



## Analysis of Factors Affecting Poverty in the North Sumatra Province

Arif Rahman<sup>1✉</sup>, <sup>2</sup>M. Syafii, <sup>3</sup>Sukma Hayati Hakim

Faculty of Economics and Business University of North Sumatra

### Article

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### Abstract

North Sumatra is the province with the largest number of poor people in 2019 with the fifth highest poverty percentage on the island of Sumatra. This province has a good potential for accelerating economic growth and improving the quality of life if all levels of society are empowered with all their capabilities in carrying out productive business activities, and can access to socio-economic resources. This study aimed to determine and analyze the effect of the real GDP per capita variable, the open unemployment rate, and the average length of schooling simultaneously and partially on the poverty rate in 33 cities and regencies of North Sumatra Province in 2017-2019. It used secondary data using the Eviews program, while analysis technique used was panel data regression. Based on the research results, it was found that the real GDP per capita, the open unemployment rate, and the average length of schooling simultaneously had a significant effect on the poverty level. Per capita real GRDP and average length of schooling partially had a negative and significant effect on poverty rate. Meanwhile, the open unemployment rate had no significant effect on poverty. The variable that has the most dominant influence on the level of poverty was real GDP per capita.

## INTRODUCTION

Poverty is a fundamental problem for every developing country. That is why alleviating poverty to achieve better life quality becomes the concern of developing country economic development. Poor people are always in enabled condition in meeting basic needs or the inability to do productive efforts, access socioeconomic resources, determine their own fate, get discriminated, being free from both poor mental and culture, and have low dignity and pride (Arsyad, 2016).

Various efforts have been made to reduce poverty rate, for example accelerating economic growth and population control to increase per capita income. Income is one of the major variables of improving life quality, while population variable takes part as a divider in achieving per capita income of a region. Good and sustainable quality human resources will result good and sustainable economic growth, so population control is needed so as not to be the burden for development.

Instruments of education become fundamental matters in producing productive and creative human resources. In the current global competition era, people cooperate and compete to fulfil their needs, while within that competition there must be those who win and lose. The losers of this competition become the government responsibility to protect and facilitate through fiscal instrument policies in the context of upholding substantial social justice.

One of the major manifestations and factors causing the low living standard in developing countries is the lack absorption of human resources in the society economic life. Compared to developed countries, developing countries are relatively low in utilizing their resources. It is caused by the high unemployment rate due to the lack of opportunity for people who are qualified but have no chance to get job vacancy. (Todaro, 2000)

Poverty is not only a problem for developing countries, but also for developed countries. SDGs (Sustainable Development Goals) ideas within 2015-2030 prioritize poverty as a fundamental issue for the development of countries all over the world. With the theme of

“Changing Our World: 2030 Agenda for Sustainable Development”, SDGs which contain 17 goals and 169 targets are global actions to end poverty, improve health, education, economic growth, reduce inequality, and protect the environment (United Nations, 2015)

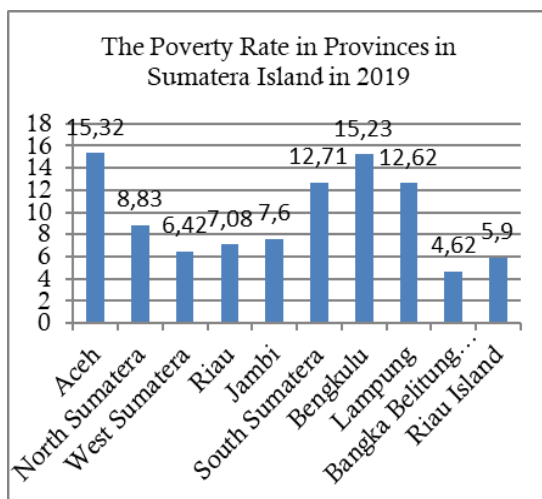
The ongoing economic development in Indonesia until 2019 apparently gave no satisfying results. There found some transactions deficit in 2018 and regarded as the first in Indonesian economic history. It became an important warning in terms of the economic direction and future target as a high-income country in 2045. In addition, regional and individual income disparity problems have not yet been handled well indicated by the Williamson index showing high inequality category, and the Gini index showing medium level. Both indexes somehow raise a question about the extent to which economic development effects on the objects of development, namely Indonesian people. It is in line with a study by Kanbur (2021) which shows that studies of economic inequality give some contributions to global policy discourse supported by the SDGs.

