

Testing the Impact of Education and Economic Growth on Poverty in Aceh Province: Evidence from Panel Data

Masrizal¹, T. Zulham², Aliasuddin^{3*}, Taufiq C. Dawood⁴

^{1,2,3,4}Faculty of Economics and Business, Universitas Syiah Kuala, Aceh, Indonesia

*Corresponding Author: aliasuddin@usk.ac.id

Abstract. *Poverty is an important social problem and an interesting issue for researchers. This research examines the influence of education and economic growth on poverty in Aceh Province. Research data uses 23 districts/cities from 2011 to 2020. Data analysis uses the Random Effect (RE) method. The research results found that education had a significant negative effect. Increasing education by one year can reduce poverty by 2.72 percent. Different things were regionally found, where the influence of education only occurred in four regions, while two regions (west and south) had no effect. However, economic growth had no effect on poverty except north zone. Therefore, policymakers need to pay attention to education as an important indicator in reducing poverty and improving the quality of economic growth so that poor people can feel the benefits.*

Keywords: *poverty, education, economic growth*

1. Introduction

Poverty is a long-standing issue in society, and its impact on communities has been significant. It remains a crucial indicator of development, and its persistence often leads to social unrest and negatively impacts various sectors, as noted by Ginting and Rasbin (2010) in their work on macroeconomics.

The problem of poverty isn't confined to national boundaries, and Aceh Province is a prime example of a region that has struggled with poverty. Aceh Province is located in Sumatra and continues to grapple with poverty. According to data released by the Aceh Central Statistics Agency in 2023, the number of people living in poverty in Aceh Province will be around 806,000. While this figure is lower than that of 2021 (which was 834,000), the number of poor people is still significant, accounting for almost 15% of the population. This situation is a cause for concern in the long run.

Previous research suggests that one way to tackle poverty is by increasing economic growth (Joko et al., 2014; Purnomo & Istiqomah, 2019; Badu et al., 2020; Putri & Yuliana, 2021). High economic growth usually translates to more job opportunities and higher income levels, which can improve living standards in a region. However, it is worth noting that economic growth potential varies across different geographical regions, and hence its impact on poverty reduction may not be uniform (Pangiuk, 2018). In addition to economic growth, investing in education is also seen as an important strategy to address poverty.

Education policies are particularly crucial for developing countries as education can provide employment opportunities (Hofmarcher, 2021). Research has shown that education and skills are important determinants of income and productivity (Arsani et al., 2020). However, individuals born into poverty face unique challenges that may affect their access to education and employment opportunities (Mihai et al., 2015). Based on this background, the research question posed is: "Does education and economic growth impact poverty reduction in the 23 districts/cities of Aceh Province?"

2. Method

This research aims to determine the impact of education and economic growth on poverty in Aceh Province. The research includes 23 districts/cities from 2011 to 2020, totaling 230 samples. 2021 was not included due to the pandemic, which caused abnormal data. The data on poverty, education, and economic growth were sourced from the Aceh Central Statistics Agency. Poverty is measured by the percentage of the poor population, education is measured by the average number of years of schooling and economic growth is measured by the rate of economic growth based on constant prices in 2010. These data are available online. The researcher formulated a model based on the data analysis, which takes the following form:

$$pov_{i,t} = \beta_0 + \beta_1 edu_{it} + \beta_2 eg_{it} + \varepsilon_t \quad (1)$$

Where *pov* is poverty, *edu* is education, *eg* is economic growth. β_1 and β_2 mean coefficient, *i* is region (23 districts/cities), *t* is time (2011-2020).

3. Results and Discussions

Table 1 displays descriptive statistics regarding the overall data picture. Average poverty is 17.32 percent with a standard deviation of 3.9. The average education is 8.83 years with a standard deviation of 1.33. Meanwhile, economic growth has an average of 3.4 percent with a standard deviation of 3.0.

Table 1. Statistic Descriptive

Variable	Obs	Mean	Std. Dev.	Min	Max
Pov	230	17.321	3.958	6.9	25.5
Edu	230	8.833	1.331	6.24	12.65
Growth	230	3.441	3.000	-20.34	13.23

Source: Author calculation (2023).

The results of the panel estimation are presented in Table 2, showing two estimates: FE and RE. However, to interpret these results correctly, it is crucial to select the best model. Three tests were performed: Chow, Hausman, and LM. The Chow test compares estimates between Common Effect (CE) and FE, while the Hausman test compares RE and FE. The LM test compares CE and RE but is unnecessary if the Chow and Hausman tests have already provided a conclusion (Kurniadi et al., 2021). According to the test results, the RE estimation is the best model.

