



## The Effect of Human Development Index (HDI), Population, Unemployment Rate and GRDP on Poverty Level in 2017-2023 (Study of 10 Big Cities in Java Island)

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### ABSTRACT

This study aims to examine the influence of the Human Development Index (HDI), unemployment rate, population, and Gross Regional Domestic Product (GRDP) on poverty levels in 10 major cities in Java. The data used are secondary data spanning 2017-2023. The analysis was conducted using a panel data regression method with a Random Effect Model (REM) in the cities of Jakarta, Surabaya, Bandung, Bekasi, Tangerang, Depok, Semarang, Bogor, Malang, and Tasikmalaya. The results show that partially, the HDI and population variables do not have a significant effect on poverty levels, while the unemployment rate and GRDP have a positive and significant effect on poverty in these cities.

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## **INTRODUCTION**

A decent standard of living is a human right recognized worldwide. As a nation governed by the rule of law, Indonesia clearly recognizes this, with one of the state's primary roles being to improve public welfare, educate the nation, and create social justice for all Indonesians. Therefore, freedom from poverty and a decent standard of living are everyone's rights, and it is the government's responsibility to ensure these rights are fulfilled.

Poverty is a worldwide problem that hinders societal progress. It is a complex and persistent problem that has long been felt by people in developing countries (Zanzibar et al., 2024). Poverty is a global problem and no country is free from it, including Indonesia (Rambe et al., 2023). Poverty is growing in South Africa due to unemployment, powerlessness and instability (Fransman & Yu, 2019).

Poverty is the cause of many children dropping out of school, difficulties in financing health care, lack of access to public services, and causes many people to lack the necessities of life such as clothing, food and shelter (Prayoga et al., 2021). Poverty prevents an individual or community from accessing clean and nutritious food, adequate education, and a clean environment. Poverty begins to emerge when individuals within a household are unable to meet their basic financial needs and consider their standard of living below the minimum standard.

According to (Adam & Martin, 2019) Poverty arises when an individual's or family's income falls below the generally accepted level of need. They define poverty as a lack of resources that, if available, could support a person in meeting basic needs, such as food, clothing, and shelter. Thus, poverty is not simply a lack of clearly measurable resources, but rather a multidimensional phenomenon closely related to social aspects. On the other hand, (Lucci et al., 2018), emphasizing that people experiencing poverty are a group of individuals who live in very poor environments, without access to clean water services, proper sanitation, adequate housing, and a safe environment.

Efforts to address poverty are being made to ensure that all people can enjoy a decent life, so the involvement of various parties is essential. Poverty is not only experienced by people in districts, but also by residents in urban areas. It is important to foster empathy, both from low-income and well-off families, especially in the public decision-making process (Azizah & Asiyah, 2022).

Indonesia has 38 provinces with different geographical conditions, infrastructure, and natural resources in each region. Java Island is the island with the largest population in Indonesia, namely around 155 million people or 55-56% of the total national population which will reach 280 million people by the end of 2023. On Java Island there are 10 large cities with the largest populations.