Indonesia is in the fourth place of the worldwide country having serious poverty problem. In percentage form, Indonesia poverty rate got reduced stable since 2010 with 13.33% and reduced to 9.41% in 2019. However, absolute data show the poor people in Indonesia are seemingly large, namely 25.14 million (Statistics Indonesia, 2019). Surely, development disparities among regions take part in the slow poverty alleviation in Indonesia.

To measure poverty, Statistics Indonesia (BPS) uses basic needs approach. In this approach, poverty is seen as the economic inability to meet basic needs including food and non-food calculated from the expenditure. Poor people mostly have per month per capita expenditure below poverty line. Meanwhile, poverty line is the sum of the food poverty line and the non-food poverty line.

North Sumatera is a province contributing the largest poor people in 2019 by 1.28 million people with the fifth highest poverty percentage of 8.83 percent in Sumatera Island. Fortunately, other provinces of West Sumatera, and Riau which are close to North Sumatera

have lower poverty rate, namely 6.43 percent and 7.08 percent respectively (BPS, 2019). In details, the data of all provinces in Sumatera Island are presented in the following figure 1.



**Figure 1.** The Poverty Rate in Provinces in Sumatera Island in 2019.

Source: Statistics Indonesia

The largest population owned by North Sumatera apparently can be pretty good potential for the acceleration of economic growth and life quality if all levels of society are empowered to do productive efforts, and access socioeconomic resources. However, when this large population is not managed well by human capital improvement and growth control, there will be bad effects on the equal distribution of the quality of life.

According to Mahendra (2016), in his study concludes that economic growth, per capita income, inflation, and unemployment during the period of 2003 to 2014 have no significant effect partially and simultaneously on the number of poor people in North Sumatera at a 5 percent confidence level. Moreover, Nakabashi (2018), assumes that poor states in Brazil remain having low wage for workers although they can control physical capital investment, human capital stock, and capital depreciation effectiveness. Other findings show that the variables which examine the portion of households and individual on extreme poverty are more important than those which estimate the portion of households and individual living in poverty in determining wage per worker.

According to Dagunga *et al.* (2021), in their study in Ghana reveal that socioeconomic factors and different bargaining sides influence multidimensional poverty in various countries. The heterogenous effects of socioeconomic on cross-belt multidimensional poverty imply that designing the “most appropriate” policy strategy is more effective than a “one size fits all” policy strategy. Ekayuliana *et al.* (2019) added in their study in East Lombok Regency decide village fund allocation has positive and significant effects on poverty rate, while the village fund itself does not.

A study by (Ferreira, *et al.*, 2016) infers conversion parity of purchasing power in 2011 has shifted the revision of international poverty line by the World Bank. This revision made a relatively small change in the global poverty incident in 2011, namely from 14.5 percent to 14.1 percent. In 2012, there was 12.7 percent of world population or 897 million people lived in extreme poverty. Moreover Tomar *et al.* (2019) conducted a study of the role of social entrepreneurship in alleviating poverty in India. They found that even though there is no single social entrepreneurship contributing significant effect on poverty, there are still some initiatives describing how they help poor people.

According to Prasetyoningrum (2018), in her study revealed Human Development Index (HDI) has a negative and direct effect on poverty, unemployment has a positive effect on poverty, and economic development has no effect on poverty rate. Then, Erlando *et al.* (2020), through multivariate PVAR model explains the higher financial inclusion in Eastern Indonesia, the lower poverty rate will be. They also mention financial sector is able to contribute to the alleviation of poverty through capital provision. For more, Kyzyma (2020) in his study of the poor people income in European countries indicates that most of European countries and a half of poor people surpass 30 percent of poverty line and there are only few percent of them experiencing income deficit by 80 percent or more.

