This is indicated by the p-values of such coefficients, which are less than 0.05.

The positive sign of regional GDP means that the larger market size of a province will attract more foreign investment approval. In particular, the higher the regional gross domestic product, the greater the potential domestic demand, and thus, the more attractive a province should be to potential investors. Moreover the positive relationship between regional economy and foreign investment inflows suggest that the disparity of regional economy should be the main priority in government program. Less developed region needs foreign investment to accelerate economic growth, but foreign investors prefer to come to a

more developed region. Thus some more intended regional policy such as the greater investment incentive is required.

The requirement of more intended regional policy is also indicated by positive but statistically insignificant coefficient of regional policy. The coefficient is fairly large (0.468), but the p-value is 0.096, which means it is not significant at 95 per cent level. The insignificant coefficient may be due to some reasons. The first reason is the significant disparity of regional economy. The attractiveness of market size or regional economy becomes the main consideration for foreign investors to spend their funds in a province or not, thus compensate the investment incentives. Secondly some investment incentives such as lower tax and longer license are not effective. Because in province or district level investors still must pay some special transaction costs to get some permits (Oktaviani and Firdaus, 2004).

The insignificant regional policy can contribute to more widening spatial income disparity, especially between western part of Indonesia and eastern part of Indonesia. From the investor's point of view, it is more profitable to produce in western part of Indonesia, which has a better investment climate, rather than in eastern part of Indonesia. Indonesian government should take some actions to create a more attractive investment environment in eastern part of Indonesia. They must be more beneficial to those who care to come. Experiences from some developing countries can be used to formulate some more applicable policies.

The Board of Investments Thailand established under the Investment Promotion Act, lists the five priority sectors eligible for investment incentives. Generally, the most generous incentives are offered to those economic activities that bring new technology to less-developed provinces. For these areas, incentives include such as tax exemptions, exemption from or reduc-

tion of import duties on imported machinery, raw materials and components and permission to own land for carrying out targeted activities.

Based on some regional studies, Chinese government has identified that the coastal areas of east China has outstripped central and west China in the rate of economic growth since the late 1970s. Scarcity of inbound foreign capital in the central and west regions is a major reason behind this situation. Since 1997 the Chinese government has formulated a series of preferential policies to encourage development in central and west regions. Indonesian government can also formulated some stronger policies of "Go to EAST", thus eastern part of Indonesia can draw far more attention from central government than before.

Indonesian government can formulate some alternative policies. Firstly, tax preferential policy. Investors who come to the remote areas and eastern part of Indonesia can get a tax reduction for some years. Investor of some critical sector such as high-tech energy, transportation, power supply and telecommunication can enjoy the more preferential policy. They can be tax exemption or longer tax reduction. Second, applying land use preferential policy. Foreign investors can have the right to operate and use the grassland and the forest in the eastern part of Indonesia if they can restore the forest and grassland. They can obtain the land utilization power through leasing which can be renewed, inherited and transferred after that. Third, imposing the policy to increase government investment. The central government should increase the portion of funds for eastern part of Indonesia rather than western part of Indonesia. They can be a number of large projects related to the infrastructure building.

As hypothesized in the previous chapter, there is an important linkage between trade and foreign investment in flows. Whether however these two va-

riables are complements or substitutes is not clear a priori. On the one hand, greater openness to trade may translate into less foreign investment if imports are substitutes for direct investment. On the other hand, trade and foreign investment may be complements in the sense that a province that already is heavily engaged in trade with foreign countries may appear, in the eyes of potential foreign investors, less risky and thus more attractive. In Indonesia many imports are substitutes for direct investment, which compensate the openness of foreign trade, thus the coefficient is not statistically significant.

Electric supply is also statistically significant to attract more foreign investment. The infrastructure development of a province will indicate how difficult and costly it may be to access suppliers and distribute to markets. The more developed province region, the easier the access to markets and the lower the transportation costs is, and, thus, the greater incentives to invest in that region.

Some previous studies show that many provinces in eastern part of Indonesia have a great potential to develop more rapidly. However, many of them have weak infrastructure such as lack of power supply availability and lack of paved road. Investors must build their own road to open the market access. Moreover about 86 percent of existing telecommunication infrastructure is located in western part of Indonesia. Thus, the government program to make infrastructure improvement as the main priority in regional development (Infrastructure Summit) needs to be supported. Some actions must be taken to make eastern part of Indonesia to be more attractive. Government should facilitate grants and cheap financing scheme through nations or international financial institutions to run some programs such as rural electrification in eastern part of Indonesia.

Education level attainment is also statistically significant to influence the for-

foreign investors to come to a province. In this study it is measured from the percentage of people, which finish the senior high school. This means that the foreign investors are prefer to propose investment approvals in province, which has better human resources. This is due to the characteristics of foreign manufactures, which need more skilled worker. High quality of labor will provide multinational firms with more flexibility in the choice of technology. This is consistent with some previous studies conducted in some South East Asian countries. Similar to some above policies, Indonesian government should encourage capacity building to improve the human resource quality in less-developed provinces.

Finally, the coefficient of agriculture's share is statistically significant but not consistent with theory. The coefficient of such variable is positive which can be explained as follows. In 2003 more than 68 per cent of foreign investment approvals located in Java island. At the same year manufacturing, transportation and communication industries absorb about 71 per cent of foreign investment approvals with the excessive predominance of Java. Most of all foreign investment approvals in other islands are dominated by agricultural sector, such as palm oil and cacao plantations. Sumatra has the most suitable land for palm oil plantings, thus large proportion of foreign investment in Sumatra provinces such as from Malaysia and Singapore is in agriculture. Some provinces in Sulawesi and Kalimantan also received some foreign investment in plantations sector. As this study employs a panel data approach, the positive relationship between cumulative foreign investment approvals and agriculture's share prevails.

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## CONCLUSION

The SYS-GMM was selected as the most preferred model. It provided the unbiased, valid and consistent estimates. This study found some determinants of spatial foreign investment inflows. The market size, economic development level, infrastructure and education level attainment were statistically significant in attracting the foreign investors to come to the province.

The findings of this study suggested some policy implications. Investment was proven to play the important role to overcome the regional disparity problem. Government should give the priorities to some efforts to attract more foreign investment to the provinces. Some remote areas and eastern part of Indonesia should be given the greater incentives because the regional policy has not been yet effective to attract the foreign investors. Those policies are tax-preference policy, land-use preferential policy, increasing government investment and expanding areas of foreign investment in remote areas and eastern part of Indonesia. The central government should give more attention on infrastructure buildings and education program improvements in remote areas and eastern part of Indonesia.

Finally, this study did not break down the nature of foreign investment. The foreign investment encompassed different sector among different provinces in Indonesia. Therefore the study of determinants of foreign investment inflows across sector, for instance agriculture, manufacturing, trade and services could not be carried out. This study concentrated only on the behavior of total approval foreign investment.

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