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## The Role of Capital Expenditures, Human Development Index and Access to Electricity on Economic Growth in Java and Non-Java Islands

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### A B S T R A C T

*This study aims to determine whether there is a positive effect of capital expenditure, HDI and access to electricity on economic growth and is there a difference between economic growth in Java (in fact as a development area) and the Non-Java region. The data source used is secondary data in the form of the 2015 Ministry of Finance Report, as well as the publication of the Central Statistics Agency. The analysis used is the Ordinary Least Square (OLS) analysis where this test was carried out in 33 provinces in Indonesia (North Kalimantan was not used in the observation because it was a newly formed province). From the test results, it is found that: Capital Expenditure, HDI has a positive and significant effect on Economic Growth. Meanwhile, Electricity Accessibility has no influence on growth. This condition means that the economic growth in the Java Region is indeed higher than the economic growth outside Java.*

**Keywords:** Economic Growth, HDI, Capital Expenditure.

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## INTRODUCTION

Research on differences in regional economic growth is still very interesting to revisit. Currently, the structure of economic development in Indonesia is still experiencing an imbalance. Where the Central Statistics Agency report states that Indonesia's economic growth in the first quarter of 2020 weakens and shows a figure of 2.97% (Statistics, 2020). Even so, the Indonesian economy is still supported by the island of Java. The data obtained states that the island's economy grows 3.42% and contributes at least 59.14% to the Gross Domestic Product. For this reason, there are several interesting problem topics to be studied in this study, namely regarding the relationship between capital expenditure, human resources, access to electricity, and economic growth.

Talking about economic development is often interpreted as a process of change towards a better state in an effort to improve people's welfare. In addition, economic growth can be interpreted as the development of activities in the economy that causes goods and services produced in society to increase so that it will increase the prosperity of the community (Rakhmawati, 2016; Sukirno, 1986). According to Samuelson and Nordhaus (2004), one of the macro indicators of development success is seen from the economic growth which shows the goods and services produced by a region. The factors that can encourage economic growth include the availability of human resources, natural resources, capital formation, infrastructure, and technology.

Human resources in this context are human capital, which is an indicator to create and encourage a better state of economic growth. To measure the quality of human capital, the United Nations Development Program (UNDP) introduced the concept of the quality of human capital, which is named the Human Development

Index (HDI). The faster human development by means of equitable education and health, the economic growth will achieve increased productivity, job opportunities, and community income (Croes et.al., 2020; Fahimi et.al., 2018; Kamaan, 2014). A high level of human development greatly determines the ability of the population to absorb and manage sources of economic growth, both in relation to technology and to institutions as an important means of achieving economic growth (Dewi, 2016).

The form of government expenditure in this case is in the form of an allocation of capital expenditures for the provision of various public facilities and infrastructure which can become regional fixed assets and have a benefit value of more than one year. Where these conditions are expected to be a supporting capital for the implementation of various economic activities in the community. The purpose of this fiscal policy is to stabilize prices, the level of output, and job opportunities and to spur or encourage economic growth (Sukirno, 2002). Alexiou (2009) & Tri (2004) also stated that government spending on public investment will have a significant positive impact on economic growth.

The importance of budgeting will affect economic growth which will also have an impact on the welfare of the community because an increase in economic growth is expected to be accompanied by an increase in the welfare of the community. Economic growth accompanied by increased social welfare can be carried out if capital expenditures are allocated appropriately. So that everything that is needed in the province in question can be fulfilled (Arini, 2016). Meanwhile, in the infrastructure sector, it plays a role in increasing the economic growth of a region. One of the infrastructures considered important in increasing the

growth of a region is the accessibility of electricity. This was stated by (Lia, 2007) if the accessibility of electricity is needed as the main factor in supporting production activities in the manufacturing sector. Without electricity, production process activities can be hampered so that in the end the amount of production will decrease and result in decreased income. So that a statement can be drawn if the increase in infrastructure is adequate and efficient, in the long run, it will increase the economic productivity of a country or region.

Given some rational circumstances based on several theories and previous studies, the problem formulation that the author raises is whether the role of the three determinants (Capital Expenditure, HDI, and Electricity Accessibility) affects the size of the economic growth in the Indonesian Development Zone.

## METHODOLOGY

In this research, the method used is the quantitative method. Where this research will contain quantitative explanations with static and dynamic characteristics. The procedure presented is a quantitative analysis and provides definitions and decisions from the process to the results carried out by Teguh (2014). The same thing was stated by Moh (2008) that quantitative research is a process to find knowledge using data in the form of numbers as a tool to analyze several things according to the data used. The discussion in this research is how much influence the human development index, capital expenditure, and access to electricity have on economic growth in Indonesia. The objects in this study were 33 observations or provinces in Indonesia, where the province of North Kalimantan was not used in this study because it was a new province. The data used in this research is in the form of published data from the Indonesian Central Bureau

of Statistics which is taken from the official website of the Indonesian Central Bureau of Statistics (BPS Indonesia).

