The Factors Influencing the Extreme Poverty Rate in Medan City in 2008-2022

Dea Ameylia[1],*, Dewi Mahrani Rangkuty[1], Annisa Ilmi Faried[1], Kiki Hardiansyah Siregar[1]

[1]Universitas Pembangunan Panca Budi, Indonesia

*E-mail:deaameylia2@gmail.com

ABSTRACT

Poverty remains a significant issue in various developing countries, including Indonesia, still face high poverty problems and many people live below the poverty line. This situation negatively impacts individuals' well-being, particularly their ability to meet basic needs such as food, clothing, and shelter. In North Sumatra, especially Medan City, high population density combined with limited job opportunities raises concerns that these factors may worsen poverty levels in the region. To combat and lessen poverty in Medan City, an efficient solution is therefore required. The purpose of this study is to examine how extreme poverty in Medan City is impacted by several factors between 2008 and 2022, including the unemployment rate, education level, population, workforce, investment, inflation, and economic growth. The data used in this study were taken from the Central Statistics Agency (BPS) of Medan City, which includes various publications such as *Medan City in Figures*, poverty statistics, and city data from 2008 to 2022. The methods used in this study are Confirmatory Factor Analysis (CFA) and multiple linear regression. The results of the study show that education level and economic growth have a significant effect on poverty in Medan City, while factors such as unemployment, population, workforce, investment, and inflation do not show a significant effect. Based on these findings, it can be concluded that improving education and fostering economic growth are key to reducing extreme poverty in Medan City.

KEYWORDS

Unemployment; Population; Education Level; Economic Growth; and Extreme Poverty

1. INTRODUCTION

Poverty is a phenomenon that is still difficult to eliminate and will most likely never be completely eradicated from the world. Poverty arises due to differences in ability, opportunity, and resources. Todaro and Smith argue that solving the problem of poverty and inequality in income distribution is the root of many development problems and is the main goal of development policies in various countries. The topic of poverty has always been an important topic of discussion among economists around the world. Although global poverty cannot be eliminated, this problem must remain a major concern, because of its wide impacts, including increased crime. Those who live in poverty are often unable to meet their social needs, such as decent education, adequate access to health, and optimal implementation of religious obligations, and in the end, they do not have a prosperous life. Although many people who are not classified as poor also face difficulties in living a religious life or obtaining a good education, this difference is more related to individual willingness than ability.

According to the Central Statistics Agency, poverty is seen as the inability of the economy to meet basic needs, both food and non-food, which is measured by expenditure. Therefore, a person is categorised as poor if their per capita expenditure is below the poverty line.

The economic crisis not only destroyed various development programs but also damaged the economic order that had been built through the ongoing development process. Worse, this crisis made most people unable to enjoy basic facilities, such as adequate education, transportation facilities, and other infrastructure. Locally and nationally, poverty has four main dimensions, namely: lack of opportunity, low level of ability, low level of social security, and low level of capacity or empowerment.

Poverty remains a major challenge faced by many developing countries, including Indonesia, especially in Medan City, face major challenges in terms of poverty, Indonesia has difficulty overcoming poverty, especially due to rapid population growth and the dominance of the lower middle class. Various efforts made by the government to reduce poverty, such as migration programs to underdeveloped areas and industrial development in city centers, have not produced significant results. Industrial development in urban areas often worsens poverty conditions in the suburbs of large cities.

Thus, poverty is one of the main priorities in development. According to the Central Statistics Agency (2020), poverty is measured as the economic inability to meet basic food and non-food needs as reflected in household expenditure. Although the government has made many efforts to reduce poverty, the results have not shown significant changes in reducing poverty rates in Indonesia. This unresolved poverty problem has the potential to hurt the economy and society as a whole.

Medan City, as a large city that continues to experience rapid population growth and development, faces various challenges, including social, environmental, and legal issues. As a metropolitan city, Medan is inhabited by people with diverse social backgrounds, residences, economic status, and jobs. Residents in Medan, like those in other big cities, work in a variety of occupations, including traders, teachers, civil servants, office workers, entrepreneurs, and laborers. These various jobs are a way for people to meet their basic daily needs, which are very important for the survival of each individual.

