International Journal for Quality Research 13(1) 157–176
ISSN 1800-6450

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Article info:
Received 05.06.2018
Accepted 02.10.2018

UDC –314.17(594.5)
DOI – 10.24874/IJQR13.01-10

THE EFFECT OF THE QUALITY OF HUMAN DEVELOPMENT FACTORS ON THE RATE OF ECONOMIC GROWTH IN YOGYAKARTA SPECIAL PROVINCE

Abstract. *The qualified human resource employment shall strongly influence the success of economic development especially on reaching the high economic growth rate. This research aimed at examining the influence of education, health, and per capita income on the economic growth rate in Yogyakarta Special Province (DIY). This research used the secondary data of year 2007 up to year 2016 from four regencies, namely Kulonprogo, Gunungkidul, Bantul, Sleman, and Yogyakarta City. The analysis technique was pooled data regression model. Research findings showed that education has a significant negative influence on economic growth in DIY. While health has no influence on economic growth. Moreover, the per capita income showed positively significant influence on economic growth of DIY.*

Keywords: *Economic growth, Education, Health infrastructure, Per capita Income.*

1. Introduction

Economic growth rate is a development of economic activities which leads to the increasing amounts of goods and services produced in a society resulting in increasing prosperity of the society. The economic growth can be viewed as long-term macroeconomic issue. The development of the ability to produce goods and services as the result of the increase in production factors is not generally followed by the increase in the goods and services production volume.

In many countries, economic growth in the national level has a significant positive relationship to the economic growth in regional level. The research from Obradović, et al. (2016) explained that there is a long-term positive relationship between national and regional economic activity. They found it in countries within the scope of the Organization for Economic Cooperation and Development (OECD) during the period from 2000-2011. Policy recommendation that can be taken by the central government is by increasing the coordination of regional economic development policies at the central government level.

DIY Province is a special region in the island of Java (the center of economic activities in Indonesia), that has the lowest economic growth behind the Province of DKI Jakarta, West Java, East Java, Central Java, and Banten. In 2016 the economic growth in the Province of DKI Jakarta was 5.85%; West Java 5.67%; East Java 5.55%, Central Java 5.28%, Banten 5.26%, and DIY Province 5.05%. (Central Bureau of Statistics of DIY, 2017). The condition of economic growth of DIY which is the lowest

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in Java Island makes this province interesting to be researched. Special Region of Yogyakarta (DIY) Province constitutes four regencies, namely Gungkidul, Kulonprogo, Bantul, and Sleman and one city named Yogyakarta City. The development of economic growth rates of regencies/city and DIY Province is interesting to be observed. Table 1 shows that during 2010-2016 period the average economic growth rate of DIY Province was 5.12 percent. There were several regencies/city whose economic growth rate are higher than that of DIY Province, such as Bantul (5.13%), Sleman (5.33%), and Yogyakarta City (5.31%). Those regions succeed in accelerating their economic activities by maximizing the development of their regional economic potentials. An economic activity with high added value will stimulate a region to reach its rapid economic growth. The strategy to develop the dominant economic sectors is a favorable choice to improve Gross Regional Domestic Product (GRDP) and economic growth of the region. The other two regencies had considerably lower economic growth rate than DIY Province are Kulonprogo (4.35%) and Gunungkidul (4.68%). These two regencies badly need extra attention to catch up their lags from other regencies/city of Yogyakarta Province.The agricultural potentials have not yet developed maximally because of the infrastructure condition limitation of the regions.Consequently, other economic sectors like trade, hotel and restaurant, processing industries, and services become the sectors which are selected to be developed because they have large potential to advance.The improvement and right investment selection in the infrastructure establishment needed by modern economic activities sources such as airport, harbor, and transportation (including train and vehicles) as well as the improvement on the human resources quality as the leading actor of the economic activities will certainly accelerate the economic activities effectively and the economic growth rate of Kulonprogo and Gunungkidul regencies.

Table 1. Economic Growth Rate (%) of Regencies/ City of DIY and DIY Province 2010-2016

