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Analyzing the Nexus: Open Unemployment Rate, Human Development Index, and Poverty Levels

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Abstract: *This research aims to evaluate the impact of the open unemployment rate and the Human Development Index (HDI) on poverty levels. By using statistical data and regression analysis methods, this research tries to identify the relationship between the level of open unemployment, HDI, and the level of poverty in a certain population or region. Apart from that, this research also analyzes other variables that can influence these three factors. It is hoped that the results of this research will provide in-depth insight into how these variables are interconnected and provide policy recommendations to reduce poverty levels.*

Keywords: *Open Unemployment Rate, Human Development Index (HDI), Poverty Levels, Statistical Analysis, Regression Analysis, Policy Recommendations.*

INTRODUCTION

Poverty is a complex and multifaceted issue that is influenced by various socio-economic factors. Among these factors, the open unemployment rate and the Human Development Index (HDI) are significant indicators that reflect the economic and social conditions of a country or region. The open unemployment rate represents the proportion of the labor force that is actively seeking employment but is unable to find jobs. On the other hand, the HDI is a composite index that measures a country's overall achievement in terms of health, education, and income.

Understanding the interplay between the open unemployment rate, HDI, and poverty levels is crucial for formulating effective policies to alleviate poverty. High levels of open unemployment often lead to economic instability and income inequality, contributing to higher poverty rates. Conversely, a higher HDI signifies better access to education, healthcare, and economic opportunities, which can reduce poverty levels.

This research seeks to delve into this intricate relationship by conducting statistical analyses and regression modeling. By examining empirical data and employing rigorous analytical techniques, this study aims to uncover the impact of the open unemployment rate and HDI on poverty levels. Additionally, the research will explore other contextual variables that may influence these relationships, providing a comprehensive understanding of the dynamics at play.

The findings of this study are expected to contribute valuable insights to policymakers, economists, and social scientists working towards poverty alleviation and sustainable development goals. By identifying key factors driving poverty and proposing targeted

interventions, this research endeavors to make a meaningful impact on poverty reduction efforts globally.

LITERATURE REVIEW

Poverty is a condition where an individual's income in one year cannot meet their own needs.

According to the Central Statistics Agency (2010), poor people are people whose average per capita expenditure per month is below the poverty line. The determination of the calculation of the poverty line in society is people who earn less than IDR 7,057 per person per day.

Poverty is defined as a low standard of living, namely the existence of a level of material deprivation compared to the standard of living that generally applies in the society concerned. Economically, poverty can also be interpreted as a lack of resources that can be used to improve the welfare of a group of people. Poverty describes a situation of deprivation such as limited capital, low knowledge and skills, low productivity, low income, weak exchange value for the products of poor people and limited opportunities to participate in development.

OPEN UNEMPLOYMENT

Open unemployment is a person who does not have a job or is looking for work. According to BPS (2001), Unemployment is a term for people who do not work at all, are looking for work, work less than two days a week, or someone who is trying to get a job. Meanwhile, the technical definition of unemployment is all people within a certain period of time (labor force age) who are not working, either in the sense of earning a wage or working independently, then are actively looking for work.

The term unemployment is always associated with the labor force. The labor force is the part of the population, (a) aged between 15 and 65 years, (b) who has the will to work, (c) and is looking for work. However, not all people aged 15 to 65 years are included in the labor force, because they do not want to work. For example, people who no longer need work because they already have a lot of wealth, housewives, and people who are still in school or college.

The human development index in the cities of West Java itself has different numbers and experiences increases and decreases every year, such as the city of Bandung which experienced a decrease where in 2017 the HDI value was 80.31 while in 2018 it was 81.06 but in 2019 it experienced a significant increase, namely as much as 81.62 and in 2020 it decreased again to 81.51, but in 2021 it increased to 81.96.

Unemployment can affect poverty in various ways. If the household has liquidity constraints (which means that current consumption is strongly influenced by current income) then unemployment will directly affect poverty, both measured in terms of income (income poverty rate) and poverty measured in terms of consumption (consumption poverty rate).). If the household does not face liquidity constraints (meaning that current consumption is not strongly influenced by current income) then an increase in unemployment will lead to an increase in poverty in the long run, but not much in the short term.