In their study Alkire *et al.* (2021), used the Multidimensional Poverty Index (MPI) as the main poverty measure for assessment, added by the headcount ratio, intensity, number of poor

people, and poverty composition between 2005/2006 and 2015/2016. Of the data, 29 Indian states and some socioeconomic sub-groups show poverty multidimensional reduction of 271 million people in a decade. Additionally, Dan et al. (2014) in their study in Brebes Regency determine that the economic growth variable has a negative effect on the number of poor people, while per capita income and population dependency ratio have a positive effect on the number of poor people.

This study included real GDP per capita to see the extent of productivity in reducing poverty rate. There was also open unemployment rate which definitively causes underemployment seem undetected. On top of that, the involvement of those variables was intended to re-examine different findings of previous studies. Then, the average length of schooling was used to observe the contribution of time in education on the level of poverty. Overall, this study was initiated to determine and analyse the effects of real GDP per capita, level of open unemployment, and length of schooling on the poverty rate in 33 cities and regencies in North Sumatera Province.

## RESEARCH METHODS

This study used secondary data from Statistics Indonesia of North Sumatera Province. Those data were analysed using descriptive and panel data regression. Descriptive analysis method is an analysis method in which the collected data are arranged, grouped, analysed, and interpreted objectively to obtain an overview of the problem being encountered and explain the analysis results.

Data panel regression analysis method is projected to observe the combination of two data, namely time series, and cross section to produce greater degree of freedom. Besides, it can also deal with any arising problem due to variable deletion. This method of analysis uses three approaches, including common effect, fixed effect, and random effect.

The data of this study were processed using Eviews 10 software to determine the effects of real GDP per capita, level of open unemployment, and length of schooling on the

level of poverty in 2017 to 2019 in 33 cities and regencies in North Sumatera Province.

To determine the best model among those approaches, the researchers performed Chow test, Hausman test, and Langrange Multiplier (LM) test. Chow test is utilized to choose the best model among the models of common effect and fixed effect. If the selected model is fixed effect, the measurement will continue by conducting Hausman test to select between fixed effect and random effect. If the chosen model is random effect, LM test will be done to choose between common effect or random effect model.

Once the best model was obtained, the next step was to execute hypotheses testing, consisting of determination coefficient test, F test, and t hypothesis test to investigate the significant effects on independent and dependent variables (Widarjono, 2018). The equation is as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + e_{it} \dots \dots \dots (1)$$

Where Y is poverty rate; X1 is real GDP per capita; X2 is open unemployment rate (TPT); X3 is average length of schooling (RLS); e is disturbance variable; i is 33 cities and regencies; and t is time.

## RESULTS AND DISCUSSION

According to the data, North Nias was known to be the regency with the highest poverty rate by 26.87 percent since 2017 to 2019 followed by West Nias Regency by 26.48 percent. Meanwhile, Deli Serdang Regency had the lowest poverty rate by 4.21 percent followed by Binjai City by 6.09 percent. In addition, Toba Samosir City experienced worse poverty rate in 2019 than 2018, while other cities and regencies gained improvement at the end of period.

Nias Island consisting of North Nias Regency, South Nias, West Nias, Nias, and Gunung Sitoli City generated the lowest real GDP per capita with the average of IDR 16,698,889 per year from 2017 to 2019. Then next was Padang Sidempuan City, Pakpak Bharat, North Tapanuli, and Central Tapanuli

Tengah regencies which generated real GDP per capita below IDR 20,000,000 per year. Meanwhile, Medan City generated the highest real GDP per capita with an average of IDR 65,438,043 during the 2017 to 2019 period followed by Batu Bara Regency with IDR 55,723,300 and South Labuhan Batu as much as IDR 55,501,929.

Pematang Siantar City had the highest open unemployment rate of 10.67 percent followed by Tebing Tinggi City by 8.52 percent and Sibolga by 8.4 percent. On the other hand, Humbang Hasundutan owned the lowest unemployment rate average by 0.32 percent followed by Pakpak Bharat by 0.37 percent. Alternatively, regions which had below 2 percent unemployment rate were such as Karo Regency, Samosir, West Nias, Nias, North Tapanuli, and Dairi. Apart from that presentation, some regions experienced worse unemployment rate in the period of 2019 than 2018.