This study uses secondary data with a cross-section. The data obtained in this study were sourced from the Indonesian Central Bureau of Statistics (BPS Indonesia) in the form of annual data reports in 2015. In addition to data collection from the Indonesian Central Bureau of Statistics (BPS Indonesia), this study also collected data by means of literature and documentary studies.

The variables used in this research are Human Development Index data, Capital Expenditure, Electricity Accessibility, and Economic Growth in terms of the amount of GRDP at constant prices. In this study, the author will explain several variables that will be used to see what factors influence economic growth in Indonesia. The variables used in the study are as follows:

1. Economic Growth is GRDP data based on constant prices which are then logged to determine the economic growth of the Indonesian state.
2. The Human Development Index is a comparative measure of life expectancy, literacy, education, health, and living standards.
3. Capital expenditures are expenditures for payments and/or add value to fixed assets or other assets that provide benefits for more than one accounting period and exceed the minimum capitalization limit for fixed assets / other assets set by the government.
4. Electricity access is the percentage of electrical connections made by each house or the amount of electricity supplied.
5. Dummy variables are quantitative qualitative data. This study used a regional dummy, in which the Non-Java region would be coded 0, while the Java region would be coded 1.

Measurements made in the study

use the classic assumption test or commonly known as the Ordinary Least Square (OLS). Mathematically is as follows:

$$\text{Ln}Y_1 = \beta_0 + \beta_1 X_{11} + \beta_2 X_{21} + \beta_3 \text{Ln}X_{31} + \beta_4 D_{JAWA} + \mu_1 \dots \dots \dots (1)$$

$$\text{LnPDRB}_1 = \beta_0 + \beta_1 \text{IPM}_{11} + \beta_2 \text{AksesListrik}_{21} + \beta_3 \text{LnBelanjaModal}_{31} + \beta_4 D_{JAWA} + \mu_1 \dots \dots \dots (2)$$

Before testing multiple linear regression analysis on the research hypothesis, it is necessary to first test the classical assumptions of the data to be processed as follows:

The first stage is the normality test which aims to test whether the regression model, variables, or residuals have a normal distribution. It is known that the t and F tests assume that the residual value follows a normal distribution. If this assumption is violated, the statistical test will be invalid for a small sample size. There are two ways to wait whether the residuals are normally distributed or not, namely graph analysis and statistical tests. Residuals are normally distributed if they have a significant value > 0.05 (Bellinger, 2007).

The next stage is the multicollinearity test. According to Ghozali (2011), this stage aims to test whether

the regression model is found between independent (independent) variables. To test for multicollinearity by looking at the VIF value of each independent variable, if the VIF value is < 10, data can be displayed free of multicollinearity symptoms. Meanwhile, the heteroscedasticity test aims to test whether the regression model is a regression from the remainder of one observation to another. There are several ways that can be done to carry out the heteroscedasticity test, namely the plot graph test, garden test, Glejser test, and white test. Testing in the study using a plot graph between the predicted value of the dependent variable, namely ZPRED and the residual SRESID. There is no heteroscedasticity of membership, there is no clear pattern, and the dots spread above and below the number 0 on the Y-axis.

**RESULT AND DISCUSSION**

The results of the analysis will begin with the results of measurement or regression using the Ordinary Least Square (OLS) method using STATA assistance. Where the variable (X) is the Human Development Index, Electricity Electrification, Capital Expenditures, while the GRDP Logarithmic variable at constant prices becomes variable (Y).

**Table 1  
Regression Results**

Variable	Regression Model	
	Coef	Std.Err
IPM	.0778363***	.255177
Aksesibilitas Listrik	-.006887	.0116495
Ln Belanja Modal	.399094***	.1029586
Jawa	.5054817**	.1973687
Constanta	.731289*	3.131025

The results shown in the table above are the effect of each independent variable on the dependent variable. Where the human development index variable has a positive and significant effect on economic growth. A similar condition also occurs

in the capital expenditure variable which is significantly positive for economic growth. Meanwhile, the electrification access variable showed an insignificant effect. The above assumptions, if expressed mathematically, are as follows:

$$\text{LnPDRB} = 0,731 + 0,077 \text{ ipm}_1 - 0,006 \text{ akseslistrik}_2 + 0,399 \text{ belanjamodal}_3 + 0,505 D_4 + e$$

The model above shows that the human development index, capital expenditure and regional dummy variables have a positive effect, while access to

electricity shows a negative effect. In line with this, only the electricity accessibility variable has no effect on economic growth, while other variables show a significance of 1% and 5%. The constant in the model means that if all variables are considered constant, then the economic growth in Non-Java regions is 0.731 percent.

