# DETERMINANTS OF REGIONAL ECONOMICS GROWTH

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## Abstract

This study aims to determine what factors influence regional economic growth. The analysis technique used is to combine time series data and cross-section (pooling data). Time-series data from 2015 - 2017 and cross section data consisting of 34 provinces in Indonesia. The results of the model test using the redundant fixed effect test and random effect-Hausman test show that the best model is the fixed effect model (FEM). Regression results show that only the HDI (Human Development Index) variable is not significant, the other variables (fiscal decentralization, capital, and labor) have a significant positive effect on regional economic growth.

**Keywords**: Regional economic growth, pooling data, fixed effect model.

## *Abstrak*

*Penelitian ini bertujuan untuk menentukan faktor-faktor apa saja yang mempengaruhi pertumbuhan ekonomi daerah. Teknik analisis yang digunakan adalah kombinasi antara data time series dan cross section (pooling data). Data time series dari tahun 2015-2017 dan data cross section terdiri dari 34 Provinsi di Indonesia. Hasil dari uji model menggunakan redundant fixed effect test dan random effect-Hausman test menunjukkan bahwa model yang terbaik adalah fixed effect model (FEM). Hasil regresi menunjukkan bahwa hanya IPM (Indeks Pembangunan Manusia) yang tidak signifikan, sedangkan variabel lainnya (desentralisasi fiskal, kapital dan tenaga kerja) menunjukkan pengaruh signifikan positif terhadap pertumbuhan ekonomi daerah.*

***Kata kunci***: *Pertumbuhan ekonomi daerah, pooling data, fixed effect model.*

## INTRODUCTION

Every country wants high economic growth, because high economic growth will increase employment, income per capita and reduce poverty. According to Todaro and Smith (2006), the goal of economic development in addition to high economic growth, is also the elimination or reduction of poverty, overcoming inequality and providing employment with a growing economy.

Indonesia's economic development is intended to strengthen the structure of the economy. The industrial sector is driving economic growth, supported by an efficient agriculture and mining sector and effective service activities. Thus, the government is trying to encourage high rates of economic growth and increase per capita income followed by equitable distribution of income.

Various policies were formulated by the government to support increased economic growth, including changing the centralistic government system to a decentralized system. In a centralized system, programs and policies are made at the central level and implemented uniformly throughout the region. As a result, problems arise that are difficult to solve because conditions vary between regions.

The Indonesian economy in the period 1990-1996 with a centralized system did experience good growth. However, Indonesia's economic condition worsened after the 1997 economic crisis due to the weakening of the rupiah against the US dollar. Indonesia's economic growth plummeted to reach minus 13.13% in 1998. The deterioration of the Indonesian economy was allegedly not only due to the Thai crisis but also because of the weak fundamentals of the Indonesian economy with its centralistic system. Therefore, in 2001, the economic and the government system were changed to be decentralized.

In 1968, Indonesia's per capita income was around US$60. Per capita income has increased continuously until it reached US$500 at the end of 1980s. In 1995, per capita income was US$ 1,023. After the decentralization system has been running for 16 years, per capita income has become US$ 3,877.74 (2017) or more than three times compared to 1995.

On the fiscal aspect, decentralization requires the granting of duties and authority to regional governments followed by the distribution of authority to regional governments in terms of revenue. Thus, regional government expenditure can be financed from sources of revenue, both from central and regional revenue sources (Bahl, 1998). Fiscal decentralization can be an effective tool for increasing the efficiency of public spending because local governments are institutions that are close and directly dealing with the people who will have a better ability to serve the needs of their people (Oates, 1972).

Actually, there are several factors that affect the economic growth of a region, not only the centralization system, but also the amount of labor, capital, technology and the quality of human resources. The qualities of human resources are the main of factor influencing economic growth, as experienced by the Japanese economy. Therefore, many countries spend large budgets to improve the quality of human resources.

In the period of decentralization, local governments have an important role in managing regional finances. With a decentralized system, local governments are expected to be able to finance various development programs, especially in the public sector. Decentralization can be an effective tool for increasing the efficiency of public spending and increasing regional economic growth.

Economic growth is one indicator of development success. In the last five years, national economic growth has never reached 6 percent. Regional economic growths are also not much different.

Meanwhile, in order to absorb more labor, the economy must grow more rapidly, so unemployment does not increase. Therefore, this study aims to find out what factors significantly influence regional economic growth.

## LITERATURE REVIEW

### Economic Growth

Economic growth is one indicator of development success. According to classical theory, economic growth is influenced by the growth of capital accumulation, labor and technological progress. Capital accumulation can be done directly or by investing in supporting facilities such as infrastructure, economic and social investment. Population and labor growth is a positive factor that drives economic growth. Increasing the number of workers means increasing the number of productive workforce. Technological advances lead to sustainable economic growth.

