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ANALYSIS OF THE RELATIONSHIP BETWEEN POVERTY AND UNEMPLOYMENT USING PEARSON CORRELATION

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Abstract

Poverty and unemployment are two fundamental socio-economic problems that are often assumed to be closely related: the higher the unemployment rate in a region, the higher its poverty rate tends to be. This study aims to analyze the direction and strength of the relationship between the percentage of the poor population and the Open Unemployment Rate (TPT) at the provincial level in Indonesia using Pearson correlation analysis. The method used is a quantitative descriptive approach with secondary data from Statistics Indonesia (BPS), namely the poverty rate of March 2024 and the unemployment rate of February 2024 for 34 provinces. The results show a Pearson correlation coefficient of r = -0.33, a coefficient of determination of 11.1 percent, and a p-value of 0.054, indicating a weak negative relationship that lies at the borderline of the 5 percent significance level. This means that provinces with high poverty rates do not always have high unemployment rates, and vice versa. This pattern is apparently caused by the dominance of the informal and agricultural sectors in high-poverty regions, where people tend to remain employed despite low productivity and income (working poverty), while high unemployment rates mostly occur in provinces with more formal and competitive economic structures. It can be concluded that reducing unemployment alone does not automatically reduce poverty, so poverty alleviation policies also need to focus on improving the productivity and income of informal workers. Further research is recommended to include additional control variables such as average education level, and the structure of the economic sector.

Keywords: Poverty; Unemployment; Pearson Correlation; Province; Indonesian wages, education level, and the structure of the economic sector.

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INTRODUCTION

Poverty and unemployment are two interrelated development issues that are a major concern for governments in various countries, including Indonesia. Poverty describes the inability of an individual or household to meet basic living needs, while unemployment describes the condition of members of the workforce who are not absorbed in the job market. In macroeconomic theory, these two variables are often assumed to have a positive relationship, namely, the higher the unemployment rate in a region, the greater the proportion of the population that loses its source of income and is potentially plunged into poverty. This assumption aligns with the basic logic that employment is the primary source of household income, so the unavailability of employment will directly impact a household's ability to meet its basic needs.

According to data from the Central Statistics Agency (BPS), the percentage of Indonesia's poor population in March 2024 was recorded at 9.03 percent, while the national Open Unemployment Rate (TPT) in February 2024 was recorded at 4.82 percent. Although both indicators have shown a downward trend nationally in recent years, variations between provinces reveal an interesting pattern that warrants further study. Several provinces with high poverty rates, particularly in eastern Indonesia, have relatively low TPTs. Conversely, several provinces with relatively low poverty rates, particularly in industrial areas and large urban areas on Java, have quite high TPTs. This phenomenon indicates that the relationship between poverty and unemployment is not always linear or unidirectional, as is often assumed.

Several previous studies have provided mixed results regarding the relationship between poverty and unemployment in Indonesia. Research by Hidayat and Wibowo (2022), which analyzed district/city data in East Java Province, found that the unemployment rate has a positive and significant impact on poverty levels, although its contribution is relatively small compared to other variables such as average years of schooling and
per capita expenditure. Meanwhile, Nurhayati (2023), in her analysis of provincial panel data in Indonesia, found that the relationship between unemployment and poverty tends to be weak and inconsistent across regions, as the majority of Indonesia's poor are classified as working poor in the low-productivity informal sector. Rahman's (2024) study reinforces this finding by showing that the dominance of the informal and agricultural sectors in high-poverty areas results in low open unemployment rates in those regions, as those without formal employment are still recorded as working in the informal sector.

Based on this description, this study aims to analyze the direction and strength of the relationship between the percentage of the poor population and the Open Unemployment Rate at the provincial level in Indonesia using Pearson correlation analysis. The novelty of this study lies in the use of the latest data from 2024 for all provinces in Indonesia and the presentation of the results in the form of a scatter plot visualization, which facilitates the interpretation of inter-regional relationship patterns. The results of this study are expected to provide an empirical overview for policymakers regarding the need for direct linkage of poverty alleviation programs with unemployment reduction programs, as well as encourage further study of job quality as a determinant of poverty.

