DO EDUCATION, HEALTH, AND INFRASTRUCTURE AFFECT POVERTY IN 15 CENTRAL JAVA REGENCIES?

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Abstract

This study aims to analyze how mean years of schooling and gross enrollment ratio as proxy of education, the number of medical personnel and life expectancy as proxy of health, and the clean water users as proxy of infrastructure affect poverty in 15 Central Java Regencies. The result revealed that the average of mean years of schooling, gross enrollment ratio, health infrastructure, medical personnel, the number of electricity user and clean water user affect poverty simultaneously significant. Partially, the mean years of schooling, gross enrollment ratio, and the number of medical personnel affect poverty negatively significant. Health infrastructure affect poverty negatively and not significantly. Meanwhile, the clean water users negatively and not significantly affect poverty. Mean years of schooling, gross enrollment ratio, the number of medical personnel, and clean water users significantly affect poverty.

Keywords: poverty, education, health, infrastructure

Introduction

Poverty is a complex problem that has many causes and influences. The implications of poverty have a broad impact on life, not only poor private lives, but also for those who are not classified as poor (Maipita, 2014). The World Bank defines poverty as, poverty related to inadequate housing, sickness and unable to go to a doctor, unable to go to school. Thus, those people do not know how to write, unemployment, do not have access to clean water resources, have powerlessness, lack representation and freedom. According to Chen & Ravallion (2013), poverty is the main concern to policy maker because poverty is related to people prosperity directly. According to Suryandari (2018), poverty is a social problem in every developing country, including Indonesia. There is a negative relationship between poverty rate people's prosperity in Indonesia. It means that the higher the welfare of the community, the greater the opportunity to reduce poverty (Giovanni, 2018).

Figure 1.1 Poverty Rate in Indonesia, 2013-2017.
Source: BPS Indonesia, 2017 (processed data).

Figure 1.1 showed that generally, the poverty in Indonesia from 2013 to 2017 has decreased both in terms of the number of poor people and the percentage of poverty. The percentage of poverty continuously decline from 11.47% in 2013 to 10.12% in 2017. In 2015, the percentage of poverty increased by 0.17%. This condition was triggered by the increase in the price of fuel oil which was followed by an increase in prices of basic commodities.

On the other hand, a low inflation induce 1,45% decreasing of poverty in 2017, the mean value of farmer wage of 1,50%, the subsidy of basic needs such as rice is well distributed and the rate of growth of some food commodity prices is quite controlled. Meanwhile, the poverty percentage in 2017 is over 10%. This condition induce poverty problem and the population welfare that not yet well distributed in Indonesia become main issue. Table 1.1 support the finding. It explain that the spread of poor in Indonesia is still concentrated in Java which has the most number of poor people.

Table1. The number of poor people spread in Indonesia (2017)

Province	The Number of Poor Peope (million)		
	Urban Area	Rural Area	Amount
Sumatera	2,05	3,92	5,97
Jawa	6,77	7,17	13,94
Bali dan Nusa Tenggara	0,58	1,48	2,06
Kalimantan	0,32	0,66	0,98
Sulawesi	0,43	1,68	2,11
Maluku dan Papua	0,12	1,40	1,52

Source: BPS Indonesia year of 2018.

It can be seen from table 1.1 that the spread the poor is converge in Java Island with 13,94 million poor. This is caused by Java population density. It is proven that from 2013 to 2017 many regencies in Java had high poverty percentage. These conditions are explained in table 1.2.

Table2. Poverty Rate in Java (2013-2017)

Province	Poverty Rate (%)					Average
	2013	2014	2015	2016	2017	
Sumatera	3,72	4,09	3,61	3,75	3,78	3,75
Jawa	9,61	9,18	9,57	8,77	7,83	8,70
Bali dan Nusa Tenggara	14,44	13,58	13,32	13,19	12,23	12,99
Kalimantan	15,03	14,55	13,16	13,1	12,36	13,34
Sulawesi	12,73	12,28	12,28	11,85	11,2	11,87
Maluku dan Papua	5,89	5,51	5,75	5,36	5,59	5,56

Source: BPS Indonesia, 2018 (processed data)

Table 1.2 showed that there are three provinces with over 10% of poverty. DI Yogyakarta province had average poverty percentage of 13,34%. Furthermore, Central Java province is the second largest average poverty percentage of 12,99%. East Java is the third largest average

poverty percentage of 11,87%. According to BPS (Badan Pusat Statistik, 2018) from those provices, Central Java is the only province that has the most significant result in reducing poverty.

