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Reducing the provincial poverty rate in Indonesia: The impact of local government expenditure

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Abstract: This study seeks to examine the effect of local government expenditure on the improvement of provincial welfare in Indonesia. It is necessary to increase public capital such as basic infrastructure and public facilities, as well as to improve public services such as health, education, and social protection. Based on previous studies, research on government spending on poverty has a significant effect on poverty reduction, but some other studies are not the case, namely government spending has not been significant in reducing poverty and improving welfare. The data used in government expenditure is expenditure based on functions, particularly health, education, and social protection functions in the province, both district/city and provincial government expenditures obtained from the Directorate General of Financial Balance (DJPK), while the provincial poverty rate serves as a proxy for regional welfare. Over the period 2015-2021, the Fixed Effect model using the Generalized Least Square Estimation (GLSE) approach is used to estimate outcomes for 34 provinces in Indonesia. The results indicated that government expenditure on the health sector and education sector had a negative significant influence on reducing the poverty rate, whereas government expenditure on social protection did not. The control factors, such as economic growth, had a negative effect on poverty reduction in Indonesia, whereas the unemployment rate and informal labor in the agricultural sector had positive and significant effects. Government policies, especially government spending, have contributed well to reducing poverty, but the government should pay attention to the integration of spending programs with other programs.

Keywords: Poverty; Government Expenditure; Estimate General Least Square
JEL Classification: E60; H51; H52; H53; I38

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Introduction

Poverty is associated with declining income gaps and human resources (Okwi et al., 2006). Statistics Indonesia (2015) defines poverty is a lack of enough resources to meet basic needs such as food, or non-food as measured by expenditure. Inability to meet basic due to conditions that do not favor them in obtaining opportunities (Sriyana, 2021) so he is unable to expand and determine his life choices (Rustanto, 2014). Nurkse (1953) has given the concept of the Vicious Cycle Poverty states that low-income levels lead to low income and reserve funds. Therefore there will be a low rate

of investment, leading to a decrease in the productivity rate that will decrease income.

Indonesian poverty has decreased over the past seven years (2015-2020). However, poverty in some provinces will reveal a significant poverty gap, with many regions exceeding the national poverty rate. Provinces such as Papua, West Papua, Maluku, and East Nusa Tenggara have exceptionally high poverty rates compared to the national level. This problem relates to the condition of education and health infrastructure as a support for enhancing human resources. In addition, poverty also relates to vulnerability and limited access to a decent life. A research study conducted by Mckague et al. (2014) emphasizes that the government must ensure the well-being of the poor through infrastructure development, job creation, and formulation of poverty-related policies so that government expenditure is one way to overcome poverty. Numerous research states that government expenditure had a significant impact on poverty alleviation in Indonesia. Research has shown that government expenditure increases economic activity and reduce poverty rates, based on time series data from 1976 to 2010 in Pakistan (Mehmood & Sadiq 2010). Research by Oriavwote and Ukawe (2018) indicates that government expenditure in poverty reduction is a key sector of Nigerian economy. A Similar result of a significant reduction in poverty through infrastructure in China (Qin et al., 2022).

Many researchers have examined government expenditure, specifically in areas such as health, education, social protection, and more. Several studies have shown that government expenditure on health care improves quality of life standards. This includes the treatment of stunting, risk reduction of maternal and child mortality and access improvment to free health services for the poor. Research by Oriavwote and Ukawe (2018) states that government expenditure on health can decrease poverty Rate in Nigeria by increasing per capita income. Studies by Mohammad and David (2019) and Bahtera et al. (2018) concluded that there was a negative and significant relationship between government expenditure on health and poverty rate, suggesting a need for more allocations. Nonetheless, a study from Misdawita and Sari (2013) show the distinct, that expenditure on health has no significant relationship with poverty rate. This is because the schema of government expenditure in the health sector is not immediately visible and requires quite a long time. Abdelhak and Sulaiman (2012) and Pusparani (2022) find that other factors, such as ineffective management and weak performance oversight, play a role.

In addition, government expenditure on education has a significant influence on reducing poverty rates (Komarudin & Oak, 2020). Human resources through education are believed to be able to change economic conditions, specifically poverty. Odior's research (2014) states the same thing that the education sector has a significant and negative impact on poverty level in Nigeria. Alamanda (2020) also concluded that the research results indicated a negative and significant of government expenditure to poverty rate. Findings from Taruno (2019) that the effect of government expenditure has a significant influence on poverty in both villages and cities. However Widodo et al. (2012) findings found different results, where government expenditure can increase poverty rates if it is not followed by adequate welfare and employment opportunities after completing

education. This is because it can lead to educated unemployment which has an impact on increasing poverty.

The problem of poverty is related to vulnerability, where the poor are easily exposed to the risk of shocks, so they are unable to meet their basic needs. Social protection programs are specifically designed to help reduce poverty and protect people close to poverty (near poor) can survive from vulnerabilities. Several social protection programs that have been provided to the community are in the form of the Family Hope Program (PKH), National Health Insurance (JKN), Rice Assistance for Prosperous Families (Rastra), Non-Cash Food Assistance (BNPT), and others. Several studies have found that assistance from social protection programs do not have significant effect on poverty rates. Studies by Abell and Abell, (2004); (Mehmood & Sadiq, 2010); Misdawita and Sari, (2013) found that government expenditure on social protection can reduce poverty. However, several other studies state that social protection cannot directly reduce the poverty rate, it only reduces vulnerability, so it has not been succesful to alleviating the poverty rate (Suharto, 2009). Huraerah (2019) also states that expenditure on social protection has not been effective in reducing the poverty rate because it is used for other purposes. Research Dewi and Andrianus (2021) also concluded that government expenditure has not significantly reduced poverty rates, as the welfare of people after receiving assistance has not been clearly measured.