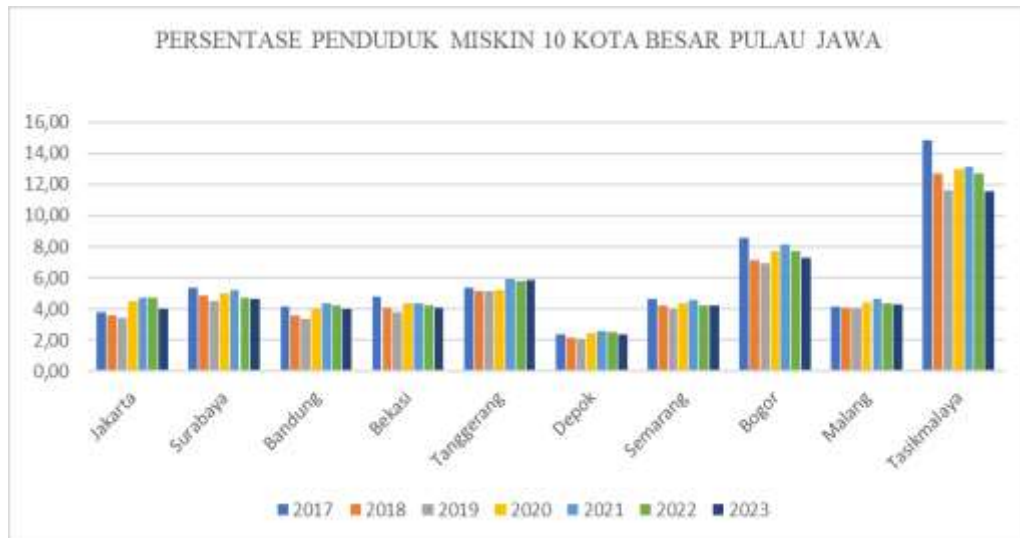


Figure 1. Percentage of the Number of Poor Population in 2017-2023

Figure 1 shows that Tasikmalaya City had the highest proportion of poor people on Java Island from 2017 to 2023, with Bogor City in second place. Conversely, Depok City recorded the lowest number of poor people, with the figure consistently below 4% each year. Based on Figure 1, Tasikmalaya City faces serious poverty issues. This demonstrates the Tasikmalaya City government's commitment to addressing poverty in the region.

Variable selection was based on development and macroeconomic theory, which explains that demographic and economic factors have a significant influence on poverty levels. These variables are a primary focus for policymakers in designing poverty alleviation programs at both the regional and national levels. Data related to these variables are available annually through the Statistics Indonesia (BPS) and official government sources, ensuring validity and consistency for the analysis period 2017–2023. Therefore, the selection of journals and variables took into account scientific aspects, relevance, data availability, and policy importance to optimally support the achievement of research objectives.

The differences in results from previous studies indicate that the factors influencing poverty can vary significantly across regions. By analyzing these factors, researchers are expected to provide policy recommendations to the government and stakeholders to reduce poverty levels in Java by improving the Human Development Index (HDI), reducing unemployment, and more effectively managing the population and Gross Regional Domestic Product (GRDP).

## LITERATURE REVIEW

### *Poverty*

Poverty is a condition where an individual or household is unable to meet basic needs such as food, clothing, shelter, education and health (Central Statistics Agency, 2023). According to (Todaro & Smith, 2011), poverty is not only measured based on income, but also includes other dimensions such as access to basic services and economic opportunities.

According to (World Bank, 1990) Poverty is divided into absolute poverty and relative poverty. Absolute poverty refers to the minimum ability to meet basic needs, while relative poverty is seen based on the distribution of income within a society.

Empirically, poverty is influenced by various socio-economic factors, such as education level, health, employment opportunities, and economic growth. Research by (Hidayat, 2022), found that the variables Human Development Index (HDI), unemployment, and population have a significant relationship with poverty levels in provinces in Indonesia.

### ***Human Development Index (HDI) and Poverty***

The Human Development Index (HDI) is a composite indicator that measures human development achievements from three dimensions: health (long and healthy life), education (knowledge), and a decent standard of living (BPS, 2024). The HDI is an indicator frequently used in poverty analysis because it represents the quality of life of the community.

According to (Conceicao, 2020) The higher the HDI, the lower the likelihood of someone living in poverty due to better access to education, health care, and a decent income. A study by Putra (2019) showed that an increase in the HDI significantly reduced poverty rates in urban areas in Indonesia. This aligns with research by Nurhadi (2017), which states that the education dimension of the HDI plays a crucial role in poverty reduction by increasing labor productivity.

### ***Population and Poverty***

Population size has a complex relationship with poverty levels. According to Malthusian theory, population growth that is not balanced with the growth in resource availability will increase poverty (Todaro & Smith, 2011). However, population growth can provide market and workforce potential, but if it is not balanced with adequate employment opportunities, it will actually increase the economic burden.

From research (Wulandari et al., 2024), there is no significant relationship between population size and poverty levels in North Sumatra. However, this finding provides a deeper understanding of the various factors influencing poverty, including population distribution patterns and other demographic characteristics. This is in line with research (Afrida et al., 2022) Which concluded that population size does not significantly influence poverty levels in East Aceh Regency. This is because population growth has been offset by improvements in community welfare in the region, so population growth does not significantly increase poverty.

### ***Unemployment and Poverty***

Unemployment is one of the main factors causing poverty. According to Keynes (1936), unemployment occurs due to an imbalance between labor supply and demand. Unemployed people do not receive income, increasing the likelihood of falling into poverty.

Research by Sari (2019) found a positive and significant relationship between the open unemployment rate and poverty levels in West Java province.

This finding is supported by a study by Wibowo (2021), which found that unemployment in large cities is predominantly among young people and those with low education, thus directly impacting poverty rates.

In addition, the poverty trap theory states that continuous unemployment can create a cycle of poverty that is difficult to break due to limited capital, education and skills possessed by individuals. (Todaro & Smith, 2011).

