JDE (Journal of Developing Economies)
https://e-journal.unair.ac.id/JDE/index

RESILIENCY OF INVESTMENT CLIMATE IN EAST JAVA ON LABOR SUPPLY SHOCK AND QUALITY OF INFRASTRUCTURE

Ahmad Hudaifah*[1]
Bambang Tutuko[2]
Andi Zulfikar Darussalam[3]

[1,2,3]Faculty of Economics and Business, Universitas Internasional Semen Indonesia, Indonesia

ABSTRACT

In this study by taking the East Java region as a case study, the research will focus on the resilience of the investment climate on labor fluctuations and the deterioration of infrastructure quality. The data used are at district and city level in East Java starting from year 2007 until year 2014 which is yearly. Dependent variable in this research is total investment (INVESTMENT) that enters into districts and cities in East Java in the form of foreign direct investment (PMA) and domestics investment (PMDN), while the independent variable is divided into two categories namely labor supply shock and infrastructure quality. To represent employment conditions, several independent variable were selected namely human development index (HDI), labor force participation rate (LFPR), and district / municipal minimum wage (UMK). The other independent variables representing the quality condition of the infrastructure consisted of good road length (ROAD), power supply electricity (electricity) and government expenditure on infrastructure (GMODAL). By using panel data regression analysis in 38 districts in East Java, it can be concluded that the coefficient of UMK that contradicts with the theory can be explained from the phenomenon of data where, the minimum wage increase of city districts start 2007 to 2013 slightly has impact on the total investment value. On the other hand, infrastructure variables such as roads, electricity and allocation of government funds do not significantly affect the value of investment in East Java.

***Keywords**: Data Panel Regression, Fixed Effect Model, Minimum Wage and Infrastructure.*

JEL: E20, E24, E29, H54

ARTICLE INFO

Received: April 27th, 2018
Revised: May 12nd,2018
Accepted: June 25th,2018
Online: June 30th,2018

*Correspondence:
Ahmad Hudaifah
E-mail:
ahmadhudaifah@gmail.com

To cite this document: Hudaifah, A., Tutuko, B., & Darussalam, A.Z. (2018). Resiliency of Investment Climate in East Java on Labor Supply Shock and Quality of Infrastructure. JDE (Journal of Developing Economies), 3(1) , 1-15.

Introduction

Investment always has a strong linkage with development and economic growth in a region. Conducive investment climate has an influence on the amount of investment that inflows into a region. Investment will also have a positive impact on job creation and community welfare. In this study by taking the East Java region as a case study, the research will focus on

JDE (Journal of Developing Economies) p-ISSN: 2541-1012; e-ISSN: 2528-2018
DOI: 10.20473/jde.v3i1.8454

the resilience of the investment climate on labor supply shock fluctuation and the deterioration of infrastructure quality.

The study of East Java Growth Diagnostics 2011 by the World Bank concluded that the province of East Java is growing its economy and does not experience substantial problems in access to financial infrastructure for investment activities. Labor conditions both the number of worker supply and its quality of skilled and trained worker, meeting the demand of labor market is also one of the advantages possessed by East Java. Although the minimum wage amounts of cities / provinces reflecting labor costs for investment developments must sometimes increase, but still in accordance with the capabilities of employers and investors.

The existing condition of macroeconomic stability of the province and the conducive security are the advantages belongs to by East Java in supporting the business climate. The primary challenges still remaining by the time business community to expand the investment is inadequate infrastructure facilities, such as lack of road network, limited port capacity, and electricity supply. In addition, the main obstacles forward are the investment climate associated with the business licensing process and the high cost of illegal fees.

The article attempts to answer two major research questions. First, is the investment climate in East Java influenced by labor supply shock fluctuation. Secondly, is the Investment Climate in East Java affected by the quality of infrastructure and local government policies in infrastructure development.

As a province with great economic power and potential, East Java is considered the fastest growing region after Jakarta. The data from East Java economic performance has stated second ranks in Indonesia, based on the percentage of gross regional domestic product distribution until 2014, reaching about 15 percent per year. The growing economic performance in East Java is rapidly also driven from the increase of non-oil exports reaching 14.1 billion USD in 2013 which then slightly decreasing in 2014. Strengthening economic transaction and trading activities of East Java as logistic hub for Eastern Indonesia depends on the availability of infrastructures such as ports, airports, toll roads, and electricity supply.