From 2008 to 2022, there were notable swings in the proportion of the population living in poverty in Medan City. From 2008 to 2009, the percentage of the population living in poverty rose by 10.43 and then fell by 9.58. 2010 had another 10.53 increase, 2011 saw a 9.63 reduction, and 2012 saw yet another 9.33 decrease. In 2013 it increased by 9.64, then in 2014 experienced a decrease again of 9.12, then in 2015 experienced an increase of 9.41, then in 2016 experienced a decrease of 9.30, then in 2017 experienced a decrease again of 9.11, then in 2018 experienced a decrease of 8.25, then in 2019 experienced a decrease again of 8.08, then in 2020 experienced a decrease of 8.01, then in 2021 experienced an increase of 8.34, and then in 2022 experienced a decrease of 8.07.

The decline in the percentage of poor people in Medan City is a positive development that reflects the success of the Medan City Government in poverty reduction efforts in overcoming poverty through various policies implemented. The problem of poverty is indeed closely related to the fulfilment of basic living needs. To meet their basic needs, people carry out various activities that support their survival.

Being a large city, Medan ought to be better equipped to deal with the issue of poverty. In actuality, though, this social issue still persists. Medan's 8% poverty rate is still very high, and it ought to be able to be brought down to less than 5%. The high poverty rate shows that the efforts made by the Medan City Government to reduce poverty have not been fully effective. This urban poverty certainly triggers other social problems. In recent years, several crimes with economic motives, such as robbery, theft, and snatching, have increased along with the high poverty rate in this city.

Table1.Poverty Level sat Districts/Cities in North Sumatra

	Pakpak Barat	Medan		Pakpak Barat	Medan
2008	6.13	217.30	2016	4.95	206.87
2009	5.93	200.40	2017	4.95	204.22
2010	5.60	212.30	2018	4.66	186.45
2011	5.39	204.19	2019	4.52	183.79
2012	5.32	201.06	2020	4.59	183.54
2013	4.94	209.69	2021	4.59	183.54
2014	4.72	200.32	2022	4.79	193.03
2015	5.12	207.50			

Source: Statistics of North Sumatra Province

According to Central Bureau of Statistics data, the highest poverty rate in the regencies/cities of North Sumatra in 2008-2022 was the poverty rate in Medan, which reached 193.03%, and the lowest poverty rate in the regencies/cities of North Sumatra in 2008-2022 was the poverty rate in Pakpak Bharat, which reached 4.79%.

The distance between Medan City's center and its environs, particularly North Medan, remains wide. While the Medan City Government prefers to overlook the North Medan area, the majority of the present development initiatives are more concentrated on the city center. Among the many issues this area suffers is inadequate infrastructure. Floods frequently happen during the rainy season as well as during tidal floods or high tides. This problem is not only related to physical development but also includes more complex socio-economic problems. One is the lack of access to work skills education, which impacts limited employment opportunities in the area. Therefore, it is not surprising that the unemployment rate in North Medan remains high.

From the phenomenon, the author can in principle study through Gross Regional Domestic Product with the title: "Factors Affecting the Extreme Poverty Levelin Medan City in 2008-2022".

2. METHODOLOGY

In this study, the data that has been collected is then processed and analyzed using Confirmatory Factor Analysis and Multiple Linear Regression Analysis techniques. Confirmatory Factor Analysis aims to find ways to summarize the information contained in the original (initial) variables in new dimensions or variables (factors), with the formula:

$$Xi = \beta i_1 F_1 + \beta i_2 F_2 + \beta i_3 F_3 + Vi\mu i + e$$

where:
Xi = Standardized-variable
Bij = Partial regression coefficient for variable i on the j the common factor
Fj = The i-the common factor
Vi = Standardized regression coefficient for the i-the variable on the i-the unique factor
μi = Unique factor of the i-the variable

Multiple regression analysis is used to determine the direction and magnitude of the influence of the in variable nthedeEc Growthndent variable, with the formula:

$$Y = a_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + e$$

where:
Y = Gross Regional Domestic Product
a = Constant
x1,x2,x3 = Relevant Variable/Relevant Factor
e = Error term.
b = Regression Coefficient

Before entering the multiple linear regression test, first determine the Classical Assumption Test. The classical assumption test is a statistical requirement that must be carried out in multiple linear regression analysis based on an ordinary lest square. The tests carried out are the Data Normality Test, Multicollinearity Test, and Autocorrelation Test. The purpose of this study is to determine how Medan City's extreme poverty is impacted by the distribution of unemployment, education level, population, labor, investment, inflation, and economic growth.

