Multidimensional Poverty in Indonesia Period 2015–2018

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Abstract. Poverty remains a severe problem in many countries around the world. Poverty is not only seen from the economic dimension but can be seen in a multidimensional manner, such as education, health, and living standards. This study aims to analyze the dynamics of multidimensional poverty in all provinces in Indonesia, the reduction policies, and the factors that influence it. The data used is panel data from 34 provinces in Indonesia in the 2015–2018 period. The quantitative research method used to examine the factors affecting multidimensional poverty uses multiple regression analysis. The analysis results show that simultaneously (F-statistical probability), the economic growth rate, unemployment rate, and per capita income significantly affect the multidimensional poverty rate in Indonesia. It can be seen from the R-squared value of 0.954953, which means that 95.49% of the variation of the multidimensional poverty rate in Indonesia is influenced by the three independent variables used, while other factors influence the rest. When viewed partially (t-Statistic probability), economic growth has a positive but insignificant influence on Indonesia's multidimensional poverty rate. The unemployment rate has a positive and significant impact on the multidimensional poverty rate in Indonesia. Meanwhile, per capita Income has a significant negative influence on the multidimensional poverty rate in Indonesia.

Keywords: Multidimensional Poverty · Poverty Dynamics · Poverty Factors

1 Introduction

Poverty remains a major issue in many countries around the world. One of the Sustainable Development Goals (SDGs) is eradicating poverty in all forms and everywhere. It is the first, most important, and most visible component of the 2030 Sustainable Development Goals transformation agenda [1], as well as the foundation for achieving other SDGs goals [2].

The COVID-19 pandemic and the Ukrainian crisis have both had an impact on the achievement of the SDGs. It is characterized by increasing poverty [2]. The Covid-19 pandemic has also proven to be a barrier to poverty alleviation in developing countries. It is due to the unstable economic system and no financial support [1]. The Covid

19 pandemic and the Ukraine crisis significantly increased the number of poor people worldwide [3].

Poverty is a dynamic and multidimensional phenomenon, not a static and single phenomenon [4, 5]. Due to these dynamics, individuals' welfare and socio-economic status change over time [6]. Poverty is also a multidimensional phenomenon that includes economic and non-economic indicators [7]; encompasses many aspects such as the geographical, socio-economic, system, and cultural environment [8]; occurs at both the economic and social levels and can be caused by behavioral, structural, and political factors [9].

The Multidimensional Poverty Index (MPI) measures acute poverty in over 100 developing countries worldwide. UNDP & OPHI define multidimensional poverty using three dimensions and ten indicators: (1) health (nutrition and child mortality); (2) education (years of school and school attendance); and (3) standard of living (fuel for cooking, sanitation, drinking water, electrical energy, housing, and asset ownership). While Aidha measure multidimensional poverty in Indonesia using three dimensions and eight indicators, which are as follows: (1) the health dimension (sanitation, drinking water, and under-five nutrition); (2) the education dimension (early childhood education); and (3) the standard of living dimensions (source of lighting, cooking fuel, and condition of the roof, floor, and walls of the house).

The research on achieving SDGs 1 is still limited, and it has not become the primary focus of the national review document published by 75 countries in 2018 [10]. Previous research from various countries presents methods for measuring poverty levels, as well as an analysis of the dynamics and factors that influence poverty. Thompson & Dahling examined how unemployment can contribute to economic inequality and poverty in 2019. The bibliometric analysis results show that awareness of the relationship between poverty and sustainable development increases yearly. The bibliometric analysis also revealed that poverty is influenced by a lack of Income and the insecurity of basic needs [11].

In Indonesia, for example, research into the problem of poverty is conducted in various regions, with varying time dimensions and perspectives. The findings indicate that poverty persists in Indonesia. The Covid-19 pandemic has also hampered Indonesia's ability to meet SDG targets and reduce poverty levels [12]. W. Hanandita and G. Tampubolon [13] used the Alkire-Foster method to examine the multidimensional pattern of poverty in Indonesia from 2003 to 2013, finding that poverty has been reduced over the last decade at the national and regional levels. The Indonesian version of the MPI was developed by increasing consumption of the existing poverty measure with health and education information represented by disease, morbidity, primary school completion, and literacy indicators. The findings indicate that inclusive progress has been made across population subgroups, though spatial variation remains significant. Although multidimensional poverty is higher in rural areas than in urban areas, the gap is closing due to a significant increase in the incidence and intensity of poverty in rural areas. The progress made in the last 11 years has been relatively inclusive, but disparities between districts in the Indonesian archipelago remain stark.