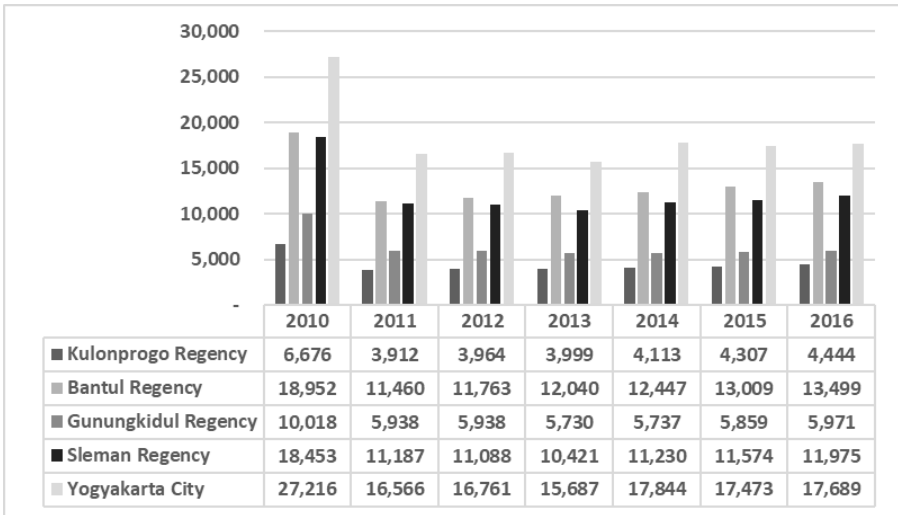
Regency/City	Year							Average
	2010	2011	2012	2013	2014	2015	2016	
Kulonprogo Regency	3.06	4.23	4.37	4.87	4.57	4.62	4.76	4.35
Bantul Regency	4.97	5.07	5.33	5.46	5.04	4.97	5.06	5.13
Gunungkidul Regency	4.15	4.52	4.84	4.97	4.54	4.82	4.89	4.68
Sleman Regency	4.49	5.42	5.79	5.89	5.30	5.18	5.25	5.33
Yogyakarta City	4.98	5.84	5.40	5.47	5.28	5.09	5.11	5.31
DIY Province	4.64	5.21	5.37	5.47	5.17	4.95	5.05	5.12

Source: Central Bureau of Statistics of DIY

Economic growth can also be defined as a process of an increasing economic production capacity which is reflected from the national income increase. Economics assumed as growing in case that the amount of the real return of the production factors use during a particular year is larger than that of the preceding year. One of the important factors to increase the economic activities and growth is Human Resources (HR) quality. This might happen because the main resource of an economic growth is basically humans themselves (Skare & Blazevic, 2015).

The allocation of the qualified human resources is a necessary condition for an economic growth. In human capital development there is a connection between human resources development and economic growth. Human development shall influence the economic growth, since without the sustainable human development the regional

economic growth is not going to be optimally realized. The qualified human development can be attained through education, health, and per capita income improvement of a particular region.



	2010	2011	2012	2013	2014	2015	2016
Kulonprogo Regency	6,676	3,912	3,964	3,999	4,113	4,307	4,444
Bantul Regency	18,952	11,460	11,763	12,040	12,447	13,009	13,499
Gunungkidul Regency	10,018	5,938	5,938	5,730	5,737	5,859	5,971
Sleman Regency	18,453	11,187	11,088	10,421	11,230	11,574	11,975
Yogyakarta City	27,216	16,566	16,761	15,687	17,844	17,473	17,689

Source: Central Bureau of Statistics of DIY

Figure 1. Number of Senior High School Students

Completed education level by the human resources in an area reflects the quality of the human resources there. The education level of senior high school reflects the average of graduate education workers in the province. The development of senior high school student in the period of 2010-2016 in DIY shows a downward trend in almost all regencies/city in the province, except for Sleman Regency. The number of senior high school graduates in the regencies/city in DIY can be observed in Figure 1.

The number of Senior High School students on 2016, the highest was the Yogyakarta City with 17,689 people then followed by Bantul Regency with 13,499 people, Sleman Regency with 11,975 people, Gunungkidul Regency with 5,971 people and Kulonprogo Regency with 4,444 people. The number of students is in line with the schools availability and the number of people in each regency/city in the province. The government continues to encourage each regency/city to increase Senior High School students as an effort to improve the quality of the population and its workforce.

The quality of people's purchasing power in DIY province can be reflected by the level of income per capita of the people. The higher the income level per capita, the higher the purchasing power of the people. The per capita income progress of regency/city of DIY and DIY Province can be seen in Table 2. In the 2016, per capita income of Yogyakarta City (56,345.76 Thousand IDR) and Sleman Regency (25,052.45 Thousand IDR) was certainly a good example for the other three regencies, those are Kulonprogo, Bantul, and Gunungkidul. The regencies and city of DIY Province must keep finding and optimizing the regional resource potentials in order to obtain higher GRDP (Gross Regional Domestic Product) from time to time. Through the implementation of population control which is supported by the government policies concerning on the per capita income equality, the regional government will surely create prosperity for its people.