Poverty is a condition of economic inability of a person or group of people to meet basic life needs such as food, clothing, shelter, education, and health. According to Sukirno (2019), poverty can be divided into absolute poverty, which is a condition where income is below the poverty line determined based on minimum calorie requirements, and relative poverty, which is a condition where income is far below the average income of the surrounding community even

though in absolute terms it is able to meet basic needs. The Central Statistics Agency measures poverty using the concept of the ability to meet basic needs (basic needs approach), where residents are categorized as poor if the average per capita expenditure per month is below the poverty line.

Unemployment

Unemployment is a situation where someone in the labor force is unemployed and trying to find work. According to Mankiw (2021),

Unemployment can be divided into frictional, structural, and cyclical unemployment, each of which has different causes and policy implications. The Central Bureau of Statistics defines the Open Unemployment Rate (TPT) as the percentage of the number of unemployed to the total workforce, including those who are unemployed and looking for work, preparing for a business, feeling it is impossible to find work, and those who already have a job but have not started working.

The Relationship between Poverty and Unemployment

Theoretically, the relationship between unemployment and poverty can be explained through the concept that employment is the primary source of household income. Okun's Law, developed in a macroeconomic context, explains the relationship between unemployment rates and economic output, which indirectly impacts people's income levels (Pratama & Sari, 2022). However, in the context of developing countries with labor markets dominated by the informal sector, such as Indonesia, this relationship becomes more complex. Tambunan (2020) explains that the majority of the workforce in Indonesia, particularly in rural areas and eastern Indonesia, is absorbed in the agricultural and informal sectors, which do not require formal qualifications. Consequently, the open unemployment rate in these areas is relatively low despite high poverty rates. Conversely, in urban areas with a formal economic structure, intense labor market competition can lead to high unemployment rates despite relatively low poverty rates due to the existence of social safety nets and household savings.

Pearson Correlation

Pearson Correlation or Pearson Product Moment Correlation Coefficient is a statistical technique used to measure the strength and direction of a linear relationship between two variables on an interval or ratio scale. The correlation coefficient (r) value ranges from -1 to +1, where values close to +1 indicate a strong positive relationship, values close to -1 indicate a strong negative relationship, and values close to 0 indicate no significant linear relationship. According to Sugiyono (2021), the interpretation of correlation strength can be categorized as follows: 0.00–0.199 (very weak), 0.20–0.399 (weak), 0.40–0.599 (moderate), 0.60–0.799 (strong), and 0.80–1.00 (very strong). In addition to the correlation coefficient value, the significance of the relationship can be tested through the probability value (p-value), where the relationship is declared statistically significant if the p-value is smaller than the specified significance level, generally 0.05.

RESEARCH METHODS

This study uses a quantitative approach with a correlational design, a research design that aims to determine whether there is a relationship between two variables without providing treatment to the variables being studied. The variables analyzed consist of two variables: the percentage of the poor population as the first variable and the Open Unemployment Rate (TPT) as the second variable.

The population in this study comprised all provinces in Indonesia, with the sample consisting of data from 34 provinces officially published by the Central Statistics Agency (BPS).

The data used were secondary data, including the percentage of the poor population in March 2024 and the Open Entrance Test (TPT) in February 2024 for each province. Data collection was conducted through documentation studies, namely by tracing and compiling data from official BPS publications.

The data analysis technique was carried out in several stages. The first stage was descriptive analysis to determine the average, minimum, maximum, and standard deviation values for each variable. The second stage was Pearson correlation analysis to determine the direction and strength of the relationship between the percentage of the poor population and the TPT, using the Pearson correlation coefficient formula as follows:

$$r = [n.\Sigma(XY) - (\Sigma X)(\Sigma Y)] / \sqrt{[(n.\Sigma X^2 - (\Sigma X)^2)(n.\Sigma Y^2 - (\Sigma Y)^2)]}$$

Description: r is the Pearson correlation coefficient, n is the number of provinces (samples), X is the percentage of poor people, and Y is the Open Unemployment Rate. The third stage is a significance test of the correlation coefficient obtained with a significance level (α) of 0.05, as well as the presentation of the results in the form of tables and scatter plots to facilitate the interpretation of the relationship pattern between the two variables.

RESULTS AND DISCUSSION

Results

Data Description

Data on the percentage of poor people and the Open Unemployment Rate (TPT) for 34 provinces in Indonesia are presented in Table 1.

