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## How to Determinant Economic Growth In Java Island

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**Abstract.** This study aims to provide an emperical picture of the relationship between Investment, Local Original Income, Income Inequality, Unemployment and Crime against Economic Growth of provinces in Java Island using panel data from 2006 to 2021. By using the panel data regression model method, namely the one-way model. Based on the results of data analysis, variables that have a positive and significant effect on economic growth are Investment, Regional Original Income, Income Inequality. And the effect of Unemployment and crime on Economic Growth is significant and negative. Meanwhile, the form of relationship that occurs from all variables to economic growth is inelastic which is shown by the value of a small regression coefficient of one. For this problem it is recommended that local governments make policies that are for investment, local original income, income inequality, unemployment and crime that encourage greater economic growth.

**Keywords.** Economic Growth, Investment, Local Original Income, Income Inequality, Unemployment and Crime

### A. Introduction

Java Island is the most populous island in Indonesia, there are at least more than 150 million people living in the region and the contribution to Gross Domestic Product is 58.7% (Indonesian Central Bureau of Statistics), but in 2020 the economic growth of Java island experienced a very large contraction, this has an impact on economic growth in Indonesia. Java Island has an area of about 138,793.6 km<sup>2</sup> which is located in the south bordering the Indian Ocean, north by the Java Sea, on the west by the Sunda Strait, and on the east by the Bali Strait and has six provinces namely DKI Jakarta, Banten, West Java, Central Java, DI Yogyakarta, and East Java. The astronomical location of Java Island can be seen in figure 1 below:

Figure 1. Java Island in Indonesia



Source: Know the Land and Sea Boundaries of Java Island, Including Conditions Geographically (Universita Muhammadiyah Malang).

Activities economy in Java are supported by 3 main sectors, namely industry, trade, agriculture and other sectors with a low contribution. The industrial sector is a generator of economic growth on the island of Java to move the wheels of the economy for other sectors. The success of running the wheels of a country's economy can be described by economic growth. According to (M.P Todaro & Smith, 2009) economic growth is a process of increasing production capacity over time, Keynes states that economic growth is formed from consumption, investment, government spending and foreign trade activities (Sukirno, 2011). Then (R.F. Harrod and Evsey Domar, ) stated that to achieve strong economic growth, requires investment, Schumpeter ((Jhingan, 2014) said economic growth depends on the amount of quality human resources and (Robert Solow, ) stated that economic growth is a series of dependent activities On four factors namely people, capital accumulation, modern technology and output. Meanwhile (Puji Lestari & Yolanda, 2022) stated that economic growth is a continuous change in the country's economic conditions towards a better direction.

The increase in national income can be seen from the amount of Gross Domestic Product produced each year. Economic Growth can affect the environment (Aşici, 2013), energy poverty (Ullah, Khan, & Yoon, 2021), poverty (Korankye, Wen, Michael, & Baah-nketiah, 2020), Generation gap (Harnphattananusorn & Puttitanun, 2021) and Unemployment (Hendrawati, Murti, & Yolanda, 2022),

Here is a table showing that economic growth in Java Island is seen through the Growth Rate of Gross Regional Domestic Product on the Basis of Constant Prices:

Table 1.  
Economic Growth in Java and Indonesia % (Y-ON-Y)

Provinsi	Tahun					
	2016	2017	2018	2019	2020	2021
DKI Jakarta	5,87	6,2	6,11	5,96	-2,39	3,56
Jawa Barat	5,66	5,33	5,66	4,12	-2,52	3,74
Jawa Tengah	5,25	5,26	5,31	5,34	-2,65	3,33
Jawa Timur	5,57	5,46	5,5	5,52	-2,33	3,56
DI Yogyakarta	5,05	5,26	6,20	6,59	-2,67	5,58
Banten	5,28	5,75	5,77	5,26	-3,39	4,44
Indonesia	5,03	5,07	5,17	5,02	-2,07	3,70