Based on the result studies are paired, there are differences in the impact of government expenditure on poverty reduction in Indonesia. This study intends to fill the aforcited research apparent. This research is intended to be a reference for the development of further research, both in the field and in literature studies using various variables, methods and analysis required. The novelty is to use provincial data, so that contribute to make policymakers and give a oversight to other academicians. Thus, it is necessary to conduct research to review between government expenditure (education, health, and social protection) and provincial poverty rate in 2015-2021.

Research Method

This research method uses a quantitative approach. The scope of the research is 34 provinces, and secondary data for 7 years (2015-2021) is used. One of the purposes of using macro data is to provide an overall overview of the poverty rate in a country or region, as well as to offer a broader perspective on the poverty rate on a national or regional scale. This study used 3 independent variables and 3 control variables. The purpose of using control variables is to increase accuracy and provide a treasury for explanations.

Table 1 Operational Variable

No	Variable	Abbrev.	Definition of variable	Source	Unit of Measurement
1	Poverty	Pov	Percentage of poverty rate	BPS	Percent
2.	Government expenditure of health	RGEhealth	The ratio of government expenditure on health to current GDRP	DJPK	Percent
3	Government expenditure of education	RGEedu	The ratio of government expenditure on education to current GDRP	DJPK	Percent
4.	Government expenditure of social protection	RGEsoc	The ratio of government expenditure on social protection to current GDRP	DJPK	Percent
5	Economic growth	LNPDRB	The natural logarithmic of constant GDRP	BPS	Percent
6	Unemployment	Un	Unemployment rate	BPS	Percent
7	Informal labour of the agriculture	TKI	Percentage of labour in the agriculture	BPS	Percent

Notes: DJPK (Directorate General of Fiscal Balance, Ministry of Finance), Statistics Indonesia

The model used fixed effect in panel data regression. Previously, the Chow test was conducted to determine the best intermediate model between common effects (CE) or models Fixed Effect (FE) in performing research calculations. If the probability F < 0.05, then FE is the chosen model. After conducting the Chow test, the next step is to perform the Hausman test. The Hausman test is a test that chooses between Fixed Effects (FE) or Random Effects (RE). If the probability F < 0.05, then FE is the chosen model, otherwise if the F value > 0.05, then the Random Effect is selected and proceeds to the Lagrange Multiplier (LM) test.

The model is adapted from Abdelhak and Sulaiman (2012) and is modified based on empirical studies that have been conducted, by adding the variables unemployment Susanti (2013) and informal agricultural sector workers referring to Rini's research (2013) on the control variable. The equation of this research model is as follows:

$$Pov_{it} = \alpha_0 + \beta_1 RGEhealth_{it} + \beta_2 RGEedu_{it-1} + \beta_3 RGEsoc_{it-1} + \beta_5 LnPDRB_{it} + \beta_6 UN_{it} + \beta_7 TKI_{it} + e_{it} \quad \ldots\ldots\ldots\ldots (1)$$

Where *POV* is the poverty percentage, *RGEhealth* is the ratio of government expenditure on health to GDRP, *RGEedu* is the ratio of government expenditure on education to GDRP, *RGEsoc* is the ratio of government expenditure on social protection to GDRP, LnPDRB is economic growth, *UN* is the unemployment rate, *TKI* is informal labour of agricultural, *i* is 34 provinces, *t* is the time of research, *t-1* is variable lag, and e *is* an error term. The variable *RGEdu* and *RGSoc* are use of lag is used to determine the effect of the previous

year on the period, because the variables are because these variables are the ones whose results are not directly visible in the short term.

Firstly, classic assumption tests, including multicollinearity test, autocorrelation test, and heteroscedasticity test were conducted. In the classical assumption test of multicollinearity, it can be told from the value of the variable coefficient of less than 0.8 to indicate that multicollinearity does not occur. As for autocorrelation, it can be examined from the value of Durbin Watson. However, if there is autocorrelation, then it is done by adding the variable AR (1) to improve autocorrelation. This research was conducted by Aleksandrovich and Upadhyaya (2015) who used these variables to improve autocorrelation.

$$Pov_{it} = \alpha_0 + \beta_1 RGEhealth_{it} + \beta_2 RGEedu_{it-1} + \beta_3 RGEsoc_{it-1} + \beta_5 LnPDRB_{it} + \beta_6 UN_{it} + \beta_7 TKI_{it} + AR(1) + e_{it} \ldots\ldots\ldots\ldots\ldots (2)$$

Similar to the heteroskedasticity test, this test is used in regression models to determine whether there are residual differences between one observation and others. The model can be followed from probability of Obs R^2. If the value of Obs R^2<0.05, there is heteroscedasticity. Otherwise, the value of probability of Obs*$R2$> 0.05, there is no heteroscedasticity (Kurniawan, 2008).