### ***Gross Regional Domestic Product (GRDP)***

According to (BPS, 2022) The meaning of GRDP is the economic sector that produces gross added value in a region. The GRDP figure of a region reflects the region's ability to optimize regional resources (Damanik & Sidauruk, 2020).

According to (Ksatria et al., 2022), shows that increases in GRDP in the primary and secondary sectors have a significant negative impact on poverty levels, while the tertiary sector has no significant impact. This finding suggests that economic growth in the primary and secondary sectors can create jobs and reduce poverty.

## **METHODOLOGY**

This study aims to explain the causal relationship between independent variables and dependent variables. This study uses secondary data sourced from the Central Statistics Agency (BPS) with a panel data analysis method (a combination of time series and cross section) to provide a larger number of observations in the study and increase the degree of freedom and is processed using Eviews 12. Data on Poverty Level, Human Development Index, Unemployment Rate, Population and GRDP variables are taken from BPS.

$$Y_{it} = \beta_0 + \beta_1 IPM_{it} + \beta_2 JP_{it} + \beta_3 TP_{it} + \beta_4 PDRB_{it} + \varepsilon_{it}$$

Information :

Y : Poverty (%)

$\beta_0$ : Constant

$\beta_1$ : HDI coefficient

HDI = Human Development Index

$\beta_2$ : JP Coefficient

JP = Population (millions of people)

$\beta_3$ : TP coefficient

TP = Unemployment Rate (%)

$\beta_4$ : GRDP coefficient

GRDP = Gross Regional Domestic Product (Billion Rupiah)

$\varepsilon$  : Error term

i : Cross section (city)

t : Time series (year)

**RESEARCH RESULT**

***Chow Test Results***

Table 1. Chow Test

Effects Test	Statistics	df	Prob.
Cross-section F	206.934634	(9.56)	0.0000
Cross-section Chi-square	247.3730849		0.0000

The results of the processed Chow Test above can be seen know that the value of the Cross-Section F Prob is  $0.0000 < 0.05$  so that the selected model is the Fixed Effect Model (FE.M).

***Hausman Test Results***

Table 2. Hausman Test

Correlated Random Effects - Hausman Test

Equation: Untitled

Cross-section random effects test

Test Summary	Chi-Sq. Statistic	Chi-Sq. df	Prob.
Random cross-section	2.073211	4	0.7223

The results of the Hausman Test above can be seen know that the Random Cross-Section Prob value is  $0.7223 < 0.05$  so the selected mode is Random Effect Mode (RE.M). Because the Hausman Test supports the choice of mode.l RE.M. Therefore, the appropriate mode.l for this research is Random E.ffe.ct Mode.l (RE.M).

***Classical Assumption Testing***

***Multicollinearity test***

Table 3. Multicollinearity Test

	X1	X2	X3	X4
X1	1,000,000	-0.622220	0.232011	-0.046498
X2	-0.622220	1,000,000	-0.059864	-0.060816
X3	0.232011	-0.059864	1,000,000	-0.379838
X4	-0.046498	-0.060816	-0.379838	1,000,000

BeBased on the results of the multicollinearity test, there is no correlation between variables that exceeds 0.8, meaning that the regression model is free from multicollinearity problems.

