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Measuring poverty of province of Java using micro data, are the results the same as macro data?

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ABSTRACT

Poverty is a problem that still occurs in many countries, both developed and developing countries. One of the important pieces of information from using microdata is to provide a map of the characteristics of the target households. Characteristics of poor households obtained through analysis of micro poverty data. The data used in this study is IFLS (*Indonesian Family Life Survey*) 5 data using data from the Provinces of DI Yogyakarta, West Java, Central Java, East Java, DKI Jakarta, and Banten. The variables used are characteristic variables from the *Multidimensional Poverty Index* (MPI) indicators, namely household health, health insurance, school level, and quality of household life in the form of sanitation, drinking water, electricity, cooking fuel, vehicles, electronics, and savings. This study found that there are differences in poverty calculated by applying monetary and multidimensional poverty. This research shows that monetary (consumption) alone is not enough to explain the deprivation faced by the poor. The low level of education, health, and household quality in the form of drinking water is a concern for the government to evaluate existing programs and policies.

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1. Introduction

The Central Bureau of Statistics (BPS) calculated the number and percentage of poor people for the first time in 1984. The calculation covers the period 1976-1981 using the Consumption Module National Socioeconomic Survey (Susenas) data at that time. BPS uses macro data (expenditure) from Susenas as a measure of poverty. Macro poverty is poverty that is seen as an economic inability to meet basic food and non-food needs (measured from the expenditure side). To measure poverty, BPS uses the concept of the ability to meet basic needs (*basic needs approach*), so that poverty is seen as an economic inability to meet basic food and non-food needs as measured from the expenditure side through this approach (Badan Pusat Statistik, 2023). Understanding poverty as multi-dimensional allows for a more comprehensive and accurate assessment, which can lead to more effective policies and interventions. Poverty is not just about income deprivation. People living in poverty may also lack access to basic services like education, healthcare, clean water, and sanitation. By adopting a multi-dimensional view, researchers can explore how different factors (social, political, and economic) contribute to an individual's or community's poverty (Erlando et al., 2020).

The advantage study on poverty as multi-dimensional allows more comprehensife for capturing the full scope of poverty, people living in poverty condition may face lack of basic services like education, healthcare, clean water and sanitation (Suripto et al., 2024), another factors of poverty often result of structural inequalities such as unequal access to resources, social exclusion, discrimination, or lack of infrastructure. A multi-dimensional approach allows researchers to identify systemic

barriers that exacerbate poverty, such as inequality in education, healthcare and clean water (Wuranti, 2022). Figure 1 shows the province's poverty rate for the Special Region of Yogyakarta (DIY) was recorded at 11.49 percent, making DIY the poorest province on the island of Java compared to the provinces of West Java, East Java, Central Java, DKI Jakarta, and Banten. The percentage of poverty in DIY is above the national average of 9.57 percent. The Poverty Line in September 2022 was recorded at IDR 535.547,00/capita/month with a composition of the Food Poverty Line of IDR 397.125,00 (74.15 percent) and the Non-Food Poverty Line of IDR 138.422,00 (25.85 percent). In September 2022, on average, poor households in Indonesia have 4.34 household members. Thus, the average poverty line per poor household is IDR 2.324.274,00/poor household/month.