Table 2. Rate of per Capita Income (Thousand IDR) of Regencies/ City of DIY 2010-2016

Regency/ City	Year						
	2010	2011	2012	2013	2014	2015	2016
Kulonprogo Regency	12,916.54	13,308.34	18,331.64	14,240.97	14,726.97	15,239.75	15,793.25
Bantul Regency	13,318.91	13,803.94	14,344.06	14,928.87	15,478.87	16,029.15	16,652.30
Gunungkidul Regency	13,062.23	13,500.69	13,999.82	14,535.22	15,032.33	15,591.56	16,190.71
Sleman Regency	19,466.23	20,288.64	21,220.83	22,218.34	23,138.20	24,067.21	25,052.45
Yogyakarta City	44,406.52	46,384.23	48,262.99	50,262.26	52,267.57	54,259.26	56,345.76

Source: Central Bureau of Statistics of DIY

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This research has a difference compared to previous studies. The research result from Azam & Ahmed (2015) in Commonwealth of Independent State proved that education, health, and foreign direct investment have a significant positive influence toward economic growth. The weakness of the research result from Azam & Ahmed (2015) is did not use the variable of per capita income, but foreign direct investment. The research from Bayraktar-Sağlam (2016) tested the influence of human capital development toward economic growth in the Organization for Economic Cooperation and Development (OECD). The difference with this research is the previous one only use the education variable, there are no health and per capita income variables. While Neeliah & Seetanah (2016) in Mauritius proved that education (secondary school enrollment), health (life expectancy), and nutrition have a significant positive influence toward economic growth. The difference is the use of variable of per capita income, and this is the weakness of the research.

The controversy of research result happen from Pegkas & Tsamadias (2017) who examined the effect of education and physical capital investment toward economic growth in Greece. The result proves that education does not have a significant relationship with economic growth. While the research from Şen et al. (2018) in 8 developing countries found that education has a positive influence toward economic growth. Another controversy arises from the research result from Kurt (2015) and Halici et al. (2016). Kurt (2015) found that health has a positive influence toward economic growth in Turkey. On the contrary, the result from Halici et al. (2016) in low and high income countries found that health had a negative influence on economic growth.

Human development needs three factors, which are education, health, and per capita income, and these three factors are used as the basis for determining the Human Development Index (Shah, 2016). Therefore, the renewal of this research will close the previous research gap by examining the influence of human development factors, namely education, health, and per capita income on economic growth in DIY Province, Indonesia, during the period of 2007-2016.

2. Literature Review

Human development factors that could affect economic growth are education, health, and per capita income. Theoretically, if education, health, and per capita income are increasing, then economic development can rise as well. Thus, correct government policies in increasing human development factors are important to be noted so that it can increase economic growth.

2.1. Education

The theories about economic growth are plenty to be found. One of them is the theory that discuss about the factor of human resources as a trigger of the growth itself. Romer (1986) and Lucas (1988) first came up with the theory stated that in general, the quality of human resources has a positive significant influence toward economic growth. It means, in particular, an individual with higher education will become more efficient in working and more productive in creating output. In other words, the level of education of someone can increase productivity, whether in their own individual capabilities as well as easiness in adapting to technology.

Eregha et al. (2015) conducted a research in Nigeria during 1970–2015 using the approach of analysis of Error Correction (OLS), Fully Modified OLS (FMOLS), and Dynamic OLS (DOLS). The research result shows that the level of education and completion rate gives a positive influence toward economic growth in Nigeria. The recommendation of the research is that government needs to encourage the increase of completion rate because it can push the economic growth. Ciucu & Dragoescu (2015) also conducted a research about education and economic growth in two countries, namely Hungary and Romania using the analysis of Vector Error Correction Model (VECM) during 1974–2011 (Hungary) and 1989–2011 (Romania). The research result proves that the quality of education in Hungary and Romania has an important role for economic growth in those two countries. Researchers give a recommendation for government to increase the expansion of education that is more oriented to the increase of education quality.

The research result is in line with the research from Mefteh et al. (2016) in Tunisia during 1990-2013, Hanif & Arshed (2016) in the countries of SAARC during 1960–2013, and Korkmas & Kulunk (2016) in some countries of OECD during 2007–2013. The research result found that the level of education can influence economic growth positively. The policy recommendation is to encourage the government to increase the quality of education and provide subsidies for education costs because it will have a positive impact on economic growth.

Whereas, the research from Ushakov & Arkhipov (2017) in 61 mid-income countries during 2001–2014 proved that government expenses for education sector has a positive influence on economic growth. The result is in accordance with the research findings from Yalcinkaya & Kaya (2017) in PISA countries during 1990-2014. The result indicates that education has a positive influence in a long-term toward economic growth in the countries studied. The recommendation is the government must increase the quality of education since it is proved to be able to increase economic growth.

Kyophilavong et al. (2018) conducted a research in Laos during 1984–2013. The conclusion of his research is that education can provide positive and significant influence toward the economic growth in Laos. The research uses the analysis of Johansen Co-integration and Granger Causality and divide education variable into three, namely the school participation rate of primary, secondary, and higher education. The conclusion that is found is there is a long-term positive causality relationship between education and economic growth in Laos, for every level of education.