**Heteroscedasticity Test**

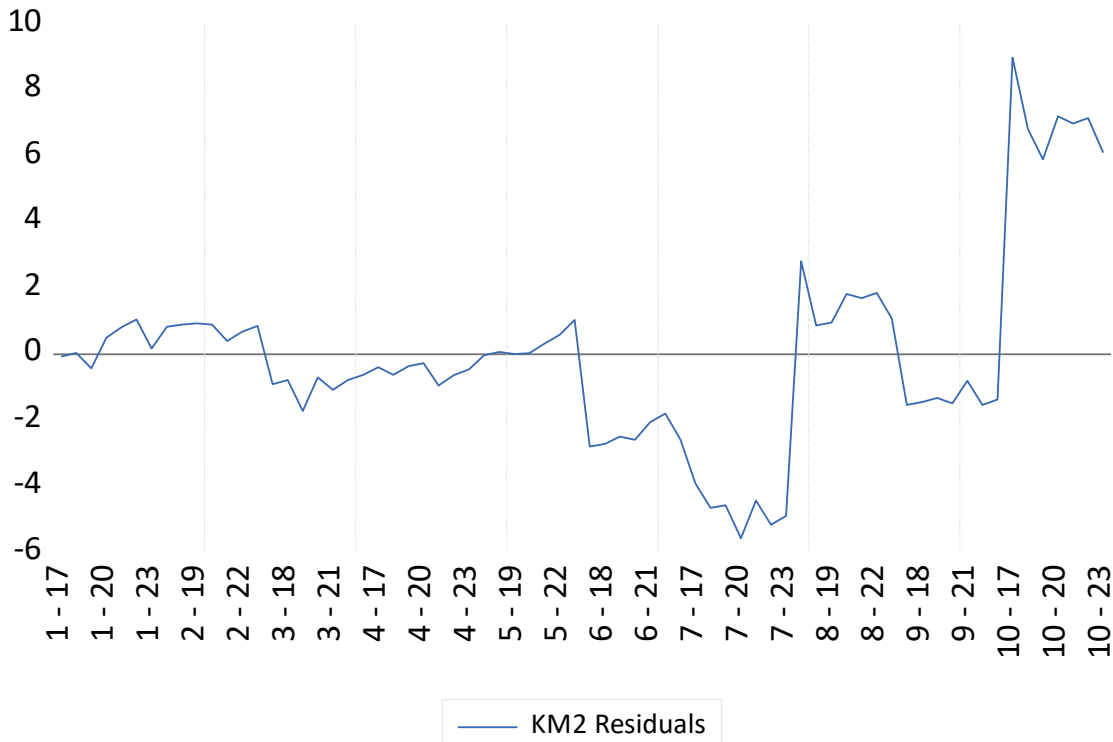


Figure 2. Heteroscedasticity Test

From the residual graph (blue color) it can be seen that it does not cross the limits (500 and -500), meaning that the residual variance is the same. Therefore, there is no heterogeneous statistical symptoms or it passes the heterogeneous statistical test.

**Hypothesis Testing**  
**t-Test Results**

Table 4. t-test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.589451	3.055551	3.138371	0.0026
HDI	-0.061990	0.032586	-1.902332	0.0616
JP	-5.922107	3.851207	-1.538178	0.1289
TP	0.161416	0.054937	2.938189	0.0046
GRDP	0.054828	0.024595	2.229267	0.0293
R-squared	0.514395			
F-statistic	3.921184			
Prob(F-statistic)	0.006507			

- ⌚ X1: The t-statistic value is -1.9023 with Prob. (0.0616 > 0.05), so that X1 has a negative but not significant effect on poverty.
- ⌚ X2: The t-statistical value is -1.5381 with Prob. (0.1289 > 0.05), so that X2 has a negative but not significant effect on poverty.

- ⌚ X3: The t-statistic value is 2.9381 with Prob. (0.0046 < 0.05), so that X3 has a positive and significant influence on poverty.
- ⌚ X4: The t-statistic value is 2.2292 with Prob. (0.0293 < 0.05), so that X4 has a positive and significant influence on poverty.

### ***F Test Results***

F-statistic value  $F_{(3, 39)} = 3.921184$  with  $\text{valueprob} = 0.006507 < 0.05$ , so statistically it shows that the Human Development Index (HDI), Population, Unemployment Rate and GRDP have an effect on poverty in 10 large cities on Java Island 2017 – 2023.

### ***Coefficient of Determination (R<sup>2</sup>)***

Based on the regression results, R-Square is 0.514395 or 51%. So it can be concluded that the contribution of the influence of the Independent Variable to the rise and fall of the Dependent Variable is as large as 51%. Meanwhile, the remaining 49% is influenced by other variables outside this research.

## **DISCUSSION**

Based on the results of the data processing above, the following regression results were obtained:

$$Y = 9.589451 + -0.061990IPM + -5.922107JP + 0.161416TP + 0.054828GRDP$$

Explanation :

1. The constant value obtained is 9.589451, this means that if the value of the IPM, JP, TP, GRDP variables is 0, then poverty is 9.5894 percent.
2. The regression coefficient for the HDI variable is -0.0619. This means that, holding other variables constant, a 1 percent increase in the HDI will result in a -0.0619 percent decrease in poverty.
3. The regression coefficient for the JP variable is -5.922107. This means that, holding other variables constant, a 1 million increase in population will reduce poverty by -5.9221 percent.
4. The regression coefficient for the TP variable is 0.161416. This means that if other variables remain constant and TP increases by 1%, poverty will increase by 0.1614 percent.
5. The regression coefficient for the GRDP variable is 0.054828. This means that if other variables remain constant and GRDP increases by 1 billion Rupiah, poverty will increase by 0.0548 percent.