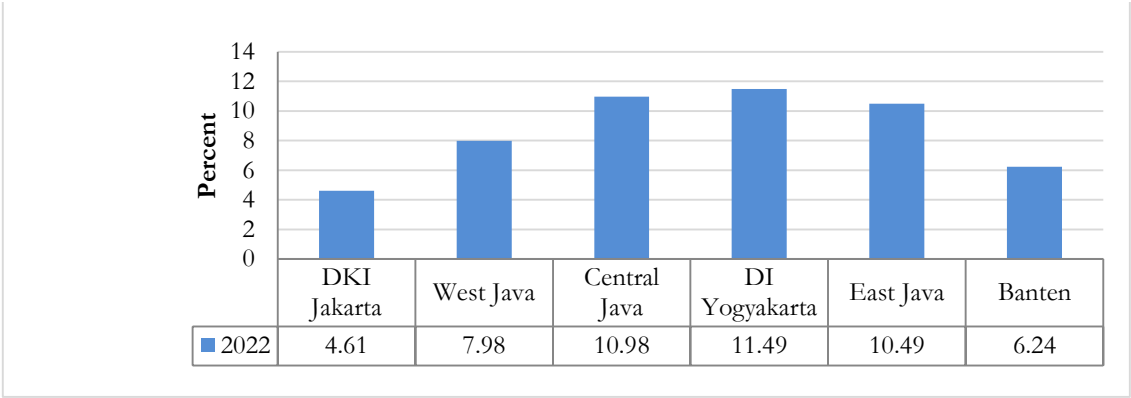


Figure 1. Poverty Rate in Java Island in 2023

Macro poverty data only provides a measure of the number of poor households/population at the urban or rural provincial level and district/city level but cannot determine who and where the poor households/population are, so it is necessary to examine micro conditions by looking at the causes of household poverty with certain characteristics. as households and individuals. One of the important pieces of information from this microdata is to provide a map of the characteristics of the target household. Characteristics of poor households were obtained through analysis of micro poverty data (Sudirman, 2014). Micro poverty is based on 14 household-based poverty criteria. The 14 variables used are floor area per capita, floor type, wall type, defecation facilities, sources of drinking water, sources of lighting, fuel, buying meat/chicken/milk, frequency of meals, buying new clothes, medical ability, field business of the head of the household, education of the head of the household, and assets owned by the household (Kurnianingsih, 2012). Poverty is a problem that still occurs in many countries, both developed and developing countries. Therefore, many studies have been carried out by researchers to study and understand poverty from various aspects, both macro and micro, through household analysis (Direja, 2021).

Much research has been done on household characteristics and poverty/welfare, a study from Direja, 2021; Azmi, 2014; Akbar, 2019; Adnyani & Sugiharti, 2019; Rahayu & Lesmana, 2019; Nurrika et al., 2020; Setyari, 2012; and Irwan & Moeis, 2019, gave results that individual characteristics such as education of the head of the household, microcredit, savings ownership, land ownership, location, age, age squared, employment status, length of schooling, business field, education, health, ownership of movable assets, as well as the existence of school facilities, and household food spending, have a significant effect on household poverty/welfare. The novelty of this study lies in its approach to measuring the poverty level in the Java Island Province using microdata based on the characteristics of the Multidimensional Poverty Index (MPI) indicators, namely health, education, and quality of life. This differs from the poverty measurement conducted by BPS (Statistics Indonesia) through Susenas (National Socio-Economic Survey), which uses macro data. This study provides a more detailed and specific perspective on poverty by incorporating microdata, which can reveal local variations and nuances in the experience of poverty that might not be visible in aggregate macro data. While BPS provides valuable insights through macro data that allow for broad policy planning and national-level assessments, such data may overlook smaller-scale poverty disparities.

This gap arises from the lack of granularity, as macro data often averages conditions across large populations, potentially obscuring the real challenges faced by smaller communities or specific demographic groups. In contrast, microdata offers more detailed insights at the household or individual level, capturing nuances such as healthcare access, educational attainment, and living standards that can vary even within a single region. Additionally, BPS's poverty measurement through

Susenas relies heavily on income and expenditure data, while the MPI approach goes beyond financial metrics and includes dimensions such as education and quality of life, providing a more comprehensive understanding of multidimensional poverty. By comparing macro and micro-level measurements, this study can expose the limitations of current poverty alleviation policies based on Susenas data, offering policymakers a clearer understanding of the real impact of their interventions at the grassroots level and guiding more effective, targeted strategies. This research fills the gap by introducing microdata and MPI indicators to offer a richer, multidimensional perspective on poverty, potentially leading to more accurate and targeted policies.

2. Literature Review

According to BPS, poverty is seen as an economic inability to meet basic food and non-food needs as measured from the expenditure side. Residents are categorized as poor if they have an average expenditure per capita per month below the Poverty Line (GK), which is a reflection of the rupiah value of the minimum expenditure needed by a person to fulfill his basic needs for a month, both food and non-food needs. The GK consists of the Food Poverty Line (GKM) and the Non-Food Poverty Line (GKNM). The Food Poverty Line (GKM) is the minimum expenditure value for food needs which is equivalent to 2100 kilocalories per capita per day. Commodity packages for basic food needs are represented by 52 types of commodities (grains, tubers, fish, meat, eggs, milk, vegetables, nuts, fruits, oils, and fats, etc.). The Non-Food Poverty Line (GKNM) is the minimum expenditure value for non-food needs in the form of housing, clothing, education, and health. Commodity packages for basic non-food needs are represented by 51 types of commodities in urban areas and 47 types of commodities in rural areas (Central Bureau of Statistics, 2023).