Sumber : <https://www.bps.go.id>

Table 1 above illustrates the economic growth rate of provinces in Java and Indonesia in 2016-2021. In 2020 all provinces in Java experienced a decline, with economic growth occurring above 2.00 percent and the largest decrease was in Yogyakarta province (-2.67 percent). This condition was triggered by the Covid-19 pandemic, where at that time there were regulations on Large-Scale Social Restrictions, causing lockdowns aimed at breaking the chain of spread of Covid-19. This regulation led to a decrease in economic activities. In 2021 after the easing of Covid 19 and the revival of economic activity in the world and especially in Indonesia, economic growth in the province of Java showed a significant increase, which was above 3 percent, except in Yogyakarta and Banten above 4 percent. Going forward, economic growth is predicted to increase, supported by accelerated vaccination, wider economic opening, and continued monetary, fiscal policy stimuli from relevant authorities.

In terms of expenditure, almost all components of Produk Domestik Bruto grew positively and higher compared to previous growth including household consumption in line with the increase in community mobility in various regions of Indonesia, investment, and The Government's consumption performance is driven by accelerated spending for the ongoing national economic recovery program, including the handling of Covid-19 and high export performance, supported by strong demand from major trading partners.

Economic growth as described above, in many countries economic growth is a parameter to see the development or progress of the country's economy and therefore many researchers conduct research on economic growth. Researchers who conduct research on economic growth in countries include (Chirwa & Odhiambo, 2016) for Developed and Developing Countries, (Pekarčíková, Vaněk, & Sousedíková, 2022) for OPEC Countries, (Ho & Iyke, 2020) for Ghana, (Oyebowale & Algarhi, 2020) untuk Negara Africa, (U. L. Joshi, 2022) untuk Negara Nepal, (Majumder, 2022) for Bangladesh, (Naftaly, 2021) for Kenya, (Vedia-Jerez & Chasco, 2016) for South America, (Nasir, Wibowo, & Yansyah, 2021) for 10 Asia-Pasifik, (Zimková, Vidiečanová, & Cisková, 2021) for Uni Eropa. (Yolanda, Nagara, Sumarni, & Efiani, 2021) for the island of Sumatra in Indonesia, (Nurul Aini Raja Aziz & Azmi, 2017) for Malaysia.

Based on the description above, it can be known that many researchers are interested in discussing economic growth and the factors that influence it. So this makes the author interested in discussing the same thing in the provinces on the island of Java with six hypotheses that must be answered. The hypotheses proposed are:

1. There is a significant and positive influence of Investment, Local Original Expenditure, Gini Ratio, Unemployment, Crime Index, on economic growth simultaneously.
2. There is a positive and significant influence of investment on partial economic growth.
3. There is a positive and significant influence of local original income on partial regional economic growth
4. There is a positive and significant influence of the Gini ratio index on partial economic growth.
5. There is a negative and significant influence of unemployment on partial economic growth.
6. There is a negative and significant influence and significant crime rate on partial economic growth.

## **B. Literature Review**

**Investment is the activity** of investing in an activity, either directly or indirectly, to get a number of benefits at a certain period of time. (Sadono, 2006) states that investment is

a form of investment and capital expenditure activities, which are used to be able to increase goods for good purposes in terms of production. (Boediono, 1999), investment is the expenditure by the producer sector (private) for the purchase of goods and services to increase the stock used or for factory expansion. And the Financial Services Authority in Indonesia, states that investment in the long term, to procure the purchase of shares and other securities to obtain profits is called investment. Investment can be seen from management, namely direct investment and indirect investment, from time, namely short and long-term and from sources, namely domestic and abroad. Keynes' theory states that investment can affect a country's national income and will directly affect economic growth. The problem of the influence of investment affects economic growth examined by several researchers including (Darwanti, ., & ., 2021) Stated that FDI negatively affects economic growth in Indonesia, (M, Yolanda, & Sebayang, 2015), (L. M. Wulandari & Zuhri, 2019), (L. M. Wulandari & Zuhri, 2019) that investment is influential positive and significant to economic growth.

