

Poverty Determinant Models: Interregional Study in Indonesia

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ABSTRACT

This research aims to analyze nine models of poverty determinants in seven regions in Indonesia. The formation of the model is based on model 1, namely the poverty trap, economic growth, DAK, and spending on government functions which consists of spending on education, health, economic functions, social protection, as well as housing and public facilities. The next model was formed by combining the economic growth variables and DAK with GDP per capita and real GDP, as well as DAK with DAK for 1 year and DAK for the previous 2 years, while the poverty trap and government function spending remained the same and were not combined. In this way, nine poverty determinant models were obtained which were applied to seven regions in Indonesia, namely Sumatra, Java and Bali, Kalimantan, Sulawesi, Nusa Tenggara, Maluku and Papua. This research uses secondary data from BPK and BPS. The data used is panel data from 509 districts/cities (cross section) in 2014-2020 (time series). The method used is panel data regression analysis. This research produces a model of the determinants of poverty in each region. The determinant models for the Sumatra region is model 1, Java and Bali are models 6 and 9, Kalimantan is models 2 and 3, Sulawesi is models 4 and 7, Maluku is models 1 and 2, and Nusa Tenggara and Papua are models 2 and 3. The poverty trap variable is significantly has a positive direction in all regions, which means that the worse the poverty level was in the past year, the current poverty level will increase. Therefore, to overcome poverty levels in the coming year, the significant variables produced in this research model can be used as a reference.

Keywords: Poverty, Regional Expansion, Economic Growth, Government Spending, Special Allocation Funds.

1. INTRODUCTION

Poverty is a major problem that is a problem in all countries in the world, including Indonesia. The causes are unemployment, length of schooling, and disability (Fransman & Yu, 2019), low education, lack of access to water and sanitation, violence and crime (Bissonette, 2019), low income, addiction, mental illness, violence, sedentary life, poor health, and unsafe environments (Desmond & Western, 2018). The impact of poverty results in slow economic growth due to low savings, investment, and income (Loría, 2020 and Islam et al, 2017). Besides that, poverty also results in loss of access to development and lack of basic facilities (Chaturvedi, 2019), poor health (Bukari et al., 2021 and Ngoma & Mayinbo, 2017), low education (Buck & Deutsch, 2014), minimal educational achievement (Farid et al., 2014), lack of educational attainment (Silva-Laya et al.,

2020), poor handling of youth (Amina & Ibrahim, 2020), and high rates of crime, violence and crime (Faqiri et al., 2020 & Parks, 2014).

In Indonesia, in general there was a reduction in poverty in all regions until 2019. However, on the island of Java, due to the Covid-19 pandemic, the government implemented PSBB (Large-Scale Social Restrictions) which resulted in the economy declining so that poverty increased. Under normal conditions, poverty decreases very slowly in some areas, but decreases rapidly in other areas. During the pandemic, there were areas that experienced an increase in poverty, but there were others that experienced a decline, although very slowly. Why are there differences in poverty reduction between regions? This indicates that there are differences in the determinants of poverty which are very interesting to

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research, what determinants influence poverty on the island of Sumatra?

Data from 2014 to 2020 obtained from BPS shows a very slow decline in poverty in all regions, only decreasing by around 1% during 2014-2020. This indicates the existence of a poverty trap, namely those who are poor are trapped in poverty. Poverty breeds poverty. So past poverty is a direct cause of future poverty (Kraay & McKenzie, 2014; Todaro & Smith, 2015). According to Kraay & McKenzie (2014) the poverty trap is a self-reinforcing mechanism, so that poverty breeds poverty and becomes the cause of poverty in the future. Several research results explain the causes of the poverty trap. Among them, Barrett & Carter (2013) explain that the cause of the poverty trap is household income that consistently falls below the poverty line. Carrera (2019) added that the poverty trap is a form of coordination failure as an evolutionary game between companies and workers.

Other causes of poverty are poor assets over time and unresponsive agricultural land due to extensive soil degradation (McKay & Perge, 2013; Tittonell & Giller, 2013). Meanwhile, according to Gweshengwe & Hassan (2020), poverty has six dimensions, namely financial, material, seasonal, environmental, social, and economic dimensions. However, the poverty trap does not only occur in rural areas, but also occurs in urban areas (Wu & He, 2018). In this way, the poverty trap becomes the cause of poverty in the future. In other words, poverty in the past year is the cause of poverty in the following year.

