

Determinants of Poverty in Indonesia: A Dynamic Panel Analysis of Economic and Social Factors across 20 Provinces

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ABSTRACT

This study aims to analyze the influence of economic growth, population, general allocation funds (DAU), education budget, and foreign direct investment (FDI) on the number of poor people in 20 provinces in Indonesia in the 2012-2022 period. The analysis tool used in this study is the dynamic panel regression approach. This study found that in the short term, the number of people and DAU had a positive effect on the increase in the number of poor people, while the education and FDI budgets had a negative impact, reducing the number of poor people. In the long run, economic growth, population growth, and FDI have been shown to have a significant effect on reducing poverty rates. These findings provide important insights for government economic policy, which needs strengthen effective allocation of funds and focus on improving the quality of education and improving the investment climate to drive inclusive economic growth. In addition, policies that promote foreign investment and more efficient management of DAU can accelerate the poverty alleviation process in Indonesia.

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INTRODUCTION

Poverty is one of the main challenges faced by many countries, including Indonesia. Although Indonesia has experienced significant economic growth in recent decades, social and economic inequality remains an issue that has not been effectively resolved. Various factors, including economic growth, population, fund allocation policies, education budgets, and foreign direct investment (FDI), are believed to play an important role in poverty reduction in Indonesia. Therefore, it is important to understand how these factors affect poverty rates, both in the short and long term.

Economic growth is often considered a key driver of poverty reduction because it increases employment opportunities and increases household income ([Todaro & Smith, 2009](#); [Suryahadi, et al., 2012](#); [Misini & Badivuku, 2017](#)). However, economic growth is not always even, and its impact on poverty can vary depending on how the results of such growth are distributed in society ([Hassan, 2015](#); [Nguyen, et al. 2020](#); [Roshaniza & Selvaratnam, 2015](#)). In the Indonesian context, although economic growth is recorded positive, income inequality remains high, which causes most of Indonesia's population to remain below the poverty line.

Another factor that affects poverty is population, which contributes to high pressures on natural resources and social services such as education and health. Research [by Cahyo, et al \(2022\)](#) and [Wietzke \(2020\)](#) shows that rapid population growth can worsen poverty conditions if it is not balanced with improved infrastructure quality and access to basic services.

One of the important fiscal instruments in poverty alleviation is the General Allocation Fund (DAU), which is used to fund development programs in the regions. Research by [Putra \(2017\)](#) revealed that effective DAU management can reduce the poverty gap. However, inappropriate allocation or inefficient management can exacerbate the poverty gap between regions.

The education budget also has an important role in poverty alleviation. Quality education is one way to improve the skills and competitiveness of the workforce, which in turn can reduce poverty rates. Several studies have shown that increasing the education budget allocated to improve the quality of primary and secondary education can reduce the level of social and economic inequality ([Duruh & Chima, 2022](#); [Sulasmu, et al., 2023](#)).

FDI is a factor that drives economic development through technology transfer, job creation, and increased productivity. FDI can be an important driver in reducing poverty, especially if allocated to labor-intensive sectors and can improve people's quality of life ([Agarwal, et al., 2017](#); [Anetor, et al., 2020](#)). The impact of foreign direct investment, foreign aid and trade on poverty reduction: Evidence from Sub-Saharan African countries. *Cogent Economics & Finance*, 8(1), 1737347.). However, the impact of FDI on poverty is highly dependent on policies implemented to facilitate investment and maximize its benefits for local communities ([Magombeyi & Odhiambo, 2017](#)).

Some research also shows that government economic policies play a key role in creating a climate that supports inclusive and sustainable economic growth. Policies that favor improving the quality of education, equitable distribution of resources, and job creation through FDI can accelerate poverty alleviation ([CHO, 2021](#)). Therefore, it is important for the Indonesian government to optimize fiscal and social policies to achieve more effective poverty reduction goals.

Economic growth has a negative impact on poverty levels in the long run, which means that increased economic growth has the potential to reduce poverty. Increasing economic productivity and creating new jobs have a direct impact on poverty reduction. [Murjani \(2019\)](#); [Makarenko, et al \(2022\)](#); and [Zhu, et al \(2022\)](#) found that countries with high economic growth rates tend to have lower poverty rates because they create more jobs and increase per capita income.

Research conducted by [Cruz & Ahmed \(2018\)](#) shows that in the short term, the number of people has a positive influence on the increase in the number of poor people. This is because an increase in the population without an improvement in quality of life and employment opportunities can lead to an increase in poverty rates. A rapid increase in population will lead to reduced employment and lower per capita income, leading to an increase in poverty. In addition, [Peterson \(2017\)](#) found that the influence of population size on poverty is more dominant in the short term, where there is great pressure on the distribution of existing economic resources.