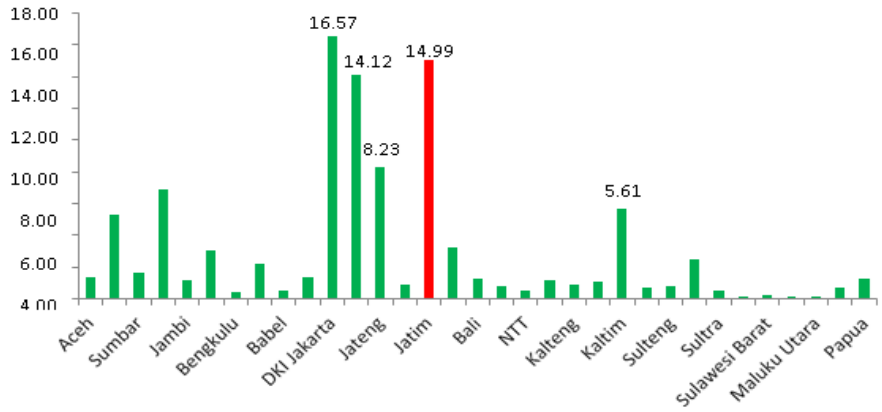

Figure 1: **Distribution of Gross Regional Domestic Product Based on Province (GRDP) (Current Price -In Percentage) 2000-2013**

Source: Indonesian Statistic Bureau, 2015

Total investment in East Java up to the fourth quarter of 2014 (PMA, PMDN and PMDN Non-Facility) has reached 145 trillion rupiahs with the impact of recruitment of labor approximately 500 thousand workers. The total investment value creates 125 thousand investment

projects. The inclusion of investment in East Java also boosted the province's economic growth up to 6 percent in 2014. East Java's economic structure is dominated by manufacturing industries (26 percent), hotel and restaurant trade (31 percent), and agriculture (16 percent) forming 73 percent of East Java's economy in 2014. Revenue per capita in East Java has increased annually about 10 percent and reached 30 million rupiah in 2014. The increase in per capita income is also a positive impact of the increase in total investment in East Java.

Investment in East Java is still dominated by Non-Facilities PMDN that reaches 83 trillion rupiahs with the number of projects as much as 125 thousand and employment of 413 thousand workers in 2014. While the PMA and PMDN until 2014 has reached 62 trillion rupiahs with the impact of employment less that amounted to 78 thousand workers. Investment projects of PMA and PMDN in East Java until 2014 are still focused on capital intensive using more sophisticated machinery and technology in the production process.

Gresik is the most favorite area for investing foreign and domestic investment model with total investment ranging 19 trillion rupiahs and creating employment about 9 thousand employees in 2014. This region became the destination of foreign and domestic investment because of the geographical location closed to the sea port and completeness of industrial supporting infrastructure. The number of investment projects in Gresik alone is about 78 projects. Although, based on geographical size, Surabaya is slightly larger than Gresik, the number of investment projects in 2014 reaching 81, the total investment is far less than Gresik. The spread of investment (PMA and PMDN) is concentrated in areas with good road infrastructure quality and the availability of seaports and airports.

Referring to business fields, PMA and PMDN are focused on sectors involving high technology usages, such as chemical and pharmaceutical industry and non-metallic processing industry. Most of the PMA entering into East Java in 2014 is to open chemical and pharmaceutical industries with a total investment value of 60 trillion rupiah. While the tendency of PMDN in East Java is gradually dominated by non metallic minerals industry, housing, office industry area, and food and pharmaceutical industry with total investment value up to 26 trillion rupiahs in year of 2014.

Total investment in East Java is actually more dominated by non-facility PMDN activities which reach 60 percent (80 trillion rupiahs) of total investment in 2014. Investment activity of PMDN Non Facility is also almost equally happening in all districts / cities in East Java although concentrated in area urban and industrial areas with adequate infrastructure facilities such as Surabaya, Sidoarjo, Pasuruan and Gresik. Based on data from integrated services in each regency and city, total non-facility PMDN investment in these four regions reaches 52 trillion rupiahs in 2014. While total Non-Facilities PMDN in other areas all districts in East Java city only reached 28 million rupiah. Non-facility PMDN also has a far greater employment recruitment opportunities reaching 414 thousand workers by 2014.

Table 1: **Total Investment in East Java Province 2014 Based on Investment Classification and Jobs Creation**

No	Investment Classification	Projects	US$ (Billions)	Rupiah (Trillions)	Employees (Persons)
1	Foreign Direct Investment (PMA)	245	1,80	19,29	36.725
2	Domestic Investment (PMDN)	192		42,55	41.203
3	Non-Facility-Domestic Investment (PMDN Non Facilitas)	124.714		83,19	413.325
	Total Investasi	125.151		145,03	491.253

Note : Quarter I to III : 1 US.$ = Rp. 10.500,- dan Quarter IV : 1 US.$ = Rp. 11.600,-

Source: East Java Investment Board, 2014

Unlike PMA and PMDN, investment in the category of Non-Facilities PMDN in East Java is dominated by the trade, industry and construction services sector which reached 63 trillion rupiah in 2014. All three sectors are also able to open the opportunity for employment recruitment in 2014 in Java East reaches 220 thousand people. While the sector that is able to open a large employment opportunity reaches 106 thousand people but with an investment value of only 570 billion rupiah is the agricultural sector. Having the same characteristics as agriculture, investment activity in the plantation sector has a total value of 2.2 trillion rupiah with the impact of labor recruitment reaching 20 thousand people in 2014.