**Regional Original Revenue** is revenue for regions based on regional regulations and the contribution of large local original revenues to the total regional budget will improve government performance. Meanwhile (Meidona et al., 2021)), states that Regional Original Revenue consists of Regional Taxes, Regional Levies, Separate Regional Property Management, and Other Regional Original Revenues. In addition (Ifeakachukwu, 2020) stated that Regional Original Income has a role in regional capacity improvement plans in terms of finance so that they do not always depend on the central government. Based on the description above, it can be illustrated that local original income will affect the economy of a region / country and at the same time affect economic growth. The effect of local native income on economic growth was examined by researchers including (Omodero, Ekwe, & Ihendinihu, 2018), (Azizah, Sirojuzilam, & Amalia Fachrudin, 2022), dan (Gumanti, Fauzi, & Jatiningrum, 2022).

**Income inequality** is a problem of economic inefficiency that will have an impact on many things in a country. One of the impacts of high income inequality is on economic growth and community welfare. Income inequality measures can be used using the Lorenz curve, Gini Index and Bank Indonesia criteria. The Gini index is a measure of inequality with a value of zero and one that researchers often use. A Gini Index value of zero means no inequality (perfect inequality) while a value of one means perfect inequality . (Michael P. Todaro, 2003) states that the distribution of income is said to be evenly distributed if the Gini ratio is small or close to zero, while approaching 1 is increasingly uneven. According to the Indonesian Central Bureau of Statistics, the calculation of the value of the Gini Ratio or Gini Index is as follows:

$$GR = 1 - \sum_{i=1}^n f_{pi} \times (F_{ci} + F_{Ci-1})$$

GR = Gini coefficient,  $f_{pi}$  = frequency of population in i-th expenditure class,  $F_{Ci}$  = cumulative frequency of total expenditure in i-th expenditure class,  $F_{Ci-1}$  = cumulative frequency of total expenditure in i-th expenditure class. The effect of income inequality proxied from the Gini Ratio on economic growth has been widely studied by researchers including (Wolde, Sera, & Merra, 2022) ) in (Wolde et al., 2022) with the results of research on the negative relationship between income inequality and economic growth in the long run and in the short term has a positive relationship, (Vo, Nguyen, Tran, & Vo, 2019) in middle income countries (Vo et al., 2019) (Gnangoin, Du, Assamoi, Edjoukou, & Kassi, 2019) states that income inequality has no impact on economic growth (Gnangoin et al., 2019) in Asian countries, (Caraballo, Dabús, & Delbianco, 2017) ) income inequality has a positive influence on economic growth for rich

countries, (R. Joshi, 2017) states income inequality has a positive and significant influence on economic growth in countries. The Indian part, (Saleem, Farooq, & Aurmaghan, 2021) states that income inequality and economic growth are negative and significant for Developing Countries.

**Unemployment** adversely affects the economy, politics, and society, so the problem is very complex. Indonesia's Central Bureau of Statistics states that the unemployed are a workforce that is unemployed, looking for work, working less than two days a week, trying to get a decent job, or preparing for an independent enterprise. This happens because inadequate employment, high population, population growth, and the number of labor force or job seekers are not proportional to the number of existing jobs (Yolanda et al., 2021). The effect of unemployment on economic growth was studied by several researchers including (Oshora, Nguse, Fekete-Farkas, & Zeman, 2021) which shows that unemployment has a negative impact on Ethiopia's economic growth, (Olusadum, 2018) there is a negative relationship between unemployment and economic growth both in the long and short term in South Africa, (Seth, Messiah, & Daljatu, 2018) this findings show that there is no long-term relationship between unemployment rate and economic growth in Nigeria, (Pasara & Garidzirai, 2020) (Pasara & Garidzirai, 2020) that unemployment does not depend on economic growth in the short run to South Africa, (Lubbock, Merin, & Gonzalez, 2022) in its research unemployment shows a negative impact on economic growth in the Philippines.