In the short term, the General Allocation Fund (DAU) has a positive effect on increasing the number of poor people. This happens because inefficient management of DAU or the use of DAU that does not focus on poverty reduction can worsen regional economic conditions. According to [Ninu & Hutabarat \(2024\)](#), DAU that is not used effectively in reducing poverty can lead to greater social inequality. Another study by [Bado, et al \(2019\)](#) also found that poor DAU management in certain areas can contribute to an increase in poverty rates.

An increase in the education budget followed by an improvement in the quality of education can increase the skills and competitiveness of the workforce, thereby increasing people's income and reducing poverty. [Amakom \(2020\)](#) show that a larger budget allocation for the education sector can directly contribute to poverty reduction by creating better job opportunities for the community. Another study by [Dissou, et al \(2016\)](#) confirms that higher spending on education is directly related to improved labor quality, which helps reduce poverty rates.

Foreign Direct Investment (FDI) shows a negative relationship with poverty, both in the short and long term. FDI increases production capacity, creates jobs, and introduces new technologies that can reduce poverty by increasing productivity. [Ganić \(2019\)](#) Research show that FDI that goes into strategic sectors such as manufacturing and infrastructure can create new jobs that help reduce poverty rates. Research by [Muturi \(2023\)](#) also confirms that FDI can improve infrastructure and create employment opportunities that ultimately reduce poverty rates.

Some of the reasons for the research gap that can be used in this study are because previous research has not covered all regions of Indonesia, so it has not provided a comprehensive picture of the impact of economic factors on poverty at the national level; It does not take into account other social factors such as the quality of health services, income distribution inequality, or access to infrastructure that can also affect poverty levels; Previous research has not examined the impact of recent policies post-COVID-19 pandemic, especially in the context of economic recovery and its impact on poverty.

Based on this background, this study aims to examine the influence of these factors on the number of poor people in 20 provinces of Indonesia in the 2012-2022 period. By using a dynamic panel regression approach, this study is expected to provide deeper insights into the relationship between economic growth, population, DAU, education budget, FDI, and poverty level in Indonesia, as well as provide more appropriate policy recommendations in poverty alleviation efforts.

RESEARCH METHODOLOGY

VECM (Wooldridge, 2016; and Gujarati, 2021) is used for the analysis of time series data that are not stationary but cointegrated (there is a long-term relationship between variables). Given the panel data (Baltagi, 2021; and Pesaran & Shin, 1995), this model will combine a fixed effects or random effects approach with cointegration. The VECM equation model can generally be written as follows:

$$\Delta Y_{it} = \alpha_i + \sum_{j=1}^{p-1} \gamma_j \Delta Y_{it-j} + \delta_t + \beta_1 \Delta X_{it} + \epsilon_{it}$$

Where:

- Y_{it} is the vector of dependent variables (e.g. the number of poor population) for province i at the time t .
- ΔY_{it} is the first change of the dependent variable (number of poor population) for province i at the time t .
- X_{it} is an independent variable vector (economic growth, population, DAU, education budget, FDI) for the province i at the time t .
- δ_t is a time dummy variable to address specific time effects
- ϵ_{it} is a residual error term that is assumed to be uncorrelated with an independent variable.

The first step in implementing VECM (Baltagi, 2021; and Pesaran & Smith, 2019) is to perform a stationarity test on the panel data using an Augmented Dickey-Fuller (ADF) or Levin-Lin-Chu (LLC) test, to ensure that all variables in the model do not contain root units and are already stationary at some level (usually at the first difference). After confirming that the data is stationary at the first level, the next step is to test the cointegration between variables using the Pedroni Cointegration Test or Kao Cointegration Test for the panel data. After confirming the cointegration, we can estimate the VECM model. In the VECM model, there are two main components: the short-term component (with the change of variables over a period) and the long-term component (the cointegration relationship between variables).

The VECM model for the data panel can be written as:

$$\Delta Y_{it} = \alpha_i + \gamma_1 \Delta X_{it} + \sum_{j=1}^{p-1} \gamma_j \Delta Y_{it-j} + \eta_t + \mu_{it}$$

Where:

- ΔY_{it} is a change in the dependent variable (the number of poor).
- ΔX_{it} is a change in independent variables (economic growth, population, DAU, education budget, FDI).
- α_i is intercept for each province (Aceh, Sumut, Sumbar, Riau, Jambi, Sulsel, Bengkulu, Jateng, DIY, Kalsel, Kaltim, Sulut, Sulteng, NTB, NTT, Maluku, Papua, Malut, Banten, Papua Barat)
- γ_j is the short-term coefficient
- η_t is a specific time effect.
- μ_{it} is an error term.