East Java Province is not only a place of great economic activity, but also as a port and exporter of non oil and gas production in Indonesia. East Java Province is able to export non- oil commodity goods to various countries in the world. The large contribution of East Java Province in boosting exports is inseparable from the distribution of East Java GRDP to the national economy which reaches about 14 percent each year. As a province with economic potential supported by sufficient quality of infrastructure, East Java grows as a province that becomes the center of industry, trade and services.

Theoretical Background

The academic study of the investment climate is dominated by factors that cause foreign capital inflows, for example Yasmin et al. (2003), Ghose (2004), Tsen (2005), Agiomirgianakis et al (2006), and Enu et al (2013). Most of studies have focused on macroeconomic variables, such as interest rates, inflation and exchange rates, to analyze the investment climate in certain regions and countries. Another study that is strongly related to the investment climate is the relationship between investment and economic growth in a country as an example Anwer and Sampath (1999) and Alfaro (2003).

The study of investment is always related to the influencing factors. Among the various studies, the papers conducted by Yasmin and colleagues (2003) examines such factors affecting foreign investment in developing countries. The study used a sample of 15 developing countries with representatives from 5 low income countries, 5 middle income countries and 5 high income countries. The methodology used is panel data regression analysis with foreign direct investment as independent variable. While the dependent variables are GDP percapita, domestic private and public investment (calculated from percentage of GDP), trade balance (calculated from percentage of GDP), foreign debt (calculated from percentage of GDP), trade openness of total import transactions plus exports divided by total GDP, inflation, government spending on transport and communications (calculated from the percentage of GDP, the standard of living defined as public and government consumption minus military expenditures (calculated from percentage of GDP), urbanization rate calculated from urban population divided with total population, labor force participation rate, total government tax revenue (calculated from percentage of GDP), government revenue from import duty (calculated from percentage to GDP), and average worker's wage.

Enu et al (2013) conducted a study that has similarities with Yasmin et al (2003) with a focus on the macroeconomic conditions of a country affecting foreign investment. In the study, by making Ghana the main reference, foreign investment is strongly influenced by the state of exchange rate of a country and trade openness (trade openness). Enu et al (2003) is using time series data analysis with the main focus of cointegration relationships between foreign investment, exchange rate stability and trade openness.

Escribano et al (2009) conducted an empirical study of the impact of infrastructure quality on the productivity of a company by taking the case of manufacturing industry in Africa from 1999 to 2005. The quality of infrastructure in this study considers variables such as adequate ports, energy supply, water availability and transport facilities and communication. While the productivity of the company is calculated from the total output (sales) that is successfully marketed. This study concludes that the quality of infrastructure is very influential on the productivity of the company.

Walsh and Yu (2010) used foreign investment data (PMA) divided into primary, secondary and tertiary investment categories, conducting PMA analysis of macroeconomic, developmental and qualitative / institutional variables. The study uses the method of Generilized Method of Moment (GMM) dynamic estimator based on the Arellano-Bond Methodology. This study concludes that foreign direct investment inflows (FDI) for the primary sector are not significantly affected by these variables, but foreign investment in the tertiary and secondary sectors tends to be influenced by various variables such as macroeconomic (state income and exchange rate), developmental (depth of financial inclusiveness and school enrollment rate), institutional / institutional (legal transparency and labor market flexibility).

Methodology and Data

This study utilizes secondary data published by government agencies such as the Capital Investment Board (BPM), Central Bureau of Statistics (BPS), Directorate General of Regional Financial Balance (DJPK), and East Java Provincial Government (Pemprov Jawa Timur). The data being used are at district and city level in East Java starting from 2007 until 2014, which is yearly time series. Dependent variable in this research is total investment (INVESTASI) that enter into regencies and cities in East Java both PMA and PMDN. While the independent variables are divided into two categories namely labor shock (labor supply shock) and the quality of infrastructure. To represent the employment conditions, the variables of human development index (IPM), labor force participation rate (TPAK), and district / city minimum wage (UMK) are selected. Other independent variables representing the condition of infrastructure quality consist of good road length (JALAN), power supply (LISTRIK), and government spending on infrastructure (GMODAL).