Subsequently, statistical criteria testing was carried out consisting of a partial test (t test), simultaneous test (F test), and the coefficient of determination. A partial test (t-test) was conducted to examine how the effect of the independent variables on the dependent variable partially (each variable). The simultaneous test (F test) assesses how independent variables collectively affect the dependent variable. The coefficient of determination measures how well the independent variable can explain the dependent variable through the adjusted R-square value.

The next analysis is a descriptive analysis using quadrants. The advantage using the quadrants is to identify the priority of quality indicators that need immediate improvement, maintenance, or can be ignored and produce an improvement formula (Shia et al., 2016). Before determining the location of the indicator, the first step is to determine the average value of the level indicators. The next step is to plot these data into cartesian diagram according to analys tools. There are 4 quadrants interpret the relationship between the two variables. The following quadrant interpretation is used:

- Quadrant I show the ratio of independent variable is high and the poverty rate is high.
- Quadrant II shows the ratio of independent variable is low and the poverty rate is high.
- Quadrant III shows a ratio of independent is low and poverty rate is low.
- Quadrant IV shows the ratio of independent variable is high and poverty rate is low.

As for the quadrants, some points are numbered (provincial code), with the following information:
1) Aceh, (2) North Sumatra, (3) West Sumatra, (4) Riau, (5) Jambi, (6) South Sumatra, (7) Bengkulu, (8) Lampung, (9) Bangka Belitung Island, (10) Riau Island, (11) DKI Jakarta, (12) West Java, (13) Central Java, (14) D.I. Yogyakarta, (15) East Java, (16) Banten, (17) Bali,

(18) West Nusa Tenggara, (19) East Nusa Tenggara, (20) West Kalimantan, (21) Central Kalimantan, (22) South Kalimantan, (23) East Kalimantan (24) North Kalimantan, (25) North Sulawesi, (26) Central Sulawesi, (27) South Sulawesi, (28) Southeast Sulawesi, (29) Gorontalo, (30) West Sulawesi, (31) Maluku , (32) North Maluku, (33) West Papua, (34) Papua.

Result and Discussion

The results of the research will start with descriptive analysis, which will be explained in the form of quadrants. Quadrant analysis is seen in graphical representation of the independent and dependent variables. The dominant provinces in the government expenditure of health variable are in quadrant III. This suggests that these provinces have been the most effective in reducing poverty. To eradicate poverty, local governments have to allocate a specific dedicated budget. Provinces in quadrant IV have high government spending and low poverty rates. This is due to the local government's compliance with the requirement to allocate a 5% health budget. Besides that, public health and variations health rates across different province pose challenges for each local government in reducing poverty. Some regions have experienced positive changes in reducing poverty, such as the province of Central Kalimantan, while several other provinces have negative changes in poverty reduction. North Sulawesi 2015 was in quadrant IV, but it changed to quadrant III in 2021. Central Sulawesi, which was in quadrant I (2015) became quadrant II in 2021. North Sulawesi moved from high to low expenditure. Meanwhile, Central Sulawesi remained in a high poverty position in 2015 and 2021.

Table 2 Changes in Provincial Positions in the Quadrant of Government Expenditures on Health Sector to Poverty Rate

No	Province	2015	2021
1	Central Kalimantan (21)	III	IV
2	North Sulawesi (25)	IV	III
3	Central Sulawesi (26)	I	II

Source: Processed data (2022)

The quadrant analysis of government expenditure on education and the poverty rate per province in Indonesia show that several provinces have low poverty conditions. Provinces in quadrant III, which have higher government expenditure on education are indicated to have better quality human resources compared to other quadrants (other than quadrant IV). Local governments in quadrant III indicate that the community has met the target of the education program, so that the local community in quadrant III can reduce poverty. With improved human resources, there are better opportunities to get a job, and poverty rates can be reduced.

Table 3 Changes in the Position of the Province in the Quadrant of Government Expenditure on Social Protection to Poverty Rate

No	Province	2015	2021
1	Bali (17)	III	IV
2	South Kalimantan (22)	IV	III
3	Central Sulawesi (26)	I	II

Source: Processed data (2022)

In the government expenditure on social protection indicates that many provinces fall within quadrant III. Regional governments outside quadrants III and IV must improve their social protection budgets, and this can be achieved by assessing changes in the community's poverty rate. However, the role of local governments in decreasing poverty through social protection spending has lowered the poverty rate in certain regions. As evident from the transition to quadrant IV in 2021, five areas have reduced poverty significantly. Meanwhile, some provinces have not performed well.

Table 4 Changes in the Position of the Province in the Quadrant of Government Expenditure on Social Protection to Poverty Rate

No	Province	2015	2021
1	Bengkulu (7)	I	II
2	West Sulawesi (30)	I	II
3	DI Yogyakarta (14)	II	I
4	DKI Jakarta (11)	III	IV
5	West Nusa Tenggara (18)	III	IV
6	West Kalimantan (20)	III	IV
7	South Kalimantan (22)	III	IV
8	West Sumatera (3)	III	IV
9	North Sulawesi (25)	IV	III
10	Central Sulawesi (26)	IV	III

Source: Processed data (2022)

Then, in several provinces that were in quadrant III in 2015 and transitioned to quadrant II in 2021, the role of regional economic growth in poverty alleviation remains a crucial factor. Based on these developments, the growth of regional economies has no significant influence on poverty reduction. Therefore, the government should focus on optimizing the economic sector in order to stimulate economic growth, which will have an effect on labor input. As local government expands the potential economic sector, they must also provide necessary infrastructure to create employment opportunities for the purpose to reduce poverty.