3. RESULTS AND DISCUSSION

Confirmatory Factor Analysis Data Analysis Results

Table2.KMO and Bartlett's test

KMO and Bartlett's Test		
Kaiser-Meyer-OlkinMeasureofSamplingAdequacy.		.660
Bartlett'sTestofSphericity	Approx.Chi-Square	62.679
	df	21
	Sig.	.000

Source: SPSS version 25.0 processing results

The *principal component* method is the approach utilized in this factor analysis. The Kaiser-Meyer-Olkin (KMO) value, as seen in the above table, is 0.660. This score shows that the data is suitable for factor analysis and other forms of further investigation. The correlation matrix that was created is not an identity matrix because the Bartlett's Test of Sphericity value of 62.679 with a significance value of 0.000 is significantly less than 5%. To put it another way, the factor model that was employed is excellent.

The *Measure of Sampling Adequacy* (MSA) test is the following phase, in which every variable is examined to identify which ones should be eliminated and which can be processed further. Each variable must have an MSA value greater than 0.5 in order to proceed with processing. This MSA value, which is the correlation number denoted by the letter "a" and situated diagonally from top left to bottom right, may be found in the *Anti-Image Matrice* table in the *Anti-Image Correlation* section.

Table 3.Anti-image Matrices

Anti-image Matrices		X1	X2	X3	X4	X5	X6	X7
Anti-imageCovariance	Unemployment	.120	.078	.064	-.006	.028	.058	.094
	Level of Education	.078	.110	.022	-.052	-.058	-.015	.050
	Population	.064	.022	.237	-.085	-.024	-.038	.145
	Labor	-.006	-.052	-.085	.662	.036	.170	-.131
	Investment	.028	-.058	-.024	.036	.171	.123	.034
	Inflation	.058	-.015	-.038	.170	.123	.604	-.055
	EC GROWTH	.094	.050	.145	-.131	.034	-.055	.184
Anti-imageCorrelation	Unemployment	.590[a]	.682	.380	-.020	.193	.215	.631
	Level of Education	.682	.716[a]	.135	-.193	-.420	-.058	.353
	Population	.380	.135	.707[a]	-.214	-.119	-.101	.695
	Labor	-.020	-.193	-.214	.548[a]	.106	.269	-.376
	Investment	.193	-.420	-.119	.106	.833[a]	.383	.189
	Inflation	.215	-.058	-.101	.269	.383	.596[a]	-.164
	EC GROWTH	.631	.353	.695	-.376	.189	-.164	.585[a]

a. Measure sof Sampling Adequacy (MSA)

Source: SPSS version 25.0 processing results

From the table above, it can be seen that the variables in this study have MSA values greater than 0.5, which indicates that these variables meet the requirements for further analysis as a whole. Additionally, to determine which variables have *commonalities* values above or below 0.5, the results of the analysis show the following:

Table4.Communalities

Communalities		
	Initial	Extraction
Unemployment	1.000	.898
Level of Education	1.000	.912
Population	1.000	.789
Labor	1.000	.575
Investment	1.000	.884
Inflation	1.000	.531
EC GROWTH	1.000	.880

ExtractionMethod:PrincipalComponentAnalysis.

Source:SPSSversion25.0processingresults

The data analysis's findings indicate that a variable's association to the factors created is stronger when its *commonalities* value is larger. The extraction findings for each variable are shown in the commonalities table, along with the percentage of variance that can be accounted for by the underlying causes. In this study, seven variables contribute more than 0.5 (or 50%), meaning they explain more than half of the variance in the data. These variables include unemployment and education level, population, workforce, investment, inflation, and economic growth. However, the feasibility of this model must be further tested using *Explained Variance*.