The classical economist, David Ricardo (1817) stated, a doubling of population growth will cause abundant labor at one time. That could cause wages to fall. The decline causes wages to only be able to finance minimum living standards so that the economy will stagnant.

Classical theory eventually developed into Neoclassical theory led by Harrod Domar and Robert Solow. Harrod-Domar (1939) believes that capital must be used effectively because economic growth is greatly influenced by capital formation, while Solow (1994) explains that capital stock growth, labor force growth and technological progress interact with one another in the economy. These variables affect both national and regional income.

According to Solow (1996), population growth must be utilized as a positive resource. The Solow growth model is a pillar that contributes to the Neoclassical growth theory. This model is a development of the Harrod-Domar growth model by adding labor and technology factors to the growth equation. In the Solow economic growth model, labor and capital use the assumption of decreasing return to scale if analyzed separately but if analyzed simultaneously using the assumption of constant return to scale (Todaro and Smith, 2006).

The Neoclassical growth model assumes the mobility of the factors of production both capital and labor at the beginning of the subtle development process. At that time, capital and skilled labor tended to be concentrated in more developed regions so that development inequality tended to widen. In the subsequent development process, the better infrastructure and communication will encourage increased capital and labor mobility. As the country progresses, development inequality will decrease.

Another growth theory pioneered by Romer (1994) is the theory of endogenous growth. Neoclassical growth theory emphasizes exogenous factors with the assumption of constant return to scale and diminishing return. Meanwhile, endogenous growth theory emphasizes internal factors with the assumption of increasing return to scale and non-diminishing return. Endogenous growth theory states that economic growth can occur by optimizing internal potential, which prioritizes the quality of human resources with the power of science, natural resources, technological and institutional assets including regional autonomy.

The quality of human resources is shown based on the human development index (HDI). Strengthening internal (endogenous) factors will attract positive externalities as a spillover of economic growth. Endogenous growth theory is a theory of long-term economic growth.

## Previous research

Previous studies have shown mixed results. The results of research by Akai and Sakata (2002), Brothaler and Getzner (2010) as well as Bahl and Wallace (2006) show that fiscal decentralization will encourage regional economic growth. However, these results contradict the findings of Zhang and Zou (1998), as well as Pose and Krojer (2009), where the object of research is in India and the results show that decentralization impedes economic growth. Different results are shown by Oates (1985) and Nelson (1986). Both researchers point out that there is no relationship between fiscal decentralization and economic growth.

Suparno's research (2010) shows that private and government capital influence regional output, as well as labor, the level of regional economic openness and regional autonomy. Whereas Sobari (2011) shows that, education and health expenditure affects gross regional domestic product.

## Hypothesis

The hypothesis used in this research are fiscal decentralization, labor, capital and human development indeks (HDI) have a positive effect on regional economics growth.

## RESEARCHS METHOD

### Data Type and Data Sources

The data used in this research is secondary data. Data sources are from BPS (Badan Pusat Statistik), namely provincial GRDP (Gross Regional Domestic Product) according to expenditure (2013-2017); Provincial Government Financial Statistic, 2015-2017; The Condition of Workers in Indonesia; and The Portrait of Indonesia Education; as well as data released by the Ministry of Finance and other institutions. The data used are the degree of fiscal decentralization (total provincial expenditure, total central expenditure, central transfers to the province), regional capital, the number of workers, the Human Development Index (HDI) and provincial GRDP (Gross Regional Domestic Product). The data taken is pooling data, the period 2015-2017 for 34 provinces in Indonesia.

## Research model

The models used in this study are:

$$G_{it} = \beta_0 + \beta_1 DDF_{it} + \beta_2 K_{it} + \beta_3 L_{it} + \beta_4 HDI_{it} + \varepsilon$$

Where:
G : Regional economic growth
DDF : Degrees of Fiscal Decentralization
K : Capital
L : Labor
HDI : Human Development Index
$\beta_0$ : Constants
$\beta_{1-4}$ : Coefficient
i : The province
t : Time
$\varepsilon$ : Disturbance error

## Analysis Technique

This research uses panel data. Panel data is a data set containing individual sample data that combines cross-section and time series data. By accommodating information both related to cross section and time series variables, panel data can substantially reduce the problem of omitted-variables; a model that ignores relevant variables. Cross-section analysis does not take into account the effects of technological developments that occur in one time estimation, so that the estimated effects of increases in physical capital on earnings may be inaccurate. With panel data, the existence of time series data can accommodate the effects of technological improvements on corporate profits, so that omitted-variable problems can be eliminated.

Panel data is also useful for technical-pragmatic reasons, which are related to

data availability. By combining time series data and cross sections, it will be able to increase the number of observations significantly without making any treatment to the data. Therefore, panel data might provide a satisfactory solution.