Poverty is a complex condition. Apart from the poverty trap, there are other determinants of poverty which state that economic progress can reduce poverty levels (Ebunoluwa & Yusuf, 2018; Nakabashi, 2018; Nyasha et al., 2017). The indicator that is often used in the analysis of economic progress is economic growth. Economic growth data for 2014 - 2020 shows that the most stable district/city economic growth occurs in Java, in fact it is always above national economic growth. On the other hand, economic growth fluctuates greatly in Bali & Nusa Tenggara and Papua & Maluku. From Figure 1 and Figure 2 three different conditions occur. First, the lowest average poverty level is in districts/cities in Kalimantan, with slightly fluctuating economic growth. Second, the poverty rate in Java is higher than Kalimantan, but economic growth is stable. Third, high levels of poverty are in Papua & Maluku and Bali & Nusa Tenggara. It turns out that economic growth in these two regions fluctuates greatly. In 2020, during the Covid-19 pandemic, five regions in Indonesia experienced negative economic growth, indicating an impact on the slow reduction in poverty levels. For this reason, it is necessary to analyze the role of economic growth in reducing poverty.

Several research results have found that economic growth can reduce poverty levels (Cruz & Ahmed, 2018; Nguyen-van et al., 2019; Santos et al., 2019). Chaturvedi (2019) also revealed that higher economic growth helps reduce poverty in India. These findings have previously been discussed by Škare & Družeta (2016) who found that when economic growth occurs, the poverty rate decreases. However, they added that economic growth alone is not enough, it depends on the speed and pattern of growth.

A different opinion was put forward by Dauda (2017) who corrected the role of economic growth in reducing poverty. He argued that the substantial economic growth that occurred in Nigeria was not able to stem poverty. The same finding was also stated by Lee & Sissons (2016) where economic growth is not able to reduce poverty in cities in England. According to him, this paradox is caused by growth that is not pro-poor. This contradiction raises the question of how real the role of economic growth is in poverty. This is based on the phenomenon of success and failure of countries in overcoming poverty by using economic growth variables. Thus, the research hypothesis is that economic growth has a negative effect on poverty.

Another determinant for reducing poverty is government spending. Previous research reveals the influence of government spending in reducing poverty (Abubakar, 2015; Anderson et al., 2018). The government's role in reducing poverty is demonstrated by the allocation of regional government spending, especially pro-poor programs. It is hoped that the appropriate allocation of government spending through pro-poor programs will be successful in alleviating poverty. Based on PP number 12/2019, of the 9 function expenditures, there are 5 function expenditures that are in direct contact with the needs of the poor (pro poor program), namely the functions of education, health, economy, social protection, and housing & public facilities. For this reason, the focus of the research is five expenditure functions that are pro-poor programs.

Apart from increasing economic growth, government spending intended for poverty alleviation programs (pro-poor programs) is also able to reduce poverty levels (Boldeanu & Ianu, 2016). However, Abubakar (2015) and Anderson et al. (2018) found that government spending on pro-poor activities was still low. Ebunoluwa & Yusuf (2018) also found that it turns out that the poor do not benefit from government spending. Government spending is allocated into several functions. Several functional expenditures that play an important role in efforts to reduce poverty are education expenditure (Simeon & Odior, 2014), health expenditure and infrastructure expenditure (Agénor, 2015). Social spending in the form of cash transfers can also overcome poverty (Ghatak, 2015).

A review of regional spending by function was also carried out by Dinarjto & Kusumaningtyas (2020) who concluded that government spending on public services, health, education, and social protection had an effect on reducing long-term poverty. Meanwhile, in the short term, spending on social protection and public services has no effect, but for health, education, and the economy it does. Because of that the hypothesis in this study is that government spending by function affects poverty.