After estimating the VECM model, we need to test and interpret the Error Correction Term (ECT) coefficient, which describes the speed of adjustment back to long-term equilibrium when there is a disturbance in the long-term relationship between variables. The ECT coefficient must have a negative

and statistically significant sign to indicate that the system variables tend to return to equilibrium in the long term after the presence of an imbalance.

ANALYSIS AND DISCUSSION

In the context of the Vector Error Correction Model (VECM) panel, the stationarity test is a very important first step to ensure that the data used in the regression model does not contain root units (i.e. data that is non-stationary). The stationarity test aims to test whether the time series data in the panel is in a stationary condition or not at a certain level.

Table 1 Stationary Test on data level and First Difference

Variabel	Method	Data Level			First Derivative Data		
		Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
POV	Statistic	-0.984	44.100	125.577	-1.896	57.766	156.837
	Prob	0.163	0.302	0.000	0.029	0.034	0.000
PDRB	Statistic	2.339	18.400	149.710	-11.181	149.748	99.093
	Prob	0.990	0.999	0.000	0.000	0.000	0.000
POP	Statistic	2.241	20.010	12.302	-17.152	228.695	253.400
	Prob	0.988	0.997	1.000	0.000	0.000	0.000
DAU	Statistic	5.166	5.362	5.637	-4.396	95.407	186.585
	Prob	1.000	1.000	1.000	0.000	0.000	0.000
EDU	Statistic	5.554	6.935	15.191	-0.922	44.689	126.759
	Prob	1.000	1.000	1.000	0.178	0.281	0.000
HEALTH	Statistic	1.739	20.059	38.377	-4.934	106.504	211.610
	Prob	0.959	0.996	0.544	0.000	0.000	0.000
FDI	Statistic	-6.636	119.075	82.296	-5.317	107.613	211.944
	Prob	0.000	0.000	0.000	0.000	0.000	0.000
Obs		180	180	200	180	180	200

Source: Data processed, 2024

Based on the calculation results in Table 1, the stationary test on the data level almost all variables did not pass the stationary test on the data level (see the probability value above 0.05). The next test was upgraded to a stationary test on the first derivative data. The results of the first derivative test of all variables passed the first difference stationary test (see probability value below 0.05).

In the Vector Error Correction Model (VECM) model for panel data, determining the lag length is a very important step, as the exact lag length can affect the quality and accuracy of the model. The lag length test aims to determine how much lag (previous period) should be included in the model to obtain the most accurate and relevant results. The tests used to select the lag length in the VECM panel model include: Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Information Criterion (HQIC). In table 2, you can see the most Star signs are at lag 2, so the lag that will be used in the analysis is lag 2.

Table 2. Uji Optimum Lag

Lag	LogL	LR	FPE	AIC	SC	HQ
0	452.0631	NA	9.05E-12	-5.563288	-5.428750*	-5.508657
1	545.7101	177.9293	5.18E-12	-6.121376	-5.045065	-5.684323*
2	613.2339	22.3869*	4.12e-12*	-6.352924*	-4.334841	-5.53345

* indicates lag order selected by the criterion

The stability test in the Panel Vector Error Correction Model (VECM) aims to ensure that the constructed model not only has a long-term relationship between stable variables, but can also provide reliable results in terms of policy prediction and analysis ([Basuki & Prawoto, 2021](#)). In the context of data panels, stability tests are critical because they can provide assurance that model systems will behave in a consistent manner despite any disruptions or changes in data conditions. In Figure 1 can be seen the Characteristic Root Test, This test is used to test the stability of the VECM system by examining the eigenvalues of the long-term coefficient matrix. In the Figure, all the characteristic roots are within a circle of units, the model is considered stable.

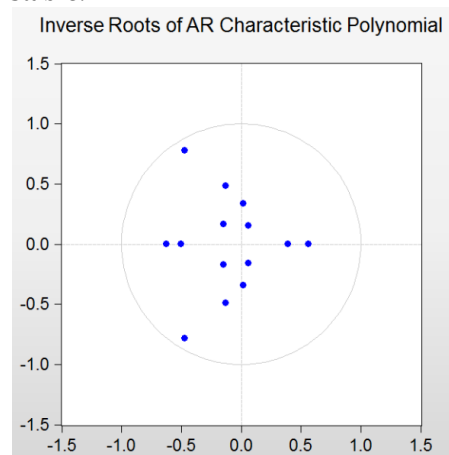


Figure 1. Stability Test

The cointegration test in the Panel Vector Error Correction Model (VECM) aims to test whether there is a stable long-term relationship between two or more variables in a model that contains time series or panel data. Cointegration allows us to identify structurally bound relationships even though those variables may have different short-term fluctuations. The Unrestricted Cointegration Rank Test (Trace) is one of the methods used in the Vector Error Correction Model (VECM) to test the cointegration between variables in the model. This test was developed by [Johansen \(2014\)](#) and [Seo \(2006\)](#) is used to detect the amount of cointegration present in multivariate models, both in time series data and panel data. The Trace test is included in the test methods that are more commonly used in the VECM model to determine if there is a significant long-term relationship between the variables in the model.