From 2013 to 2017, Central Java Province successfully decrease the number of poor as many of 282.230 inhabitant. In that period, as many of 43.030 population have succesfully out from poverty line. Meanwhile, in East Java the number of poor people is decreasing as many as 21.520 population and DI Yogyakarta only decrease as many as 300 population. Whereas the poverty rate in Central Java province from 2013 to 2017 is still high compare to national level (10,12%). In 2013, the percentage of poverty was 14.44%, in 2014 and 2015 it fell and was stable at 13.58%. In 2016 fell back to 13.27% and decreased in 2017 to 13.01%.

The high rate of poverty in Central Java Province was allegedly triggered by 15 regencies in Central Java Province which were included in the red zone of poverty (percentage of poverty above province (13.01%) and national (10.12%) from 2013 to 2017. This condition explained in graph 1.2.
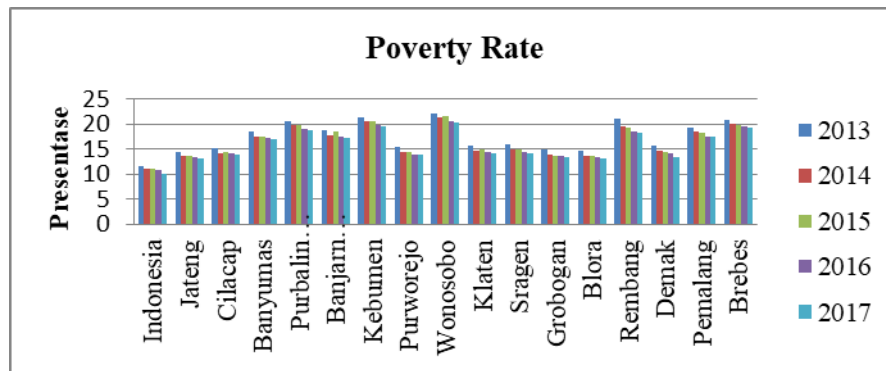

Figure 1.2 The poverty rate in 15 Regencies in Central Java Province 2013-2017
Source: BPS of Central Java Province, 2017

Figure 1.2 showed that there are 15 regencies in Central Java over province level (13,01%) and national level (10,12%). It prove that the society prosperity is distributed as a whole. Education, health, and infrastructure is estimated as factors that trigger the high poverty rate in 15 regencies in Central Java province. This is the definition of poverty using Basic Need Approach introduced by AmartyaSen (Asselin & Dauphin, 2001). The concept of Basic Need Approach is direct approach to is a direct approach to the problem of the level of social injustice in poverty. This concept is also explain six area that have relation with the factors cause poverty as nutrition, education, heath, sanitation, water supply, housing condition, and also infrastructure.

Literature Review
There are some experts formulate the basic needs components (Badan Pusat Statistik Indonesia, 2008). According to Hendra Esmana (1986:320-321), the components of basic needs cover clothing, food, shelter, education, and health. According to Green (1978) in Thee Kian Wie (1981:31), the basic needs components consist of personal consumtion (cloth, food, and shelter)

dan basic public service (education, health infrastructures, water piping, culture and transportation).

A research by Dores & Jolianis (2014) found that education affect poverty negatively significant. It means, the higher the level of education, the higher the quality and quality of education which will reduce poverty. In line with that, Annur (2013) found that people with higher education would have higher income compared to people with low education. On the other hand, Giovanni (2018) found that education did not affect poverty, which was caused by the low level of school participation in a region.

In addition to education, there are some factors that affect poverty that are health. Suryandari (2018) found that health affect poverty negatively significant. On the other hand, Henlita & Handayeni (2013) stated that the number of bad facility and health services in developing countries are higher than those in developed countries. Developing countries that have relatively large population will bring health problem if it is not balance with sufficient healthcare infrastructure and health personnel.

Infrastructure is also important to increase the quality of life and prosperity. Amaluddin (2014) found that infrastructure negatively significant affect poverty. The availability of infrastructure such as clean water system relevant with the level of development. The sufficient and affordable clean water facility, improve the quality of human resources, and boost productivity. Thus, the number of poor people get reduced.

Research Method

This study utilizes quantitative method. The data is secondary data generated from Badan Pusat Statistik. The data consist of : literacy rate and gross enrollment ratio as proxy of education ; the number of medical personnel and life expectancy as proxy of health ; and the number of clean water users as proxy of in frastructure. This study employ panel data regression that consist of cross section data from 15 regencies in Central Java province and time series data from 2013 to 2017. The data is processed by e views 9.

There are three approaches in panel data regression that are Common Effect Model (CEM), Fixed Effect Model (FEM), Random Effect Model (REM). The best model selection is conducted by several tests that are chow test, lagrange multiplier test and hausman test. Classic assumption test is ran on the chosen model that are normality test multicollienarity test, multicollinearity test, heteroscedasticity test, and statistic test that consist of F-test, R-Square test, and T-test. The regression equation is as follows:

$Ly = \beta_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X5_{it} + \varepsilon_{it}$ ……………………………(1)

Specifications:

Ly : Poverty rate (in million people), X1 : Literacy rate (in year), X2 : Gross enrollment ratio (percentage), X3 : The number of medical personnel (in person), X4 : Life expectancy (year), X5 : the number of clean water user (percentage), β_0 : Intercept, β_1- β_5 : Regression Coefficient, i : cross section unit (i=15 regencies), t : time series unit (t=2013-2017), ε : Error term.