The government's role in alleviating poverty is also demonstrated by the large amount of special allocation funds (hereinafter referred to as DAK) from the central government to the regions. Local governments that receive DAK mean they receive additional spending that can be used for physical and non-physical development, for example school buildings. Under these conditions, DAK has an influence on poverty alleviation. Previous research found the influence of DAK in reducing poverty (Fitriyanti & Handayani, 2020). An urgent study of the determinants of poverty is carried out so that poverty does not get worse. Therefore, it is necessary to design poverty determinant models for each region so that poverty alleviation strategies are not "averaged" for all regions. Each region may have different determinants of poverty, so that poverty alleviation solutions in each region will be ineffective and inefficient if they do not pay attention to the determinants of poverty in each region.

Apart from government spending, Special Allocation Funds (DAK) also play a role in reducing poverty levels. Previous research found that DAK had a positive effect on reducing poverty levels (Fitriyanti & Handayani, 2020; Paulus et al., 2017). However, there are also those who argue that DAK has no effect on poverty levels (Fajri et al., 2020; Fikri et al., 2019; Widianto et al., 2016). Thus, the hypothesis of this research is that DAK has a negative effect on poverty.

It is urgent to study the determinants of poverty, because a high poverty rate indicates poor economic development performance. A poverty determinant model is needed for each region in Indonesia, so that the poverty alleviation model is not 'averaged' for all regions. Each region may have different determinants of poverty, so that poverty alleviation solutions in each region will be ineffective and inefficient if they do not address the problems of poverty determinants that exist in each region.

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2. RESEARCH METHODS

The research design is explanatory by analyzing and comparing the determinant model of poverty in seven regions in Indonesia. The seven regions are Sumatra with 154 districts/cities, Java and Bali with 123 districts/cities, Kalimantan with 56 districts/cities, Sulawesi with 81 districts/cities, Maluku with 21 districts/cities, Nusa Tenggara with 32 districts/cities, and Papua has 42 regencies/cities with a total of 509 regencies/cities in Indonesia. Data collection was carried out using panel data documentation techniques from 2014 to 2020. This research uses the panel data regression analysis method carried out with the Eviews application. In this method, several tests will be carried out to obtain the best model in each region, whether the fixed effect model (FEM), random effect model (REM) or common effect model (CEM) is the best model (Wooldridge, 2013). While the observed variables consist of nine poverty determinant models as follows:

1. Model 1 consists of the poverty trap variable as measured by the previous year's poverty rate (TK_{t-1}) , economic growth (PE), DAK, and government spending (education spending (BPdd), health spending (BKes), economic spending (BE), spending on social protection (BPS), and spending on housing & public facilities (BPFU)}.

2. Model 2 consists of variables in model 1 and replaces DAK with DAK 1 year earlier (DAK_{t-1})

3. Model 3 consists of variables in model 1 and replaces DAK with DAK 2 previous years (DAK₁₋₂)

4. Model 4 consists of variables in model 1 and replaces economic growth (PE) with GRDP per capita (GRDP/cap)

5. Model 5 consists of variables in model 1 and replaces economic growth (PE) and DAK with GRDP per capita and DAK 1 year earlier (DAKt-1) 6. Model 6 consists of variables in model 1 and replaces economic growth (PE) and DAK with GRDP per capita and DAK 2 previous years (DAKt-2)

7. Model 7 consists of variables in model 1 and replaces economic growth (PE) with real GRDP (GRDP)

8. Model 8 consists of variables in model 1 and replaces economic growth (PE) and DAK with real GDP (PDRBril) and DAK 1 year earlier (DAKt-1)

9. Model 9 consists of variables in model 1 and replaces economic growth (PE) and DAK with real GDP (GRDP Real and DAK 2 previous years (DAKt-2).