**Crime** is an act or behavior that is contrary to applicable laws and regulations that can affect order, balance in society and at the same time can endanger the development and economic growth of a country. According to (Jeke, Chitenderu, & Moyo, 2021) the evil is inherent in human nature and society, with variations in levels and types. While (Khan, Ahmed, Nawaz, & Zaman, 2015) stated crime is closely related to the education level, economic and social background of the individual. The results of research related to crime and economic growth conducted by (Adekoya & Abdul Razak, 2017) in Indonesia (Adekoya & Abdul Razak, 2017) growth significantly, (Ahmad, Ali, & Ahmad, 2014) shows that crime has a negative and significant impact on economic growth for the long term and short term a negative but not significant influence for developing countries (Pakistan), research (Torres-Preciado, Polanco-Gaytán, & Tinoco-Zermeño, 2017) (Torres-Preciado et al., 2017) crime has a negative effect on economic growth in all states of Mexico and (Nairobi, Firdaus, & Afif, 2021) also said the same for the Indonesian Kalimantan region.

### **C. Methodology**

The analysis method used is panel data regression analysis with the aim of obtaining an overview of the relationship between one variable and another. The variables in this study include dependent variables (economic growth) and independent variables (investment, local income, inequality of opinion, unemployment and crime) for Provinces on the island of Java (DKI Jakarta, Banten, West Java, Central Java, East Java) in the period 2006-2020. To see a general overview of the data used, look at it through descriptive statistics.

The panel data estimation method uses three approach model techniques, namely: Common Effective Model, Fixed Effect Model, Random Effect Model. To get the best model from the panel regression model performed Chow Test (choosing which model is best whether Common Effect or Fixed Effect model), Hausman Test (choosing which model is best between Fixed Effect Model and Random Effect Model) and Breusch Pagan Test – Lagrange Multiplier test (choosing one of the best models between Common Effect Model vs. Random Effect Model). This selection is done by comparing the probability values F and *Chi-square*

with  $\alpha = 5\%$ .

Regression panel data must pass the Classical Assumption test (uji Normality, Multicolonierity, Hetheroskedacity and Autocorrelation). And Uji Classical Assumptions aims to provide certainty that the regression equation obtained has accuracy in estimation, is unbiased and consistent.

The panel regression equation in this study is

$$\hat{Y}_{it} = a + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + e_{it}$$

Keterangan:

- $\hat{Y}$  = Economic Growth
- a = Constant
- $X_1$  = Investment
- $X_2$  = Local Revenue
- $X_3$  = Income Inequality as Projected from the Gini Index
- $X_4$  = Unemployment
- $X_5$  = Crime is proxied from the Crime index
- $e_{it}$  = Residuals

In this study, a t test / partial test and F test were carried out. Uji F is a test to see the effect of all independent variables on the dependent variable and the t test is used to determine how far the independent variable partially has an individual influence on the dependent variable. To explain how much variation in investment, local revenue, income inequality, unemployment and crime explain their relationship to economic growth in use. Coefficient of determination ( $R^2$ ).

#### D. Result and Discussion

To obtain an over view of each research variable seen from the mean value, standard deviation, and range containing minimum and maximum values using Eviews 10 can be seen in table 2 below:

**Table 2.** Results of Descriptive Statistical Analysis

	Y	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>
<b>Mean</b>	11.20369	11.93536	12.31226	7.505357	15.25560	11.99286
<b>Median</b>	11.19000	12.03000	12.39500	7.105000	15.67500	11.37500
<b>Maximum</b>	11.30000	13.80000	13.80000	15.75000	20.04000	19.69000
<b>Minimum</b>	11.13000	9.890000	10.25000	2.720000	10.01000	10.02000
<b>Std. Dev.</b>	0.048041	0.942174	0.812105	3.199221	3.160126	1.860050
<b>Skewness</b>	0.599504	-0.009539	-0.343554	0.619708	-0.222417	2.630115
<b>Kurtosis</b>	2.044475	2.299359	2.694112	2.634996	1.686585	10.39388
<b>Jarque-Bera</b>	8.227270	1.719416	1.979901	5.842833	6.730282	288.1884
<b>Probability</b>	0.016348	0.423286	0.371595	0.053857	0.034557	0.000000
<b>Sum</b>	941.1100	1002.570	1034.230	630.4500	1281.470	1007.400
<b>Sum Sq. Dev.</b>	0.191556	73.67849	54.73967	849.5061	828.8707	287.1623
<b>Observations</b>	84	84	84	84	84	84