### ***The Influence of the Human Development Index (HDI) on Poverty***

The HDI had a negative but insignificant effect on poverty in 10 major cities on Java Island. This means that the uneven distribution of human development benefits means that increases in the HDI in 10 major cities on Java Island may not necessarily be felt by all levels of society, especially the poor. Consequently, increases in the HDI do not directly lead to significant poverty reduction.

This is in line with the results of journal research (Agustina, 2020) shows that the Human Development Index (HDI) has no significant impact on poverty levels in Central Java Province. This indicates that even if human development, as measured by the HDI, increases, this may not necessarily lead to a decrease in

poverty, particularly if economic development and opportunities are not evenly distributed across the region.

### ***The Influence of Population on Poverty***

The test results indicate that the population variable has a negative but insignificant effect on poverty in 10 major cities on Java. This is due to several other, more important factors, such as economic distribution, human resource quality, and the effectiveness of public policy.

This is in line with research (Hasibuan, 2022) found that the population variable did not have a significant effect on the poverty rate in West Kalimantan Province, although the study also analyzed other variables such as health and education levels. The population variable was proven to have no partial significant effect on the poverty rate in West Kalimantan Province in the 2016–2021 period. This finding indicates that in efforts to reduce poverty, it is necessary to consider other factors besides population as the main determining variable.

### ***The Impact of Unemployment Rate on Poverty***

The unemployment rate has a positive and significant impact on poverty in 10 major cities on Java Island. This means that a high unemployment rate is directly related to an increase in the number of poor people. As the unemployment rate rises, more people lose their jobs or remain unemployed, thus contributing to the rising poverty rate in the 10 major cities on Java Island. According to classical economic theory, there is a positive relationship between unemployment and poverty, where an increase in unemployment is usually followed by an increase in poverty..

This research is in line with (Yacoub, nd2012) which shows that the unemployment rate has a significant effect on the poverty rate, which shows that the relationship between unemployment and poverty in West Kalimantan is not always in a positive direction as assumed in classical economic theory, but is influenced by the local economic structure and the conditions of the primary labor sector that dominates.

### ***The Influence of GRDP on Poverty***

The increase in GRDP will be accompanied by an increase in poverty in 10 major cities on Java Island. This means that when GRDP per capita increases, poverty levels also tend to increase. This contradicts the trickle-down effect theory in economics, which states that economic growth should benefit all levels of society. However, in some cases, economic growth does not necessarily reduce poverty due to unequal income distribution. If GRDP per capita increases but is not accompanied by income equality, only a small group benefits from economic growth, while the lower classes remain in poverty.

This research is in line with the results of a study by (Sipahutar & Nasution, 2023) and Lestari et al. (2016) who stated that GRDP per capita has a positive effect on poverty, where an increase in GRDP per capita automatically increases community welfare, so that the GRDP per capita value of a region greatly influences the amount of poverty that occurs. However, these results differ from the research (Mandey et al., 2023) And (Sari & Novianti, 2024) who found a

negative influence of GRDP per capita on poverty, namely that an increase in GRDP per capita actually reduces the number of poor people

## **CONCLUSIONS AND RECOMMENDATIONS**

This study shows that the Human Development Index (HDI) has a negative but insignificant effect on poverty in 10 major cities in Java, so that an increase in the HDI does not significantly contribute to poverty reduction. Furthermore, population growth also has a negative but insignificant effect on poverty in these major cities during the 2017-2023 period, meaning that population growth does not necessarily lead to an increase in poverty rates. Meanwhile, the unemployment rate is proven to have a positive and significant effect on poverty in the region; the higher the unemployment rate, the greater the poverty rate. Furthermore, GRDP also has a positive and significant effect on poverty in 10 major cities in Java, meaning that an increase in GRDP is followed by an increase in poverty rates in the region.

## **ADVANCED RESEARCH**

Future research could explore the paradoxical findings of this study – particularly the insignificant impact of HDI on poverty and the positive relationship between GRDP and poverty – by incorporating variables that capture income distribution, such as the Gini coefficient, and structural economic factors like sectoral composition of growth. A deeper investigation using disaggregated HDI components (education, health, and income) could reveal which dimensions are less effective in reducing poverty at the city level. Additionally, adopting spatial econometric approaches would allow researchers to examine whether economic growth in one city generates poverty spillovers or benefits in neighboring cities. Combining quantitative analysis with qualitative case studies of cities that successfully decoupled growth from poverty could provide richer policy insights for fostering inclusive and equitable development in Java.

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