The model approach departs from the framework that the total investment will be influenced by the most sensitive variables affecting the value of investments, which are labor conditions, infrastructure quality, and various other variables that have not been defined. Thus, the model equations of panel data regression analysis in 38 districts in East Java are as follows:

$$INVESTASI_{it} = \beta_{1it} + \beta_2 JALAN_{2it} + \beta_3 LISTRIK_{3it} + \beta_4 GMODAL_{4it} + \beta_5 IPM_{5it} + \beta_6 UMK_{6it} + \beta_7 TPAK_{7it} + \mu_{it} \quad (1)$$

Where:

INVESTASI = total investment (PMA and PMDN) in regencies and cities in East Java from 2007-2014 in Rupiah;

JALAN = the length of the road with good quality at the city districts in East Java from 2007-2014 in percentage;

LISTRIK = electricity supply at city districts in East Java from 2007-2014 calculated from electrification ratio of household in percentage;

GMODAL = the government's spending on infrastructure in districts and cities in East Java from 2007-2014 in rupiah;

IPM = is a human development index in districts and cities in East Java from 2007-2014 in percentages;

UMK = the minimum wage of regencies and cities in East Java from 2007-2014 calculated in rupiah; and

TPAK = the level of labor force participation in each district city in East Java from 2007-2014 is calculated in percentage

Discussion and Analysis

Regression analysis using panel data in 38 regencies and cities in East Java for INVESTASI, JALAN, LISTRIK, GMODAL, IPM, UMK and TPAK variables will be discussed into three methods: Pooled OLS, FEM (LSDV / Least Square Dummy Variable), and REM (Random Effect Model).

Pooled OLS Model (PLS)

The Pooled-OLS estimation result with panel data regression analysis is shown by the Appendix 1. Of the 6 variables, only 2 variables inferred have a significant effect on the investment, such as UMK and TPAK. Its significance is concluded from the value of both probabilities that are perfectly worth 0.000. The conclusion can also be known from the t statistic value for the UMK variable of 10.224 and the TPAK of -4.751, where the two values are outside the zone of acceptance H0.

Using t distribution / two-sided testing if the value of t statistic is determined in the middle zone (between t distribution results of the table) then H0 will be accepted. Based on the comparison of t-stat values on both variables (UMK and TPAK) which are outside the acceptance of H0, then the mean H1 is accepted so that the coefficient value has the meaning of not = 0.

In this model the problem encountered is the low R quare which is only 0.27, meaning that the value is very small possibility of independent variable (JALAN, LISTRIK, GMODAL, IPM, UMK and TPAK) could influence the variable of INVESTASI. Even, if all such variables affect INVESTASI, those can explain only about 27%. The value of Durbin Watson Stat which is only 0.91 also indicates that the model has a great possibility of autocorrelation (strong relationship) among independent variables involved. The classical assumption testing needs to be considered further in the model. The autocorrelation seems to prevail in the model. In addition, the Pooled OLS model also oversimplifies the diversity of each city district in the observation.

Fixed Effect Model (FEM/LSDV)

To provide the diversity / characteristics of data in FEM, the dummy variable technique for each cross sectional unit is used (differential intercept dummy variable technique). As an illustration, the equation below is an investment function of 38 districts / cities in East Java from 2007-2017. INVESTASI function is influenced by JALAN, LISTRIK, GMODAL, IPM, UMK, and TPAK. So the equation will be written as follows:

$$\begin{aligned} Investasi_{it} &= \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \alpha_4 D_{4i} + \alpha_5 D_{5i} + \alpha_6 D_{6i} + ... + \alpha_{38} D_{38i} \\ &+ \beta_2 Jalan_{it} + \beta_3 Listrik_{it} + \beta_4 G\bmod al_{it} + IPM_{it} + UMK_{it} + TPAK_{it} + \mu_{it} \end{aligned} \quad (2)$$

Where:

INVESTASI = Total investment of both PMA and PMDN in each regency / city in East Java from 2007-2008 is calculated in rupiah nominal;

JALAN = The percentage of roads with good quality in every district / city in East Java is the average salary of employees in the six sharia banks;

LISTRIK = The percentage of households accessing electricity is divided by the total number of households in each district of the city in East Java;

GMODAL = The ratio of government expenditures for development capital is divided by total government spending in each city districts in East Java;

IPM = Human development index that reflects the quality of development in each district of the city in East Java;

UMK = Worker's wage rate in each city districts in East Java;

TPAK = The labor force participation rate which is the inkater of the labor force supply in the labor market in each city districts in East Java;

D_21 = Dummy variable (interspt) for district / city to 2;