Table 3. Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.552	354.069	125.615	0.000
At most 1 *	0.383	241.590	95.754	0.000
At most 2 *	0.357	173.962	69.819	0.000
At most 3 *	0.294	112.216	47.856	0.000
At most 4 *	0.242	63.463	29.797	0.000
At most 5 *	0.161	24.613	15.495	0.002
At most 6	0.001	0.085	3.841	0.770

Trace test indicates 6 cointegrating eqn(s) at the 0.05 level

In Table 3 Trace finds several cointegrations that are more than 0, this means that there is a stable long-term relationship between the variables in the model. This suggests that the variables analyzed in the VECM model have deeper interactions in the long term, although they can have fluctuations or changes in the short term.

Table 4. Long-Term VECM Panel Regression Results

Variabel	Koefisien	Se	t hitung
LOG (POV (-1))	1.000		
LOG (PDRB (-1))	-5.046	-2.135	[-2.36280] **
LOG (POP (-1))	-4.149	-2.049	[-2.02494] **
LOG (DAU (-1))	0.796	-1.286	[0.61926]
LOG (EDU (-1))	0.274	-1.340	[0.20425]
LOG (HEALTH (-1))	2.359	-1.567	[1.50513]
LOG (FDI (-1))	4.601	-0.586	[7.84619] ***
C	-9.027		

Source: Data processed, 2024

Based on Table 3, it can be seen that in the long run, economic growth, population growth, and FDI have been proven to have a significant effect in reducing poverty rates. In the long run, economic growth has a significant impact on reducing poverty rates. Increasing economic growth tends to increase per capita income, create jobs, and improve people's quality of life. The mechanism involved is that as the economy grows, productive sectors such as industry, trade, and services develop, leading to the creation of new jobs. This increases household income and reduces income inequality, which in turn reduces poverty rates. Research by [Grant, C. \(2017\)](#) and [Zhu, et al \(2022\)](#) shows that sustainable economic growth can reduce poverty by increasing people's purchasing power and expanding access to basic services such as education, health, and infrastructure. Increasing economic growth directly has an impact on national income and a more equitable distribution of income. With healthy economic growth, productive sectors grow, create more jobs, and lower the unemployment rate, which ultimately reduces poverty rates.

The number of people in the long term has a significant effect on poverty reduction, although in the short term the number of people tends to increase poverty. In the long term, efficient population management can support poverty reduction through a range of policies, including family planning programs, better natural resource management, and adequate social service provision. The mechanism involved is that if population growth is well controlled, there will be more opportunities to optimally allocate resources, reduce pressure on social and economic systems, and improve the overall quality of life. Research by [Alonzo, et al \(2004\)](#) and [Das Gupta \(2014\)](#) shows that good control of the population through appropriate policies can reduce poverty in the long term. Although in the short term, the number of people can increase poverty, in the long term, if managed well (through family planning policies, improving the quality of human resources, and equitable development), a controlled population can support poverty reduction.

Foreign Direct Investment (FDI) has a significant impact on reducing poverty rates, both in the short and long term. FDI can increase national production capacity, create jobs, and introduce new technologies that support economic growth. The mechanism involved is that with the influx of foreign investment, productive sectors such as manufacturing, technology, and infrastructure will develop, which in turn creates new jobs and increases people's incomes. Research by [Ahmad, et al \(2019\)](#) and [Anetor, et al \(2020\)](#) revealed that increasing FDI in strategic sectors can create jobs, reduce unemployment, and ultimately reduce poverty levels through a more equitable distribution of benefits. Increased FDI brings new capital and technology to the country, which increases national production capacity and creates jobs. This increase in employment helps reduce poverty rates by increasing people's incomes and improving infrastructure and social services.

In Table 5, this study found that in the short term, the number of people and DAU have a positive effect on increasing the number of poor people, while the education budget and FDI have a negative impact on reducing the number of poor people.

