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The Influence of the Human Development Index (HDI) and Population Size on Open Unemployment in Enrekang Regency

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Abstract: This study examines the effects of the Human Development Index (HDI) and population on the open unemployment rate in Enrekang Regency, considering the importance of understanding the factors underlying local unemployment dynamics. The study employed a quantitative approach using secondary time-series data obtained from the Central Statistics Agency (BPS) of Enrekang Regency for the period 2015–2024. The data were analyzed using multiple linear regression with the assistance of SPSS software. The results indicate that HDI has a negative and significant effect on the open unemployment rate, with a coefficient of -3.794 and a significance value of 0.020, indicating that improvements in human development are associated with lower unemployment. Population has a positive and significant effect, with a coefficient of 2.071 and a significance value of 0.013, indicating that population growth is associated with higher unemployment. Simultaneously, HDI and population significantly affect the open unemployment rate, as indicated by an F-test significance value of 0.037. The coefficient of determination (R^2) of 0.610 indicates that 61% of the variation in the open unemployment rate is explained by HDI and population. These findings highlight the importance of strengthening human development while considering population dynamics in addressing unemployment in Enrekang Regency.

Keywords: Human Development Index, Population, Open Unemployment

1. Introduction

Open unemployment is one of the important indicators of the economic and social development of a region. A high unemployment rate can generate various social problems, such as poverty, crime, and social instability (Todaro & Smith, 2015). In Indonesia, open unemployment is often influenced by various factors, including the Human Development Index (HDI) and population size. The HDI reflects the quality of human life through education, health, and income dimensions (United Nations Development Programme [UNDP], 2020), while population size can affect the availability of employment opportunities and labor market competitiveness (Malthus, 1798/2008). Enrekang Regency, as one of the regions in South Sulawesi Province, has shown an increasing trend in HDI over the years. Based on the available data, the HDI of Enrekang Regency increased from 72.76 in 2020 to 75.83 in 2024. Nevertheless, this increase in HDI does not necessarily directly reduce the open unemployment rate, particularly if continuous population growth is not accompanied by adequate job creation (Sukirno, 2006). National data indicate that Indonesia's HDI also increased, from 71.94 in 2020 to 74.20 in 2024 (BPS, 2024), while unemployment remains a crucial issue (World Bank, 2023). To provide a clearer overview, the following table presents HDI data from 2020 to 2024 at the national level, South Sulawesi Province, Makassar City, and Enrekang Regency, as presented in Table 1.

Table 1. Human Development Index (HDI) at the National Level, South Sulawesi Province, Makassar City, and Enrekang Regency, 2020–2024

Year	National HDI	South Sulawesi HDI	Makassar City HDI	Enrekang Regency HDI
2024	74.20	74.05	83.90	75.83
2023	73.55	73.46	83.52	75.11
2022	72.91	72.82	83.12	73.39
2021	72.29	72.24	82.66	72.91
2020	71.94	71.93	82.25	72.76

Source: Processed data from the Central Statistics Agency (BPS, 2024).

The data in Table 1 show that the HDI at the national level experienced a consistent increase from

71.94 in 2020 to 74.20 in 2024, reflecting overall progress in human development in Indonesia (BPS, 2024). At the provincial level, South Sulawesi showed a similar trend, with HDI increasing from 71.93 to 74.05, although its average value remained slightly below the national level, indicating disparities in development across regions. Makassar City, as the provincial capital, had an HDI considerably higher than both the national and provincial levels, with a value consistently above 82 throughout the period and reaching a peak of 83.90 in 2024 (BPS, 2024). This indicates that Makassar City has better access to education, health, and income, which may contribute to a lower unemployment rate (Todaro & Smith, 2015).

Meanwhile, Enrekang Regency, which is a regency within the same province, experienced an increase in HDI from 72.76 in 2020 to 75.83 in 2024 (BPS, 2024). Although the HDI of Enrekang Regency was higher than the national and provincial averages in the later years, it remained below that of Makassar City. This comparison is interesting because Makassar City, as an urban area. This condition cannot be separated from the theory of human development proposed by Sen (1999), who argues that an increase in HDI needs to be accompanied by measures involving all stakeholders to avoid social and economic disparities. In greater detail, the analyzed data indicate that although HDI increased by an average of 1.05 points annually, the open unemployment rate reached its highest level of 2.44% in 2020, possibly due to external factors such as the global pandemic (Bloom et al., 2003). Table 2 below presents the complete data, which will be analyzed to identify critical patterns, such as the nonlinear correlation between HDI and unemployment. This study contributes to the academic discourse by highlighting that exponential population growth may exacerbate inequality, as supported by demographic transition theory (Bloom *et al.*, 2003).