According to Artha and Dartanto [14] in the context of Indonesia, which has socio-economic, demographic, and geographical diversity, current spending approaches to

measuring poverty cannot adequately represent the deprivation of the poor. As a result of using Alkire and Foster's multidimensional framework, the measurement that can be used to estimate poverty and identify the poor in Indonesia includes ten indicators related to three dimensions of welfare: education, health, and standard of living. According to this study, approximately 73% of the population is classified as multidimensionally poor. According to the investigation's findings into the relationship between monetary and multidimensional poverty, there was a 60 percentage point difference in the ratio of heads of poverty calculated using monetary and multidimensional poverty metrics.

Several previous studies have identified factors that influence regional poverty levels in Indonesia, including (1) research by Rofi'i et.,al [15], which states that economic growth, education, and health affect poverty levels in Gorontalo province; (2) study by Alifah et.,al [16] which states that the education factor (percentage of the population who graduated from high school) affects the percentage of poor people in the City/Regency of West Sumatra; (3) according to Sinta & Fahrati [17], HDI, per capita Income, and economic growth all have a significant effect on poverty in Hulu Sungai Selatan Regency; (4) according to Hidayatullah et al. [18], the GDP variable has a negative and significant effect on the poverty variable, the HDI variable has a negative and significant impact on the poverty variable, and the minimum wage variable has a positive and significant effect on the poverty variable (5) according to Pertiwi & Hardiyanti [19], the literacy rate variable has a significant negative impact on poverty, life expectancy has a significant positive impact on poverty, and the unemployment rate has a significant positive impact on poverty in Java.

According to the description above, there is still a scarcity of research on multidimensional poverty in Indonesia and the factors that influence it. As a result, the purpose of this research is to examine the dynamics of multidimensional poverty in all provinces of Indonesia, the reduction policies to support the achievement of the SDGs' main goals, and the factors that influence it. This research's practical contribution is to serve as a reference for developing a multidimensional poverty alleviation policy strategy in Indonesia, and its academic contribution is to serve as a reference for future strategic research.

2   Methods

This study used data from the Central Statistics Agency (BPS) and Lembaga Prakarsa. The data is panel data from 34 Indonesian provinces from 2015 to 2018. Analysis of the multidimensional dynamics of poverty portrait uses data on estimates of the number of multidimensionally poor people and multidimensional poverty rates published by the Prakarsa Institute. The Multidimensional Poor Population is the total number of poor people on multiple levels. Meanwhile, the Multidimensional Poverty Rate is the multidimensional poor population's proportion of the total population. Poor people in terms of health, education, and living standards are classified as having multidimensional poverty. For the health dimension, indicators include (1) sanitation, drinking water, and under-five nutrition; (2) early childhood education and school sustainability; and (3) sources of lighting, cooking fuel, and roof, floor, and wall conditions for the standard of living dimension [11].

Furthermore, the factors that influence the multidimensional poverty rate include factors or variables based on previous research, namely economic growth. The dependent and independent variables can be expressed using the formula below.

$$AKM = \alpha + \beta_1 LPE + \beta_2 P + \beta_3 PP + \varepsilon \tag{1}$$

AKM is the Multidimensional Poverty Rate, LPE is the Economic Growth Rate, P is Unemployment, and PP is Per Capita Income.

The data was analyzed using Eviews 12 software. Using panel data, the estimation method will generate three regression models: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM) (REM). Several tests were used to find the best regression model for estimating poverty, including the Chow test, Hausman test, and Lagrange Multiplier. The Chow test is used first to determine whether CEM or FEM will be used. The criteria used to determine which model is best for this test are as follows: if the probability value generated is more significant than 0.05, CEM is chosen; if the probability value is less than 0.05, FEM is chosen. Second, the Hausman test determines whether FEM or REM is preferable. The criteria used to determine which model is best for this test are as follows: if the probability value generated is more significant than 0.05, REM is chosen; if the probability value is less than 0.05, FEM is chosen. The Lagrange Multiplier is then used to determine whether CEM or REM will be used. The criteria used to determine which model is best for this test are as follows: if the probability value generated is more significant than 0.05, CEM is chosen; if the probability value is less than 0.05, REM is chosen.

The classical assumption test was performed in addition to the three model tests. The Multicollinearity Test is a classic assumption test, especially for panel data (Verbeek and Gujarati. The Multicollinearity Test determines whether there is a relationship between the independent variables. The multicollinearity test criteria are as follows: if the correlation value between the two independent variables is more significant than 0.8, the two variables are said to have a high correlation; if the correlation value between the two independent variables is less than 0.8, the two variables are said to have a low correlation [20].