3. MATH AND EQUATIONS

- $TK(_{it})_1 = \alpha + \beta_1 TK_{(t-1)it} + \beta_2 PE_{it} + \beta_3 DAK_{it}$
- + β_4 BPdd_{it}+ β_5 BKes_{it}+ β_6 BE_{it}+ β_7 BPS_{it}+ β_8 BPFU_{it} + ε_{it} TK(_{it})₂ = α + β_7 TK(_{t-1})_{it}+ β_2 PE_{it}+ β_3 DAK(_{t-1})_{it}
- $+\beta_4 BP dd_{it} + \beta_5 BK es_{it} + \beta_6 BE_{it} + \beta_7 BP S_{it} + \beta_8 BPF U_{it} + \epsilon_{it}$ TK(_{it})₃ = $\alpha + \beta_7 TK_{(t-1)it} + \beta_2 PE_{it} + \beta_3 DAK_{(t-2)it}$
- + β_4 BPdd_{it}+ β_5 BKes_{it}+ β_6 BE_{it}+ β_7 BPS_{it}+ β_8 BPFU_{it} + ε_{it} TK(_{it})₄ = α + β_7 TK_{(t-1)it}+ β_2 PDRB/cap_{it}+ β_3 DAK_{it}
- $+\beta_4 BPdd_{it} + \beta_5 BKes_{it} + \beta_6 BE_{it} + \beta_7 BPS_{it} + \beta_8 BPFU_{it} + \epsilon_{it}$ $TK(_{it})_5 = \alpha + \beta_7 TK_{(t-1)it} + \beta_2 PDRB/cap_{it} + \beta_3 DAK(_{t-1)it}$
- $+\beta_4 BPdd_{it} + \beta_5 BKes_{it} + \beta_6 BE_{it} + \beta_7 BPS_{it} + \beta_8 BPFU_{it} + \epsilon_{it} \\TK_{(it)6} = \alpha + \beta_7 TK_{(t-1)it} + \beta_2 PDRB/cap_{it} + \beta_3 DAK_{(t-2)it}$
- $+\beta_4 BPdd_{it} +\beta_5 BKes_{it} +\beta_6 BE_{it} +\beta_7 BPS_{it} +\beta_8 BPFU_{it} +\varepsilon_{it}$ TK(it)7 = a+ β_1 TK(-1)it+ β_2 PDRBriil_{it}+ β_3 DAK_{it}
- $+\beta_4 BPdd_{it} + \beta_5 BKes_{it} + \beta_6 BE_{it} + \beta_7 BPS_{it} + \beta_8 BPFU_{it} + \epsilon_{it}$ $TK_{(it)8} = \alpha + \beta_7 TK_{(t-1)it} + \beta_2 PDRBritl_{it} + \beta_3 DAK_{(t-1)it}$
- $+\beta_4 BPdd_{it} + \beta_5 BKes_{it} + \beta_6 BE_{it} + \beta_7 BPS_{it} + \beta_8 BPFU_{it} + \varepsilon_{it}$ $TK(_{it})_9 = \alpha + \beta_1 TK_{(t-1)it} + \beta_2 PDRBrill_{it} + \beta_3 DAK_{(t-2)it}$
- $+\beta_4 BPdd_{it} +\beta_5 BKes_{it} +\beta_6 BE_{it} +\beta_7 BPS_{it} +\beta_8 BPFU_{it} +\varepsilon_{it}$

Note: TK is the poverty level; TKt-1 is the poverty trap as measured by the previous year's poverty rate (time lag t-1); PE is economic growth; BPdd is education spending; BKes is health spending; BEko is economic spending; BPS is social protection spending, DAK is Special Allocation Funds, DAK(t-1 and t-2) is DAK 1 year and 2 years earlier, GRDP/capit is GRDP per capita, Real GRDP is REAL GRDP, BPFU is housing and facilities spending general; And. Next, ε is the error term; \beta1,..\beta8 are the coefficients of the independent variables; t is time; and i is the district/city. The significance level at the level of confidence of 95% or a = 5% is used for the accuracy of calculations while reducing human error. This test involves a significance test either partially (t test) or simultaneously (F test). Determination of the best determinant model in each region is based on the results of the partial test and the highest number of significant variables in each model.

3.1. Coefficient of Determination Value and Simultaneous Test Results

The results of statistical tests using the coefficient of determination show that the nine poverty determination models have an R2 value of more than 97 percent. This means that more than 97 percent of all variables observed in the nine poverty determinant models are considered capable of explaining variations in poverty levels in seven regions in Indonesia. The partial test results are shown in table 1. Furthermore, the results of the simultaneous test via the F test carried out on nine poverty determinant models in seven regions have a probability value of 0.00000. This means that simultaneously the nine observed models influence the poverty rate in seven regions in Indonesia. With these results, in each model there is at least one variable that partially influences the poverty level in seven regions in Indonesia.