HUMAN DEVELOPMENT INDEX

The human development index (HDI) is a measure of human development achievements based on a number of basic components of quality of life. Where the measurement is through a three basic dimensional approach, namely long and healthy life, knowledge and a decent life. Human capital is one of the important factors in economic development process. With quality human capital. A high level of human development, in the sense of a high level of health, education and skills, will influence the economy through increasing the capability, productivity and creativity of the population (workforce). IPM is important because it can compare potential human development performance to advance regional development.

HDI is one of the most important standards that underlies the development model of a country or region in economic terms. The poverty level must have a positive correlation with the human development index. If the HDI level is high, the quality of life should be high and the poverty level should be low.

RESEARCH METHODS

The data used in this research is secondary data obtained from the Central Statistics Agency (BPS) which was processed or combined from time series from 2017 - 2021 in 9 cities in West Java province. The data used in the research are

- Data on the number of poverty from 9 cities in West Java Province
- Data on the number of open unemployed from 9 cities in West Java Province
- Data on total development indices from 9 cities in West Java Province

The variables tested are Poverty (Y) open unemployment (X1) Human Development Index (X2)

ANALYSIS METHODS

The analysis method used is the panel data method. Panel data is combined data between cross-time data (*time series) and* cross-individual data (*cross section*). Analyze this panel data use three approach that is *Common Effect, Fixed Effect, Random Effect.*

To determine what model to use in the panel data parameters, 2 tests were carried out, namely

1. Chow Test

   According to (Widarjono, 2007) in (Banten, 2022) defines the Chow test as a method that compares the fixed effect method or the common effect method.

   Where in the Chow test what is observed is that the Chi-square prob.cross-section is smaller than alpha which is symbolized by α with a level of (0.05), so the temporary model is a fixed effect model. Meanwhile, if the cross-section Chi-square prob is greater than α (0.05) then the temporary model is the comment effect model
2. Hausman Test

   According to (Gujarati, 2012) in (Banten, 2022) defines that the Hausman test is carried out to compare the random effect method and the fixed effect model to ensure which method is correct for conducting panel data regression.

   Where in the Chow test what is observed is that the Chi-square cross-section prob is smaller than alpha which is symbolized by α with a level of (0.05), so the temporary model is a fixed effect model. Meanwhile, if the cross-section Chi-square prob is greater than α (0.05) then the temporary model is a random effect model.

In general, panel data regression also uses several classic assumption tests, namely:

1. Normality test

   The normality test is carried out to see or assess whether the distribution of the data or variables being tested is normally distributed or not. Where a good regression model is data that has a normal distribution.

   The thing to pay attention to in the normality test is that if the Jarqu-Bera personality value is greater than the alpha level (0.05), then the data is normally distributed. Meanwhile, if the Jarqu-Bera probability value is smaller than the alpha level (0.05), then the data is not normally distributed.
2. Multicollinearity test

The multicollinearity test was carried out to see that the data in the model regression contained collinearity between the independent variables.

The thing to pay attention to in the multicollinearity test is that if the Correlation Matrix value is smaller than 0.08 then multicollinearity does not occur.

3. Heteroscedasticity Test

   The heteroscedacity test was carried out to determine whether there were differences in the variance of the residuals for all observations in the model.

   The thing to pay attention to in the Heteroscedacity Test is that if the calculated Chi-square value is smaller than the Chi-Square table then Heteroscedacity occurs. Meanwhile, if the calculated Chi-square is greater than the table's Chi-Square, then heteroscedacity will not occur.

   Chi-square is calculated using the formula Rsquared xn

   Chi-square table is obtained using the formula in Excel =CHINV(0,05,nk)

4. Hypothesis testing

   Two tests were carried out, namely partial (t test) and simultaneous (f test)

   Partial hypothesis testing to determine the effect of each independent variable on the dependent by comparing t-count and t-table. The t-count is shown in the output of the calculation results, while the t-table is with the formula =TINV(0.05;nk)

   With the hypothesis criteria, if the t statistic value > t table or –t statistic < -t table with probability < α (0.05) then H0 is rejected, H1 is accepted, meaning the independent variable has a significant effect on the dependent variable. And if the t statistic value < t table or –t statistic > -t table with probability > α (0.05) then H1 is rejected, H0 is accepted, meaning the independent variable has no effect and is not significant on the dependent variable.