3   Results

3.1   Dynamics of Multidimensional Poverty in Indonesia for the 2015–2018 Period

The results of data analysis on the number of poor people and the multidimensional poverty rate in Indonesia show a downward trend. In 2015, Indonesia's multidimensional poor population reached more than 34 million, with an AKM of 13.53%. In 2016, the multidimensional poor fell to 30.94 million people with an AKM of 12%. In 2017, the multidimensional population dropped dramatically to 24.95 million, with an AKM of 9.56%. Meanwhile, in 2018, the number of multidimensionally poor people fell again to 21.58 million, with an AKM of 8.17% [11]. With an average decline in the number of poor people by 14.38% from 2015–2018, the number of multidimensionally poor people in Indonesia has shrunk by 12.9 million.

The Multidimensional Poverty Rate (AKM) in all provinces in Indonesia has generally decreased. It does not apply to the provinces of DI Yogyakarta, Maluku, and North Maluku. In these three provinces, AKM experienced fluctuations. In the di Yogyakarta and North Maluku provinces, the increase in AKM occurred in 2015–2016 and decreased in 2017–2018. Meanwhile, in Maluku Province, the rise in AKM occurred in 2016–2017. Then when viewed from the high and low AKM, it can be seen that during the four-year research period, the three provinces that had the highest AKM came from provinces of Papua, East Nusa Tenggara, and West Papua, with an average AKM of 64.72%; 44,33%; and 38.14%. Meanwhile, the provinces with the lowest average AKM are DKI Jakarta, DI Yogyakarta, and Central Java, with an average AKM of 2.71%; 3.70%, and 5.21%.

When viewed based on dimensions and indicators, in the research period (2015–2018), the three most extensive indicators form multidimensional poverty in Indonesia: sanitation, cooking fuel, and drinking water. Sanitation and drinking water come from the health dimension, while cooking fuel comes from the living standards dimension. The education dimension contributes less to the formation of multidimensional poverty in Indonesia. Of the two indicators in the education dimension, the number of poor people is more due to the aspect of early childhood education than the aspect of school sustainability. In detail, the number of poor people in Indonesia in 2015–2018 based on dimensions and indicators of multidimensional poverty is presented in Table 1.

Table 1 shows that the number of poor people in each dimension and multidimensional poverty-forming indicators have decreased. The reduction of multidimensional poverty in Indonesia is inseparable from the contribution of development programs launched by the government. For example, the increasing budget allocation of health, education, and social protection has also accelerated the reduction of multidimensional poverty in Indonesia. The acceleration of government programs is also more evenly distributed. It can be seen mainly from the increase in households' beneficiaries of the poverty alleviation policy in Indonesia in the 2015–2018 period through social assistance programs such as the Family Hope Program (PKH), Social Food Assistance, Health

Table 1. Number of poor people based on dimensions and indicators of multidimensional poverty in Indonesia for the period 2015–2018 (million people).

Multidimensional Poverty Indicators	2015	2016	2017	2018
Sanitation	29,71	25,9	20,82	17,8
Drinking Water	25,36	23,45	19,38	17,42
Nutritional Intake of Toddlers	6,42	6,07	5,18	4,96
ECCE	5,79	5,64	5,26	4,74
School Sustainability	3,09	2,97	2,69	2,4
Lighting Source	10,92	9,53	7,94	3,49
Cooking Fuel	27,94	24,41	19,18	16,35
Roof, Floor, and Wall Condition of the House	10,58	9,66	4,92	4,19

Insurance Contribution Assistance (Healthy Indonesia Card) and Smart Indonesia Card (KIP) education assistance.

3.2 Factors Affecting Multidimensional Poverty in Indonesia for the Period 2015–2018

As outlined in the research methods section, the factors considered to affect multidimensional poverty in Indonesia in 2015–2018 are the Rate of Economic Growth, Unemployment, and Per capita Income. The data used is panel data, so determining the best model must go through various tests.

Chow Test, Hausman Test, Lagrange Multiplier, and Classical Assumptions. Table 2 Displays the Chow Test Results for the Various Regression Models that Were Used. The Probability Value of the Chi-Square Cross-Section is 0.0000, as Shown in Table 2. This Probability Value is Less Than the Used Level of Significance (A = 0.05). Thus, Based on the Chow Test Results in Table 2, It Can Be Concluded that the FEM Model Should Be Used.