D_31 = Dummy variable (interspt) for the 3rd district / city;

D_41 = Dummy variable (interspt) for 4th district;

D_51 = Dummy variable (interspt) for 5 districts;

D_61 = Dummy variable (interspt) for 6th district; to

D_38 = Dummy variable (interspt) for 38 districts / cities consisting of Pacitan, Ponorogo, Trenggalek, Tulungagung, Blitar, Kediri, Malang, Lumajang, Jember, Banyuwangi , Bondowoso Regency, Situbondo Regency, Probolinggo Regency, Pasuruan Regency, Sidoarjo Regency, Mojokerto Regency, Jombang Regency, Nganjuk Regency, Madiun Regency, Magetan Regency, Ngawi Regency, Bojonegoro Regency, Tuban Regency, Lamongan Regency, Gresik Regency, Bangkalan Regency Sampang, Pamekasan, Sumenep, Kediri, Blitar, Malang, Probolinggo, Pasuruan, Mojokerto, Madiun, Surabaya and Batu.

Based on Eviews output results at Appendix 2, this can deliberated that the value of R square FEM model is significantly improved. The R square is approximately 0.609. Each district / city in the FEM model also has an intercept (dummy variable) which is its fixed effect. In this model the UMK and TPAK variables have a significant influence in the model while the other variables are not. Durbin Watson Statistic's value reaching 1.67 indicates that this model is likely to avoid autocorrelation (strong relationship among independent variables in the model).

The value of the UMK coefficient that is contrary to the theory can be explained from the data phenomenon where the increase of minimum wage of city and districts from 2007 to 2013 does not significantly affect the value of investment. In almost all districts and municipalities in East Java, wage increases in these periods can still be tolerated / understood by the business communities, hence the value of incoming investment remains large and shows an increasing trend. The intolerable UMK increase was happening in 2014 where wage rose gradually between 20 to 40 percent in 38 districts of East Java and were becoming burdensome to business districts. That year's data on investment value trends in all city districts depicted signs of sharp decline.

In all urban districts in East Java, the increase of UMK (minimum wage) from 2007 to 2013 can still be tolerated by entrepreneurs so that the amount of investment (PMA and PMDN) inflow to East Java remains high. The rise of UMK at that time ranges below 20% per year. Entrepreneurs are still considering the inclination of East Java's carrying capacity to the investment climate such as road networks, seaports, airports, toll roads and power supply. At that time UKM in all districts in East Java are still the same to two provinces in Java which became the investment destination areas, namely Central Java and West Java.

The symptoms of East Java wage increase are already evident in 2013 where UMK rose by 18 percent and continued by 13 percent in 2014 due to strong pressure from government-facilitated trade unions. The drastic increase in wages is responded by several investment relocation plans to other regions with lower UMK compared to East Java, however investment infrastructure and supporting facilities have similar quality, those provinces are Central Java and West Java. The average wage increase in East Java is lower than West Java every year but is still higher than Central Java. Investment relocation responding to the increase of East Java UMK in the long term occurs and manufacturer will consider move to Central Java if the UMK wage decision is still below East Java. The quality of investment facilities also has more in common. In addition to this the cost of relocation should also be lower than cost burden doe to increase in the value of worker salary.

The UMK drastical escalation in 2013 and 2014 actually has little effect on capital inflows in some districts of East Java, such as Lumajang, Bondowoso, Situbondo, Sumenep, Kediri, Malang and Probolinggo. This is because those provinces are an investment area with a characteristic of UMK fluctuation resilience. Types of businesses that do not pay attention to the rise of UMK are considered as natural resource-based investments, such as oil drilling in Sumenep. Moreover, such investment characteristic in the region is more considering the condition of territorial carrying capacity and supporting infrastructure facilities rather than the increase of UMK. Investors in the area also prefer to the quality of human resources workers and the availability of the number of workers, so that the increase in UMK is not necessarily responded by relocation in the short term.

The Eviews estimation for F test as the selection method between FEM and PLS (Appendix 3) also shows the same value at Cross-Section F of 6.04 with prob 0.000. It also indicates that FEM is more suitable for model use.

REM (Random Effect Model)

The FEM model, although it is easy to use and interpret, FEM has a tendency to require a lot of degree of freedom, so it is possible to have constraints in decision making or testing. If the dummy variable in the LSDV-FEM is particularly considered to depend on the intersept to represent the diversity of data / variables, then there is a model that is supposed to help eliminating the weaknesses in FEM, the model developed from the error term (disturbance) called the error component model (ECM) or Random Effect Model (REM).