   The simultaneous test is to determine the influence of all independent variables on the dependent variable by comparing the table f value with calculated f. Fcalculation is obtained using the formula FINV=(0.05;k-1;nk). With the hypothesis criteria, if the Fstatistics value > Ftable with probability < α (0.05), then H0 is rejected, H1 is accepted, meaning that all independent variables have a significant effect on the dependent variable. And if the Fstatistic value < Ftable with probability > α (0.05), then H1 is rejected, H0 is accepted, meaning that all independent variables have no effect and are not significant on the dependent variable.

5. Determination and correlation

   Determination is carried out to measure how much influence independent variables simultaneously have on the dependent variable. According to Ghozali (2016), the criteria for testing determination is that if the R-squared is close to 0 then the independent variable cannot provide the information needed to predict the dependent variable. Meanwhile, if the R-squared is close to 1, the independent variable can provide the information needed to predict the dependent variable.

   Correlation is carried out to see how big and strong the independent and dependent variables are.

RESULTS AND DISCUSSION

Regression Analysis

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	737142.3	11827.43	62.32482	0.0000
UNEMPLOYMENT	-76.54118	87.20284	-0.877737	0.3851
HDI	-0.006674	0.016363	-0.407859	0.6854

Table 1Results of *Multiple Regression Analysis*

The regression equation obtained is:

$$kemiskinan_t = 737142.3 - 76.54118\ Pengangguran_{\ t} - 0.006674\ IPM_t + \in_t$$

Based on the results of these calculations, they can be interpreted as follows:

a. Coefficient/ β0 = 737142.3 meaning that when the Unemployment and HDI variables are equal to 0 then poverty increases by 737142.3
b. Unemployment to Poverty = a 1% change in unemployment will reduce poverty by 76.54%, with other v ariable assumptions ceteris paribus , and vice versa .
c. Human Development Index on poverty = a change in HDI of 1% will reduce poverty by -0.006%, with other v ariable assumptions ceteris paribus , and vice versa .

Model Specific Test

a. Test Chow

Redundant Fixed Effects Tests
Equation: Untitled
Cross-section fixed effects test

Effects Test	Statistics	df	Prob.
Cross-section F	0.817548	(8.34)	0.5925
Chi-square cross-section	7.917215	8	0.4416

Table 2 *Chow Test Results*

Interpretation
Based on the tests I carried out, the value of Prob. The Chi Square cross-section is 0.4416 which is greater than the alpha value (0.05). So it can be concluded that the temporary model is CEM.

b. Hausman test

Correlated Random Effects - Hausman Test
Equation: Untitled
Cross-section random effects test

Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.
Random cross-section	1.764167	2	0.4139

** WARNING: estimated cross-section random effects variance is zero.

Table 3 *Hausman Test Results*

Based on the tests I carried out, the value of Prob. Cross-section – Random section 0.4139 is greater than the alpha value (0.05). So it can be concluded that the temporary model is REM.

Classic assumption test

a. Normality test

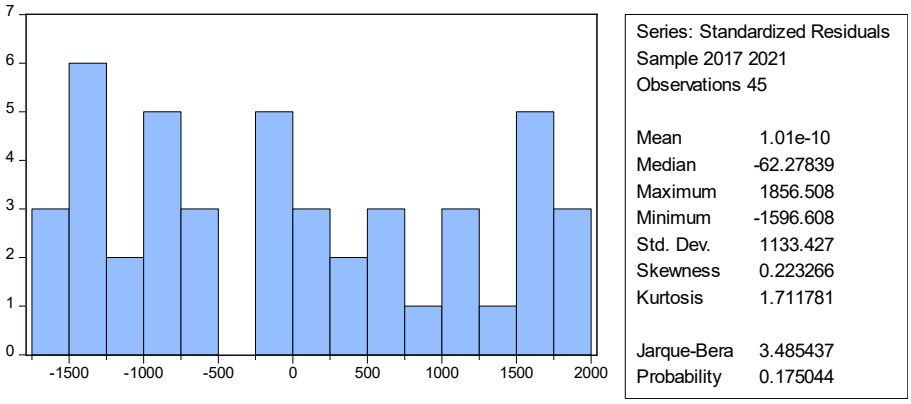

Table 4 *Normality Test Results*

Based on the data parameters that I tested, it is known that the probability value for JB is 0.175044, which is greater than the value of 0.05. Thus it can be concluded that the distribution of data in the regression model is normally distributed.