Table 2. Chow test result.

Redundant fixed effects tests			
Equation: untitled			
Test cross-section fixed effects			
Effect Test	Statistic	D.F	Prob
Cross-Section F	59.625052	(33,99)	0.0000
Cross-section chi-square	413.243222	33	0.0000
Redundant Fixed Effects Test Equation: Untitled Test cross-section fixed effects			
Effects Test	Statistic	d.f	Prob.
Cross-section F	59.625052	(33,99)	0.0000
Cross-section Chi-square	413.243222	33	0.0000

Table 3. Hausman the Result.

Correlated Random Effects-Hausman Test			
Equation: Untitled			
Test Cross-section random effects			
Test Summary	Chi-Sa Statistic	Chi Sa. d.f.	Prob
Cross-section random	22.283099		
Cross-section random		3	0.0001

The   Hausman   Test   results   are   shown
in Table 3. The Hausman Test revealed that the probability value of cross-section r
andom was 0.0001. This Probability value is also significantly lower than the level of
significance employed. Thus, based on the Hausman Test results in Table 3, it can be
concluded that the FEM model should be used.

Based on the conclusions drawn from the Chow Test and the Hausman Test, namely
the FEM model chosen, the Lagrange Multiplier Test was not carried out. The results
of the Classical Assumption Test are shown in Table 4. The correlation value for each
pair of independent variables is less than 0.8, according to the Multicoliniertity test. As
a result, the independent variables used have no multicollinearity.

**Effect of Economic Growth Rate, Unemployment, and Per capita Income on Multi-
dimensional Poverty.** Based on the Chow Test, Hausman Test, and Classical Assump-
tion Test results, it is concluded that the FEM model can be used to estimate the Multi-
dimensional Poverty Rate in Indonesia. Table 5 shows the regression results of the FEM
model.

The regression model based on Table 5 that can be used to estimate the multidimen-
sional poverty rate in Indonesia is as follows:

$$AKM = 37.94801 + 0.047643LPE + 1.697293P - 0.000762PP \qquad (2)$$

According to Table 5, the Economic Growth Rate has a partially (t-Statistical proba-
bility) positive but insignificant influence on Indonesia's multidimensional poverty rate.
The LPE coefficient value of 0.047643 indicates a positive impact. Because the proba-
bility value for LPE is 0.7312, which is much greater than the significance level of =
0.05, it is said to be insignificant. Unemployment has a positive and significant impact
on Indonesia's multidimensional poverty rate. This is due to the fact that the P coeffi-
cient value is 1.697293 and the probability P value is 0.0002, both of which are much
lower than the significance level of 0.05. Meanwhile, the Per capita Income variable has
a negative and significant impact on Indonesia's multidimensional poverty rate. This is
due to the fact that the PP coefficient value of -0.000762 and the probability value for
PP of 0.0000 are both much lower than the significance level of = 0.05.

Then, when viewed simultaneously (F-statistical probability), the rate of economic
growth, unemployment, and per capita income all have a significant impact on Indone-
sia's multidimensional poverty rate. It is evident from the Probability (F-statistic) of
0.000. The model has an R-squared value of 0.954953 when viewed from the variations.
It demonstrates that the three independent variables used influence 95.49% of the vari-
ation in the multidimensional poverty rate in Indonesia. In comparison, the remaining
4.51% is influenced by factors that are not accounted for in the model.

Table 4. Multicollinearity test results.

	LPE	P	Pp
LPE	1	−0.2096	−0.2006
P	−0.2096	1	0.3086
Pp	−0.2006	0.3086	1

Table 5. FEM model regression results.

Dependent Variable: AKM
Method:Panel Least Squares
Date: 09/02/22 Time: 15:06
Sample:2015 2018
Periods Include: 4
Cross-section included: 34
Total panel (balanced) observations: 136

Variable	Coefficient	Std. Error	t-Statistic
C	37.94801	6.819449	5.564674
LPE	0.047643	0.138294	0.344503
P	1.697293	0.438008	3.875023
PP	−0.000762	0.000146	−5.231632

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.954953	Mean dependent var	16.61324
Adjusted R-squared	0.938572	S.D. dependent var	13.25997
S.E of reqression	3.286427	Akaike info criterion	5.444062
Sum squared resid	1069.260	Schwarz criterion	6.236475
Loq likelihood	−333.1962	Hannan-Quinn criter.	5.766078
F-statistic	58.29754	Durbin-Watson stat	1.218447
Prob(F-satistic)	0.000000		

3.3 Discussion

Based on the results of multiple regressions, it is clear that the factors influencing multidimensional poverty in Indonesia from 2015 to 2018 are the rate of economic growth, unemployment, and per capita income. Meanwhile, only unemployment and per capita income have a significant impact on multidimensional poverty in Indonesia when viewed in isolation. Unemployment has a positive impact on multidimensional poverty in Indonesia, whereas per capita income has a negative impact. While the rate of economic growth has a positive impact on multidimensional poverty, the impact is not significant.