Table 1. Percentage of Poor Population and Open Unemployment Rate by Province in Indonesia, 2024

Province	Percentage of Poor Population (%)	TPT (%)
Aceh	14.23	5.85
North Sumatra	7.66	5.10
West Sumatra	5.97	6.06
Riau	6.62	4.33
Jambi	7.40	4.42
South Sumatra	10.74	3.93
Bengkulu	14.04	3.13
Lampung	10.74	4.18
Bangka Belitung Islands	4.42	4.90
Riau Islands	5.69	6.94
DKI Jakarta	4.30	6.03
West Java	7.46	6.91
Central Java	10:47	4.79
DI Yogyakarta	10:40	2.85
East Java	9.79	4.23
Banten	6.17	7.02

Bali	3.80	1.87
West Nusa Tenggara	12.91	2.83
East Nusa Tenggara	19.06	3.05
West Kalimantan	6.71	4.55
Central Kalimantan	5.07	4.00
South Kalimantan	4.04	4.13
East Kalimantan	5.78	5.75
North Kalimantan	6.20	4.57
North Sulawesi	7.18	6.52
Central Sulawesi	11.74	3.10
South Sulawesi	8.18	4.34
Southeast Sulawesi	10.78	3.18
Gorontalo	14.41	3.05
West Sulawesi	10.78	2.40
Maluku	16.42	4.94
North Maluku	6.36	4.49
West Papua	20.49	6.02
Papua	26.03	2.43

Source: Central Statistics Agency, Percentage of Poor Population March 2024 and Open Unemployment Rate February 2024 (processed).

Based on Table 1, the average percentage of poor people in 34 provinces is 9.77 percent with a standard deviation of 5.12, while the average TPT was 4.47 percent with a standard deviation of 1.41. The province with the highest percentage of poor people was Papua (26.03 percent), while the province with the lowest percentage of poor people was DKI Jakarta (4.30 percent). Meanwhile, the province with the highest TPT was Banten (7.02 percent), while the province with the lowest TPT was Bali (1.87 percent). The considerable variation in these two variables indicates significant differences in socio-economic structures between provinces in Indonesia.

Pearson Correlation Analysis Results

The results of the Pearson correlation analysis between the percentage of poor people and the TPT in 34 provinces in Indonesia showed a correlation coefficient of r = -0.33 with a coefficient of determination (r^2) of 0.111 or 11.1 percent, and a p-value of 0.054. The visualization of the relationship between the two variables is presented in the form of a scatter diagram in Figure 1.

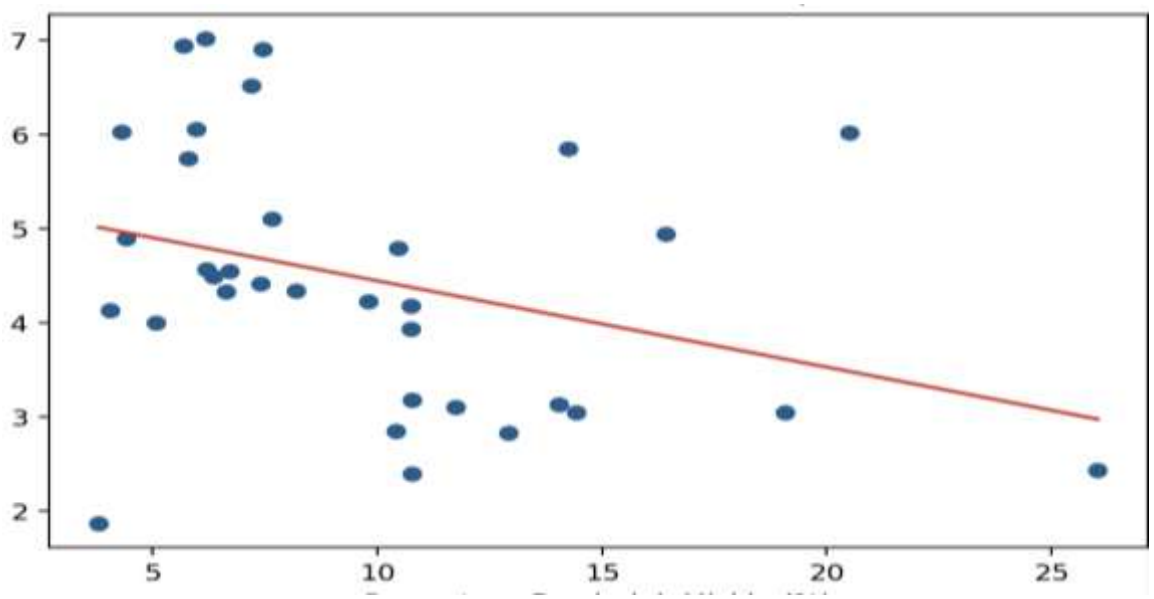

Figure 1. Scatterplot of the Relationship between the Percentage of Poor Population and the Open Unemployment Rate by Province in Indonesia, 2024