In terms of length of schooling, the shortest schooling length region was Nias Regency by 5 years; or in other words, most of its population aged 25 years old did not finish elementary school. The second region was South Nias Regency by 5.22 years. On the other hand, Medan City and Pematang Siantar gained the longest schooling length average by 11.33 years and 11.09 years respectively or in general the population aged 25 years and above almost graduated from High School.

Data panel regression model estimation was operated through three approaches, namely common effect, fixed effect, and random effect. After the estimation was done, the next step was to select the best approach with three tests. The first test was to do the Chow test to choose the best between the Common Effect and Fixed Effect models.

If the results of the Chow test lead to the selection of the Fixed Effect model as the best model, then a second test will be carried out by comparing the Fixed Effect and Random Effect models through the Hausman test. If the best result is the Random Effect model, then the next step will be Langrange Multiplier (LM) test. However, if the Hausman test chooses Fixed

Effect as the best model, then the LM test is not necessary.

The results of statistical testing of panel data estimation began with the Chow test. This test was conducted to select the best model among the Common Effect model with the Fixed Effect model. The results are as follows:

**Table 1.** Chow Test Estimation Result

Effects Test	Statistic	d.f.	Prob.
Cross-section F	75.307082	(32,63)	0.0000
Cross-section Chi-square	363.328261	32	0.0000

Source: Data Processing, 2021

The results of Chow test estimation in the above table showed that the probability of Cross-section F was 0.0000 meaning that Ho was rejected. The selection of fixed effect informed that there were differences in the regional characteristics so that there was a need for dummy variable to capture intercept differences.

Hausman test was carried out afterwards. It was aimed to select the best model among fixed effect and random effect. The results are as follows:

**Table 2.** Estimation Results of the Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	17.931936	3	0.0005

Source: Data Processing, 2021

The hypotheses in the Hausman test are H0 as random effect; and Ha as Fixed Effect. The Hausman test estimation results as presented in the above table found the probability of random effect cross section was 0.0005 or below  $\alpha$  5 percent, meaning that Ho was rejected. It informed that there was no correlation between the error terms and the independent variables supported by a large cross section sample.

After performing the above two tests, fixed effect model appeared to the best model to do estimation, so there was no need to do Langrange Multiplier (LM) test.

**Table 3.** Estimation Results of Fixed Effect Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	43.90531	5.976306	7.346565	0.0000
REAL_GDP_PERCAPITA	-3.70E-07	8.60E-08	-4.298728	0.0001
TPT	-0.034233	0.118169	-0.289697	0.7730
RLS	-2.418327	0.831639	-2.907906	0.0050
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.988168	Mean dependent var	11.54566	
Adjusted R-squared	0.981594	S.D. dependent var	4.954394	
S.E. of regression	0.672151	Akaike info criterion	2.318621	
Sum squared resid	28.46260	Schwarz criterion	3.262301	
Log likelihood	-78.77173	Hannan-Quinn criter.	2.700435	
F-statistic	150.3266	Durbin-Watson stat	2.048557	
Prob(F-statistic)	0.000000			

Source: Data Processing, 2021

The next test was determination coefficient test. It was done to examine how well regression line explained the data or how comprehensive independent variable could explain the dependent variable. If the number is closer to 1, the regression line works better because it can explain the actual data, but if the number is closer to zero, the line is less good.

In the above fixed effect estimation results, the R-squared valye was 0.988168 meaning that the real GDP per capita, the open unemployment rate, and the average length of schooling could explain the poverty rate of 98.8 percent, while 1.2 percent was explained by the residual variable, namely the variable that was not included in the model.

Model feasibility test (F test) is utilized to evaluate the overall effects of independent variables on the dependent variables so that the model significance can be identified. In this study, the hypotheses of F test were as follows:

Ho: real GDP per capita, open unemployment rate, and overall average length of schooling have no effect on poverty rates.

Ha: real GDP per capita, open unemployment rate, and the average length of schooling simultaneously whole have an effect on the poverty rate.

Based on table 3, it was known that F-statistic was 150.3266, while the F table value was  $N1 = k-1 = 4-1 = 3$ ,  $N2 = Nk = 99-4 = 95$ , where N is the number of observations and k is the number of variables, with  $\alpha$  of 1 percent, the F table was 4.01. The result of the F-statistic was greater than the F table, so Ho was rejected, meaning that the real GDP per capita, open unemployment rate, and schooling length simultaneously affected the level of poverty. This could also be seen from the F-statistic probability of 0.000000 which was smaller than  $\alpha$  1 percent.