Table 2. Human Development Index (HDI), Population, and Open Unemployment Rate in Enrekang Regency, 2013–2024

Year	Human Development Index (HDI)	Population (Persons)	Open Unemployment Rate (Percent)
2015	70.03	199,998	1.33
2016	70.79	201,614	1.60
2017	71.44	203,320	1.87
2018	72.15	204,827	1.66
2019	72.66	206,38	2.15
2020	72.76	225,17	2.44
2021	72.91	227,69	2.34
2022	73.39	231,12	0.58
2023	75.11	234,57	1.53
2024	75.83	238,10	1.51

Source: Central Statistics Agency. (2024). Employment and human development statistics of Enrekang Regency. BPS Enrekang Regency.

The issue of open unemployment (TPT) is one of the main challenges in Indonesia, particularly in rural areas such as Enrekang Regency, South Sulawesi Province. The Human Development Index (HDI) and population are key factors influencing the availability of employment opportunities, where HDI reflects the quality of human resources through education, health, and purchasing power, while population growth can place pressure on labor supply relative to limited employment demand (BPS, 2024). Data from the August 2024 National Labor Force Survey (Sakernas) indicate that the TPT in Enrekang Regency reached 1.51 percent, representing a slight decrease of 0.02 percentage points compared with the previous year. Nevertheless, this condition requires further analysis because population growth and historically low HDI may exacerbate unemployment, thereby necessitating research to understand the causal relationships among these variables.

Based on the August 2024 Sakernas, the Employment Rate (TKK) in Enrekang Regency reached 98.49 percent, indicating that most of the labor force was absorbed; however, TPT remains an indicator of the underutilization of labor. This study focuses on the effects of HDI, as a measure of human resource quality, and population on TPT, considering that Enrekang Regency has the lowest TPT in South Sulawesi Province (1.51 percent), compared with Makassar City (9.71 percent). For example, a low HDI may result in a mismatch between workforce skills and employment requirements, while population growth may intensify competition for employment opportunities (BPS, 2024). Therefore, empirical analysis is required to identify the extent to which these two variables contribute to fluctuations in TPT.

Previous studies on the effects of the Human Development Index (HDI) and population on the open unemployment rate (TPT) have been widely conducted, but gaps remain to be addressed. Most studies, such as those by (Santoso et al., 2022) or (Rahayu., 2018), focus only on regions in Java or Sumatra and do not specifically examine Enrekang Regency in South Sulawesi, which has a rural context characterized by an agriculture-based economy and unique fluctuations in TPT based on data from (BPS). The TPT in Enrekang Regency declined sharply from 2.44% in 2020 to 0.58% in 2022. This study uses panel data for 2015–2024, combining time and location data to analyze annual changes, such as the increase in HDI from 70.03 to 75.83 and population growth from 199,998 to 238,100 persons. This difference fills the gap by providing a more specific analysis of Enrekang Regency and helping to understand how increasing HDI may contribute to reducing unemployment in the future, despite continued population growth.

Based on the above discussion, the researcher is interested in conducting a study entitled **"The Influence of the Human Development Index (HDI) and Population Size on Open Unemployment in Enrekang Regency."**

2. Method

2.1 Research Design

Research methodology comprises a series of systematic stages and procedures undertaken to collect empirical data or information in order to address research problems and test formulated hypotheses. In this study, the data analysis technique employed is quantitative analysis. Quantitative analysis is an approach aimed at obtaining comprehensive, accurate, and thorough explanations based on measurable empirical data. In solving a problem through a quantitative approach, the researcher focuses on numerical data or quantitative facts relevant to the research problem. Subsequently, the researcher develops a mathematical model capable of describing the objectives, constraints, and various other aspects related to the problem (Anderson, 2014:73).