Table 5. Short-Term Vecm Results

Variabel	Koefisien	Se	t hitung
CointEq1	0.001716	-0.00064	[2.68486] **
D (LOG (POV (-1)))	-0.141364	-0.08466	[-1.66974]
D (LOG (POV (-2)))	0.073785	-0.08158	[0.90445]
D (LOG (PDRB (-1)))	-0.11434	-0.14809	[-0.77212]
D (LOG (PDRB (-2)))	-0.161273	-0.14045	[-1.14827]
D (LOG (POP (-1)))	-0.366502	-0.18814	[-1.94801] *
D (LOG (POP (-2)))	-0.217592	-0.19223	[-1.13196]
D (LOG (DAU (-1)))	-0.016825	-0.01666	[-1.00967]
D (LOG (DAU (-2)))	0.040274	-0.02125	[1.89535] *
D (LOG (EDU (-1)))	-0.010758	-0.00696	[-1.54580]
D (LOG (EDU (-2)))	-0.014665	-0.00699	[-2.09654] **
D (LOG (HEALTH (-1)))	-0.008687	-0.00617	[-1.40697]
D (LOG (HEALTH (-2)))	-0.001883	-0.00852	[-0.22101]
D (LOG (FDI (-1)))	-0.0158	-0.00453	[-3.48562] ***
D (LOG (FDI (-2)))	-0.007992	-0.00381	[-2.09943] **
C	0.026231	-0.01355	[1.93614] *
R-squared		0.264521	
Adj. R-squared		0.187909	
Sum sq. resids		0.414923	
S.E. equation		0.053679	
F-statistic		3.452726	

Source: Data processed, 2024

The Term Correction Error Coefficient (ECT) of 0.001716 in the VECM Panel model used to analyze the influence of economic growth, population, general allocation funds (DAU), education budget, and foreign direct investment (FDI) on the number of poor people in 20 Indonesian provinces in the 2012-2022 period, can be interpreted as the ECT value = 0.001716 indicating that the system takes a relatively long time to return to long-term equilibrium after deviations. In this case, the value of 0.001716 indicates that the number of poor people in 20 provinces in Indonesia has a very slow pace of adjustment to the long-term equilibrium. The small ECT coefficient (0.001716) indicates that each period (every year) the number of poor people will only decrease slightly to return to long-term equilibrium after the occurrence of an imbalance or disturbance. That is, if there is a disruption or change in the factors that affect the number of poor people, it takes a considerable amount of time to return to a position of long-term equilibrium.

The number of people has a positive effect on the increase in the number of poor people in the short term. This can be explained by economic theory which states that a population that continues to grow without an increase in economic resources and capacity will affect the poverty rate. As the population increases, especially if it is not accompanied by an increase in employment and per capita income, poverty rates tend to increase. The mechanism that occurs is an increase in demand for goods and services, while economic capacity does not develop proportionally, thus increasing the pressure on the economy which ultimately increases the number of poor people. [Peterson's \(2017\)](#) research on the imbalance between

population growth and economic development, and economic development contributes to high poverty rates.

The General Allocation Fund (DAU) has a positive influence on increasing the number of poor people in the short term. Although DAU is designed to support regional development financing, inefficient or untargeted allocations can exacerbate poverty conditions. DAU is often used to fund unproductive projects or to cover budget deficits without improving the quality of public services. The mechanism involved here is that when DAU is used suboptimally, inappropriate allocation of funds can worsen infrastructure and the quality of social services, which in turn affects people's well-being and increases poverty. Research by [Abrar, et al \(2020\)](#) and [Putra \(2017\)](#) found that DAU significant influences on poverty and HDI through capital expenditure, but poor DAU management leads to a decline in the quality of life of people in poor areas.

The education budget has a negative effect on the number of poor people. Increasing education budgets can have a significant positive impact on poverty reduction by improving access and quality of education. Education is one of the most effective ways to reduce poverty because it can open better job opportunities and increase productivity. The mechanism that occurs is that when the government allocates more funds for education, the quality of education improves, leading to an increase in the skills and competitiveness of the workforce. Research by [Odior \(2014\)](#) and [Nkurunziza, et al \(2017\)](#) revealed that an increased education budget is directly related to poverty reduction through improving people's quality of life and creating better jobs.

Health budgets can have a significant impact on poverty alleviation in the long term, but in the short term, their effects may not be immediately visible or felt. There are several reasons why health budgets may not have a significant short-term impact on poverty reduction in Indonesia. The development of adequate health infrastructure takes a long time. Although health budgets are increasing, improving the quality of health facilities, training of medical personnel, and the distribution of medicines and medical equipment may take years to be widely felt by the public, especially those living in remote or underdeveloped areas. If the budget is not immediately accompanied by improvements in the effective distribution of health services, access to health services remains limited, and its impact on poverty reduction will be slower. The uneven distribution of health budgets in different regions can cause some areas that are more in need (such as rural areas or remote areas) to not get benefits quickly enough. Uneven or untargeted budgets can result in health care disparities, which in turn reduces the positive impact on poverty, especially in the short term. Areas with weak health infrastructure may need more time to build or improve health facilities before communities can benefit from it.

Health budgets tend to be focused on improving health services in the long term, such as disease prevention, vaccination, and improving hospital quality. While this is important for long-term well-being, its impact on immediate poverty alleviation (e.g., a reduction in the number of poor people) will not be seen in the short term. Poverty alleviation is more often dependent on policies that more directly target income and job creation, which have a more visible effect in the short term.