Result and Discussion

This study determines the regression model using chow test and hausman test.

Table3. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	729.688.024	(14,55)	0.0000
Cross-section Chi-square	392.228.302	14	0.0000

Source: Output of Eviews 9 (data processed).

The Chow test show that the value of Cross-section Chi-square Pobability is 0,0000 which < 0,05. Thus, H_a is accepted and the best model is fixed effect. The next step is Hausman Test to determine the best model between *fixed effect* and *random effect*.

Table4. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	10.161.308	5	0.0708

Source: Output of Eviews 9 (data processed).

The Hausman test revealed the value of *C*ross-section random probability is 0,0708 which < 0,05. Thus, H_1 is accepted and the best model is random effect model. The next step is run the Lagrange Multiplier Test to determine the best model between common effect and random effect.

Table5. Lagrange Multiplier Test

	Hypothesis Test		
	Cross-section	Time	Both
Breusch-Pagan	10.161.308	5	0.0708
	(0.0000)	(0.9004)	(0.0000)

Source: Eviews 9 Output (processed data).

The Lagrange Multiplier test result showed that the probability value of Bresh-Pagan using Hypothesis Both test is 0.000 which < 0,05. Thus, H1 is accepted and the best model is random effect model.

It can be concluded that the best model in this study is random effect. Below is the result of classical assumption test from random effect model (multicollinearity and heteroscedasticity test).

Table6. Multicollinearity Test

	X1	X2	X3	X4	X5
X1	1.000.000	0.612844	0.030461	0.625051	0.082500
X2	0.612844	1.000.000	0.056090	0.563832	0.266312
X3	0.030461	0.056090	1.000.000	-0.062750	-0.010359
X4	0.625051	0.563832	-0.062750	1.000.000	0.145509
X5	0.082500	0.266312	-0.010359	0.145509	1.000.000

Source: Eviews 9 Output (processed data).

Multicollinearity test result revealed that the correlation value among variables is lower than 0,8. Thus, H_1 is accepted. It means, there is no multicollinearity in the regression model.

Table7. Heterocedasticity Test

Dependent Variable: RESABS

Total panel (balanced) observation : 75

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.582762	0.966997	-0.602651	0.5487
X1	-0.013135	0.038034	-0.345357	0.7309
X2	0.000502	0.001134	0.442939	0.6592
X3	-2.07E-06	9.75E-06	-0.212432	0.8324
X4	0.010678	0.014925	0.71543	0.4768
X5	0.000636	0.000625	1.017.404	0.3125

Source: Eviews 9 Output (processed data).

The heteroscedasticity test revealed that each independent variable has the probability value of > 0,05 and H_1 is accepted. Thus, it can be concluded that the independent variables are free from heteroscedasticity assumption.

Table8. Statistic Test

Dependent Variable: Y

Method: Panel EGLS (Cross-section random effects)

Total panel (balanced) observations: 75

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.598.021	2.348.805	6.803.551	0.0000
X1	-4.581.058	2.650.894	-1.728.118	0.0884
X2	-0.141790	0.052846	-2.683.073	0.0091
X3	-0.000706	0.000335	-2.103.554	0.0391
X4	-1.858.474	3.318.539	-5.600.276	0.0000
X5	-0.054494	0.028552	-1.908.572	0.0605
R-square		0.662859		
Prob. (F-statistic)		0.000000		

Source: Eviews 9 Output (processed data).

Statistic test is employed to test the hypothesis with variable coefficient significancy. Table 8 revealed the R-square is 0,662859 it means that 66% of dependent variable that are poverty (Y) explained by independent variables using statistic model, the mean years of schooling (X1) and gross enrollment ratio as proxy of education; the number of health personnel (X3) and life expectancy (X4) as proxy of health; and clean water users (X5) as proxy of infrastructure). Meanwhile, the rest 0,34 or 34% are explained by another factors outside the model.

The probability value of F-test is $0.0000 < 0.05$. It means that simultaneously, the independent variable significantly affect dependent variable. The regression coefficient test individually is conducted using T-test. Based on table 8, it can be seen that the probability value and coefficient value of the mean years of schooling (X1) are $0.0884 > 0.05$ and -0.4581058 respectively. It can be concluded that the mean years of schooling do not affect poverty. The probability value and coefficient value of school participation rate (X2) are $0.0091 < 0.05$ and -0.141790 respectively. It can be concluded that the number of gross enrollment ratio negatively and significantly affect poverty.