Table 1. Coefficient of determination of nine	poverty
determinant models in seven regions	

Model	Sumatera	Jawa dan Bali	Kalimantan	Sulawesi	Maluku	Nusa Tenggara	Papua	Jumlah sig
1	5	5	4	4	4	1	4	27
2	3	5	5	4	4	5	5	31
3	4	5	5	4	2	2	3	25
4	3	4	4	5	1	1	1	19
5	3	5	4	4	3	5	5	29
6	3	6	4	4	1	2	3	23
7	2	5	2	5	3	1	2	20
8	3	4	3	3	3	4	4	24
9	3	6	2	4	2	3	2	22

Source: processed data

Through partial testing with the t test, the probability values for nine poverty determinant models in seven regions in Indonesia were obtained. The probability value determines the significance level of each variable at alpha = 0.05 as shown in Appendix 1. The results of the partial test applied to nine models of poverty determinants show that each region responds differently to the same model. This response can be seen from significant variables whose numbers differ from one region to another. Apart from that, there are areas that have the same significant variables and in other areas they are different. This condition is shown in table 2.

Model	Sumatera	Jawa dan Bali	Kalimantan	Sulawesi	Maluku	Nusa Tenggara	Paj
Model 1	0.991538	0.982904	0.973326	0.982613	0.996283	0.982875	0.98
Model 2	0.991764	0.983781	0.971574	0.982603	0.996353	0.993234	0.98
Model 3	0.991762	0.986143	0.974288	0.982875	0.996357	0.997920	0.98
Model 4	0.991892	0.985081	0.973500	0.983583	0.996236	0.982619	0.98
Model 5	0.991980	0.984999	0.971074	0.983269	0.996241	0.993108	0.98
Model 6	0.991949	0.986129	0.973794	0.983324	0.996310	0.997927	0.98
Model 7	0.992181	0.985243	0.975745	0.983936	0.996273	0.982649	0.98
Model 8	0.992097	0.985051	0.973140	0.983495	0.996254	0.993159	0.98
Model 9	0.992074	0.985977	0.975043	0.983440	0.996330	0.997939	0.98
~ 1	4 .4	4.1.					

Table 2. Number of significant variables according to the model in seven regions in Indonesia

Sumber : hasil penghitungan

Based on the information in the table, model 2 has the highest number of significant variables in seven regions in Indonesia, namely 31 variables. Each region has at least 3 - 5 significant variables. This means that the variables contained in model 2 generally play a role in influencing the level of poverty and are determinants of poverty in Indonesia. These variables are the poverty trap, economic growth, previous year's DAK, and five government function expenditures (education, health, economy, social protection, and changes and public facilities).

3.2. Determination of the Determinant Model

The difference in the number of significant variables contained in certain models indicates that the significant variables in these models are able to influence the level of poverty in certain areas. Therefore the appropriate model as a determinant of poverty in an area is a model that has the most significant variables in an area as shown in table 2.

The table shows that model 1 is the right determinant of poverty in Sumatra and Maluku with a significant number of variables 5 and 4. Model 2 is right in Kalimantan, Maluku, Nusa Tenggara and Papua with a significant number of variables 5, 4, 5 and 5, and so on. The information in the table also shows that none of the regions received model 8. This means that the variables in the model are not appropriate as determinants of poverty in all regions.

3.3. Regression Coefficient

 Table 3. Regression coefficients of the determinant model for seven regions in Indonesia