Foreign Direct Investment (FDI) has a negative impact on the number of poor people, both in the short and long term. FDI can create new jobs, transfer technology, and increase economic competitiveness. The mechanism that occurs is that FDI accelerates the growth of the industrial sector, increases exports, and creates jobs that can reduce unemployment and poverty. Research by [Saleem, et al \(2021\)](#) and [Tsauroi \(2018\)](#) shows that FDI that comes with investment in the right sectors can significantly reduce poverty rates, especially through job creation and infrastructure improvements.

Variance Decomposition

Variance Decomposition ([Shahbaz, 2012](#)) is a method used to determine how much each variable contributes to explaining the fluctuations or variances of another variable in a multivariate system. Variance decomposition provides insight into how much information or shock from other variables affects changes in the target variable.

Table 6. Variance Decomposition

Period	S.E.	L(POV)	L(PDRB)	L(POP)	L(DAU)	L(EDU)	L(HEALTH)	L(FDI)
1	0.054	100.000	0.000	0.000	0.000	0.000	0.000	0.000
2	0.071	97.483	0.155	0.271	0.235	0.847	0.288	0.721
3	0.087	94.688	0.773	0.342	0.867	2.507	0.219	0.603
4	0.097	94.075	1.662	0.350	0.978	2.174	0.268	0.494
5	0.109	93.535	2.190	0.313	1.178	2.101	0.227	0.456
6	0.119	93.214	2.535	0.285	1.220	2.033	0.226	0.487
7	0.129	92.653	2.832	0.258	1.333	2.059	0.302	0.564
8	0.137	92.295	3.069	0.234	1.393	2.004	0.298	0.708
9	0.146	91.949	3.226	0.213	1.461	1.981	0.323	0.847
10	0.154	91.602	3.371	0.195	1.495	1.968	0.377	0.992

In the 1st period, POV contributed 100% to the variance of POV changes. Then in the 5th period POV contributed 93.54% to the variance of POV change, GDP only contributed 2.19% to the variance of GDP change. EDU only accounts for 2.1% of the EDU change variance, DAU only accounts for 1.18% of the DAU change variance. And FDI only accounts for 0.46% of the variance in FDI change. In the 10th period POV accounted for 91.6% of the variance of POV change, GDP only contributed 3.34% to the variance of GDP change. The contribution of EDU decreased accounting for only 1.9% of the variance of EDU changes. The contribution of DAU increased by accounting for 1.5% of the variance of DAU changes. And the contribution of increased FDI contributed 0.99% to the variance of FDI changes.

CONCLUSION

In the long run, economic growth has proven to be significant in reducing poverty rates. This shows that increased economic growth can help reduce the number of poor people in Indonesia.

The number of people has a positive effect on the increase in the number of poor people both in the short and long term. Increasing population can worsen poverty levels if not balanced with the right economic policies.

DAU has a positive influence on increasing the number of poor people in the short term. This shows that inefficient DAU management can worsen poverty conditions. Therefore, the efficiency of DAU management is very important for poverty alleviation.

Education budgets have a negative effect on poverty, which means that the higher the education budget, the lower the number of poor people. This indicates the importance of investing in the education sector to reduce poverty.

FDI has a negative impact on the number of poor people, both in the short and long term. Increased foreign investment can help reduce poverty by encouraging economic growth and job creation.

The central government needs to improve the management of the General Allocation Fund (DAU) to be more efficient and on target, as well as increase the education budget and its quality to strengthen the competitiveness of human resources. Improving quality education can open more job opportunities, reduce poverty, and improve people's welfare. In addition, encouraging the influx of Foreign Direct Investment (FDI) by creating a conducive investment climate is essential to encourage inclusive economic growth and create jobs, which will have a direct impact on poverty reduction.

On the other hand, the government needs to design economic policies that can support inclusive and equitable growth at all levels of society. This includes controlling the rate of population growth through family planning programs and more targeted social policies. With policies that are more focused on poverty alleviation and community empowerment, it is hoped that Indonesia can achieve more significant and sustainable poverty reduction.

Some of the limitations of this study are: It has not been analyzed how the realization of DAU at the regional level or how appropriate the allocation is used in practice; It has not considered geographical conditions, regional fiscal capacity, or differences in development levels between provinces that may affect the effectiveness of the policy; and it is not explicitly discussed how crises such as COVID-19 affect poverty.