The quantitative approach was selected in this study because it is consistent with the characteristics of the research topic, which involves measuring the effects of the Human Development Index (HDI) and population on the open unemployment rate. Numerical data, such as the unemployment rate, HDI values, and population figures, can be statistically analyzed to produce measurable and testable conclusions. In addition, this method minimizes researcher subjectivity because it relies on empirical data collected from reliable sources such as the Central Statistics Agency (BPS), thereby making the research findings more reliable. By using a mathematical model, this study can examine the strength of relationships among variables, predict future trends, and provide evidence-based policy recommendations, which are highly important for addressing unemployment problems in Enrekang Regency.

2.2 Research Location and Period

a. Research Location

This study focuses on Enrekang Regency, South Sulawesi, with the primary data collection conducted through the Central Statistics Agency (BPS) of Enrekang Regency. This location was selected

because of its relevance to the research topic.

b. Research Period

The research was conducted over approximately two months, from February to March 2026.

2.3 Type and Source of Data

a. Type of Data

The data used in this study are secondary data, namely data obtained from information that had previously been made available and collected by other parties. This study uses panel data, namely a combination of time-series data. The panel data used consist of time-series data from 2015 to 2024 sourced from publications of the Central Statistics Agency (BPS) of Enrekang Regency.

b. Data Source

The data used in this study are secondary data, namely data based on information that had previously been collected from available sources. The data source for this study is publications of the Central Statistics Agency (BPS) of Enrekang Regency.

2.4. Population and Sample

a. Population

The population in this study consists of all data on open unemployment, the Human Development Index (HDI), and population in Enrekang Regency during the 2015–2024 period, obtained from publications of the Central Statistics Agency (BPS) of Enrekang Regency. This population includes annual data reflecting the dynamics of human development and population growth.

b. Sample

The sample in this study was selected using purposive sampling, namely the selection of data based on specific criteria such as data completeness and relevance to the research period. The sample consists of panel data covering 10 years (2015–2024), including HDI values, population figures, and the open unemployment rate in Enrekang Regency.

2.5 Data Collection Technique

Data collection was conducted using the documentation method, which involves recording, studying, collecting, and processing data from official documents published by relevant government institutions. This method ensures accuracy through standard validation procedures to produce appropriate insights. The instrument testing in this study covers two main aspects:

2.6 Operational Definitions of Variables

To facilitate the researcher in identifying data and determining the research variables, while also ensuring consistency in the understanding of the terms used, the variables in this study are operationally defined as follows:

a. **Human Development Index**

   The Human Development Index is the first independent variable (X1), measured using several indicators, namely health, education, and standard-of-living indicators.

b. **Population**

   Population is the second independent variable (X2), defined as the total population of Enrekang Regency from 2015 to 2024.

c. **Open Unemployment Rate**

The open unemployment rate is the dependent variable (Y), defined as the proportion of the total labor force aged 15 years and above who do not have a job but are actively seeking employment, measured as a percentage.

2.7 Data Analysis Method

The data analysis method employed in this study is multiple linear regression analysis to examine the causal relationship between the independent variables (HDI and population) and the dependent variable (open unemployment rate). The analysis was conducted using SPSS software, which enables accurate and efficient statistical modeling (Hair et al., 2019).

a. Classical Assumption Tests

Several model approaches can be used to analyze panel data, including the following:

1) Normality Test

The normality test aims to assess whether the dependent and independent variables in the regression model have a normal distribution. A good regression model is characterized by data that are normally distributed or at least approximately normally distributed. One method for testing normality is through histogram analysis and by examining the probability value of the Jarque-Bera test. If the probability value is greater than 5 percent (0.05), the data can be considered normally distributed. Conversely, if the probability value is less than 5 percent (0.05), the data are considered not normally distributed.

2) Heteroscedasticity Test

According to Supranto (2010), heteroscedasticity is a condition in which the variance of the error term is not constant across the values of the independent variables. The heteroscedasticity test is conducted to determine whether there are differences in residual variance across observations in the regression model. If the residual variance remains constant from one observation to another, the condition is referred to as homoscedasticity, indicating the absence of heteroscedasticity. One method that can be used to detect heteroscedasticity is the White test, by examining the probability value of Obs*R-squared. If the probability value is greater than 5 percent (0.05), it can be concluded that heteroscedasticity does not occur or that the data exhibit homoscedasticity. Conversely, if the probability value is less than 5 percent (0.05), the data are considered to exhibit heteroscedasticity.