Table 5 Changes in the Province's Position in the Quadrant of Economic Growth to the Poverty Rate

No	Province	2015	2021
1	Central Java (13)	I	II
2	West Nusa Tenggara (18)	I	II
3	Gorontalo (29)	I	II
4	West Sulawesi (30)	I	II
5	D.I Yogyakarta (14)	II	I
6	Bangka Belitung Island (9)	III	IV
7	Banten (16)	III	IV
8	West Kalimantan (20)	III	IV
9	North Maluku (12)	III	IV
10.	East Java (15)	IV	I

Source: Processed data (2022)

Another variable is the rate of unemployment and poverty. In Indonesia, provinces tend to be in quadrant II, indicating that reduced unemployment does not always improve poverty. The decline in unemployment has not been adequate to satisfy life's requirements in moving with the increased expense of living. This may be due to the low area minimum wage. Quadrant III contains provinces that have seen positive developments. Riau, North Kalimantan, and North Maluku will be in quadrant III in 2021. These three provinces have low unemployment rates and low poverty rates. Employment is crucial for each region's endeavors to alleviate unemployment and poverty.

Table 6 Changes in Province Position in the Quadrant of Unemployment Rate to Poverty Rate

No	Province	2015	2021
1	Central Java (13)	II	I
2	West Java (15)	II	I
3	West Kalimantan (20)	III	IV
4	Riau (4)	IV	III
5	North Kalimantan (24)	IV	III
6	North Maluku (34)	IV	III

Source: Data processed (2022)

The Informal agricultural workforce and the poverty rate on a provincial scale are mostly in quadrant II in 2015 and 2021. People identified as poor, in general, work in the informal agricultural sector; as the informal agricultural industry declines, poverty increases. Because many poor individuals rely on this industry, the poverty rate is unlikely to fall a lot of time Notwithstanding being in quadrant II between the informal agricultural workforce and the poverty rate, certain regions outperform other provinces. Only two provinces witnessed favorable gains in poverty reduction, especially Aceh and West Kalimantan. In the circumstance of persons who work informally in the agricultural sector, the government has to consider labor rules. The government has to implement programs to help employees in the informal agriculture sector, such as farmers, by effectively offering training, information, and agricultural technical knowledge.

Table 7 Changes in the Province's Position in the Quadrant of Informal Labour of Agricultural Sector to Poverty Rate

No	Provinsi	2015	2021
1	Aceh (1)	III	IV
2	West Kalimantan (20)	IV	III

Source: Processed data (2022)

The next analysis will be discussed after conducting econometric and statistical testing. In this study, model selection was performed using the chow test to choose between fixed effect or common effect.

Table 8 Chow test

Effects Test	Statistic	d.f	Prob.
Cross-section F	736.185600	(33,198)	0.0000

Source: EViews 9 data, processed.

Based on chow test, the best model is obtained fixed effect proven value probability less than 0.05, so it continues with the Hausman test. On the occasion, from the Hausman test is obtained fixed effect proven value probability less than 0.05 (Gujarati, 2004)

Table 9 Hausman test

Test Summary	Chi-Sq.Statistic	Chi-Sq. d.f	Prob.
Cross-section random	32.148697	6	0.0000

Source: EViews 9 data, processed

Then, the classical assumption test was carried out consisting of a multicollinearity test, autocorrelation test, and heteroscedastic test. Based on the multicollinearity test, the coefficient of each variable is less than 0.8, this indicates that these variables do not have multicollinearity.

Table 10 Multicolienarity Test

Variabel	RGEhealth	RGEedu(-1)	RGEsoc(-1)	LnPDRB	UN	TKI
RGEhealth	1.000	0.722	0.615	-0.408	-0.178	0.366
RGEedu(-1)	0.722	1.000	0.697	-0.499	-0.266	0.482
RGEsoc(-1)	0.615	0.697	1.000	-0.504	-0.170	0.365
LnPDRB	-0.408	-0.499	-0.504	1.000	0.393	-0.414
UN	-0.178	-0.266	-0.170	0.393	1.000	-0.298
TKI	0.366	0.482	0.365	-0.414	-0.298	1.000

Source: EViews 9 data, processed

Afterwards, the test is autocorrelation test through the Durbin Watson (DW) value. The condition for no autocorrelation is dU < dw < 4 – dU. In the model below there are 2 (two) estimation results, where in the first estimation it is infected with autocorrelation with a dw value of 1.263183 (does not meet the requirements). For this reason, a second estimate is made for improvement by adding the AR variable (1). The use of this method is by the study of Aleksandrovich and Upadhyaya (2015), stating that the autocorrelation-

constrained model is better after being corrected using AR (1) and accepted at α Rate of 1%, 5%, and 10%. From the results of AR (1), there is no problem with autocorrelation.