REFERENCE

- Abrar, M., Juanda, B., Firdaus, M., & Hakim, D. B. (2020). The Impact of Special Autonomy Funds on Poverty of Human Development and Unemployment in Aceh. *International Journal of Innovation, Creativity and Change*, 12(10), 713-734.
- Agarwal, M., Atri, P., & Kundu, S. (2017). Foreign direct investment and poverty reduction: India in regional context. *South Asia Economic Journal*, 18(2), 135-157. <https://doi.org/10.1177/1391561417713129>
- Ahmad, F., Draz, M. U., Su, L., Ozturk, I., Rauf, A., & Ali, S. (2019). Impact of FDI inflows on poverty reduction in the ASEAN and SAARC economies. *Sustainability*, 11(9), 2565. <https://doi.org/10.3390/su11092565>
- Alonzo, R. P., Balisacan, A., Canlas, D., Capuno, J., Clarete, R., Danao, R., ... & Tecson, G. (2004). Population and poverty: the real score. University of the Philippines, School of Economics.
- Amakom, U. (2020). *Public spending and poverty reduction in Nigeria: A benefit incidence analysis in education and health* (Doctoral dissertation, AERC).
- Anetor, F. O., Esho, E., & Verhoef, G. (2020). The impact of foreign direct investment, foreign aid and trade on poverty reduction: Evidence from Sub-Saharan African countries. *Cogent Economics & Finance*, 8(1), 1737347. <https://doi.org/10.1080/23322039.2020.1737347>
- Bado, B., Alam, S., & Cahyani, A. (2019, March). The Effect Of Government Admission on Poverty In The City of Makassar: 2000-2017. In *First International Conference on Materials Engineering and Management-Management Section (ICMEMm 2018)* (pp. 127-130). Atlantis Press.
- Baltagi, B. H., & Baltagi, B. H. (2021). Dynamic panel data models. *Econometric analysis of panel data*, 187-228.
- Basuki, A. T., & Prawoto, N. (2019). Analisis Regresi: dalam Penelitian Ekonomi dan Bisni. *Depok: Rajagrafindo Persada*.
- Cahyo, B. D., Setyowati, A. S., & Prabowo, A. (2022). Pearson Correlation Between Education Level and Population Growth on Poverty in Central Java, 2019-2021. *International Journal of Business, Economics, and Social Development*, 3(4), 174-180. <https://doi.org/10.46336/ijbesd.v3i4.349>
- CHO, E. E. (2021). Paths out of poverty: International experience. *Journal of Integrative Agriculture*, 20(4), 857-867. [https://doi.org/10.1016/S2095-3119\(20\)63295-6](https://doi.org/10.1016/S2095-3119(20)63295-6)
- Cruz, M., & Ahmed, S. A. (2018). On the impact of demographic change on economic growth and poverty. *World development*, 105, 95-106.
- Das Gupta, M. (2014). Population, poverty, and climate change. *The World Bank Research Observer*, 29(1), 83-108.
- Dissou, Y., Didic, S., & Yakautsava, T. (2016). Government spending on education, human capital accumulation, and growth. *Economic Modelling*, 58, 9-21. <https://doi.org/10.1016/j.econmod.2016.04.015>
- Duruh, B. & Chima, C. (2022). Impact of education budget on poverty reduction in Nigeria. *J Econ Allied Res*, 7(4), 150-163.
- Ganić, M. (2019). Does foreign direct investment (FDI) contribute to poverty reduction? Empirical evidence from Central European and Western Balkan countries. *Scientific Annals of Economics and Business*, 66(1), 15-27. <https://doi.org/10.2478/saeb-2019-0003>
- Grant, C. (2017). The contribution of education to economic growth.
- Gujarati, D. N. (2021). *Essentials of econometrics*. Sage Publications.

