

Determinants of the number of impoverished people in Central Java, Indonesia

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ABSTRACT

Purpose — *This research aims to estimate the impact of the education index, health index, poverty alleviation budget, and purchasing power on the number of impoverished people.*

Method — *This study employs panel data regression, utilizing samples from 35 regencies/cities in Central Java Province with annual data spanning from 2016 to 2022. The data is processed using Eviews 10 software.*

Result — *By using the Fixed Effects Model (FEM) approach, we found that the education index and health index have a positive impact on reducing the number of impoverished people, while the poverty alleviation budget and purchasing power have a negative impact on the number of impoverished people.*

Novelty — *This research adds value by focusing on purchasing power and poverty alleviation budgets, which have been less explored in previous studies. By delving into these aspects, the research provides a deeper understanding of the poverty dynamics in Central Java Province, offering new insights and more targeted solutions to effectively address poverty-related issues.*

Keywords: *poverty, education, health, poverty alleviation budget, purchasing power, panel data*

INTRODUCTION

The potential of sustainable development to address poverty issues lies in its ability to create employment opportunities, increase income for the population, and reduce poverty rates (Zhu et al., 2022). Additionally, investments in infrastructure, health, and education sectors are key elements in development efforts that can enhance the quality of life for communities and expand their access to basic services (Du et al., 2022). Sustainable development endeavors can also contribute to reducing economic disparities by providing more equitable opportunities for all segments of society (Kanbur, 2021). Therefore, well-planned development initiatives have the potential to be effective solutions in poverty reduction.

Table 1. Number of impoverished people and poverty alleviation budget in Indonesia from 2016 to 2022

Year	Number of impoverished people (million people)	Poverty alleviation budget (trillion rupiah)
2016	27,764	7,305
2017	26,583	7,194
2018	25,675	10,028
2019	24,786	10,450
2020	26,424	12,540
2021	27,543	14,622
2022	26,161	11,350

Source: BPS and Portal DJPK (2023)



Table 1 reveals that Indonesia witnessed its highest number of impoverished people in 2016 and 2021. According to data from BPS Central Java Province, the average poverty contribution was 4.5 million people. Brebes Regency recorded the highest average number of impoverished people at 315.47 thousand people, while Salatiga City had the lowest with 9.57 thousand people. However, in 2022, Indonesia's number of impoverished people saw a significant decrease following the economic recovery post-Covid-19 pandemic. In contrast, data on poverty alleviation budgets experienced fluctuations. In 2021, the highest budget recorded was 14.622 trillion rupiah, attributed to the global Covid-19 pandemic at that time.

The issue of poverty is a significant challenge faced by Indonesia, including in the province of Central Java. To address this problem, the government typically implements policies and special programs, such as poverty alleviation budgets. Research by Rurun et al. (2018) indicates that poverty alleviation budgets have a negative impact on poverty. Additionally, poverty alleviation budgets serve as a strategic foundation for allocating resources to achieve sustainable development goals. However, despite significant efforts in allocating funds to address poverty, data shows persistent challenges in controlling the number of impoverished people. This aligns with the findings of Ramdani (2015) and Melati & Burhany (2021), where poverty alleviation budgets have proven ineffective in tackling the issue of poverty. This suggests that poverty alleviation programs still require evaluation and improvement. External factors, such as economic changes and the impact of the Covid-19 pandemic, also pose challenges for the government in reducing poverty (Singh & Chudasama, 2020).

Human capital, specifically education and health, plays a pivotal role in addressing poverty issues, as highlighted by Muzam (2023) and Nutbeam & Lloyd (2021). Education and health are central to poverty reduction efforts. Despite substantial budget allocation efforts, the poverty rate can be effectively reduced by enhancing community access to education and health services. Quality education equips individuals with the skills and knowledge needed to improve their employment prospects. Meanwhile, improved access to healthcare supports workforce productivity and competitiveness. Research by Wibowo (2014), Margareni et al. (2016), Palenewen et al. (2018), and Jacobus et al. (2021) suggests that education and health have a positive impact on poverty reduction. This is because individuals are better equipped to participate effectively in economic activities, leading to a more resilient economic environment and expanded employment opportunities (Sima et al., 2020).