Table 11 Comparison of Regression Results Before and After Using AR Another test

Variable	Before added AR (1)		After added AR (1)	
	Coefficient	Prob.	Coefficient	Std. Error
C	9.365692	0.744245	9.935660	0.929604
RGEHEALTH	-0.157254	0.019892	-0.028131	0.012608
RGEEDU (-1)	-0.045111	0.038935	-0.037995	0.019546
RGESOC (-1)	-0.099007	0.630841	2,60E-01	0.380471
LNPDRB	-0.511926	0.087363	-0.392797	0.199033
UN	0.115628	0.021433	0.125064	0.028494
TKI	0.034132	0.008135	0.013272	0.006202
AR (1)	-	-	0.623437	0.044020
R-squared	0.996336		0.998701	
Adjusted R-squared	0.995464		0.998298	
F-statistic	1143.384		2479.426	
Prob(F-statistic)	0.000000		0.000000	
Dw	1.263183		2.067100	

Source: DJPK and Statistics Indonesia, E-views 9.0 processed.

This study used the Generalized Least Square (GLS) method for the heteroscedasticity assumption classic test so that the heteroscedastic problem can be overcome. According to Juanda (2009), the GLS method is a method used to transform the weighting of the original data so that it can improve heteroscedasticity problems.

The following test statistical criteria consist of a partial test (t test), simultaneous test (f test), and test of the coefficient of determination tests. Based on the t-test 5 (five) variables have t stat values that are greater than the t table values. The results of the t-stat test show that these variables are significant to the dependent variable (poverty level), whereas the RGEsoc variable is not significant to for dependent variable (poverty level).

Table 12 t-statistic test

Variabel	t-stat	t-table	Prob	Ket.
RGEhealth	-2.231183	1.970024	0.0274	**
RGEedu (-1)	-1.943886	1.651308	0.0541	*
RGEsoc(-1)	0.682610		0.4961	Not significant
LnPDRB	-1.973522	1.651308	0.0506	*
UN	4.389072	2.596732	0.0000	***
TKI	2.139996	1.970024	0.0342	**

*Note: *significant on 90%, ** significant on 95% *** significant on 99%*
Source: DJPK and Statistics Indonesia, processed by E-views 9.0

After carrying out a partial test (t-stat test), an F-stat test found out whether all the independent variables together could influence the dependent variable. For the simultaneous test method by looking at the value probability in the state. Based on the results, the value probability of the F-stat is 0.0000 less than α 1%, so the independent

variables simultaneously have a significant effect on the dependent variable (poverty level) at the same time. The coefficient of the determination test shows a value of adjusted R-square is 0.998298. This shows that the independent variables in the model can explain 99% of the dependent variable, while the remaining values are influenced by other variables from the outside variable.

Based on the selection of models, the fixed effect model (FEM) using weighting with Cross Section Weight (GLS) is the best model. The estimation results obtained in the Table 13.

Table 13 The relationship between dependent variable and independent variable

Variable	Coefficient	Std. Error	inf.
C	9.935660	0.929604	
RGEHEALTH	-0.028131	0.012608	**
RGEEDU (-1)	-0.037995	0.019546	*
RGESOC (-1)	0.259713	0.380471	not significant
LNPDRB	-0.392797	0.199033	*
UN	0.125064	0.028494	***
TKI	0.013272	0.006202	**
AR (1)	0.623437	0.044020	
R-squared		0.998701	
Adjusted R-squared		0.998298	
F-statistic		24.79426	
Prob(F-statistic)		0.000000	
Durbin Watson stat		2.067100	

*Note: *significant on 90%, ** significant on 95% *** significant on 99%*
Source: DJPK and Statistics Indonesia, processed by E-views 9.0

Based on the result above, each independent variable will show the dependent variable. The dependent variables in this research are government output (health, education, and social protection), economic growth, unemployment, and informal labor in the agricultural sector. The variable of government expenditure on health has a significant effect on reducing poverty rate. The value of the coefficient of government expenditure on health is -0.02813, every one percent increase in government expenditure on health can reduce the level of poverty in Indonesia by 0.02813 percent. Some of these studies explain that government expenditure on health can reduce the level of poverty as research by Bahtera et al. (2018) indicates that government investment in health is adversely and significantly associated with the degree of poverty, whereas some of these studies explain that government spending on health can lower the level of poverty. Similar to Marna's (2016) research, the production of the health sector is one of the key elements in lowering the rate of poverty. This suggests that good health improves both production and income, both of which can lower poverty. This indicates that the government's endeavor to decrease poverty through government production is on target and ongoing as stated in Health Law No. 39 of 2009.

Furthermore, government expenditure on education in the previous year had a significant effect on reducing the poverty rate this year with the coefficient being -0.037995.

Research from Carolina (2022) and Oriavwote and Ukawe, (2018) are in line with this research. Government expenditure on the education sector can reduce poverty through increased income. There is a lag in this variable because government expenditure on education cannot be seen directly in the same year. For example, the realization of the construction of educational infrastructure, which cannot be directly benefited in the same year, will need to be processed in the next few years, so that an increase in school enrolment rates will be seen in the coming year. Likewise, an increase in human resources does not directly affect the reduction in the poverty rate, because it requires a gradual educational process. So, those who have graduated from education will work to increase their income to meet their daily needs. According to Carolina's research (2022) government spending on education has an effect on reducing poverty through higher income levels. Thus, they can improve their welfare through this matter.