The main assumptions that must be met in the ECM model are the individual error components (each variable is used) are not correlated with each other, and there is no autocorrelation in the cross section and time series (no autocorrelation relationship between variables in time and diversity). In the event of such conditions the ECM Model will result in an inconsistent regression coefficient estimate. To know the condition, Hausman test is used as a tool to know whether ω_it / error term correlated with explanatory variables.

The REM results, at Appendix 4, when compared with FEM in the previous method have a perception in the interpretation. In REM model R square value is much smaller that is only 0.167 with Durbin Watson Statistic about 1.5. the explanation of the random effects in the REM model almost has similarities to the FEM model. The fixed effects coefficient will be tested by using Hausman's Test to determine whether the value differs significantly with the FEM result coefficient.

Based on the consideration of Hausman Test result at Appendix 5, REM model can be used, but by looking at the characteristics of panel data in the form of short panel (cross sectional unit is bigger than data length) and the R square and DW statistic, FEM is better then FEM model will be more used. So the interpretation of panel data regression analysis result is based on FEM model calculation rather than Random Effect Model.

Conclusion

The results of this study are divided into three methodological approaches using the best method selection among the three. F test is used to determine between PLS with FEM and Hausman test is used to select between FEM and REM. The panel data regression analysis approach emphasizes the use of Fixed Effects Model (FEM) and Random Effect Model (REM) methods.

Based on Eviews output results known that the value of R square FEM model is better that is equal to 0.609. Each district / city. Moreover, FEM model also has an intercept (dummy variable) which is its fixed effect. UMK and TPAK variables have a significant influence in the model while the other variables are not. Durbin Watson Statistic's value of 1.67 indicates that the model is likely to avoid autocorrelation (strong relationship between independent variables in the model).

The main problem faced in the FEM model is the coefficient value of UMK and TPAK contradicting the theory. Based on the theory, UMK coefficient should be negative which means the higher increase in UMK will reduce investment in 38 districts of cities in East Java. On the other hand, the TPAK should have a positive value which means the higher TPAK as a signal to the abundant supply of labor in 38 districts of the city in East Java.

The value of the coefficient of UMK that is contrary to the theory can be explained from the data phenomenon where the increase of minimum wage of city districts from 2007 to 2013 does not significantly affect the value of investment. In almost all districts and municipalities in East Java, wage increases in these periods can still be tolerated / understood by the business sector, so that the value of incoming investment remains high and has an increasing trend. The opposite trend of UMK was happening in 2014 where wage increases between 20 to 40 percent in 38 districts of East Java became burdensome to business districts. This year's data on investment value trends in all city districts shows the signs of sharp decline.

Based on data estimation and analysis using E views 7, the majority of urban district community in East Java from 2007 to 2013 can still tolerate the increase of UMK, so that the amount of investment (PMA and PMDN) inflows to East Java remains high. The rise of UMK at that time is below 10% per year. Entrepreneurs are still considering the inclination of East Java's carrying capacity to the investment climate such as road networks, ports, airports, toll roads and power supply. At that time, UMK in all districts in East Java are still the same to two provinces in Java, which became the investment destination areas of Central Java and West Java.

The REM model results when compared to FEM have similarities in interpretation.

Referring to REM, the R square value is much smaller that is only 0.167 with Durbin Watson Statistic about 1.5. The explanation of the random effects in the REM model almost has similarities to the FEM model.

Based on the consideration of Hausman Test result, REM model can be used, but by looking at the characteristics of Panel Data in the form of short panel (cross sectional unit is bigger than data length) and the R square and DW statistic. FEM model will be more preferably used. Hence, the interpretation of Panel Data regression analysis result is based on FEM model calculation rather than Random Effect Model.

Reference

Agiomirgianakis, G., Voulgaris, F., & Papadogonas, T. (2006). Financial factors affecting profitability and employment growth: the case of Greek manufacturing. International Journal of Financial Services Management, 1(2/3), 232. https://doi.org/10.1504/ijfsm.2006.009628

Alfaro, L. (2003). Foreign direct investment and growth: does sector matter? Harvard Business School Proceedings, April.

Anwer, M. S., & Sampath, R. K. (1982). Investment and Economic Growth. Introduction to Economics: Theory and Data, 670–698. https://doi.org/10.1007/978-1-349-16933-7_15

Aulia, T. (2004). Modul Pelatihan Ekonometrika. Fakultas Ekonomi. Bank Indonesia.

East Java Investment Board. (2014). Foreign and Domestic Investment Statistic.