A correlation coefficient of -0.33 indicates a negative relationship between the percentage of poor people and the Open Entrance Exclusion Rate (TPT). This means that the higher the percentage of poor people in a province, the lower the TPT in that province, and vice versa. Based on the correlation interpretation categories proposed by Sugiyono (2021), the r value of 0.33 (in absolute value) falls into the weak relationship category. The p value of 0.054 is right at the 0.05 significance level, meaning this negative relationship cannot be statistically declared conclusively significant, although it indicates a consistent negative tendency.

Discussion

The finding of a weak negative relationship between poverty and unemployment aligns with the research findings of Nurhayati (2023), who stated that the relationship between the two variables tends to be weak and inconsistent across regions in Indonesia. This pattern can be explained through several arguments. First, most provinces with high poverty rates, such as Papua, West Papua, East Nusa Tenggara, and Maluku, have economic structures still dominated by the agricultural, plantation, and informal sectors. In these regions, residents without formal employment tend to remain in the informal sector with low productivity and income, thus statistically not being recorded as openly unemployed. This condition aligns with the concept of working poverty proposed by Rahman (2024), which is a condition where someone has a job but their income is insufficient to

escape the poverty line.

Second, provinces with the highest Open Enrollment Rate (TPT), such as Banten, Riau Islands, West Java, and Jakarta, are regions with a formal economic structure, manufacturing industry, and a more competitive labor market. In these regions, the percentage of the poor is relatively low due to higher average income levels and the existence of urban social safety nets, although competition for formal employment results in some of the workforce being listed as openly unemployed. This reinforces the findings of Hidayat and Wibowo (2022), who stated that the effect of unemployment on poverty is relatively small compared to other variables such as per capita income and education level. Third, from a policy perspective, these findings indicate that programs to reduce unemployment cannot automatically be the sole strategy for reducing poverty, especially in provinces with high poverty but low Open Enrollment Rate (TPT). In these regions, more relevant policies include increasing labor productivity in the informal and agricultural sectors, expanding access to business capital, and improving the quality of infrastructure and education. Conversely, in provinces with a high Open Enrollment Rate but low poverty, more relevant policies include creating formal jobs that match the qualifications of the workforce and providing job skills training programs. Overall, the results of this study indicate that the relationship between poverty and unemployment at the provincial level in Indonesia is complex and cannot be generalized simply. The coefficient of determination value of 11.1 percent indicates that variations in the TPT can only explain a small portion of the variation in the percentage of the poor population between provinces, so that there are other factors that are more dominant in explaining poverty levels, such as the structure of the economic sector, education level, access to infrastructure, and income inequality.

CONCLUSION

Based on the results of the Pearson correlation analysis of data from 34 provinces in Indonesia in 2024, it can be concluded that the relationship between the percentage of the poor population and the Open Unemployment Rate (TPT) is negative and weak, with a correlation coefficient of r = -0.33 and a coefficient of determination of 11.1 percent. The p-value of 0.054 indicates that the relationship is at the 5 percent significance limit, so it cannot be declared conclusively significant, but still indicates a tendency for a consistent negative relationship between provinces.

These findings indicate that provinces with high poverty rates do not necessarily have high TPT, and vice versa, largely due to the dominance of the informal and agricultural sectors in high-poverty areas and a more competitive formal economic structure in low-poverty areas. Therefore, poverty alleviation strategies cannot solely focus on reducing open unemployment, but also need to be directed at increasing the productivity and income of informal workers, expanding access to capital, and improving the quality of education and infrastructure in high-poverty areas.

Further research is recommended to use multiple regression analysis with the addition of control variables such as average wages, education level, economic sector structure, and income inequality (Gini ratio) to obtain a more comprehensive picture of the determinants of poverty at the provincial level in Indonesia. Furthermore, the use of panel data (time series across provinces) is also recommended to examine the dynamics of the relationship between poverty and

unemployment over time.

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