3) Autocorrelation Test

The autocorrelation test aims to identify whether there is a relationship between the error term in period t and the error term in the previous period (t-1). Autocorrelation generally occurs because time-series data exhibit interdependence among observations over time. To detect the presence or absence of autocorrelation in this study, the Durbin-Watson test was employed based on the following criteria:

a) DW value < -2 = positive autocorrelation occurs.
b) DW value between -2 and +2 = no autocorrelation occurs.
c) DW value > 2 = negative autocorrelation occurs.

4) Multicollinearity Test

The purpose of the multicollinearity test is to examine whether there is a strong relationship among the independent variables in the regression model (Hauzan et al., 2021). One method for detecting strong relationships among independent variables is by using tolerance values and the Variance Inflation Factor (VIF). A low tolerance value results in a high VIF value. The interpretation of

tolerance and VIF values is as follows:

a) If the Variance Inflation Factor (VIF) value is greater than 10 and the tolerance value is less than 0.10, it can be concluded that the regression model has a multicollinearity problem.
b) If the Variance Inflation Factor (VIF) value is less than 10 and the tolerance value is greater than 0.10, it can be concluded that the regression model does not have a multicollinearity problem.

b. Multiple Linear Regression Analysis

To answer the research question concerning the effects of the Human Development Index and population on the open unemployment rate in Enrekang Regency, multiple linear regression analysis is used with the following equation:

Description:

Y = Open Unemployment Rate
α = Constant
β_1 = HDI regression coefficient
β_2 = Population regression coefficient
X_1= HDI
X_2= Population
ε = Error variable.

2.8 Hypothesis Testing

Hypothesis testing in this study is conducted to examine the significance of relationships among variables based on the multiple linear regression model. The hypotheses are tested using a significance level of α = 0.05 and statistical tests such as the t-test and F-test. The tests conducted in this study are described as follows:

a. Partial Test (t-Test)

The t-statistic test is used to examine the effect of each independent variable partially on the dependent variable. In other words, this test aims to determine the extent to which each independent variable can significantly explain the variation occurring in the dependent variable. The decision-making criteria for the t-test are as follows: if the calculated t-value is greater than the critical t-value, H0 is rejected and Ha is accepted, indicating that the independent variable has a significant effect on the dependent variable. Conversely, if the calculated t-value is smaller than the critical t-value, H0 is accepted and Ha is rejected, indicating that the independent variable does not have a significant effect. This test is conducted at a 5% significance level (α = 0.05).

b. Simultaneous Test (F-Test)

The F-test is used to determine whether the independent variables jointly affect the dependent variable. If the probability value (F-statistic) is less than or equal to 5% (F-table), it can be concluded that the independent variables simultaneously affect the dependent variable. Conversely, if the probability value is greater than 5% (F-table), none of the independent variables affects the dependent variable.

c. Statistical Analysis of R^2 (Coefficient of Determination)

The coefficient of determination (R^2) test is used to determine the extent to which the independent variables affect the dependent variable. If the R^2 value is small or close to 0, this indicates that the independent variables have limited ability to explain the dependent variable (Ali, 2020). Conversely, if the coefficient of determination (R^2) approaches 1, this indicates that the independent variables are capable of explaining almost all of the variation occurring in the dependent variable. Thus,

the regression model used has a very strong explanatory capability. This evaluation is conducted to determine the proportion or percentage of the total variation in the dependent variable that can be explained by the independent variables in the regression model.

3. Results and Discussions

3.1 Results

a. Description of Research Variables

The development of the variables used in this study consists of the Human Development Index (HDI) and Population as the independent variables (X), and the Open Unemployment Rate (TPT) as the dependent variable (Y). The data used are secondary data sourced from the Central Statistics Agency (BPS) of Enrekang Regency during the research period.

1) Development of the Human Development Index in Enrekang Regency

The Human Development Index (HDI) is a composite indicator that describes the extent to which the population can access the outcomes of development in the areas of health, education, and a decent standard of living. HDI has several benefits, including serving as an indicator for measuring the success of human quality development, as a basis for comparing levels of development across regions, and as one of the strategic indicators in the formulation of development policies.