The findings revealed that the rate of economic growth has a positive but insignificant impact on multidimensional poverty in Indonesia. It is in line with previous research proposed by [21] that economic growth has a positive effect on poverty; research [22] that economic growth variables do not have a significant negative impact on the poverty rate in Indonesia; research [23] that economic growth does not have a significant effect on reducing the poverty rate, and research [24] that economic growth has no effect and is not significant to the poverty variable. However, the results of this study are different from previous studies, which stated that economic growth has a negative and significant effect on the poverty rate [15, 17, 18].

The unemployment rate has a positive effect on multidimensional poverty in Indonesia. It is in line with the results, which state that the unemployment rate contributes to

poverty. Thompson & Dahling [25] explained that at least four aspects that psychologically cause unemployment have a positive and significant effect on multidimensional poverty. First, unemployment has financial and psychological consequences capable of damaging the lives of individuals, families, and society. It happens because an unemployed person is financially unstable, both individually, family, and in society. It results in increased financial stress and decreased ability to support family and community finances. So that the ownership of resources to overcome anxiety becomes less compared to people who are more financially stable. The unemployment rate is related to poverty in the broader environment (society). Thus, the increasing unemployment rate will increase the multidimensional poverty rate.

Per capita income negatively and significantly influences multidimensional poverty in Indonesia. It is in line with the results, which state that per capita income negatively impacts poverty substantially. It means that when the per capita income of people in Indonesia increases only slightly, multidimensional poverty in Indonesia will decrease significantly. On the other hand, if per capita income decreases, it will impact the multidimensional poverty rate in Indonesia. Per capita Income is one of the tools used to measure the level of community welfare in an area. The higher per capita income in that area, the higher the with the increase in people's purchasing power, the welfare of the site will also increase. Thus, the increasing welfare of the community will reduce the multidimensional poverty rate.

4   Conclusion

Based on the results of the research that has been carried out, several conclusions were obtained as follows. First, the dynamics of multidimensional poverty in Indonesia in 2015–2018 experienced a downward trend. The number of poor people and the aggregate multidimensional poverty rate continue to decline. At the beginning of the study period, the number of multidimensionally poor people was 34.48 million, with an average decrease of 14.378% of Indonesia's multidimensional poor population in 2018 to 21.58 million. Similarly, the multidimensional poverty rate has decreased. At the beginning of 2015, Indonesia's AKM reached 13.53%. An average decrease of 18.429% of Indonesia's AKM in 2018 to 8.17%.

The decline in the multidimensional population and AKM is partly due to poverty reduction policies in Indonesia. During the research period, several multidimensional poverty reduction policies in Indonesia included the Family Hope Program (PKH), Social Food Assistance, Health Insurance Contribution Assistance (Healthy Indonesia Card), and Smart Indonesia Card (KIP) education assistance.

The results of multiple regression analysis on the factors that affected multidimensional poverty in Indonesia in 2015–2018 show that (1) Economic Growth Rate has a positive but not significant effect on multidimensional poverty in Indonesia; (2) Unemployment has a positive and significant effect on multidimensional poverty in Indonesia, and (3) Income per capita has a negative and significant effect on multidimensional poverty in Indonesia.

The research recommends that the government use macro and micro policies to reduce unemployment, increase the rate of economic growth, and per capita income.

About the results of the research that has been carried out, the advice that can be given is as follows. First, this study uses data from 2015–2018 so that conditions in the latest year cannot be known. It is recommended that researchers who are interested in conducting similar research use the latest data so that the latest conditions regarding Indonesia can be analyzed more comprehensively. Second, looking at multidimensional poverty, researchers use data from non-governmental institutions. For this reason, it is highly expected that government agencies such as the Central Statistics Agency have complete data on globally recognized multidimensional poverty indicators so that researchers do not have difficulty obtaining the data in question. Third, further research can be conducted to assess the effectiveness of multidimensional poverty reduction policies.

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