The coefficient value for the variable government expenditure on social assistance is 0.4961, and it does not significantly affect poverty rates. This outcome is not predicted by the hypothesis for several reasons, including the fact that the design of social protection attempts to reduce vulnerability and enhance social standing, hence preventing any discernible decline (Suharto, 2009). Social protection frequently lacks monitoring and assessment, particularly in the absence of clear directives, so the program is ineffective. Social protection in the form of poor assistance does not reflect the government's goal of alleviating poverty (Perotti, 2005). Due to a lack of vigilance in maintaining an integrated database, inaccurate beneficiary data are the most significant obstacle to social protection (Beni & Manggu, 2020). Yet, other factors, such as inadequate public awareness of beneficiaries between those who are eligible and those who are not, have contributed to the emergence of social conflict Bah et al. (2015) and Habib et al. (2020). Government investment in distributing cash for social protection is a good thing, but it must be paired with solutions and attention to several issues for social protection to have a significant impact on poverty rates.

One of the variables that determine the amount of poverty is economic growth. This is due to the correlation between economic growth and per capita income. In this study, the coefficient for the relationship between economic growth and poverty is -0.392797. This demonstrates that for every one percent gain in economic growth, poverty can be reduced by 0.392797 percent. This is consistent with Hambarsari and Inggit (2016) conclusion that the relationship between economic growth and poverty is negative and significant and that economic expansion can reduce the poverty rate. Economic expansion affect the economy by stimulating economic activity in the form of employment. The acceleration of the economy allows individuals to raise their income, hence reducing poverty. According to Nyamweya and Obuya (2020), economic growth is a prerequisite for poverty elimination.

Unemployment is one of the problems in macro indicators. This study shows that the unemployment variable has a coefficient of 0.125064 and has a significant effect. This shows that a one percent increase in unemployment can increase poverty by 0.125064 percent. This research is in line with Susanti's research (2013) which concluded that an increase in unemployment can increase poverty. The most influential factor why

unemployment can increase poverty is the loss of income which causes a loss of one's welfare and is unable to meet the necessities of life, especially basic needs (basic need). If basic needs are not met, then the community is categorized as poor (Statistics Indonesia, 2016).

Other research was conducted by Muthalib et al. (2018) and Quy (2016) Unemployment and poverty have a relationship that cannot be ignored because losing a job means losing other access needed so it is difficult to obtain other basic needs such as clean water, health facilities, housing, and others. Unemployment is also a problem at the macro level because it lowers the level of state income in the form of a decrease in per capita income followed by a decrease in labor productivity. This affects economic activity which creates a poverty trap because it is unable to maintain a minimum standard of living.

The bond between the variables of agricultural sector informal labor of agriculture and poverty in this study has a coefficient of 0.013272 and is significant. This shows that every 1 percent increase in the informal labor of the agricultural sector will increase poverty by 0.013272 percent. Based on this study, the informal labor of agriculture has not been able to increase income so there are still many informal laborers of agricultural sector who are categorized as poor. Rini's research (2013) concluded that informal labor is closer to poverty, one of the informal sectors that affect poverty is the agricultural sector. This is due to the low development of the agricultural sector resulting in low productivity. Besides low productivity, there are still many people with low rate of education. Approximately 66 percent of the informal labor in agricultural sector are elementary school graduates and only 3 percent are Diploma and Bachelor graduates (Statistics Indonesia, 2020). Workers in the informal sector tend to have low human capital, which has implications for low productivity and fluctuating income (Maloney, 2003).

Communities, especially in rural areas, choose an informal workforce in the agricultural sector, this is a source of income that is obtained, or an alternative is available only in the agricultural sector, so that rural communities tend to absorb labour in the agricultural sector. The classic problem in the informal agricultural sector is low wages while the prices of necessities of life continue to rise. Problems like this make people who work in the informal agricultural sector remain poor. World Bank (2020) notes that in Indonesia there is 34.3 million informal laborers in agriculture who do not have a fixed income and are highly vulnerable to poverty.

Conclusion

Government expenditure is very important for the implementation of policies to reduce poverty. This study analyses how government expenditure on health, education, and social protection affects poverty reduction. Using panel data for 2015-2021 with the method fixed effect estimated generalized least square (EGLS) obtained results of this study show that the variables of government expenditure on health and education have a significant effect, while government expenditure on social protection has no significant effect on the poverty rate. Regarding the control variable, namely economic growth has

a negative effect while unemployment and labor in the informal agricultural sector have a positive and significant effect.

The government's role in tackling the poverty rate through regional government expenditure is an appropriate policy because poverty alleviation is one of the responsibilitites delegated to the regions according to Law no. 23 of 2014 concerning Regional Government. However, there is something to which the government needs to pay attention, namely improving the quality of regional expenditure, especially local government expenditure on social protection. The evaluation of data management and the updating of data are required foundations for vulnerable individuals who need protection to be more effectively targeted. In addition, it is felt that the socialization of protection programs that are specific to the area and efforts to approach the community more effectively also need improvement. Other policies aimed to reduce unemployment and informal employment in the agricultural sector are being implemented and are progressing well. It is hoped that the government's goal of reducing the poverty rate can be achieved more quickly.