Furthermore, the increase in community purchasing power, as explained by Samiun & Muhammad (2018), can also reduce poverty levels. Improved purchasing power resulting from effective economic policies can enhance access to basic necessities such as food, healthcare, and education. Findings from Amaliah et al. (2020) also suggest that increased purchasing power has a positive impact on poverty reduction. When purchasing power rises, people tend to have greater access to goods and services, which can improve their overall well-being and ultimately reduce poverty levels. Conversely, economic constraints can lead to or worsen poverty, underscoring the importance of economic policies that support the enhancement of community purchasing power (Priseptian & Primandhana, 2022).

Previous studies by Margareni et al. (2016), Palenewen et al. (2018), Rurun et al. (2018), Amaliah et al. (2020), Jacobus et al. (2021), and Melati & Burhany (2021) have provided empirical insights into the factors influencing poverty. The main distinction in this study, compared to earlier research, lies in its examination of the purchasing power and poverty alleviation budget factors in relation to poverty, aspects that have not been extensively explored in prior studies. Therefore, this research contributes to a deeper understanding of the factors influencing poverty in Central Java Province.

In the introduction provided, the purpose of this study is to assess the impact of the education index, health index, purchasing power, and poverty alleviation budget on the number of impoverished people in Central Java Province. This research is of paramount importance as it can yield significant insights into the factors influencing the population of impoverished individuals in Central Java Province. The findings obtained can serve as a solid basis for crafting

more effective policies aimed at improving community well-being, optimizing budget allocation strategies, and bolstering poverty alleviation initiatives.

METHOD

This research is a quantitative study that utilizes secondary data obtained from the Central Statistics Agency (BPS) and the DJPK Portal. Data collection for this research was conducted through documentation and a comprehensive literature review. The analytical approach employed in this study is panel data analysis, which combines both cross-sectional and time series data. The cross-sectional data encompass 35 regencies/cities in Central Java Province, while the time series data covers the years 2016-2022. The primary focus of this analysis is the number of impoverished people. The estimation models under consideration include the Common Effects Model (CEM), Fixed Effects Model (FEM), and Random Effects Model (REM). To identify the most appropriate model, two tests are conducted: the Chow Test and the Hausman Test. This study utilizes key variables established in prior research, as several independent variables have been found to influence the number of impoverished people, and this data is readily available at the national level (Ramdani, 2015; Margareni et al., 2016; Zuhdiyaty & Kaluge, 2017; Meimela, 2019; Jacobus et al., 2021). Therefore, this research applies the following statistical models:

$$LOG(JPM)_{it} = \beta_0 + \beta_1 IP_{it} + \beta_2 IK_{it} + \beta_3 LOG(APK)_{it} + \beta_4 LOG(PPKD)_{it} + \varepsilon_{it}$$

Information:

JPM = Number of Impoverished People (Thousand People)

IP = Education Index (%)

IK = Health Index (%)

APK = Poverty Alleviation Budget (Billion Rupiah)

PPKD = Purchasing Power (Thousand Rupiah/People/Year)

LOG = Logarithm

ε = Error Term

β_0 = Constant

$\beta_1 \dots \beta_4$ = Regression Coefficient of Independent Variable

it = Panel Data

Hypotheses development

Education index and number of impoverished people

High-quality education is widely recognized as a pivotal factor in poverty reduction, as it has the capacity to enhance skills and improve competitiveness in the workforce (Spada et al., 2023). Communities with higher levels of education tend to enjoy improved access to well-paying jobs, ultimately leading to a reduction in unemployment rates. Furthermore, quality education is seen as a catalyst for fostering innovation and driving economic development, with the potential to alleviate poverty on a broader scale (Apostu et al., 2022).

H1: The education index has a negative impact on the number of impoverished people

Health index and number of impoverished people

Maintaining good health in individuals has a positive impact on their workplace productivity, enabling them to work more efficiently and contribute significantly to the economy. This, in turn, can lead to increased income and a reduction in poverty rates (Kirsten, 2010). Additionally, healthier communities tend to incur lower healthcare costs, as they require fewer medical treatments. This, in effect, eases the financial burden of healthcare expenses, which often push families into poverty or exacerbate existing poverty conditions (Vaughan et al., 2015). Therefore,

improving health indices can be viewed as a long-term investment in sustainable economic development and the reduction of poverty levels.