Therefore, researchers give recommendation for government to increase the investment in education sector and also increase the promotion about the important meaning of education for society.

Trabelsi (2018) conducted a research in cross countries using the data during 1980-2013 with the analysis of Structural Threshold Regression (STR). Education variable uses the investment and government expenditure proxy for the education sector. The result shows that the government investment and expenditure or the education sector is able to have a positive and significant influence on economic growth.

H1. Education has positive influence toward the economic growth rate

2.2. Health

Health is also one of the variables in measuring the growth of economy. The theory that explains relationship between health and economic growth is brought by Barro (1996). He stated that health can be measured by using the variable of life expectancy of an individual. Life expectancy can also be seen from the condition of education, human relationship, a country's democracy, as well as inflation rate. On the other hand, health variable can also be measured using the development of infrastructure such as hospitals, clinics, and other health facilities.

In health sector, Kurt (2015) found that the quality of health positively influenced Turkish economic growth. Health, education, and economic growth can be described as inter-related triangle lines constituting a dynamic triangulation (Mishra and Mishra, 2014). Unlike the above mentioned research, Eggoh et al. (2015) indicated that public expenditure on education and health had

negative impact on the economic growth. In this research that he conducted in 49 countries in Africa, he assumed that the negative influence arose from inefficiency, corruption, bureaucracy, and lack of investment in health and educational sectors.

Piabuo & Tieguhong (2017) conducted a research in African countries to test the influence of health, namely health expenditure, life expectancy, household consumption, labor force, and trade on economic growth. The research is using the method of OLS, FMOLS, and DOLS. The research result shows that health can give a positive and significant result toward economic growth. Similar results were proven by Atilgan et al. (2017) who conducted a research in Turkey during 1975–2013 using the analysis of ARDL and Kalman filter. The research variables are health which is using health expenditure as the proxy and economic growth which is measured using GDP per capita. The research result proves that health can provide positive and significant influence toward economic growth.

Singh (2017) conducted a research in India during 1991–2013 using the health variable, namely the indicator of life expectancy and investment in health sector, while for the economic growth is using GDP per capita variable. The research result finds that there is a two-way and positive causality relationship between health and economic growth. It indicates that if there are health conditions in the community both in physical and infrastructure, it will significantly increase economic growth. These events can be explained as follows. If there are conditions in community that cause good public health and adequate health infrastructure, then it will be able to encourage people to increase their productivity, so that it can increase people's income, which ultimately can influence economic growth positively. This research also provides recommendation to the government if it wants to become a developed country, then the important investment is in the health sector.

H2. Health has positive influence toward the economic growth rate

2.3. Per capita Income

Meanwhile, related to the relationship between per capita income with economic growth is stated by Solow (1956) which is the first to find the relations between per capita income with economic growth. The model put per capita income as a measurement of the wealth rate of a country, aside from accumulation of capital. Solow model economic growth stated that poor countries have high economic growth and will continue to increase along with the raise of percapita income and capital accumulation.

Regarding per capita income, Cheung (2014) proved the existence of significant positive relationship between per capita income toward economic growth in all states in America during 1997-2011. The research result proved that the greater the per capita income of an individual, the more innovative he will be, and it will make the value of the output it produces will become even greater, so that it will encourage an increase in economic growth.

While Fawaz et al. (2015) have conducted a research about economic growth and income which is measured using the proxy of the income gap. The research is conducted in 101 developing countries in the category of low-income, high-income, and transition period. The data from World Development Indicator (WDI) of World Bank during 1960–2010 is used in the research to analyze the variables such as the percentage of Gross National Income (y), Gini ratio, and school participation rate (x). The research result shows that there is a negative causality relationship between economic growth and income gap in the low-income developing countries. On the other side, economic growth and income gap are found to be having a significant positive influence in high-income developing countries and countries that are on the transition period. Researchers provide the recommendation for future research to be able to broadly discuss economic growth, which can actually be influenced by many factors outside the model.

Berumen (2016) tested about income using the proxy of income gap and economic growth of 12 countries in Europe during 1975–2009. This research is meant to look for conclusion about the influence of income gap toward economy. This research uses the dependent variable of GDP, independent variable of coefficient of Pareto-Lorenz, and the control variable is inflation, schooling time, trade, interest rates, household consumption, and unemployment rate. The research result shows that income that has a small gap can have a positive and significant influence toward economic growth.

H3. Per capita income has positive influence toward the economic growth rate

3. Research Method

This research employed the secondary data of the Regencies of Kulonprogo, Gunungkidul, Bantul, Sleman, and Yogyakarta City in the 2007-2016 periode regarding with economic growth, education, health, and per capita income. The data collection technique used was library research in Central Bureau of Statistics and Regional Development and Planning Agency of DIY. The analysis technique carried out to assess the influence of educational, health, and per capita income factors on the economic growth rate of DIY Province was pooled data regression model using fixed effect model approach.