Table 2. Panel Estimation Results

Variables	Fixed Effect (FE)	Random Effect (RE)
Edu	-2.827** (0.166)	-2.722** (0.157)
Growth	0.026 (0.028)	0.030 (0.028)
Constant	42.166** (1.482)	41.271** (1.534)
R-Square	0.437	0.437
Obs	230	230
N	23	23
T	10	10
F-stat /Wald stat	147.36**	303.91**
Chow Test (CE/FE)	77.87**	
Hausman Test (FE/RE)		3.73
LM Test (CE/RE)		769.62**

Source: Author calculation (2023). () standard error in parentheses ** mean significance level at 1%.

The results of the RE estimation indicate that the education regression coefficient is negative and significant at the 1 percent level. This implies that if education increases by 1 year, poverty will decrease by 2.7 per cent, assuming *ceteris paribus*. This finding is consistent with Purnomo & Istiqomah (2019). On the other hand, the economic growth coefficient was positive but statistically insignificant for poverty. This finding is consistent with Pangiuk (2018), but contradicts the findings of Badu et al. (2020), Mulok et al. (2012), and Putri et al. (2023).

Table 3. Estimation Results Based on Agglomeration Area Groups

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Edu	-3.141** (0.259)	-3.130** (0.349)	-1.335** (0.135)	-2.714** (0.297)	1.753 (0.973)	-2.267 (1.117)
Growth	-0.141 (0.164)	0.203** (0.071)	0.056 (0.079)	-0.387 (0.199)	0.170 (0.338)	0.246 (0.239)
Constant	48.705** (2.318)	46.23** (3.239)	25.757** (1.145)	41.636** (2.673)	2.154 (8.375)	36.680** (8.882)
R-Square	0.871	0.646	0.798	0.694	0.109	0.135
Obs	40	60	30	40	30	30
N	4	6	3	4	3	3
F-stat	124.36	52.09	53.51	42.05	1.65	2.11
P-value	0.000	0.000	0.000	0.000	0.211	0.141

Source: Author calculation (2023). () standard error in parentheses **, * mean significance level at 1% and 5%. District group: (1) Sabang, Banda Aceh, Aceh Besar, Pidie. (2) Aceh Tengah, Aceh Utara, Lhokseumawe, Bener Meriah, Bireuen, Pidie Jaya. (3) Aceh Timur, Aceh Tamiang, Langsa. (4) Gayo Lues, Aceh Singkil, Aceh Tenggara, Subulussalam. (5) Simeulue, Aceh Barat Daya, Aceh Selatan. (6) Nagan Raya, Aceh Barat, Aceh Jaya. Estimates based on Ordinary Least Square (OLS).

The previous analysis drew only one conclusion for all regions, which was not coherent enough. To address this issue, researchers studied the influence of education and economic growth on poverty in six different agglomeration groups. Table 3 presents the estimation results for each group. The researchers found that education had a negative and significant effect on poverty in almost all agglomeration areas, except for Regions 5 (south) and 6 (west), where education had no significant effect. The greatest influence of education was observed in Regions 1 (central), 2 (north), 4 (southeast), and followed by 3 (east).

On the other hand, economic growth had no significant effect on poverty in all agglomeration regions, except for Region 2, where it had a positive and significant effect. If economic growth increased by 1 per cent, poverty would increase by 0.203 per cent. This is paradoxical because high economic growth usually creates employment opportunities, resulting in a high labor absorption capacity. However, one of the reasons for this positive influence is that the economy grows only in one region and does not spread evenly to other regions. Regions 5 and 6 showed that education did not affect economic growth.

4. Conclusions

The purpose of this study is to examine the impact of education and unemployment on the growth of Aceh Province. The researchers used panel data from 23 districts/cities spanning from 2011 to 2020. After conducting tests on the best model, Random Effect (RE) was used for estimation. The results indicated that education had a negative effect on poverty (2.72 percent), while economic growth had no effect. It was also observed that only a few regions had a significant effect on education, while the western and southern

regions had no effect. Interestingly, economic growth was found to be positive and significant only in the northern zone.

In light of these findings, some recommendations have been made. Firstly, education is found to be the most effective tool in overcoming poverty. Therefore, the government needs to increase the availability of higher education both formally and informally. Additionally, the government can also encourage a 12-year compulsory education program. It is also advised that educational improvements should be evenly distributed across all regions. Secondly, the government needs to grow the economy in a quality and effective way so that the benefits can be felt by every member of society, especially the poor. It is necessary to increase economic growth spread evenly, and not just in one region, particularly the western and southern regions.

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