b. Multicollinearity Test

	HDI	UNEMPLOYMENT
HDI	1,000000	0.046672
UNEMPLOYMENT	0.046672	1,000000

Table 5 *Multicollinearity Test Results*

Based on the results above, it can be seen that the correlation value between the independent variables is less than 0.80. Thus it can be concluded that between the independent variables there is no correlation or multicollinearity does not occur in the linear regression model.

c. Heterscedasticity Test

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.180306	Mean dependent var	731630.7
Adjusted R-squared	-0.060780	SD dependent var	1146.472
SE of regression	1180,799	Akaike info criterion	17.19436

Sum squared resid	47405749	Schwarz criterion	17.63599
Log likelihood	-375.8730	Hannan-Quinn Criter.	17.35899
F-statistic	0.747890	Durbin-Watson stat	2.105478
Prob(F-statistic)	0.675497		

Table 6 *Heteroscedasticity Test Results*

- The way to calculate chi square is: R squared xn = 0.180306 x 45 = 8.11377
- Chi square table is calculated on ms. Excel: = CHIINV(0.05, nk) = 58.12404

Based on the results above, it can be seen that the calculated Chi square value (8.11377) is smaller than the Chi square table (58.12404). Thus it can be concluded that heteroscedasticity does not occur.

d. Partial (T) and Simultaneous (F) Tests

T test

Variables	Coefficient	Std. Error	t-Statistics	Prob.
C	741083.1	12748.91	58.12913	0.0000
UNEMPLOYMENT?	-167.8975	125.6238	-1.336511	0.1903
HDI?	-0.010993	0.017635	-0.623375	0.5372

Table 7 *Partial Test Results*

It is known that the T table value is 2.018082

- From the results of the multiple regression, the T value for unemployment statistics is -1.336511, which is smaller than the T table (2.018082) with a probability of 0.1903 which is greater than alpha (0.05), so partial unemployment has no significant effect on poverty.
- For the T value of the HDI statistic, it is -0.010993, which is smaller than the T table (2.018082) with a probability of 0.5372 which is greater than alpha (0.05), so partially the HDI has no significant effect on poverty.

F test

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.180306	Mean dependent var	731630.7
Adjusted R-squared	-0.060780	SD dependent var	1146.472
SE of regression	1180,799	Akaike info criterion	17.19436

Sum squared resid	47405749	Schwarz criterion	17.63599
Log likelihood	-375.8730	Hannan-Quinn Criter.	17.35899
F-statistic	0.747890	Durbin-Watson stat	2.105478
Prob(F-statistic)	0.675497		

Table 8 *Simultaneous Test Results*

It is known that the F table is 3.219942

From the output results it is known that the Fstatistic value is 0.747890 which is smaller than the F table 3.219942 with a probability of 0.675497 which is greater than alpha (0.05) meaning that in simulation the independent variables (unemployment and HDI) have no effect and are not significant on the dependent variable (poverty).

e. Determination and Correlation

Determination

Judging from Table 8, Simultaneous Test Results show that the R-squared value is 0.180306. This value illustrates that the contribution of the independent variables (unemployment and HDI) to the rise and fall of the dependent variable (poverty) is 18.03% and the remaining 81.97% is the contribution of other variables not included in the model proposed in the research (collected in Nuisance Variables or E).

CLOSING

Conclusion

Based on calculations and tests carried out using eview 10 in partial tests and simultaneous tests, it is stated that the unemployment variable and the human development index do not influence and are not significant on poverty, where in the determination and correlation tests it is also stated that the unemployment variable and the human development index do not influence the increase. The decrease in the amount of poverty is expressed by 18.03% and the strength of this influence is very low, namely only 06.07%, which is very far from 100%. As said by Lincolin Arsyad, poverty is not always related to unemployment and employment problems where people who do not have jobs are not necessarily poor people. (Banten, 2022) .

Suggestion

Poverty needs to be addressed by the government by expanding employment opportunities so that people have an income where with this income they can meet their daily needs, apart from

that it also provides job training to improve the quality of human resources, and to increase labor productivity across sectors, thereby increasing output. and ultimately reduce poverty.

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