H2: The health index has a negative impact on the number of impoverished people

Purchasing power and number of impoverished people

Greater purchasing power within society empowers individuals to access higher-quality education, enhance their skills, and increase their prospects for better employment opportunities (Fajaryati et al., 2020). Furthermore, higher purchasing power facilitates improved access to healthcare services, which in turn reduces the risk of diseases that could exacerbate economic hardships (Bronchetti et al., 2019). Additionally, sufficient purchasing power enables communities to secure adequate housing, thereby creating a more stable living environment. Consequently, enhancing the purchasing power of the community can create pathways for improving overall quality of life and reducing the risk of poverty through enhanced access to education, healthcare, and housing.

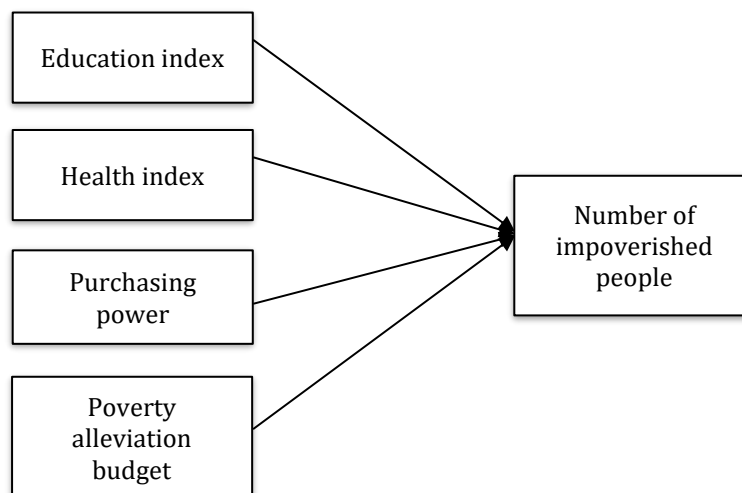
H3: Purchasing power has a negative impact on the number of impoverished people

Poverty alleviation budget and number of impoverished people

The reallocation of a larger budget for poverty alleviation programs offers essential financial support to implement effective policies and programs aimed at reducing poverty (Nugroho et al., 2021). An increased budget may encompass funding for social assistance, skills training, and economic empowerment initiatives that can enable impoverished communities to enhance their living standards. Consequently, having sufficient financial resources can provide opportunities to design and implement anti-poverty programs more effectively, ultimately resulting in a more positive impact in addressing the issue of poverty.

H4: The poverty alleviation budget has a negative impact on the number of impoverished people

Figure 1. Research framework



Source: Developed by the authors (2023)

RESULT AND DISCUSSION

Descriptive statistics

Table 2 presents the results of descriptive statistics. The findings indicate that the variable "number of impoverished people" has a maximum value of 348 and a minimum value of 8,650, with a standard deviation of 66,664. Furthermore, the mean and median values of all variables fall within their respective minimum and maximum ranges. This suggests that the data are normally distributed for all variables. The average value for the variable "number of impoverished people" is 116,408. Additionally, the education index (0.616), health index (0.843), purchasing power (10,905.73), and poverty alleviation budget (13,454) also fall within this range. The total number of observations is 245.

Table 2. Descriptive statistics

Statistics	JPM	IP	IK	PPKD	APK
Mean	116.4083	0.615783	0.843342	10905.73	13.45416
Median	104.8200	0.598111	0.840615	10514.00	11.38000
Maximum	348.0000	0.793611	0.889538	16351.00	74.56000
Minimum	8.650000	0.521500	0.744769	7447.000	0.090000
Std. Dev.	66.66449	0.065251	0.028853	1788.488	11.19726
Observations	245	245	245	245	245

Source: Eviews 10, processed (2023)

Preliminary analysis

The classic assumptions testing refers to a series of statistical tests conducted to ensure that the regression model used meets its basic assumptions. In this research, various classic assumption tests were performed, including tests for multicollinearity, heteroskedasticity, and residual normality.

Multicollinearity is a method used to identify the presence of multicollinearity issues in a regression model, where independent variables are highly correlated. This test helps determine the extent to which variability in one variable can be explained by variability in another variable. Multicollinearity problems may arise if the correlation among independent variables exceeds 0.95. In this study, multicollinearity testing was conducted using correlation methods among independent variables. The results indicate that there is no multicollinearity issue as the correlation values among independent variables are all less than 0.95.