Source: Eviews Version 10

Based on table 2 above the standard deviations for the variables Economic Growth (Y), Investment (X<sub>1</sub>), Original Income (X<sub>2</sub>), Income Inequality (X<sub>3</sub>), Unemployment (X<sub>4</sub>), and the crime (X<sub>5</sub>) is less than the mean value. This explains that the data used is less varied. The curve of variables Y, X<sub>1</sub>, X<sub>4</sub> is very pointed which is determined by the kurtosis value above 0.263 (Andi Supangat, 2007) except for variables X<sub>2</sub>, X<sub>3</sub> and X<sub>5</sub>. All variable have normal data except the variable X<sub>5</sub> which is indicated by skewness values in the range of -2 and 2 (Ghozali, 2016).

To obtain a panel regression equation that has accuracy in estimation, is unbiased and consistent, classical assumption tests are carried out, where the Multicollinearity, Heteroscedasticity and Autocorrelation tests can be seen in the table below:

Table 3. Classic Assumption Test

No.	Test Classical Assumptions	Result	Information
1	Multikolinieritas	Matrik korelasi (0.3213) < dari 0,8	Low correlated data
3	Heteroskedasity Test	Prob. Chi-Square(6) = 0.4405 > α = 0.05	There is no problem of heteroskedasticity.
4	Autocorrelation Test	Prob. Chi-Square(2) = 0.9359 > α = 0.05.	No autocorrelation problems occur.

Sumber : Process Eviews version 10

The conclusion of table 4, explains that the regression equation formed is unbiased and has accuracy in estimation.

The panel regression equation, based on the Chow test and the best Hausman Test is the Fixed Effect Model. The value of the panel regression equation can be seen in table 3 below:

Table 4. Fixed Effect Model

Dependent Variable: Ln Y?  
Method: Pooled Least Squares  
Date: 04/10/23 Time: 15:51  
Sample (adjusted): 2007 2020  
Included observations: 14 after adjustments  
Cross-sections included: 6  
Total pool (balanced) observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Ln XI?	0.012717	0.004549	2.795445	0.0066
Ln X <sub>2</sub> ?	0.027692	0.005248	5.276733	0.0000
Ln X <sub>3</sub> ?	0.006584	0.004283	5.130374	0.0000
LnX <sub>4</sub> ?	-0.754205	0.001078	-1.081193	0.0355
Ln X <sub>5</sub> ?	-0.002367	0.001203	-1.966864	0.0430
C	10.83913	0.068965	157.1681	0.0000

Fixed Effects  
(Cross)

_JAKARTA--C	0.092811
_JABAR--C	-0.002976
_JATENG--C	-0.034880
_DIY--C	0.056875
_JATIM--C	-0.056864
_BANTEN--C	-0.054967

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Effects Specification

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Cross-section fixed (dummy variables)

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R-squared	0.897177	Mean dependent var	11.20369
Adjusted R-squared	0.883092	S.D. dependent var	0.048041
S.E. of regression	0.016426	Akaike info criterion	-5.258361
Sum squared resid	0.019696	Schwarz criterion	-4.940039
Log likelihood	231.8511	Hannan-Quinn criter.	-5.130398
F-statistic	63.69609	Durbin-Watson stat	2.049313
Prob(F-statistic)	0.000000		

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Sumber: Diolah Eviews 10

Based on table 4, investment ( $X_1$ ), local original income( $X_2$ ), income inequality ( $X_3$ ), unemployment ( $X_4$ ), crime ( $X_5$ ) the regression equation can be seen as follows:

$$\hat{Y} = \alpha_i + \beta_{1it} X_{1it} + \beta_{2it} X_{2it} + \beta_{3it} X_{3it} + \beta_{4it} X_{4it} + \beta_{5it} X_{5it} + \varepsilon_{it}$$

$$\text{Ln}\hat{Y}_{it} = \alpha_i + \beta_1 \text{Ln}X_{1it} + \beta_2 \text{Ln}X_{2it} + \beta_3 \text{Ln}X_{3it} + \beta_4 \text{Ln}X_{4it} + \beta_5 \text{Ln}X_{5it} + \varepsilon_{it}$$

$$\text{Ln}\hat{Y} = 10.8391 + 0.0127 \text{Ln}X_1 + 0.0277 \text{Ln}X_2 + 0.0066 \text{Ln}X_3 - 0.7542 \text{Ln}X_4 - 0.0024 \text{Ln}X_5$$