- Hassan, O. M. (2015). The impact of the growth rate of the gross domestic product (GDP) on poverty reduction in Nigeria. *Journal of Emerging Trends in Economics and Management Sciences*, 6(3), 221-230. <https://hdl.handle.net/10520/EJC178636>
- Johansen, S. (2014). *Times Series: Cointegration*.
- Magombeyi, M. T., & Odhiambo, N. M. (2017). Foreign direct investment and poverty reduction. *Comparative Economic Research. Central and Eastern Europe*, 20(2), 73-89. <https://doi.org/10.1515/cer-2017-0013>
- Makarenko, E., Nivorozhkina, L., Tregubova, A., Toropova, T., & Nazarova, E. (2022). Risk of increasing income inequality and poverty: analysis by income source. *Sustainability*, 14(3), 1610. <https://doi.org/10.3390/su14031610>
- Misini, S., & Badivuku-Pantina, M. (2017). The effect of economic growth under nominal GDP in relation to poverty. *Romanian Economic Journal*, 20(63), 104-116.
- Murjani, A. (2019). Short-run and long-run impact of inflation, unemployment, and economic growth towards poverty in Indonesia: ARDL approach. *Jurnal Dinamika Ekonomi Pembangunan*, 2(1), 15-29. <https://doi.org/10.14710/jdep.2.1.15-29>
- Nguyen, H. T. T., NGUYEN, C. V., & NGUYEN, C. V. (2020). The effect of economic growth and urbanization on poverty reduction in Vietnam. *The Journal of Asian Finance, Economics and Business*, 7(7), 229-239. <http://dx.doi.org/10.13106/jafeb.2020.vol7.no7.229>
- Ninu, A. & Hutabarat, D. (2024). Impact of Own-Source, General, and Special allocation Funds on Poverty in East Nusa Tenggara. *Jurnal Ilmu Ekonomi dan Pembangunan*, 24(1), 44-49. <https://doi.org/10.20961/jiep.v24i1.75740>
- Nkurunziza, J., Broekhuis, A., & Hooimeijer, P. (2017). Do poverty reduction programmes foster education expenditure? New evidence from Rwanda. *Journal of Asian and African Studies*, 52(4), 425-443. <https://doi.org/10.1177/0021909615595988>
- Odior, E. S. O. (2014). Government Expenditure on education and poverty reduction: implications for achieving the MDGs in Nigeria, a computable general equilibrium micro-simulation analysis. <https://ir.unilag.edu.ng/handle/123456789/8292>
- Pesaran, M. H., & Shin, Y. (1995). *An autoregressive distributed lag modelling approach to cointegration analysis* (Vol. 9514, pp. 371-413). Cambridge, UK: Department of Applied Economics, University of Cambridge. <https://doi.org/10.1017/CCOL0521633230.011>
- Pesaran, M. H., & Smith, R. P. (2019). A Bayesian analysis of linear regression models with highly collinear regressors. *Econometrics and Statistics*, 11, 1-21. <https://doi.org/10.1016/j.ecosta.2018.10.001>
- Peterson, E. W. F. (2017). The role of population in economic growth. *Sage Open*, 7(4), 2158244017736094. <https://doi.org/10.1177/2158244017736094>
- Putra, H. S. (2017). The Linkage of Intergovernmental Transfer and Poverty in Indonesia. *Jurnal Bina Praja*, 9(1), 29-40. <https://doi.org/10.21787/jbp.09.2017.29-40>
- Roshaniza, N. A. B. M., & Selvaratnam, D. P. (2015). Gross domestic product (GDP) relationship with human development index (HDI) and poverty rate in Malaysia. *Prosiding Perkem*, 10, 211-217.
- Saleem, H., Shabbir, M. S., Shah, S. A. R., & Shah, J. (2021). Nexus between foreign direct investment and poverty reduction: A case of Pakistan. *iRASD Journal of Economics*, 3(3), 272-280. <https://doi.org/10.52131/joe.2021.0303.0043>
- Seo, M. (2006). Bootstrap testing for the null of no cointegration in a threshold vector error correction model. *Journal of Econometrics*, 134(1), 129-150. <https://doi.org/10.1016/j.jeconom.2005.06.018>
- Shahbaz, M. (2012). Does trade openness affect long run growth? Cointegration, causality and forecast error variance decomposition tests for Pakistan. *Economic Modelling*, 29(6), 2325-2339. <https://doi.org/10.1016/j.econmod.2012.07.015>
- Sulasmi, E., Prasetya, I., & Rahman, A. A. (2023). Government Policy Regarding Education Budget on The Posture of The State Budget (APBN). *Journal for Lesson and Learning Studies*, 6(1), 142-151. <https://doi.org/10.23887/jlls.v6i1.60171>
- Suryahadi, A., Hadiwidjaja, G., & Sumarto, S. (2012). Economic growth and poverty reduction in Indonesia before and after the Asian financial crisis. *Bulletin of Indonesian economic studies*, 48(2), 209-227. <https://doi.org/10.1080/00074918.2012.694155>

- Todaro, M. P., & Smith, S. C. (2009). *Economic development*. Pearson education.
- Tsaurai, K. (2018). Investigating the impact of foreign direct investment on poverty reduction efforts in Africa. *Revista Galega de Economía*, 27(2), 139-154. <https://doi.org/10.15304/rge.27.2.5664>
- Wietzke, F. B. (2020). Poverty, inequality, and fertility: the contribution of demographic change to global poverty reduction. *Population and Development Review*, 46(1), 65-99. <https://doi.org/10.1111/padr.12317>
- Wooldridge, J. M. (2016). *Introductory Econometrics: A Modern Approach 6rd ed*. Cengage learning.
- Zhu, Y., Bashir, S., & Marie, M. (2022). Assessing the relationship between poverty and economic growth: does sustainable development goal can be achieved? *Environmental Science and Pollution Research*, 29(19), 27613-27623. <https://doi.org/10.1007/s11356-021-18240-5>