Heteroskedasticity testing is a statistical method used to determine whether the variation of errors (residuals) in a regression model changes significantly across independent variable values. Heteroskedasticity issues may arise if the probability values of one or more independent variables are less than the significance level of 0.05. In this study, the heteroskedasticity test was conducted using the Glejser method. The results indicate that there is no heteroskedasticity issue, as the probability values for all independent variables, namely the education index, health index, purchasing power, and poverty alleviation budget, are greater than the significance level of 0.05.

The normality test is employed to ascertain whether the data at hand adheres to a normal distribution. Data is considered non-normally distributed if the JB probability is less than the significance level of 0.05. The results of the normality test in this study indicate that the data follows a normal distribution, as evidenced by a JB probability of 0.054, which exceeds the significance level of 0.05.

Hypotheses testing

Table 3 presents the empirical results of various panel data estimation models. The TEST column indicates the results of the Chow test and the Hausman test, both with p-values of 0.0000, which are less than α (0.05). This implies that the selected model is the Fixed Effects Model (FEM), as indicated in the FEM column.

The FEM column shows the results of the Fixed Effects Model estimator with an R-square value of 0.9973. This indicates that 99.73% of the changes in the number of impoverished people are attributed to changes in the education index, health index, poverty alleviation budget, and purchasing power, while the remaining 0.27% is influenced by factors outside the regression model.

The probability value of the F-statistic is 0.0000, which is less than α (0.05). This means that the education index, health index, poverty alleviation budget, and purchasing power collectively or simultaneously influence the number of impoverished people. Additionally, based on the probability values of the t-statistics for the education index, health index, poverty alleviation budget, and societal purchasing power, each of these variables individually or partially influences the number of impoverished people at the α level (0.05). Surprisingly, the variables of education and health indices show a positive impact on the number of impoverished people, contradicting the research hypothesis asserting a negative influence. Meanwhile, as anticipated, the poverty alleviation budget and societal purchasing power have a negative impact on the number of impoverished people, aligning with the research hypothesis.

The coefficient value of the education index (IP) is 1.861, indicating that a one percent increase in the education index will increase the number of impoverished people by 1.861 percent. The health index coefficient (IK) is 4.302, meaning a one percent increase in the health index will raise the number of impoverished people by 4.302 percent. The coefficient value for the poverty alleviation budget (APK) is -0.007, indicating that a one percent increase in the poverty alleviation budget will decrease the number of impoverished people by 0.007 percent. The coefficient value of purchasing power is -1.989, suggesting that a one percent increase in purchasing power will decrease the number of impoverished people by 1.989 percent.

Table 3. Panel data estimation results

Variable	CEM	FEM	REM	TEST
LOG(JPM)				
Constant	16,397 (0,000)	18,246 (0,000)	18,870 (0,000)	
IP	-5,475 (0.000)	1,861 (0.000)	1,727 (0.000)	
IK	-2,360 (0.000)	4,302 (0.016)	2,074 (0.204)	
LOG(APK)	0,191 (0.172)	-0,007 (0.045)	-0,009 (0.030)	
LOG(PPKD)	-0,746 (0.055)	-1,989 (0.000)	-1,846 (0.000)	
R-squared	0.5269	0.9973	0.5809	
Adjusted R-squared	0.5190	0.9968	0.5739	
Prob. F-statistic	0.0000	0.0000	0.0000	
Number of cross section	35	35	35	
Chow test p-value				0.0000
Hausman test p-value				0.0000

Source: Eviews 10, processed (2023)

Discussion

The influence of education index on the number of impoverished people

The findings of this research indicate that the education index has a positive impact on the number of impoverished people, contrary to the research hypothesis. This finding aligns with research conducted by Agustina et al. (2018), Mentari (2022), and Tanjung (2022), which found that education has a positive effect on poverty. Despite the increase in educational levels, it has not fully translated into poverty reduction. This could be attributed to other factors such as income inequality, a lack of quality job opportunities, or structural issues in wealth distribution. However, these results differ from the studies conducted by Margareni et al. (2016), Jacobus et al. (2021), and Wangke & Kainde (2021), which found that education has a negative impact on poverty. This may be due to the correlation between higher education levels and better job opportunities and higher income, subsequently reducing the poverty rate.