The explanation of the regression equation above is:

- 1) The coefficient of constant is 10.8391, meaning that if investment, local income, gini ratio, unemployment, crime, do not change (constant), then Economic Growth has a value of 10. 8391, and it is elastic.
- 2) The regression coefficient of investment ( $X_1$ ) is 0.0127, meaning that if the investment variable increases by 1 unit, then Economic Growth increases by 0.0127 and is inelastic.
- 3) The regression coefficient of local original income ( $X_2$ ) is 0.0277, this value explains that if the variable of local original income increases by 1 unit, then Economic Growth increases by 0.0277 and is inelastic.
- 4) The regression coefficient of income inequality ( $X_3$ ) 0.0066, this value explains that an increase in inequality of opinion by one unit will increase the value of the Economic Growth variable by 0.0066 and is inelastic.
- 5) The regression coefficient of the unemployment variable ( $X_4$ ) is -0.7542, this explains that an increase in one unit variable of unemployment will reduce the value of the variance label Economic Growth increases by 0.7542 and is inelastic.
- 6) The regression coefficient of the crime variable is - 0.0024, this value explains that the ability of one master of the variability of crime will decrease the value of economic growth by 0.0024 and is in. elastic.

Based on this, it can be concluded that all independent variables related to economic growth are inelastic. This explains that the increase in independent variables (investment, local original income, income inequality, unemployment, crime) does not greatly affect changes in economic growth.

The results of Test F explain that the value of F-statistic: 63.69609 with p value or Prob (F-statistic):  $0.0000 < 0.05$  which means simultaneously all variables are free, have a significant and positive effect on Economic Development. While the partial test results (t) show a significant and positive influence on the variables of Investment, Regional Original Income, and Income Inequality. Meanwhile, the variables Unemployment and Crime have a significant and negative effect.

To measure how far the ability of the variables of Investment, Local Original Income, Income Inequality, unemployment and crime in influencing economic growth variables is shown by the value of the coefficient of determination ( $R^2$ ) or Adjusted R-squared of 0.897177, this explains that the variables investment, local original income, income inequality, unemployment and crime affect the economic growth variable of 89.7177%, while the remaining 10.2823% is influenced by other factors that are not included in the model.

#### **E. Conclusion and Recommendation**

Based on the research described above, important findings can be concluded including: Investment has a positive and significant effect on economic growth, this is in line with research from (Bakari & Tiba, 2022) for The Case Of The United States Of America, (P. N. Wulandari, Badriah, & Kadarwati, 2019), (Yuliadi, 2020) dan (L. M. Wulandari & Zuhri, 2019). Regional original income for positive and significant economic growth, this result is in line with research conducted by among others (Omodero et al., 2018), (Sengaji, Sasongko, & Sakti, 2019), (Gumanti et al., 2022). Income inequality proxied from the value of the Gini Ratio index has a positive and significant effect on economic growth even though the effect is not large as seen from the value of the regression coefficient. The relationship that occurs is inelastic. The same research results for Income Inequality and Economic Growth are put forward (Caraballo et al., 2017) dan (Wolde et al., 2022) for the short term. Unemployment negatively affects economic growth and this is in line with research (Pekarčíková et al., 2022) (Pekarčíková et al., 2022), (Alla, Hysa, & Çela, 2022). Crime has a negative and significant effect on economic growth and this is in line with the results of research (Ahmad et al., 2014) for the long term and (Lubbock et al., 2022), (Torres-Preciado et al., 2017) dan (Nairobi et al., 2021).

Based on the results of the above research, it is recommended to local governments to use investment funds and local original revenues that can encourage economic growth directly. To reduce the unemployment rate, which has a significant, negative, and inelastic effect, it is expected that local governments will direct the opening of labor-intensive jobs.

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