The model specification built in this research was a functional equation EGR= f (education, health, per capita income). After going through the test model MWD, the best functional form for the estimation was natural logarithm equation (log) as follows.

$$EGR_{it} = \alpha_0 + \alpha_1 \log ED_{it} + \alpha_2 H_{it} + \alpha_3 \log INC_{it} + e_{it}$$

where:

EGR = Economic Growth Rate (%)

ED = Education= Number of senior high school student (person)

H = Health = Ratio of health

infrastructure/population (unit/person)
INC = per capita income (IDR)
α = constanta
t = 2007-2016 period
e = error term

4. Research Result

4.1. Research object

The research object existing regency/city in DIY involving four regencies Kuloprogo, Gunungkidul, Bantul and Sleman and one municipality Yogyakarta City, the economic growth model which was estimated included data during the period of 2007-2016 (10 years) resulting in the total 50 observed panel data. Panel data (pooled data) analysis is an analytical tool that combines cross section and time series, which have advantages in providing solutions that cannot be given by the two tools.

Findikçi and Tapşin (2015) stated in their research that panel data enriches empirical solutions via methods which would not be applicable if pure cross-sectional or pure time series data was adopted. Enomoto & Nagata (2016) stated that panel data is a sort of multi-dimensional time-series data that consists of several sets of the observation unit as an identical community over time. Panel data includes more information than time-series data or cross-section data. Using panel data, we are able to estimate more accurately, increase degrees of freedom, and avoid multi-collinearity.

Arshad et al. (2017) stated in his research that the study uses panel data modeling, as it provides various benefits over cross-sectional and time series analysis. Due to the availability of cross-country time series data, fixed effect estimator, which also known as the Least Square Dummy Variable (LSDV) model, seemed to be appropriate. Nwakuya (2017) also stated that panel data is a marriage of time series and cross sectional data, in other words there will be space as well as time dimensions. Panel data is more informative (more variability, less collinearity, more degrees of freedom), estimates are more efficient it minimizes bias due to aggregation.

4.2. Select the Best Model

Pilai (2016) stated that panel data or longitudinal data (the older terminology) refers to a data set containing observations on multiple phenomena over multiple time periods. Thus, it has two dimensions: spatial (cross-sectional) and temporal (time series). The main advantage of panel data comes from its solution to the difficulties involved in interpreting the partial regression coefficients in the framework of a cross-section only or time series only multiple regression. There are three types of models in the data panel: (1) constant coefficients (pooled regression) models, (2) fixed effects models, and (3) random effects models.

Abdouli & Hammami (2017) in their research stated that they use panel data to do estimation with pooled ordinary least square (common), fixed effect, and random effect. Kartikasari (2017) also stated that panel data regression consists of three models, namely common effect, fixed effect, and random effect. Pârțachi and Șișcan (2018) also stated that the estimation of panel data model includes three different methods: (model 1) Common constant, (model 2) Fixed effects, (model 3) Random effects.

Steps in the analysis of panel data are to select the best model through statistical tests among common, fixed, and random effects (Feriyanto, 2016). While Amyulianthy and Ritonga (2016) stated that to choose which model is more suitable between Common Effects Model or Fixed Effects Model can be done using the Chow Test. Chintya et al. (2018) also stated that Chow test is a test to determine the Fixed Effect or Common Effect model that is more appropriate to be used in estimating panel data.

The first stage perform statistical tests to choose a common and fixed effect models,

the results are presented in Table 4. Based on the F-test and chi-square statistic, it shows that the fixed effect model is better than the common effect model.

Table 4. Result of Redundant Fixed Effects Tests

Redundant Fixed Effects Tests			
Test cross-section and period fixed effects			
Effects Test	Statistic	d.f.	Prob.*
Cross-section F	6.072276	(4,42)	0.0006
Cross-section Chi-square	22.817795	4	0.0001

Note: Ho: Common model is true; Ha: Fixed effect is true. * = Ho is rejected at 0.05 significance level, fixedeffect is better than common model

The second stage perform a statistical test to choose between the fixed effect model and random effect, which results are presented in Table 5. The stage is in accordance with the step conducted by some researchers, such as Yang and Khalil (2014) who stated that in order to decide between Fixed Effects (FE) and Random Effect (RE) estimation, we apply Hausman test.

Uğur and Özocakli (2018) stated that the Hausman test is used to select between the fixed effect model and the random effects model. In the Hausman test, rejecting the null hypothesis that the coefficients obtained from the random effects model and the coefficients obtained from the fixed effects model are the same shows that the fixed effect model gives more effective results. On the other hand, acceptance of the null hypothesis exhibits that the random effects model gives more effective results. The results of Hausman test shows that the fixed effect model that is appropriate for this analysis (Table 5).