The influence of health index on the number of impoverished people

Alongside the education index, this research also indicates that the health index has a positive impact on the number of impoverished people, contrary to the research hypothesis. These findings align with a study by Aini & Islamy (2021), which discovered that health has a positive influence on poverty. Individuals who are sick or experience health issues incur high medical expenses. These treatment costs can diminish the income of the population, thereby increasing the risk of poverty. However, divergent research by Bintang & Woyanti (2018) and Suryandari (2018) found that health has a negative impact on poverty. Healthy and fit populations exhibit better work capabilities, leading to increased production of goods and services. This, in turn, enhances the income and well-being of the population, consequently reducing poverty.

The influence of purchasing power on the number of impoverished people

On the other hand, this research indicates that purchasing power has a negative impact on the number of impoverished people, aligning with the research hypothesis. The findings of this study align with the research conducted by Meimela (2019) and Amaliah et al. (2020), which found that purchasing power has a negative impact on poverty. Purchasing power is an indicator that reflects the community's ability to meet its living needs. The higher the purchasing power, the greater their ability to acquire essential necessities, including basic needs. As purchasing power increases, the number of people below the poverty line decreases. This is because the community can fulfill their basic needs, preventing them from being classified as impoverished.

The influence of poverty alleviation budget on the number of impoverished people

The final results of this study indicate that the poverty alleviation budget has a negative impact on the number of impoverished people, aligning with the research hypothesis. This suggests that increasing the budget for poverty alleviation through social assistance spending can effectively boost the income of the impoverished, thereby enhancing their purchasing power, productivity, and overall well-being (Dewi & Andrianus, 2021). Social assistance can take the form of cash, direct goods, or empowerment programs, such as the Family Hope Program (PKH) and Non-Cash Food Assistance (BPNT). These programs have proven successful in reducing the number of impoverished people in Central Java Province by improving the economic capabilities and opportunities of the communities benefiting from these policies.

The findings of this study align with the research conducted by Rarun et al. (2018), which revealed that social assistance spending has a negative impact on poverty. However, studies by Ramdani (2015) and Melati & Burhany (2021) indicate that social assistance spending does not affect poverty. This suggests that social assistance spending is not effective in alleviating poverty, attributed to inaccurate targeting, unsustainable disbursement, and a lack of focus on

productivity enhancement. Hence, the magnitude of the social assistance budget does not always correlate with efforts to address poverty, considering the need for more targeted, sustainable policies that prioritize productivity improvement to achieve more positive economic outcomes.

Based on this research, the government is advised to address poverty in Central Java Province by improving access to education and healthcare for the impoverished communities, including subsidies and enhancing service quality in underdeveloped areas. Efforts to enhance quality job opportunities through inclusive economic growth, skill training, and community empowerment are also necessary. The budget for poverty alleviation needs to be optimized through targeted social assistance and effective coordination among relevant institutions.

The importance of inter-agency coordination in executing programs effectively and in line with targets is crucial to ensure the achievement of poverty alleviation program goals. Giving special attention to active community participation in poverty alleviation programs is a key step to enhance effectiveness and stimulate community self-reliance.

CONCLUSION

Poverty is a complex and multidimensional issue, making it a priority for development, especially in Central Java Province. This research aims to estimate the impact of the education index, health index, poverty alleviation budget, and purchasing power on the number of impoverished people.

The results of this research, using the Fixed Effects Model (FEM) approach, indicate that the education index and health index have a positive impact on the number of poor people. Meanwhile, the poverty alleviation budget, measured through social assistance expenditure, and the purchasing power of the community, measured through adjusted per capita expenditure, have a negative impact on the number of poor people.

Therefore, based on these research findings, it is recommended that the government enhance access to education and healthcare for the impoverished population, including providing subsidies and improving service quality in underserved areas. Efforts are also needed to increase high-quality employment opportunities through inclusive economic growth, skill training, and community empowerment. Coordination among institutions is crucial to effectively implement programs and ensure the poverty alleviation program's goals are achieved.

For future research on the effectiveness of poverty alleviation strategies beyond social assistance expenditures, such as vocational training programs or microfinance initiatives, exploring various avenues could provide a more comprehensive understanding. Additionally, investigating social and cultural factors influencing purchasing power's impact on poverty, while considering the local context and societal dynamics, would enhance the depth of the analysis.

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