The limitation of this study is the data from *Directorate General of Financial Balance (DJPK)* is resctricted, the study timeline was constrained. According to the findings of this study is to be able to use additional research data using sub-distric data.

Author Contributions

Conceptualisation, N and B.M.; Methodology, N.; Investigation, N.;, Analysis N.;, Review and Editing, B.M., A.W., and S.M.J.,; Visualization, N., and S.M.J.,

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Conflicts of Interest

The corresponding authors declare no conflicts of interest. The funder had no role in the design, in the data collection, analysis, or interpretation; in the writing of the manuscript in writing the manuscript, or in decision to publish the results.

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Appendix

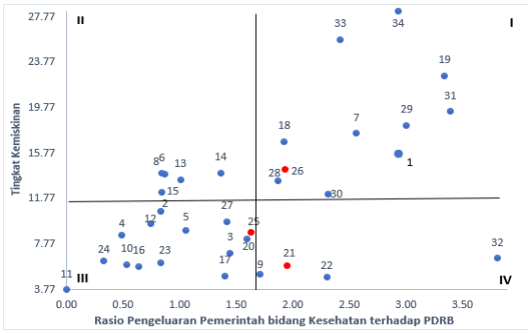

Figure 1 Quadrant Analysis of the Ratio of Government Expenditures on Health Sector to Poverty Rate in 34 Provinces in Indonesia in 2015
Source: DJPK and BPS, data processed.

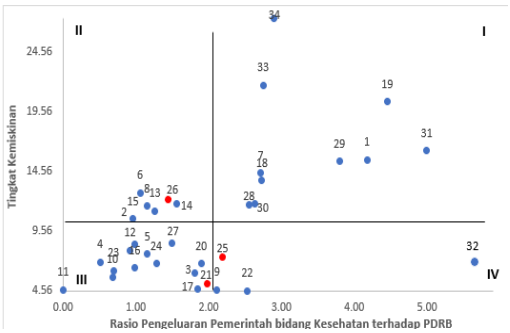

Figure 2 Quadrant Analysis of the Ratio of Government Expenditures on Health Sector to Poverty Rate in 34 Provinces in Indonesia in 2021
Source: DJPK and BPS, data processed.

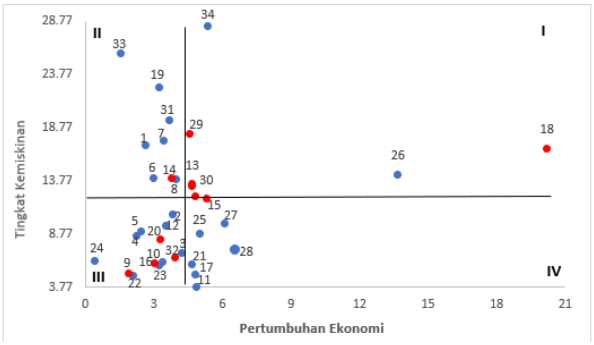

Figure 7 Quadrant Analysis of Economic Growth to Poverty Rate in 34 Provinces in Indonesia in 2015
Source: DJPK and BPS, data processed.

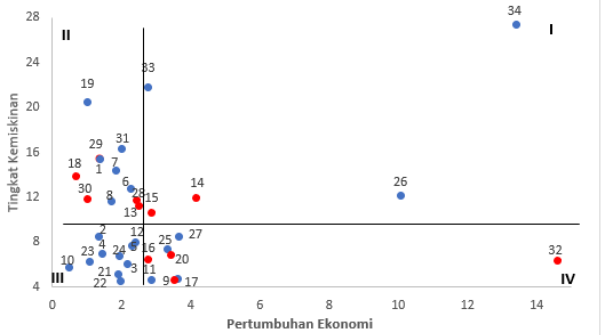

Figure 8 Quadrant Analysis of Economic Growth to Poverty Rate in 34 Provinces in Indonesia in 2021
Source: DJPK and BPS, data processed.

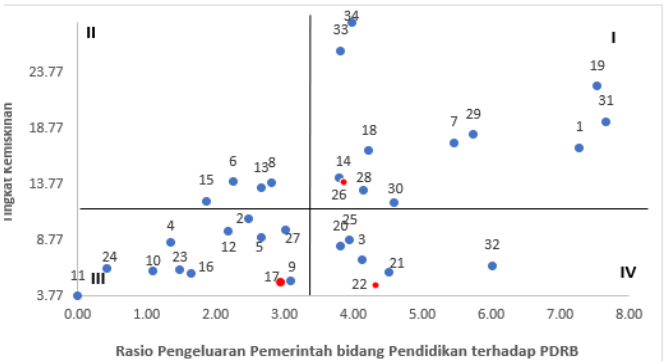

Figure 3 Quadrant Analysis of the Ratio of Government Expenditures on Education Sector to Poverty Rate in 34 Provinces in Indonesia in 2015
Source: DJPK and BPS, data processed.

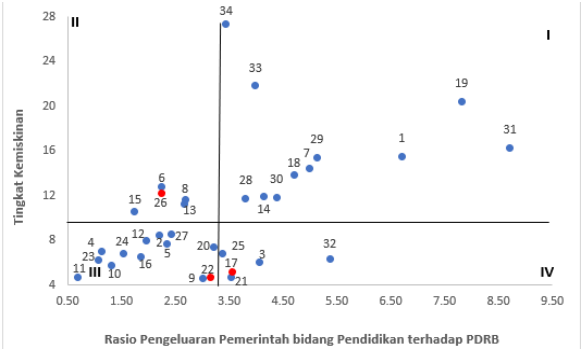

Figure 4 Quadrant Analysis of the Ratio of Government Expenditures on Education Sector to Poverty Rate in 34 Provinces in Indonesia in 2021
Source: DJPK and BPS, data processed.