The probability value and coefficient value of the number of medical personnel (X3) are $0.0391 < 0.05$ and -0.000706 respectively. It can be concluded that the number of medical personnel negatively and significantly affect poverty. The probability value and coefficient value of life expectancy (X4) are $0.0000 < 0.05$ and -1.858474. it can be concluded that the life expectancy affect poverty negatively significant. The probability value and coefficient value of the number of clean water users (X5) are $0.0605 > 0.05$ and -0.054494 respectively. It can be concluded that the number of clean water users negatively and not significantly affect poverty.

The Effect of Education to Poverty

Education is the main entrance to cope with poverty. Education is People Bridge to obtain prosperity. The higher education rate, the skill and knowledge are also increased. In the end, the productivity will get better and increase prosperity. The test result revealed that the mean years of schooling do not affect poverty in 15 regencies in Central Java from 2013-2017 and this result in line with (Niswati, 2014).

The probability value of the mean years of schooling is 0.0884 which over 0.05. Thus, it can be concluded that the mean years of schooling is not yet able to increase the productivity and decrease poverty. It is found that the adult mean years of scooling (over 25 years old) in 15 regencies in Central java in the last five years is remain low that is 6.74 years. It is equal with elementary school graduate and not yet graduated from junior high school (SMP). The low education rate cause the human resources not qualified and it is hard to find a sufficient job. Thus, the poverty rate in 15 regencies in Central Java province is still high in the last five years. People participation is also needed to knowing how far the effort of the distribution and expansion educational access is obtained.

The test showed that the gross participation rate could increase the education quality and reduce poverty in 15 regencies in Central Java from 2013 to 2017. this statement is supported by the probability value of gross enrollment ratio that is 0.0091 which lower than 0.05. Thus, it can be concluded that the gross participation rate negatively and significantly affect poverty. In the last five years, the mean value of gross participation rate of high school in 15 regencies in Central Java is 77.30. this number is lower compare to the national level. It means that 100 children with

age of 16 to 18 years old that should be enrolled in high school, there are only 77 children that continuing their education. This condition induce the poverty remain high in the last five years. On the other hand, the 15 regencies accommodate people in school age more than the target.

The Effect of Health to Poverty

To improve the people health condition, it needs health access service as medical personnel expert in servicing people. The test revealed that the number of medical personel affect poverty negatively significant in 15 regencies in Central Java from 2013 to 2017. The probability value of medical personnel is 0.0391 which lower than 0.05. thus, it can be concluded that the health services in term of medical personnel could help the people health standard and reduce poverty. On the other hand, the problem with the number of medical personnel that less compare with the population is still becoming a problem. Added with the problem with the number of medical personnel that are not spreader evenly. This study suggest that increasing the life expectancy will shape talented youth generation which can increase the number of medical personnel.

The test result revealed that life expectancy affect poverty in 15 regencies in Central Java province negatively significant from 2013-2017. It can be seen from the probability value of life expectancy that is 0.0000 which less than 0.05. It can be concluded that the better healthcare rate will reduce the number of poverty. In the last five years, the number of life expectancy is continuously increased. The record stated that the life expectancy is 73.38 year. The finding is also in line with Suryandari (2018). It stated that the increasing life expectancy will lead to the better healthcare.

The Effect of Infrastructure to Poverty

Infrastructure is an important part of the survival in an area, such as infrastructure in the field of providing clean water. The estimation result revealed that the number of clean water users affect poverty in 15 regencies in Central Java negatively and not significantly from 2013 to 2017. It is proven by the probability value the number of clean water users that is 0.0605 higher than 0.05. Thus, it can be concluded that the clean water infrastructure improvement is not yet able to reduce poverty rate.

The government of Central Java province is still face poverty, the low access of clean water services, and environmental sanitation. The less optimum clean water services is caused by the limit of basic water quantity. There is limitation on the clean water piping network, therefore, it is still necessary for PDAM and non-PDA to cooperate in expanding their operational coverage. The increasing population every year is not in line with the capacity of clean water supply. It supported by (Alihar, 2018) found that due to the limited pipeline network, the PDAM has not been able to serve all levels of society. In line with that, the high population growth means that not all population can access clean water easily, especially for the poor.

Conclusion

1. Mean years of schooling and gross enrollment ratio as proxy of education. Mean years of schooling and gross enrollment ratio do not affect poverty. Meanwhile, gros enrollment ratio affects poverty in 15 regencies in Central Java negatively significant.

2. Life expectancy and the number of medical personnel as a proxy of health. Life expectancy and the number of medical personnel as proxy of health affect poverty in 15 regencies in Central Java province negatively significant.

3. The number of clean water users as proxy of infrastructure. The number of clean water user affect poverty in 15 regencies in Central Java province negatively and not significantly.

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