The development of HDI in Enrekang Regency during the research period can be seen in the following table:

Table 3. Human Development Index of Enrekang Regency

Year	Human Development Index (HDI)
2015	70.03
2016	70.79
2017	71.44
2018	72.15
2019	72.66
2020	72.76
2021	72.91
2022	73.39
2023	75.11
2024	75.83

Source: Processed BPS data of Enrekang Regency

Based on Table 3, the development of HDI in Enrekang Regency during the period shows a continuously increasing trend from year to year. This indicates improvements in education, health, and people's purchasing power. The increase in HDI reflects the success of the local government in improving the quality of human resources.

2) Development of Population in Enrekang Regency

Population refers to all people residing in a particular area during a specific period. Population growth will affect the increase in the size of the labor force. If this increase is not accompanied by the availability of employment opportunities, it may lead to an increase in the open unemployment rate. The development of the population in Enrekang Regency can be seen in the following table:

Table 4. Population of Enrekang Regency

Year	Population (Persons)
2015	199.99
2016	201.61
2017	203.32
2018	204.82
2019	206.38
2020	225.17
2021	227.69
2022	231.12
2023	234.57
2024	238.10

Source: Processed BPS data of Enrekang Regency

Based on Table 4, the population of Enrekang Regency shows a gradual increase each year. This increase in population has implications for the growing number of members of the labor force entering the labor market.

3) Development of the Open Unemployment Rate in Enrekang Regency

The Open Unemployment Rate (TPT) is the percentage of unemployed people relative to the total labor force. TPT is an important indicator for assessing the employment conditions of a region.
The development of TPT in Enrekang Regency can be seen in the following table:

Table 5. Open Unemployment Rate of Enrekang Regency

Year	Open Unemployment Rate (Percent)
2015	1.33
2016	1.60
2017	1.87
2018	1.66
2019	2.15
2020	2.44
2021	2.34
2022	0.58
2023	1.53
2024	1.51

Source: Processed BPS data of Enrekang Regency

Based on Table 5, the open unemployment rate in Enrekang Regency fluctuated. A relatively significant increase occurred in 2020, which was influenced by a slowdown in economic activity due to the COVID-19 pandemic. However, in the following years, the unemployment rate began to show a declining trend along with economic recovery.

b. Classical Assumption Tests

1) Normality Test

Table 6. Normality Test

Descriptive Statistics

	N	Skewness		Kurtosis	
	Statistic	Statistic	Std. Error	Statistic	Std. Error
Standardized Residual	10	1,031	0,687	0,111	1,334
Valid N (listwise)	10				

Source: Processed secondary data 2026, SPSS.25

Uji Jarque-Bera (JB) :

$$JB = n\left(\frac{S^2}{6} + \frac{(C-3)^2}{24}\right)$$
$$= 10\left(\frac{1{,}031^2}{6} + \frac{(0{,}111-3)^2}{24}\right)$$
$$= 10\,(0{,}177 + 0{,}347)$$
$$= 5{,}24$$

Based on the results of the normality test, it is known that the sample consisted of 10 observations. The skewness value of 1.031 indicates that the data distribution tends to be symmetrical and does not exhibit substantial skewness. Meanwhile, the kurtosis value of 0.111 indicates that the degree of peakedness of the distribution remains close to a normal distribution. Descriptively, these two values indicate that the data do not deviate substantially from the normality assumption.

The normality test was further supported by the Jarque-Bera (JB) test, which produced a value of 5.24. Based on the decision-making criterion, if the probability value is greater than 5% (0.05), the data are considered normally distributed. The JB value indicates a probability above 0.05; therefore, it can be concluded that the data are normally distributed or approximately normally distributed. Thus, the normality assumption in the regression model has been fulfilled, indicating that the regression model used is adequate and appropriate for further analysis.

2) Heteroscedasticity Test

Table 7. Heteroscedasticity Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Durbin-Watson
1	,781[a]	0,610	0,498	0,25819	0,610	2,067

a. Predictors: (Constant), Population (Persons), Human Development Index (HDI)

b. Dependent Variable: Dependent Variable: Open Unemployment Rate (Percent)

Source: Processed secondary data 2026, SPSS.25

$$Obs*R^2 = n \times R^2$$
$$Obs*R^2 = 10 \times 0.610$$
$$= 6.10$$

The heteroscedasticity test aims to determine whether there is unequal residual variance from one observation to another in the regression model. A good regression model is one in which the residual variance remains constant (homoscedasticity), so that heteroscedasticity does not occur.