Table 5. Result of Hausman Test: Fixed and Random Effects

Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob. *
Cross-section random	18.955854	3	0.0003

Note: Ho: Random effect is true; Ha: Fixed effects is true. * = Ho is rejected at 0.01 significance level, fixed effects is better than random effects

Fixed effect model is mostly used by researchers to analyze economic growth. Salebu (2014) used fixed effect model in his research while analyzing the effect of Foreign Direct Investment (FDI) on economic growth in Indonesia during 1994-2013. Imran et al. (2015) also used fixed effect model as new regression estimates of the relationship between unemployment and economic growth for 12 selected Asian countries during 1982-2011. Zimčík (2016) used fixed effect model to identify the impacts of different taxes and expenditures on economic growth on 20 selected European Union Member States from the years 1995-2012. Doku et al. (2017) used fixed effect model to examine the quantitative effect and direction of Chinese FDI on economic growth in Africa using a sample of 20 African countries from 2003 to 2012. Yang et al. (2017) also used fixed effect model to analyze the impacts of broadband on economic growth in 30 regions of People's Republic of China during 2006 to 2015.

4.3. Regression Results

The results of an empirical assessment data using Fixed Effect Model are shown in Table 6.

Table 6. Regression Results Dependent Variable: EGR

Independent Variables	*Coefficient*	*t-statistic*
C	-1.243236	-0.220821
LOG(ED?)	-1.018398	-3.028589 [a]
H?	-45.39774	-0.514385
LOG(INC?)	1.585779	3.548164 [a]
R-squared		0.643243
Adjusted R-squared		0.583784
F-statistic		10.81818

Note: [a]= significant at 0.05 level respectively

$EGR_{it} = \alpha_0 + \alpha 1 \log ED_{it} + \alpha_2 H_{it} + \alpha_3 \log INC_{it} + e_{it}$

$EGR_{it} = -1.243236 - 1.018398 \log EDit - 45.39774 H_{it} + 1.585779 \log INC_{it}$

$R^2 = 0.643243$ N =50 F-stat = 10.81818

5. Discussion Conclusion

5.1. The Quality of Education

The result of the regression showed that the educational coefficient value was -1.018398 meaning that the education in DIY had negative influence on the economic growth rate of DIY, it was significant. If there is an increase of 1% in the number of Senior High School student (ED) in DIY, it will certainly influence the economic growth rate (EGR) of DIY that will decrease as much as 0.01018%, assuming other independent variables remains the same. Proxy quality of education with the number of students at the secondary school level caused negative effects on the rate of economic growth. This is because more and more people are in school economically they are not in the labor force and participate in economic activities. But in the long term with their graduation from high school will provide workers with a quality in economic activity, so that work productivity will rise and have a positive impact on economic growth rate.

The research done by Sajo (2017) in Nigeria during the time period of 1990-2013 discovered that the spending for education done by the government has a negative impact to economic growth in the country. Meanwhile, other variables such as school participation are found incapable to influence economic growth. The existence of the negative influence, he said, is caused by the spending of education that is relatively small. Thus, Sajo (2017) recommended to the government of Nigeria to increase the budget for education sector up to 26% at the minimum, out of the total of the country's annual budget, as encouraged by UNESCO.

Further, Abugamea (2017) has also done research about the similar issue in Palestine from 1990 to 2014. The result shows that education has a negative impact and is significant to the growth of economy in the country. Education in here is measured using the ratio of the total population that go to school whether in private or public schools. The negative impact according to the author is caused by the increased number of the population that go to school which causing a low supply of workforce, and affecting the average productivity of the population which is also low.

Education level determines the human resources quality which has an important role to keep the regional economic moving. The significant number of well-educated human resources in a region will be crucial to accelerate the region's economic activities in order to increase in relatively short time. The product (goods and services) innovations as well as the economic activities will only be probably realized and conducted by the adequate number of

qualified human resources. The adequate number of good quality human resources will encourage and increase DIY economic which further leads to larger GRDP to promote the DIY economic growth rate.

5.2. The Quality of Health

The result showed the regression coefficient amounting - 45.39774 which meant that the influence of the quality of health variable on DIY economic growth rate was negative but insignificant. The insignificance of the quality health variable was caused by the imbalanced ratio between the number of population needed to serve and the populationgrowth of DIY which resulted in the declining effectivity. In case the quality of health rate of DIY population decreases, the quality of its human resources will also sink. The relatively underqualified human resources cannot provide significant stimulus for economic growth of DIY Province.