T-statistic test for each independent variable was done to observe the effects of independent variables individually on the dependent variables. The decision will be rejecting Ho or the independent variable affects the dependent variable if the t-statistic is greater than t-table, and vice versa. In relation to the fixed effect estimation table, the real GDP per

capita gained t-statistic of -4.298728, while the t table was obtained by the formula  $df = N - k = 99 - 4 = 95$  with  $\alpha$  1 percent, the t table was 2.358. The t-statistic result was greater than the t-table, so  $H_0$  was rejected, meaning that the real GDP per capita had a significant effect on the poverty rate. From the calculation of Fixed Effect, there obtained the coefficient value of -3.70E-07, meaning that if the real GDP per capita increased by 1 million rupiah, the poverty rate would decrease by 3.7 percent.

The findings of this study are in line with a theory stating that the increase in production per individual or individual real income will improve one's living standard and move him away from poverty. In the same way, a study by (Azizah, Sudarti and Kusuma, 2018) concludes per capita income has a negative and significant effect on the poverty in the cities and regencies in East Java Province at  $\alpha = 10$  percent. In another study, (Dan et al., 2014) found contradictory results that per capita income partially has a positive effect on the poverty in Brebes Regency.

In accordance with the estimation results of open unemployment rate, namely t-statistic of -0.289697, and the t-table obtained by the formula was  $df = N - k = 99 - 4 = 95$  with  $\alpha$  1 percent resulting the t-table value of 2.358, it showed that the t-statistic result was smaller than the t-table, so  $H_0$  was accepted. It implied open unemployment rate did not have a significant effect on the poverty rate.

The above findings happen because Statistics Indonesia (BPS) defines work as "economic activities carried out by a person with the aim of earning income or profit, and done at least 1 hour (uninterrupted) in the past week. This activity belongs to unpaid worker's activity pattern as an effort to help a particular business/economic activity." The portion of the classification of family / unpaid workers in North Sumatra in 2019 was 1,370,980 people, plus 1,193,585 self-employed workers, 36 percent of the total number of workers of 7,036,486 people (Statistics Indonesia, 2020).

Workers with that status have more difficulties in earning real and decent income than the other statuses. The one hour work load

(uninterrupted) in a week was one of the issues in creating optimum productivity. As a result, the low income would intersect with the poverty line. There should be readjustment in the relevant unemployment indicators so that one will not fall into disguised unemployment.

Furthermore, the findings of this study are not in line with the findings of (Presetyoningrum, 2018) study, namely the level of open unemployment in all Indonesia provinces has a positive and significant effect on the poverty rate. However, another study by (Probosiwi, 2016) found similar results to this study that unemployment and poverty have no significant effect in Yogyakarta City.

For schooling length average variable, this study found it had t-statistic of -2.907906, while the t table obtained by the formula  $df = N - k = 99 - 4 = 95$  with  $\alpha$  1 percent gained is 2.358. Since the t-statistic value was greater than the t-table, so  $H_0$  was rejected; in other words the average length of schooling had a significant effect on the poverty rate. From the estimation results of the Fixed Effect model, its coefficient value was -2.418327, meaning that if the schooling length average increases by 1 year, the poverty rate will decrease by 2.4 percent.

The findings of this study are in accordance with a theory which states that the improvement of indirect ability will affect the one's utility improvement which later will increase income. The increase income will bring society to be out of poverty zone. Similarly, (Nguyen, 2018) in his study specifically shows that educational level is one of influential factors on Khmer ethnic society in Tra Vinh Province Vietnam. (Akhtar, et al, 2017) in their study further expands this study findings that education participation has a negative and significant effect on long-term poverty.

## CONCLUSION

The findings of this study conclude that real GDP per capita, open unemployment rate, and the average of schooling length can explain the poverty rate of 98.8 percent, while the rest 1.2 percent is explained by other variables included in the model. Additionally, F-statistic test shows

that all three previous variables affect the poverty rate with real GDP per capita as the most dominant one.

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