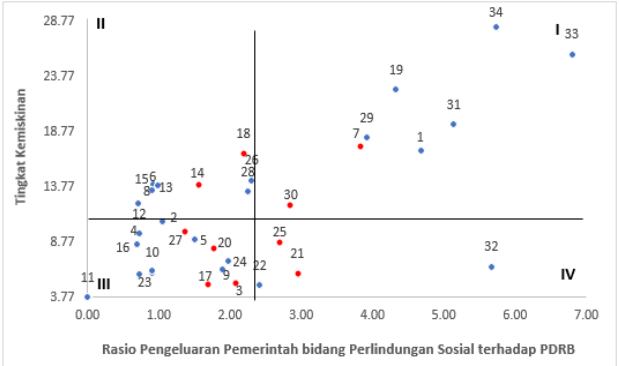

Figure 5 Quadrant Analysis of the Ratio of Government Expenditures on Sosial Protection Sector to Poverty Rate in 34 Provinces in Indonesia in 2015
Source: DJPK and BPS, data processed.

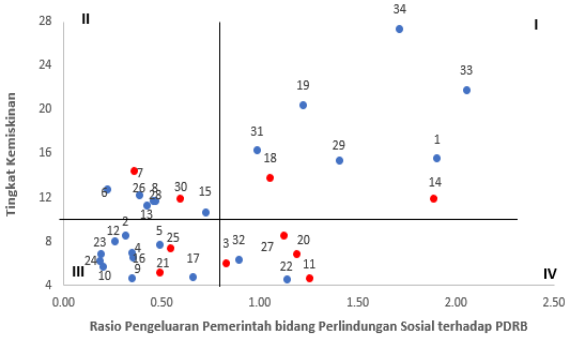

Figure 6 Quadrant Analysis of the Ratio of Government Expenditures on Sosial Protection Sector to Poverty Rate in 34 Provinces in Indonesia in 2021
Source: DJPK and BPS, data processed.

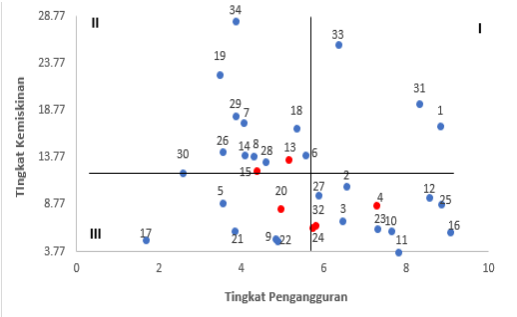

Figure 9 Quadrant Analysis of Unemployment to Poverty Rate in 34 Provinces in Indonesia in 2015
Source: DJPK and BPS, data processed.

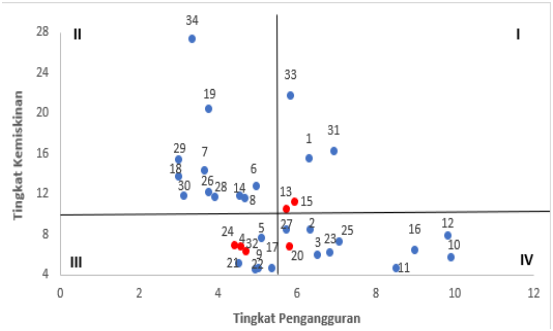

Figure 10 Quadrant Analysis of Unemployment to Poverty Rate in 34 Provinces in Indonesia in 2021
Source: DJPK and BPS, data processed.

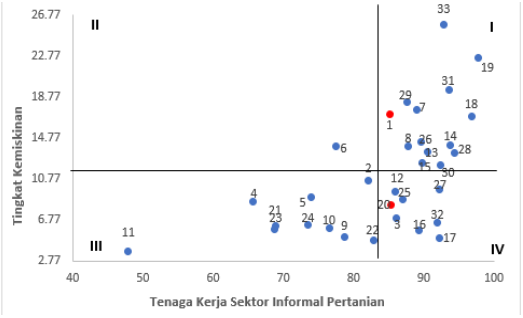

Figure 11 Quadrant Analysis of Informal labor of the agriculture t to Poverty Rate in 34 Provinces in Indonesia in 2015
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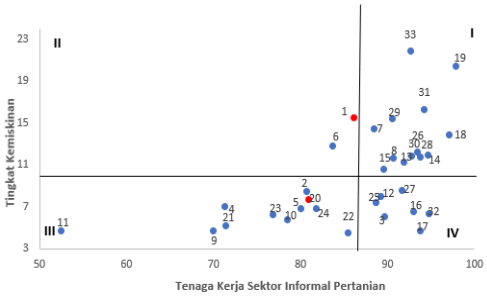

Figure 12 Quadrant Analysis of Informal labor of the agriculture to Poverty Rate in 34 Provinces in Indonesia in 2021
Source: DJPK and BPS, data processed.