Table5.Total Explained Variance

	Total Variance Explained								
Compo nent	\multicolumn{3}{}{InitialEigenvalues}			ExtractionSumsofSquare dLoadings			RotationSumsofSquaredLo adings	
	Total	%ofVari ance	Cumula tive%	Total	%ofVa riance	Cumula tive%	Total	%ofVaria nce	Cumul ative%
1	3.490	49.858	49.858	3.490	49.858	49.858	2.923	41.757	41.757
2	1.779	25.418	75.276	1.779	25.418	75.276	2.346	33.519	75.276
3	.913	13.039	88.315						
4	.468	6.680	94.996						
5	.180	2.576	97.572						
6	.113	1.618	99.189						
7	.057	.811	100.00 0						

ExtractionMethod:PrincipalComponentAnalysis.
Source:SPSSversion25.0processingresults

Only two variable components are recognized to be factors influencing poverty, according to the findings of the total variance explained in the original Eigenvalues table. When determining the variance of the seven variables under analysis, eigenvalues show the relative significance of each component. It is evident from the preceding table that just two elements are formed. due to the fact that factor 2 has 1,779 and the two factors' combined eigenvalues are 3,490, both of which are greater than 1. in order for the factoring procedure to end at the sole factor that will be involved in the subsequent analysis.
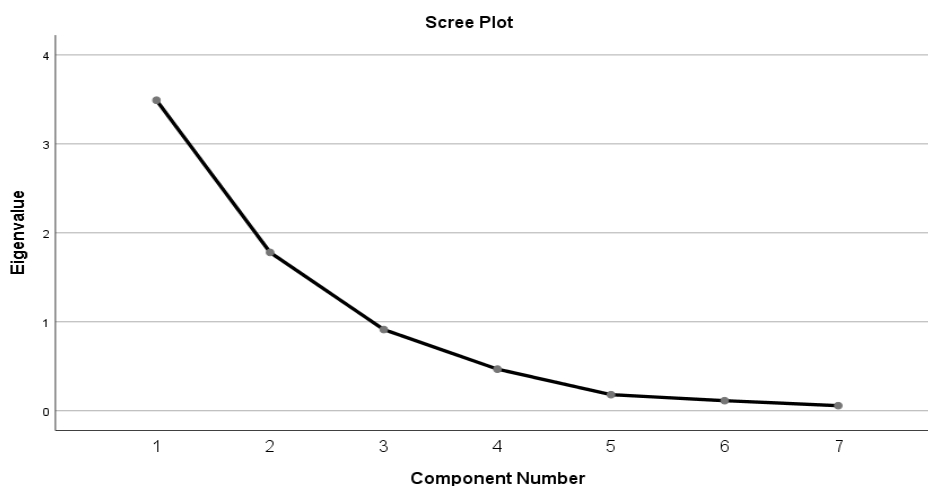
Source:SPSS version 25.0 processing results
Figure 1.Scree plot Component Number

From one to two components (the line from the Component Number axis), the scree plot graph indicates that the graph's direction falls from number 1 to number 2, from number 2 to number 3, and from number 3 onwards, the line is below number 1 of the Y axis (Eigenvalues). This demonstrates that the easiest way to summarize the eight variables is to use two components.

Table 6.Component Matrix

Component Matrix		
	Component	
	1	2
Unemployment	-.737	-.596
Level of Education	.914	.278
Population	.852	-.252
Labor	.259	.639
Investment	.940	-.030
Inflation	-.354	.553
Ec Growth	-.557	.754

ExtractionMethod:PrincipalComponentAnalysis.
a.2componentsextracted.
Source:SPSSversion25.0processingresults

The Component Matrix table, which displays the distribution of the seven variables on the two factors generated, can be examined once it is determined that two factors is the most ideal number. Factor loadings, represented by the numbers in the table, indicate how strongly a variable is correlated with factors 1 and 2. The process of determining which variables will enter which factor, is done by comparing the amount of correlation in each row. The component matrix table shows correlations above 0.5 for several variables. on factor 1, namely:
1. The level of education has a factor loading of 0, 914
2. Total population has a factor loading of 0, 852
3. Investment has a factor loading of 0, 940

In factor 2, the variables that show a correlation above 0.5 are:
1. Labor has a factor loading of 0.639
2. Inflation has a factor loading of 0, 553
3. Economic growth has a factor loading of 0.754.

Because numerous items had nearly identical correlation values, it was initially still challenging to extract the dominating items that were part of the factor. A table that displays the outcomes of the rotation is provided below to help overcome this and provide a clearer explanation of the distribution of variables. In factor analysis, a variable's loading or correlation with a factor determines where it falls on the factor.