In panel data analysis there are three kinds of estimation approaches, namely: *first, common effect approach.* In this approach, the simplest estimation of the equation model is to ignore the cross-section and time series dimensions of the panel data and estimate the data using the ordinary least squares method (OLS) applied in the data pool. So, for example there are 33 cross section data and 10 years time period, then the data is arranged sequentially, so that 330 observations are obtained for each variable in the model. The PLS model assumes that the intercept value is the same for each subject. The model also assumes that the slope coefficients are also identical for all subjects.

*Second, Fixed Effect Model (FEM).* The term fixed effect comes from the fact that although intercepts may differ between individuals, the intercepts of each individual do not vary over time (time invariant). If the intercept is written as $\alpha_{it}$, it means that each company's intercept is time variant. In addition, FEM also assumes that the coefficient of the regressor does not vary between time and individuals.

*Third, Random Effect Model (REM Effect).* The fundamental difference between FEM and REM is the assumption of an unobservable individual effect ($\mu i$). If in FEM, $\mu i$ is assumed to correlate with the regressor (X), then in REM, $\mu i$ is assumed not to correlate with regressor X or in other words $\mu i$ is assumed to be random. REM generates more efficient estimators (smaller standard errors or larger t-stat) than FEM.

To determine which model is better between PLS and FEM, the redundant fixed effect test is used. If it is significant that the probability is smaller than the level of significance ($\alpha = 5\%$), then it is better to reject Ho and accept Ha, the best model is FEM but if it is the opposite (not significant) then it is better to use PLS.

To determine which model is better in estimating FEM and REM is first, it depends on the assumptions made about the correlation between cross section component error $\mu i$ and regressor X. If it is assumed that $\mu i$ and regressor X are uncorrelated then, REM is more appropriate to be used in model. However, if it is assumed that $\mu i$ and the X regressor are correlated, then FEM is more appropriate. For this reason, correlated random effects - Hausman test are used. If the results are significant, then there is correlated meaning it is better to use the FEM model and vice versa if it is not significant, it is better to use REM.

## RESULT AND DISCUSSION
**Result**

In the data pooling model there are three models that can be used to analyze, namely the common effect model, the fixed effect model and the random effect model. To determine the best model, there are two steps that must be done. First, determine the best model of the two models, the common effect model and the fixed effect model. To determine which model is better between common effects and FEM, a redundant fixed effect test is used. If it is significant, the probability is smaller than the level of significance ($\alpha = 5\%$), then it is better to reject Ho and accept Ha, the best model is FEM, but if the opposite happens, then it is better to use the common effect.

The result in Table 1 shows that the probability value of the Chi-square cross-section (0.0000) is smaller than 5 percent. That is, the best model between the two models is the fixed effect model (FEM). The next step is to determine which model is the best among the fixed effects and

random effects models (REM) by using the Correlated random effect - Hausman Test.

The result shows that the random cross-section probability value (0.0000) is below 5 percent. Thus, the best model that will be used for further analysis between fixed effects and random effects is the fixed effect model (FEM). The fixed effect model basically remains on the principle of OLS (Ordinary Least Square). This model assumes that differences between individuals (cross-sections) can be accommodated from their intercept differences.

Based on the explanation above, it appears that the best model of the three alternative models in pooling data is the fixed effect model (FEM). Therefore, for hypothesis testing and further analysis, a fixed effect model is used.

**Table 1.** Fixed Effect Model

Dependent Variable: PDRB
Method: Panel Least Squares
Sample: 2015 2017
Periods included: 3
Cross-sections included: 34
Total panel (balanced) observations: 102

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 7317.016 | 126795.9 | 0.057707 | 0.9542 |
| DDF | 158164.2 | 10354.06 | 15.27558 | 0.0000 |
| K | 0.090563 | 0.042575 | 2.127123 | 0.0373 |
| L | 0.015114 | 0.004500 | 3.358266 | 0.0013 |
| HDI | 1514.728 | 1913.587 | 0.791565 | 0.4315 |

Effects Specification

Cross-section fixed (dummy variables)

| | | | |
|---|---|---|---|
| R-squared | 0.999597 | Mean dependent var | 279697.1 |
| Adjusted R-squared | 0.999364 | S.D. dependent var | 394203.4 |
| S.E. of regression | 9943.247 | Akaike info criterion | 21.52618 |
| Sum squared residu | 6.33E+09 | Schwarz criterion | 22.50411 |
| Log likelihood | -1059.835 | Hannan-Quinn criter. | 21.92218 |
| F-statistic | 4288.731 | Durbin-Watson stat | 2.035710 |
| Prob. (F-statistic) | 0.000000 | | |

Based on Table 1 shows that in general, the degree of fiscal decentralization in 34 provinces in Indonesia affected regional (provincial) economic growth because the probability was smaller than the level of significance ($\alpha = 5\%$) and the relationship between the two was positive, with a coefficient of 158,164.2. This means that if the degree of fiscal decentralization of a province in Indonesia increases by one point, the provincial GRDP will increase by Rp 158,164.2 billion and vice versa if the degree of physical decentralization decreases by one point, it will reduce the provincial GRDP by Rp 158,164.2 billion.