Enu, P., Havi, E. D. K., & Attah-Obeng, P. (2019). Impact of Macroeconomic Factors on Foreign Direct Investment In Ghana: A Cointegration Analysis. Teme, 9(28), 1237. https://doi.org/10.22190/teme1804237a

Escribano, A., Guasch, J. L., & Pena, J. (2010). Assessing the Impact of Infrastructure Quality on Firm Productivity in Africa Cross-Country Comparisons Based on Investment Climate Surveys from 1999 to 2005. Policy Research Working Papers, 09(86), 1–105.

Ghose, A. K. (2004). Capital Inflows and Investment in Developing Countries: The Case of Indonesia. The International Journal of Applied Economics and Finance, 4(4), 220–229. https://doi.org/10.3923/ijaef.2010.220.229

Gujarati, D. (2010). Basic Econometrics (4th ed.). The McGraw-Hill Companies.

Statistical Bureau. (2015). East Java Macroeconomic Statistic.

Tsen, W. H. (2015). The determinants of foreign direct investment in manufacturing industry of Malaysia. Journal of Economic Cooperation and Development, 26(2), 91–110.

Verbeek, M. (2007). A guide to modern econometrics. In Applied Econometrics (Vol. 8, Issue 4)

Walsh, J. P., & Yu, J. (2010). Determinants of Foreign Direct Investment: A Sectoral and Insti-

tutional Approach.

Wibisono, Y. (2005). Modul Pelatihan Ekonometrika Dasar. Lab. Ilmu Ekonomi FE.

World Bank. (2011). East Java Growth Diagnostic: Identifying The Constraints To Inclusive Growth In Indonesia's Second-Largest Province (Issue February). https://doi.org/10.1596/27420

Yasmin, B., Hussain, A., & Chaudhary, M. A. (2003). Analysis of Factors Affecting Foreign Direct Investment in Developing Countries. Pakistan Economic and Social Review, XLI(2), 59–75.

Appendix

Appendix 1: Pooled OLS Model Estimation Result

Dependent Variable: INVESTASI?				
Method: Pooled Least Squares				
Date: 06/13/15 Time: 14:31				
Sample: 2007 2014				
Included observations: 8				
Cross-sections included: 38				
Total pool (balanced) observations: 304				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
JALAN?	-0.016280	0.126310	-0.128891	0.8975
LISTRIK?	-0.071961	0.034065	-2.112475	0.0355
GMODAL?	2.356291	1.216729	1.936578	0.0537
IPM?	0.043703	0.026262	1.664149	0.0971
UMK?	2.907049	0.284349	10.22354	0.0000
TPAK?	-0.130698	0.027511	-4.750760	0.0000
R-squared	0.272078	Mean dependent var		26.99935
Adjusted R-squared	0.259864	S.D. dependent var		2.174858
S.E. of regression	1.871055	Akaike info criterion		4.110421
Sum squared resid	1043.252	Schwarz criterion		4.183783
Log likelihood	-618.7840	Hannan-Quinn criter.		4.139768
Durbin-Watson stat	0.910347			

Source: Author's Estimation Result

Appendix 2: Fixed Effect Model Estimation Result

Dependent Variable: INVESTASI?
Method: Pooled Least Squares
Date: 06/20/15 Time: 16:27
Sample: 2007 2014
Included observations: 8
Cross-sections included: 38
Total pool (balanced) observations: 304

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	14.10074	7.461074	1.889907	0.0599
JALAN?	-0.018404	0.277422	-0.066338	0.9472
LISTRIK?	-0.102931	0.076355	-1.348052	0.1788
GMODAL?	0.284609	1.225609	0.232218	0.8166
IPM?	0.092795	0.110251	0.841670	0.4007
UMK?	1.694590	0.607293	2.790398	0.0057
TPAK?	-0.096085	0.028437	-3.378910	0.0008
Fixed Effects (Cross)				
PACITAN--C	-1.927409			
PONOROGO--C	-0.857563			
TRENGGALEK--C	-1.289110			
TULUNGAGUNG--C	-1.277996			
BLITAR--C	-0.793952			
EDIRI--C	-1.328227			
MALANG--C	-0.119196			
LUMAJANG--C	-1.677967			
JEMBER--C	1.554468			
BANYUWANGI--C	1.527412			
BONDOWOSO--C	-1.150414			
SITUBONDO--C	1.259491			
PROBOLINGGO--C	2.017584			
PASURUAN--C	2.033616			
SIDOARJO--C	1.779035			
MOJOKERTO--C	0.571386			
JOMBANG--C	0.618033			
NGANJUK--C	-0.293294			
MADIUN--C	-0.493177			
MAGETAN--C	-0.742374			
NGAWI--C	0.655214			
BOJONEGORO--C	-0.099656			
TUBAN--C	2.050427			
LAMONGAN--C	0.461056			
GRESIK--C	1.966711			
BANGKALAN--C	-0.301549			
SAMPANG--C	-0.132296			
PAMEKASAN--C	-1.967571			
SUMENEP--C	-1.314471			
KEDIRIKOTA--C	-0.748363			
BLITARKOTA--C	2.318812			
MALANGKOTA--C	-1.032521			
PROBOLINGGOKOTA--C	-0.128715			
PASURUANKOTA--C	-1.424732			
MOJOKERTOKOTA--C	-1.196580			