**Table 1**  
**Regression Results**

F (4, 28)	8.09
Prob > F	0.0002
R - squared	0.5361
Adj R - squared	0.4698
Root MSE	0.40152

This stage is carried out by comparing the significance value of F with the significance value used, namely 0.1 or 10%, where:

$H_0: \beta_1, \beta_2, \beta_3, \beta_4 = 0$ , shows that the Human Development Index, Access to Electricity and Capital Expenditure and the Java Dummy variables simultaneously do not have a significant effect on Economic Growth, as well as.

$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$ , shows that the variables Human Development Index, Access to Electricity and Capital Expenditures as well as the Java Dummy simultaneously have a significant effect on Economic Growth.

Where decision making:  $H_0$  is accepted if  $F_{stat} < F_{table}$ ,  $H_1$  is accepted if  $F_{stat} > F_{table}$ . The F-statistic value obtained after regression is 8.09, while the p-value F is 0.0002, then the F test accepts  $H_1$  and rejects  $H_0$  at the 1% significance level or which means that all independent variables simultaneously have a significant influence on the variable dependent. While the coefficient value of R square shows a value of 0.5361, this means that the equation model used can explain the relationship between the dependent variable and the independent variable

by 53.61%, while the remaining 46.39% is influenced by other variables outside the regression model.

At this stage, the t significance value will be compared with the significance value used, namely 0.1 or 10%. The form of the test on the partial significance test (t-test) is:

$H_0: \beta_1, \beta_2, \beta_3, \beta_4 = 0$ , shows that the variables of the Human Development Index, Access to Electricity and Capital Expenditures as well as the Java region Dummy partially do not have a significant effect on Economic Growth, while

$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$ , shows that the Human Development Index, Access to Electricity and Capital Expenditures as well as the Java Dummy variables simultaneously have a significant effect on Economic Growth.

Testing is done using the t-test with the level of testing at  $\alpha$  10% degrees of freedom (degree of freedom) or  $df = (n - k)$ . The decision making criteria:  $H_0$  is accepted if  $t_{stat} < t_{table}$ ,  $H_1$  is accepted if  $t_{stat} > t_{table}$ . Next is the normality test stage. This testing phase is carried out using STATA with the `sktest` command on the error term.

The regression results on the Human Development Index (X1) variable shows that the probability is 0.005, which means the significance is at the 1% level. So that H1 is accepted and H0 is rejected. While the coefficient value shown is 0.077, which means that an increase in the human development index by one percent will increase economic growth by 7.7%.

The results of the estimation in this study are in line with the research conducted by Dev Batta (2001) which states that the increase in human resources, measured by the human development index, can increase economic growth. This condition occurs because with adequate skills, a country will maximize its production.

The regression results on the Human Development Index (X2) variable shows that the probability is 0.559, which means it is not significant at all levels. This condition is similar to research conducted by Maqin (2014) which states that electricity development is not completely evenly distributed in remote, outermost and deepest areas. Electrification is only distributed to areas that have the potential to contribute the highest GRDP or to areas that are growth centers.

The regression results on the Capital Expenditure variable (X3) show that the probability is 0.001, which means that the significance is at the 1% level. So that H1 is accepted and H0 is rejected. The coefficient value shown is 0.399, which means that if an increase in capital expenditure by one percent will increase economic growth by 39.9%.

The estimation results in this study are in line with the research conducted by Ajayi (2012) which states that if the capital expenditures made by the government for the needs of assets of a country or region will encourage economic growth through more efficient productivity.

The regression results on the regional dummy variable in Java show a

probability value of 0.015, which means the significance is at the 5% level. The estimation results show that the coefficient value is 0.505. This condition shows that the economic growth in Java is 0.505% higher than outside Java, while the economic growth in Java is 1.236%, while the economic growth outside Java is 0.73%.

This is supported by research by Wilonoyudho (2009) which states that the gap in the development area in Indonesia is influenced by several things, one of which is regional development and various geographical conditions.

## CONCLUSIONS

Based on the results of HDI measurements, Model Expenditures, Electrification Access and Regional Dummy on Economic Growth, it is concluded that (1) Economic growth in Java is 0.505% greater than outside Java, while growth in Java is 1.236% while poverty in outside Java 0.731%, (2) Human Development Index (X1) has a positive and significant effect on economic growth, (3) access to electricity (X2) has a negative and insignificant effect on economic growth, (4) capital expenditure (X3) has positive and significant influence on economic growth, and (5) the Java dummy has a positive and significant effect, which means that economic growth in Java is greater than economic growth outside Java.

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