Table7.Rotated Component Matrix

Rotated Component Matrix[a]		
	Component	
	1	2
Unemployment	-.946	-.062
Level of Education	.907	-.299
Population	.551	-.697
Labor	.580	.373
Investment	.751	-.565
Inflation	.028	.656

EC Growth	-.021	.938

ExtractionMethod:PrincipalComponentAnalysis.
RotationMethod:VarimaxwithKaiserNormalization.[a]
a.Rotationconvergedin3iterations.
Source:SPSSversion25.0processingresults

The Component Matrix resulting from the rotation process (Rotated Component Matrix) shows a clearer and more real distribution of variables. Determining the input of variables into a particular factor follows the amount of correlation between the variable and the factor, namely to a large correlation. According to the component matrix value results, two of the eight components are recognized to be plausible in influencing extreme poverty. These elements are generated from:

a. The largest component 1: Education level
b. 2nd largest component: Economic growth

So that a new dimension of multiple linear regression is formed with the following conceptual framework:

Furthermore, the multiple linear regression equation model in this study is formulated:

$$Y = a_0 + b_1X_1 + b_2X_2 + e$$

where:
Y = Extreme Poverty
X1 = Education Level
X2 = Economic Growth
e = Error term

The multiple linear regression model in this study uses the classical assumption test, namely:

a. Normality Test
b. Multicollinearity Test
c. Autocorrelation Test

3.1. Analysis of Confirmatory Factor Analysis (CFA) Results

From the results of the CFA analysis, shown in the KMO and Bartlett's test table, the Kaiser Mayer Olkim (KMO) value is 0.660, which is greater than the value of 0.5. This value indicates that the data processed is valid for further analysis with factor analysis. However, the sig (significant) value of 0.000 is less than 5%, while the Bartlett test score is 62.679. At that point, the correlation matrix's value is less than 5%.

3.2. Effect of Education Level on Extreme Poverty

Based on the results of the management of Confirmatory Factor Analysis (CFA) in the rotation output (Rotated Component Matrix) proves that the results of the test there is a significant effect of the level of education on extreme poverty in Medan City. It shows that the estimated parameter between the effect of education level on Extreme Poverty shows significant results with a value of 0.907. Thus the first hypothesis is accepted, meaning that if the level of education increases or is fulfilled, extreme poverty decreases.

In line with the research entitled The Effect of Education Level, Infrastructure, and Village Funds on Poverty Levels in Regencies / Cities of Bali Province (Jayanti, 2021). Stating that the level of education has a negative and significant effect on the poverty rate. The effect of increasing the level of education will reduce the poverty rate in regencies/cities in Bali Province. This is because increasing the level of education will improve the quality of human

resources (HR) of the People in an area so that it can reduce the unemployment rate in the area. With the decrease in unemployment, the productivity of the community will certainly increase so that it can meet the needs of its own life/family. (Azizah et al, 2018) in their research stated that the level of education has a significant effect on poverty. According to (Aristina and Sri Budhi) the level of education has a simultaneous and significant effect on poverty in Bali Province. The level of education hurts the poverty rate partially and simultaneously.

3.3. The Effect of Economic Growth on Extreme Poverty

Based on the results of the management of Confirmatory Factor Analysis (CFA) in the rotation output (Rotated Component Matrix) shows that the largest component 1 is kEconomic Growth of 0.938, worthy of influencing Extreme Poverty. So it can be concluded that Economic Growth is significant to Extreme Poverty in Medan City.

This is in line with a study entitled Analysis of the Effect of Economic Growth, District Minimum Wage, and Unemployment, on Poverty in Madiun Regency (Oktaviana, 2021) which states that Economic Growth partially has a negative and significant effect on poverty in Madiun Regency in 2002-2019. The results of this study are from several previous studies conducted by (Purnama) which explain that economic growth has a negative and significant effect on poverty. Economic growth in Madiun Regency affects poverty, this is influenced by the agricultural sector, esEc Growthcially food crops.

This research is not in line with research conducted on the effect of economic growth on poverty levels with unemployment as mediation in Probolinggo (Rosidatul, 2023) which states that economic growth has no significant effect on the level of poverty in the city and district of Probolinggo.

4. CONCLUSION

Based on the discussion, the conclusions of this study are: (a) Barlett's Test and the CFA test on the KMO demonstrate that the data is legitimate and amenable to factor analysis. According to the Rotated Matrix table, two of the seven factors economic growth and education level have the potential to affect extreme poverty in Medan City. (b) The relationship between Extreme Poverty and Education Level indicates that Extreme Poverty is significantly influenced by Education Level. (c) Economic growth's impact on extreme poverty demonstrates that economic growth significantly affects extreme poverty.

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