The results also show that capital has a positive effect on regional (provincial) economic growth with a coefficient value of 0.090563. This means that if the provincial capital increases by Rp 10 billion, the provincial GRDP will also

increase by Rp 0.90563 billion, and vice versa.

Another independent variable is labor. Based on the results of data processing shows that labor has a positive effect on regional economic growth with a coefficient of 0.015114. Thus, if the number of labor increased by 10 workers, the provincial GRDP would increase by Rp. 0.15114 billion.

The fourth or final variable is the human development index (HDI). The human development index is an index that measures life expectancy at birth, length of school expectancy, average length of schooling and per capita expenditure. Regression results show that HDI has no effect on regional economic growth because the probability (0.4315) is greater than the level of significance (0.05).

The statistical F test (Table 1) shows that the probability of a statistical F (0.0000) is smaller than the level of significance (0.05). This shows that the degree of fiscal decentralization, capital, labor and the human development index together influence regional economic growth.

The value of goodness of fit or the magnitude of the coefficient of determination is 0.999597 or 99.9597 percent. This shows that the ability of the model in explaining the total variation of provincial economic growth is 99.9597. The ability of the model used in this study to explain the regional economic growth is very high.

## Discussion

The results of the study show that the relationship between the degree of fiscal decentralization and growth is significantly positive. It's means that increasing the degree of fiscal decentralization will increase regional economic growth. The existence of decentralization will increase economic efficiency because local governments will provide public services in accordance with what is needed by the community. This efficiency will cause regional economic growth to grow faster.

The implication, if the regional government wants high regional economic growth, the decentralization policy must be truly enforced so that people's welfare will be easily achieved, because the goal of the decentralization policy is to fulfill regional aspirations related to control over regional financial resources, encourage accountability and transparency of the government regions, increasing community participation in the regional development process, reducing inequality between regions and ensuring the delivery of public services in each region (Simanjuntak, 2002).

Capital variable shows a significant positive relationship. If the regional government wants economic growth to increase, the formation of regional gross capital must also be increased, both capital formed by the government and by non-government. Increasing capital will increase regional investment capability. Increased investment means more jobs will be available so that the absorption of the workforce will be even greater. Thus, unemployment will decrease, poverty will decrease, economic growth will be higher.

The implication of these findings, if the regional government wants high economic growth, the regional government must continue to encourage an increase in gross capital both by the government itself and the private sector. Various facilities in investing must be provided by the local government, including a one-stop service policy with a shorter time in managing permits without unclear levies. If this really happens, it will make investors comfortable to invest in Indonesia, including the provision of adequate facilities and infrastructure.

Labor variables also show significant positive results. Thus, if the regional government wants economic growth to increase, the number of workers employed must be increased. An increase in the

number of workers will increase the amount of output produced in the economy. Increasing the amount of output produced will further increase regional economic growth. Especially if the workforce is truly qualified, it will further accelerate the increase in output produced, which in turn will accelerate regional economic growth.

HDI (Human Development Index) is a variable that measures the quality of human resources by including elements of life expectancy at birth, length of school expectations, average length of schooling and per capita expenditure. The results showed not significant. This could happen because the average length of school in Indonesia is relatively low, around 8 years, meaning that even junior high schools have not graduated. If a middle school doesn't graduate, the chances of getting a proper job will be very small. Besides that, in the HDI component there is also a per capita expenditure where per month the expenditure per person is under one million per month. Expenditures below one million per month are small. Especially with the existence of the Asean Economic Community (AEC), where the ASEAN market was freed, competition between workers has become tighter. It is likely that this makes HDI in the regions insignificant.

If the local government wants a significant HDI to influence growth, then the local government must encourage community awareness to achieve education to a higher level, the 12-year compulsory education regulation must really be applied. But consequently, the government must provide free schools or scholarships must be given to people who can not afford.

## CONCLUSION AND RECOMENDATION

Decentralization shown in the form of DDF (degree of fiscal decentralization) showed significant positive results on regional economic growth. This means that independence in fiscal expenditure will drive provincial economic growth.

Other variables namely capital, and the number of labor also showed significant positive results. This means that if the government wants high economic growth, the amount of capital invested and the number of workers employed must continue to be increased, whereas the HDI is not significant.

The central government needs to explore which provinces the DDF is not significant, so that the government can provide advise/guidance to the regional government. The central government is expected to make various policies on education and health so that these policies can increase HDI. Thus, economic growth and welfare of the people have improved.

In this study, other endogenous variables that are actually interesting to study are not included in the model, due to data and time limitations.

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