Another possibility of the insignificance of the quality of health variable was the better quality of the health infrastructure in DIY which made the medication and in-patient services more expensive and unreachable for the people needed. Moreover, for the poor society of DIY, the more expensive health cost will end up with the more difficult access for them to take care or get medication for their illness. It is likely that the increase in health budget of DIY is intended to improve and add the health infrastructure (primary health center and hospital); however, it also adds more burden to the society to spend more for the health cost that in turn limits the access to get health service. It is thus, necessary for the regional government of DIY to render more incentive for the poor society especially the ones who need health services in order to be able to get the health access and the ease in terms of health cost in the primary health centers and hospitals of DIY.

Then, related to the relationship between health and economic growth, Morgado (2014) has conducted research in Portugal during the period 1960-2005. The result shows that health cannot affect economic growth. The level of health in this study using the variable of life expectancy and birth rate. The absence of correlation between health and economic growth according to the researcher is because health is a social mechanism, so that there has not been found any influence on the economic conditions directly.

Some studies have indeed found that for countries with low incomes, health variables have little effect on economic growth, even their slopes tend to be negative. As found by Halıcı-Tülüce et al. (2016) in his research conducted in several low-income countries. The result is true that health has a very small negative impact on economic growth. This may be due to the low level of health spending compared to other sectors. Meanwhile, Sirag et al. (2016) found almost the same conclusions in which health expenditures, especially those in the public sector, have not been able to influence economic growth, or in other words the effect is still insignificant. This is because health spending is still not a top priority. The study was conducted in Malaysia during the period 1970-2013.

Health studies have also been conducted by Karimi et al. (2017) in countries that belong to the MENA organization. The results show that, health represented by the fertility rate of the population has a negative relationship to economic growth. This is because the government has not really implemented a good health system, therefore the researchers provide recommendations on improving the performance of health systems and facilities. Furthermore, the same study was also carried out by Gani & 'Ofa (2018) in the Pacific countries during the period 1992-2009. The results concluded that in general, the level of health has no significant relation to economic growth. Nevertheless, the researcher still recommends the government to provide more health budget because when the health budget is limited, it is proven to not be able to give a significant influence on economic growth.

This finding, however, contradicts what was

found by Kurt (2015), Eggoh et al. (2015), Piabuo & Tieguhong (2017), Atilgan et al. (2017), and Sigh (2017) that the quality of health significantly positive influenced the economic growth of those countries. The health facilities in the researched countries were good and relatively evenly-distributed; consequently, health variable had the significantly positive influence on economic growth rate of those countries.

5.3. The Quality of Per capita Income

The quality of public purchasing power can be proxyed with per capita income levels. The regression result indicated the coefficient value of per capita income as much as 1.585779 which meant that per capita income positively influenced the economic growth of DIY which was also supported by t-test which proved that per capita incomevariable was positively significant. The positively significant influence of per capita income on the economic growth rate of DIY indicates that provided there is an increase of 1% in the per capita income of DIY people, it will certainly influence the economic growth rate of DIY that will also increase as much as 0.01586 %, assuming other independent variables remains the same.

The increase in per capita income will encourage people's purchasing power and demand which then will push the producers to escalate their product capacity to fulfill the demand increase. The increasing demand and production activities give effect on the GRDP attainment of the province which also means increasing regional economic growth.

Sethy & Sahoo (2015) in their research conducted in India during the period of 1970-2010 found a positive correlation between income and economic growth. The study generally discusses economic and population growth, but some variables are included in order to obtain good analytical results, such as per capita income, population, economic growth, and labor force. Therefore, the authors recommended that the quality of human resources still need to be improved because with good quality of human resources, it will be able to generate more income.

Another research isconducted by Giap et al. (2017) in several countries in ASEAN during the period 1993-2013 on economic growth. According to this research, per capita income and human resources become two very important factors for economic growth. Revenue per capita has a positive and significant relationship to economic growth in the researched countries. In relation to the policy that can be taken, the researcher adds that specifically in ASEAN countries in order to prevent the slowdown of economic growth, the government needs to pay attention to the priority sectors of GDP and the improvement of human resources.

Furthermore, Mukhlis et al. (2017) have also conducted research on economic growth and incomes, although in general, the study discusses agglomeration industry, but variables such as per capita income, economic growth, population, and income gap are also incorporated into the model. The study was conducted in Indonesia during the period of 2004-2014 and concluded one of them is that per capita income is good for the current year have a positive and significant impact on economic growth. The researchers argue that the higher per capita income of a person, the better possibility to be able to produce goods and services that will ultimately have a positive impact on economic growth.

This finding is in line with the research conducted by Cheung (2014), Fawaz et al. (2015), and Berumen (2016) who stated that per capita income and economic growth have a significant positive influence. This significant influence was rooted from the relatively evenly-distributed per capita income of DIY society.