MADIUNKOTA--C	-1.924284		
SURABAYAKOTA--C	2.035003		
BATUKOTA--C	1.373169		
Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.609347	Mean dependent var	26.99935
Adjusted R-squared	0.544739	S.D. dependent var	2.174858
S.E. of regression	1.467443	Akaike info criterion	3.738047
Sum squared resid	559.8808	Schwarz criterion	4.276038
Log likelihood	-524.1831	Hannan-Quinn criter.	3.953256
F-statistic	9.431443	Durbin-Watson stat	1.673094
Prob(F-statistic)	0.000000		

Source: Author's Estimation Result

Appendix 3: F Test Estimation Result

Redundant Fixed Effects Tests			
Pool: FEM			
Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	6.048724	(37,260)	0.0000
Cross-section Chi-square	188.782691	37	0.0000

Source: Author's Estimation Result

Appendix 4: Random Effect Model Estimation Result

Dependent Variable: INVESTASI?				
Method: Pooled EGLS (Cross-section random effects)				
Date: 06/13/15 Time: 13:41				
Sample: 2007 2014				
Included observations: 8				
Cross-sections included: 38				
Total pool (balanced) observations: 304				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	12.82812	6.734431	1.904856	0.0578
JALAN?	0.009157	0.188580	0.048557	0.9613
LISTRIK?	-0.085553	0.056336	-1.518621	0.1299
GMODAL?	0.766915	1.161849	0.660082	0.5097
IPM?	0.049766	0.046218	1.076784	0.2825
UMK?	2.031858	0.398529	5.098397	0.0000
TPAK?	-0.128621	0.035088	-3.665681	0.0003
Random Effects (Cross)				
PACITAN--C	-1.213588			
PONOROGO--C	-0.559079			

TRENGGALEK--C	-0.790211		
TULUNGAGUNG--C	-0.741443		
BLITAR--C	-0.532944		
KEDIRI--C	-1.124814		
MALANG--C	-0.123408		
LUMAJANG--C	-1.404756		
JEMBER--C	1.140257		
BANYUWANGI--C	1.198901		
BONDOWOSO--C	-1.062739		
SITUBONDO--C	1.001517		
PROBOLINGGO--C	1.568898		
PASURUAN--C	1.569500		
SIDOARJO--C	1.477834		
MOJOKERTO--C	0.565763		
JOMBANG--C	0.560666		
NGANJUK--C	-0.217051		
MADIUN--C	-0.471440		
MAGETAN--C	-0.310797		
NGAWI--C	0.692827		
BOJONEGORO--C	-0.218559		
TUBAN--C	1.528548		
LAMONGAN--C	0.293857		
GRESIK--C	1.641889		
BANGKALAN--C	-0.552858		
SAMPANG--C	-0.392859		
PAMEKASAN--C	-1.803183		
SUMENEP--C	-0.883658		
KEDIRIKOTA--C	-0.627087		
BLITARKOTA--C	2.135243		
MALANGKOTA--C	-0.935822		
PROBOLINGGOKOTA--C	-0.129378		
PASURUANKOTA--C	-1.291702		
MOJOKERTOKOTA--C	-0.969629		
MADIUNKOTA--C	-1.679709		
SURABAYAKOTA--C	1.536305		
BATUKOTA--C	1.124707		
Effects Specification			
		S.D.	Rho
Cross-section random		1.173634	0.3887
Idiosyncratic random		1.471666	0.6113
Weighted Statistics			
R-squared	0.167156	Mean dependent var	10.94259

Adjusted R-squared	0.150331	S.D. dependent var	1.603795
S.E. of regression	1.478338	Sum squared resid	649.0884
F-statistic	9.934896	Durbin-Watson stat	1.434338
Prob(F-statistic)	0.000000		
Unweighted Statistics			
R-squared	0.249781	Mean dependent var	26.99935
Sum squared resid	1075.207	Durbin-Watson stat	0.865891

Source: Author's Estimation Result

Appendix 5: Hasuman Test Estimation Result

Correlated Random Effects - Hausman Test			
Pool: REM			
Test cross-section random effects			
Test Summary	Chi-Sq. Statis-tic	Chi-Sq. d.f.	Prob.
Cross-section random	9.185237	6	0.1634

Source: Author's Estimation Result