Tabel 3. Koefisien regresi model determinan tujuh kawasan di Indonesia

Variabel	Sumate	Jawa	Jawa dan Bali Kal		Kalimantan Sula		wesi Maluku		Nusa Tenggara		Papua		
	ra 1	6	9	2	3	4	7	1	2	2	5	2	5
Constant	5.45	78.29	125.52	6.31	5.8	55.86	97.44	5.16	-1.63	33.0	30.22	61.31	92.45*
TKel	0.73*	0.37*	0.34*	0.22*	0.3*	0.38*	0.36*	0.15*	0.19*	0.25*	0.26*	0.071*	0.08*
PE	- 0.01			0.02*	0.02*			-0.03*	-0.03*	0.01		0.025	
PDRB/cap		- 3.91*				-2.96					0.26		-2.07
PDRBnil			-3.71*				-3.24*						
DAK	- 0.10*					0.23*	0.3*	0.19					
DAK ₈₁				-0.05					-0.22*	-0.76*		-0.724*	-0.74*
DAK ₈₂		- 0.18*	-0.16*		- 0.09*						-0.80*		
BPdd	0.17*	0.23*	0.23*	-0.08	-0.06	0.20	0.22	0.05	0,63	-0.03	0.04	-0.291	-0.11
BKes	-0.41*	0.02	0.04	0.37*	-0.25*	-0.61*	-0.36*	0.46	0.53*	-1.92*	-1.06*	0.086	-0.14
BE	0.22*	- 0.17*	0.16*	0.19*	0.123	0.10	-0.08	-0.60*	*-0.40	0.60*	052*	-0.797*	-0.75*
BPS	-0.03	0.01	0.01	0.22*	0.21*	-0.15	-0.15	1.04*	0.89*	0.64*	0.65*	1.205*	+1.17*
BFPFU	0.07	- 0.13*	-0.15*	0.19	0.03	0.22*	0.21*	0.13	0.18	-0.11	-0.11	-0.671*	-0.6*

4. DISCUSSION

The poverty trap variable in each model shows a positive direction and has an influence on poverty levels in seven regions. This means that the poverty trap is the cause of poverty in the following year. This is also explained by (Kraay & McKenzie, 2014 and Todaro & Smith, 2015) that poverty will give birth to poverty and is the cause of poverty itself. Therefore the government must try to reduce the level of poverty so that people are not always stuck with poverty from time to time.

Steps that can be taken to overcome the poverty trap are to use significant variable determinants in each region. Variable economic growth that is significant and has a negative direction is only found in the Sumatra and Maluku Regions. This means that if economic growth increases, the poverty rate will decrease. This condition is caused because economic growth will increase the production of goods and services and will provide remuneration for the owners of production factors, namely society. As a result, people's income increases so that the poverty rate decreases.

GRDP per capita is significant with a negative direction only in three regions, namely Java and Bali, Sulawesi and Papua. GRDP per capita is individual income obtained from the production of goods and services produced in an area. If the GRDP per capita increases, it indicates the ability to produce goods and services is higher and provides income for the owners of factors of production of goods and services. This increase will result in a decrease in the poverty rate. Significant real GRDP only occurs in the Java and Bali and Sulawesi regions. Real GDP reflects a measure of the value of economic output that has been adjusted for price changes. When there is an increase in real GDP, it means that the market value of all goods and services produced is measured at constant prices. In this study, real GRDP has a negative direction, which means that if real GRDP rises, the market value of all production will rise. As a result, people whose factors of production are used appear to be getting additional income with the increase in real GRDP.

Furthermore, significant DAK with a negative direction only occurs in the Sumatra Region. This means that when the DAK increases, the poverty rate decreases. Meanwhile in the Sulawesi Region, although the DAK is significant, the direction is positive so that it has no effect on poverty. It is suspected that this is because the DAK given this year has not shown results this year. DAK has an effect on poverty when the data used is DAK for the previous year which is significant in a negative direction in the Kalimantan, Maluku, Nusa Tenggara and Papua regions. Meanwhile, the DAK for the previous 2 years was significant in a negative direction in the Java and Bali, Kalimantan and Nusa Tenggara regions.

Government spending on functions varies between regions. Expenditures on government functions are expenditures issued by regional governments to finance government facilities in order to improve the quality of human resources through expenditures on education, health, economy, social protection, housing and public facilities. With the increase in spending on government functions, it reflects the government's ability in terms of spending to improve the facilities and infrastructure needed by regions to serve their people. In the end, government spending will flow to the community whose factors of production are used to increase people's income and reduce poverty.

5. CONCLUSION

The poverty determinant model is a measure used to measure the ability of various economic variables to reduce poverty. From the results of the study it was found that each region has different determinants of poverty. This difference is due to differences in allocating government spending and activity targets for each government expenditure. One variable that is accepted by each region is the previous year's poverty trap which significantly affects the poverty rate this year. This means that if the poverty trap this year is successfully reduced, then the poverty rate in the coming year will certainly decrease. Therefore, to reduce the poverty rate in the coming year, the government can apply a poverty determinant model in each region that specifically differs between regions.

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