Report from World Bank (2022), the latest poverty calculation from the World Bank refers to the 2017 purchasing power parity (PPP). Purchasing power parity equates to the price of a set of identical goods in different locations. The World Bank can adjust the Gross Domestic Product (GDP) figures that are different in each country using this concept. The World Bank raised the extreme poverty line from US$1.9 to US$2.15 per capita per day. The World Bank updated the boundaries for income classifications in 2022 to reflect inflation and economic changes. For the lower-middle-income class, the threshold was raised from $3.20 to $3.65 per capita per day, and for the upper-middle-income class, it increased from $5.50 to $6.85 per capita per day. These revisions are part of the World Bank's ongoing effort to keep these thresholds consistent in real terms by adjusting for inflation using a weighted average of the GDP deflators from key economies like the U.S. and China.

These classifications help assess and compare economic progress globally, offering insight into how countries move between income brackets. For example, some countries like Belize and Panama moved back to higher income categories after recovering from the COVID-19 economic downturn, while others, such as Lebanon, experienced declines due to significant economic challenges (World Bank, 2022). Reports from the World Bank (2023) underline the significance of these classifications in poverty measurement, stressing the need to differentiate between monetary poverty (based solely on income) and multidimensional poverty, which includes deprivations in areas such as health, education, and living standards. This broader approach offers a more comprehensive view of poverty. Furthermore, newer tools like the Multidimensional Poverty Measure (MPM) show that certain regions, particularly Sub-Saharan Africa and South Asia, continue to face high levels of severe poverty. The MPM includes a broader range of poverty indicators, capturing disparities that income-based measures alone might miss. Recent 2023 studies further demonstrate the widening gap between income-based and multidimensional poverty rates globally, emphasizing the importance of nuanced poverty metrics that account for socioeconomic factors beyond just income.

The poverty approach using monetary analysis only sees a small part of the magnitude of the poverty problem. The problem of poverty is not only related to purchasing power, income, or consumption but there is a broader dimension. For example, access to education and health is said to be poor. Likewise, if the quality of household living standards is inadequate, it can be said to be poor (Amartya, 1980; 2000). According to Sholeh (2022) education and access to information have a negative relationship with poverty, while the number of family members has a positive effect on poverty. This linkage is based on the fact that highly educated individuals generally have higher levels of consumption and this in turn has a major impact on the size of the family budget and expenses (Sumarno et al., 2019). Contrary to study from Setyari (2012) shows the results that the

level of education of children is not significant for household welfare and there is even an adverse effect mechanism.

3. Method

This research method is quantitative. The data used in this study is IFLS 5 (Indonesian Family Life Survey) data which was censused in 2014 with the observations used being 15,000 household data spread across 24 provinces in Indonesia. The data in this study used data from the Provinces of DI Yogyakarta, West Java, Central Java, East Java, DKI Jakarta, and Banten. The variables used are characteristic variables from the Multidimensional Poverty Index (MPI) indicator, namely household health, health insurance, school level, and quality of household life in the form of sanitation, drinking water, electricity, cooking fuel, vehicles, electronics, and savings. MPI is calculated using weighted weights of dimensions and indicators. The weight of the dimensions is weighed the same, namely 1/3 of each dimension and each indicator in the dimension is also weighed the same. So that the weight of the indicators is obtained as follows: the weight of the health indicator which consists of two indicators is rated at 1/6, the weight of education which consists of two indicators is assessed as 1/6, and the weight of the quality of life which consists of six indicators is assessed as 1/8. Everyone who is assessed in the MPI is seen from the indicators being assessed. The score consists of a range of 0-1. After getting an assessment of the ten indicators, it will be calculated using the formula:

$$C_i = w_1 I_1 + w_2 I_2 + \cdots + w_d I_d \quad (1)$$

Where the man $I_1 = 1$ if someone hits indicator I and $I_1 = 0$ otherwise. w_1 is the weight of indicator I with $\sum_{i=1}^{d} wi = 1$. All indicators and dimensions are summed up, then the average value is found. Someone is said to be poor when the average total rating is less than 1/3. MPI is the multidimensional headcount ratio (H) multiplied by the intensity of poverty (A), H = $\frac{q}{n}$, where q is the number of individuals categorized as poor multidimensionally while n is the total population $A = \frac{\sum_{i=1}^{n} ci\,(\mathrm{k})}{q}$. $C_i\,(k)$ is the score of the individual id and 1 is the number of individuals experiencing multidimensional poverty, so $MPI = H\ x\ A$ (Budiantoro et al., 2013).