5.4. Intercept Coefficient Analysis

The advantage of Fixed Effect Model compared to Common Effect Model is that the regression resultcan be used to analyze the economic growth rate of regency/city in comparison with the average economic growth rate of all regions (DIY). The intercept coefficients of regencies/ city of DIY are shown in Table 7.

The regression result using Fixed Effect Model produced different intercept coefficients for each regency/city of DIY. That indicates the heterogeneity of each region reflecting the particular variables owned by each specific region which are not owned by others. A region which has prominence in other variables which are not independent variables will solely rely its economic growth rate determinant on individual effect (if it is assumed that independent variable does not change). The individual effect is a reflection of the region's heterogeneity which has specific characteristics different from other regions.

Table7. Intercept Coefficient of Regencies/ City of DIY Province

No	Regency/City	Intercept Coefficient
1	Bantul Regency	-0.346318
2	Sleman Regency	-0.901154
3	Gunungkidul Regency	-1.463599
4	Yogyakarta City	-1.563661
5	Kulonprogo Regency	-1.941449

Source: regression result

Table 7 shows the intercept coefficient order from the biggest to the smallest numbers representing Kulonprogo Regency, Yogyakarta City, Gunungkidul Regency, and Sleman Regency, and Bantul Regency respectively. Fixed Effect model is able to explain the difference of behavior of five regencies/ city this is seen from the difference of interception coefficient of each regency/ city. After the data is sorted, Bantul Regency has the highest intercept and Kulonprogo Regency has the lowest intercept value indicating that the highest percentage of economic growth is Bantul Regency, and the lowest is Kulonprogo Regency, if the variable value of education, health and income per capita and all regencies/city are zero.

The value of the coefficient of Bantul Regency is -0.346318 this indicates that economic growth at the time of independent variables and all zero regencies/ city is -0.346318 percent. Sleman Regency ranks second with a coefficient of -0.901154 which means economic growth at the time of independent variables and all zero regencies/city is -0.901154 percent. The third order is Gunungkidul Regency where the coefficient value of -1.463599 which means economic growth at the time of independent variables and all regencies/ city zero is equal to -1.463599 percent.

In the fourth and fifth place is the City of Yogyakarta and Kulonprogo Regency with the coefficient value respectively -1.563661 and -1.941449 which means the economic growth of Yogyakarta City when the independent variables and all zero regencies amounted to -1.563661 percent and economic growth Kulonprogo Regency at the time independent variables and all zero regencies/city are -1.941449 percent.

6. Contribution, Policy Recommendation and Limitation

Theoretical contribution of this study is that theoretically education has a positive influence on economic growth, but the results of this study prove that education in

DIY has a significant negative influence on economic growth. Health in theory also has a positive effect on economic growth. But the results of the study prove that the effect is not significant on economic growth because the ratio between the number of health infrastructure units per population to serve is smaller than population growth which results in decreased effectiveness. Meanwhile, findings in per capita income support previous research that has a significant positive effect on economic growth.

The practical contribution of this research is to provide direction for the provincial government of DIY to make policy to prioritize the development of education and health infrastructure, especially in Kulonprogo and Gunungkidul Regencies. Kulonprogo and Gunungkidul Regencies are two relatively lagging regencies compared to other regencies and city in the DIY province. Through this policy, it is expected that the quality of education and health, especially in Kulonprogo and Gunungkidul regencies and generally in every regencies and city in DIY Province can increase. Through investment in education and health infrastructure that is supported by an increase in location distribution policies and better access for the community for education and health infrastructure will accelerate and improve the quality of human resources so that the economic growth of each regency will increase.

The policy recomendation of this research is raise and spread of investment especially in the field of education is highly necessary in DIY Province considering the urgent need of more high quality schools by regencies in the province, so that the improvement of the condition will have an impact in increasing the level of education of the people with more number of Senior High School graduates. Aside from that, the improvement of education will also be impactful to the quality of the people especially the work force, so that the productivity of the people will be increased. The increase of quality and productivity of the people will be influential to the raise of income and the salary of the workers. The increasing income of the people and the workforce will increase the per capita income, which will encourage the increase of consumption and other economic activities, which will increase the economic growth rate. The result of this research shows that per capita income has a significant positive influence towards the economic growth rate of the city and regencies in DIY Province.

The limitation in this study is the use of proxy for the number of high school students for education because of the lack of education data for workers in regencies/ cities in DIY. The number of high school students is the closest proxy for workers' education because they will be the supply of labor in DIY. In addition, another limitation is that research is only made within 10 years and in 4 regencies and one city in DIY. The result certainly cannot represent the entire province in Indonesia amounting to 34 provinces, because each has different characteristics. Further research can be done with a broader area of research that is nationally (Indonesia) with a longer research time so that it can produce a more complete study. In addition, further research can add other independent variables that can influence economic growth rate such as foreign direct investment and domestic investment so that a more comprehensive.

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