4. Results and Discussion

Table 1 and Figure 2 reveal a significant contrast between monetary and multidimensional poverty assessments in Indonesia, particularly on Java Island. Monetary poverty measures, which primarily focus on income levels, indicate that Yogyakarta has the highest poverty rate at 14.55 percent, followed by Central Java at 13.58 percent and East Java at 12.28 percent. This suggests that, when evaluated purely on income, Yogyakarta faces considerable economic challenges compared to other provinces. However, when employing a multidimensional poverty lens—one that takes into account various deprivations such as education, health, and living standards—the picture changes dramatically. Under this analysis, East Java emerges as the poorest province at a staggering 52.1 percent, with Banten at 52.0 percent and Central Java at 51.1 percent. This disparity emphasizes the limitations of relying solely on monetary metrics to assess poverty. It reveals that while Yogyakarta appears poorer in terms of income, it has better outcomes in other dimensions of poverty, showcasing a phenomenon frequently observed in poverty studies: income alone does not adequately capture the complexities of living conditions and overall well-being (Hanandita & Tampubolon, 2016).

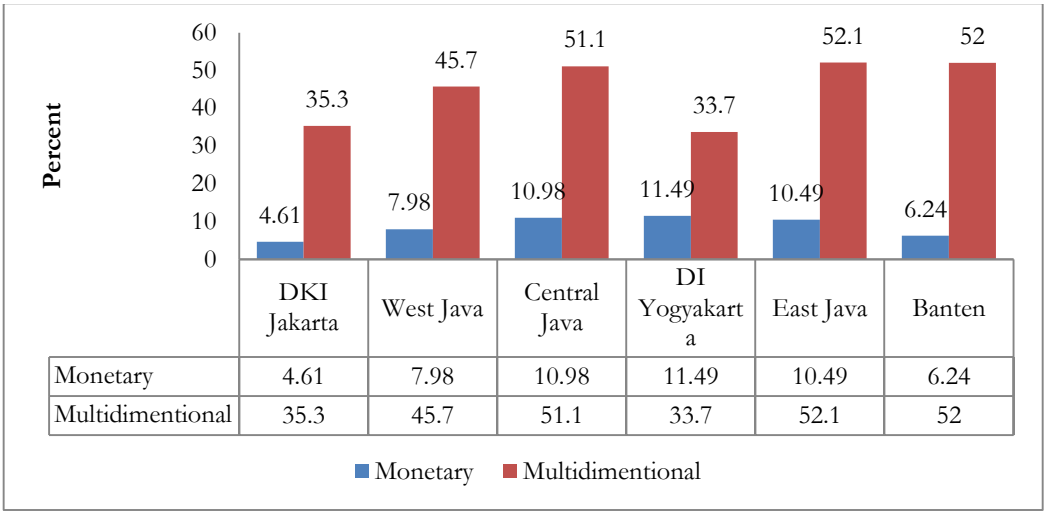
Table 1. Result of Stationery Test

Province	Monetary Poverty	Multidemensional Poverty
Jakarta	4.09	35.3
West Java	9.18	45.7
Central Java	13.58	51.1
Yogyakarta	14.55	33.7
East Java	12.28	52.1
Banten	5.51	52.0

Source: data processed

This contrast has crucial implications for policymakers. For effective policymaking, especially in regions where income levels may not accurately reflect the overall deprivation experienced by

populations, it is essential to understand multidimensional poverty. Recent international studies have reinforced this point, suggesting that poverty is not merely a function of income but also encompasses various factors that significantly affect quality of life. The significance of multidimensional poverty indices (MPI) has been emphasized in the latest research, which indicates that millions of people are deprived across multiple indicators despite income measures suggesting otherwise. For example, the 2023 Global Multidimensional Poverty Index published by the United Nations Development Programme highlights that many individuals face deficiencies in essential areas like health, education, and living standards, which may not be reflected in income-based assessments. Moreover, studies conducted in diverse regions emphasize that addressing multidimensional poverty requires tailored interventions that consider the unique contexts and challenges faced by different communities. For instance, research has shown that educational opportunities, healthcare access, and housing conditions play critical roles in determining the overall well-being of populations, underscoring the need for comprehensive policies that go beyond income support.



	DKI Jakarta	West Java	Central Java	DI Yogyakarta	East Java	Banten
Monetary	4.61	7.98	10.98	11.49	10.49	6.24
Multidimentional	35.3	45.7	51.1	33.7	52.1	52

Figure 2. Percentage of Deprivation on Various Indicators Based on Province

In summary, the findings from Java Island illustrate the necessity of adopting a multidimensional approach to poverty measurement. By recognizing and addressing the various deprivations that individuals face, policymakers can develop more effective strategies to combat poverty, ultimately leading to improved living conditions and enhanced quality of life for the most vulnerable populations. Figure 3 illustrates the percentage of deviation for various poverty indicators among the population of Java Island. Notably, a striking 65.39 percent of individuals exhibit low savings, which can be attributed to a combination of factors, including low financial literacy levels. Interestingly, this statistic appears contradictory since several provinces in Java, such as Jakarta and West Java, rank highly in national financial literacy assessments. This anomaly raises questions about the effectiveness of financial education initiatives and highlights the need for targeted strategies to enhance the practical application of financial knowledge.

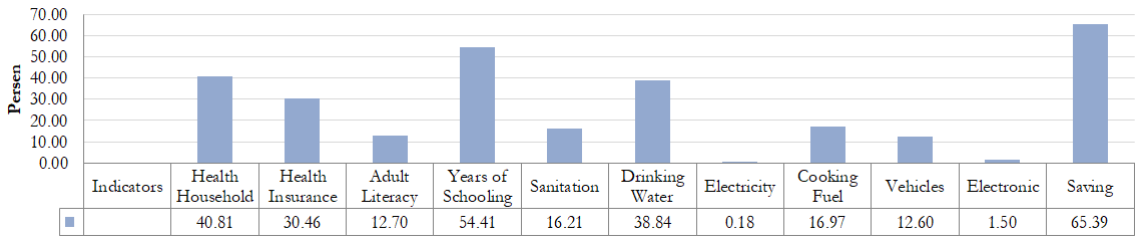


Figure 3. Percentage of Deprivation on Various Indicators

In addition to financial concerns, educational attainment remains a pressing issue, with 54.41 percent of the population demonstrating low levels of education. This finding underscores the ongoing challenges faced by Indonesia in improving educational outcomes, as noted in recent studies. Moreover, health-related deficiencies are evident, with 30-40 percent of individuals lacking adequate health insurance, and 38.84 percent facing challenges related to access to clean drinking water. These statistics suggest a lack of concern among the population regarding health and insurance matters,

potentially stemming from both economic constraints and a lack of awareness about the importance of these services. Furthermore, while conditions related to electricity and electronics appear to be comparatively better, the data indicates that a small percentage of the population still faces deficiencies in these areas. This highlights the disparity in access to essential services, which is critical for fostering economic development and improving overall quality of life. The results of this analysis resonate with previous research by Artha & Dartanto (2014), which identified significant gaps in education, health, and overall quality of life for Indonesian households. Their findings point to a systemic issue that requires comprehensive policy interventions aimed at addressing these deficiencies across various sectors. In conclusion, the indicators presented in Figure 3 reveal a multifaceted picture of poverty on Java Island, characterized by economic vulnerabilities, educational shortcomings, and health disparities. Addressing these challenges will necessitate a collaborative effort from policymakers, educators, and health professionals to implement sustainable solutions that not only alleviate poverty but also enhance the overall well-being of the population. By investing in education, financial literacy, and health services, Indonesia can work towards a more equitable and prosperous future.

5. Conclusion

In this research, we investigate the relationship between monetary and multidimensional poverty, highlighting the importance of this study in filling a significant gap in existing literature. While many studies have focused on either monetary or multidimensional poverty, few have effectively compared the two, especially within the context of Indonesia. The findings indicate that reliance solely on monetary measurements can lead to an incomplete understanding of the deprivations faced by low-income populations. Specifically, the research reveals that the province with the highest monetary poverty rate—Yogyakarta—has the lowest multidimensional poverty rate. This contradiction suggests that policymakers must reconsider their approaches to poverty assessment and develop comprehensive strategies that address both income and quality of life factors, thereby ensuring that interventions are tailored to the specific needs of diverse populations.

The implications of this research are significant, as they underscore the necessity for a nuanced understanding of poverty that extends beyond simple income calculations. The findings indicate critical areas for intervention, particularly concerning education, health, and access to essential services like clean drinking water. The low levels of education and health insurance coverage found in the study align with earlier research indicating that poverty in Indonesia is multidimensional, affecting various aspects of individuals' lives. By addressing these multifaceted issues, the government can enhance the effectiveness of existing programs and policies aimed at poverty alleviation. Ultimately, this research contributes to a growing body of literature advocating for the incorporation of multidimensional poverty indices in policymaking, as it offers a more comprehensive view of the challenges faced by disadvantaged populations and informs the development of targeted solutions.

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