In this study, the regression model uses Population (Persons) and the Human Development Index (HDI) as independent variables and the dependent variable as the outcome variable. To test for the presence or absence of heteroscedasticity in the model, the White test was employed by calculating the $Obs*R^2$ value ($n \times R^2$).

Based on the output, the R Square value was 0.610 with a total of 10 observations (n), resulting in:

$Obs*R^2 = 10 \times 0.610 = 6.10$.

The $Obs R^2$ *value of 6.10 was then compared with the Chi-Square table value at a 5% significance level of 18.307*. Because the $Obs*R^2$ value (6.10) is smaller than the Chi-Square table value (18.307), its probability is greater than 0.05.

Thus, it can be concluded that the regression model involving Population (Persons) and the Human Development Index (HDI) does not experience heteroscedasticity or exhibits homoscedasticity.

This means that the residual variance remains constant from one observation to another, so the model satisfies one of the classical regression assumptions and is appropriate for further analysis.

3) Autocorrelation Test

Table 8. Autocorrelation Test

Model Summary[b]						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Durbin-Watson
1	,781[a]	0,610	0,498	0,25819	0,610	2,067
a. Predictors: (Constant), Population (Persons), Human Development Index (HDI)						
b. Dependent Variable: Dependent Variable: Open Unemployment Rate (Percent)						

Source: Processed secondary data 2026, SPSS.25

Referring to the criteria established in this study:

1. DW value < -2 = positive autocorrelation occurs.
2. DW value between -2 and +2 = no autocorrelation occurs.
3. DW value > 2 = negative autocorrelation occurs.

Because the DW value of 2.067 lies between -2 and +2, it can be concluded that no autocorrelation occurs in this regression model. Thus, the regression model satisfies one of the classical assumptions, namely the absence of correlation among errors in consecutive periods.

4) Multicollinearity Test

Table 9. Multicollinearity Test

Coefficients[a]			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Human Development Index (HDI	0,104	9,624
	Population (Persons)	0,104	9,624
a. Dependent Variable: Open Unemployment Rate (Percent)			

Source: Processed secondary data 2026, SPSS.25

Based on the output of the Multicollinearity Test in the *Coefficients (Collinearity Statistics)* table, the Tolerance and Variance Inflation Factor (VIF) values for each independent variable are as follows:

a) Human Development Index (HDI)
Tolerance = 0.104
VIF = 9.624

b) Population (Persons)
Tolerance = 0.104
VIF = 9.624

The multicollinearity test aims to determine whether there is a strong relationship (high correlation) among the independent variables in the regression model. A good regression model should not experience multicollinearity.

Based on the criteria used in this study:

- If VIF > 10 and Tolerance < 0.10, there is a multicollinearity problem.
- If VIF < 10 and Tolerance > 0.10, there is no multicollinearity problem.

The results show that all variables have a VIF value of 9.624 (< 10) and a Tolerance value of 0.104 (> 0.10). Therefore, it can be concluded that there is no multicollinearity problem in the regression model.

c. Multiple Linear Regression Analysis

Table 10. Multiple Linear Regression Analysis

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	22,215	10,644		2,087	0,075
	Human Development Index (HDI)	-3,794	1,269	-2,190	-2,989	0,020
	Population (Persons)	2,071	0,631	2,407	3,284	0,013
a. Dependent Variable: Open Unemployment Rate (Percent)						

Source: Processed secondary data 2026, SPSS.25

Y = 22.215 - 3.794X1 + 2.071X2 + ε

The constant of 22.215 indicates that when HDI and population are assumed to remain constant, the open unemployment rate is estimated at 22.215 percent. The HDI coefficient of -3.794 means that every one-unit increase in HDI will decrease the open unemployment rate by -3.794 percent, assuming population remains constant. The significance value of 0.020 (<0.05) indicates that HDI has a significant effect on the open unemployment rate in Enrekang Regency. Meanwhile, the population coefficient of 2.071 indicates that every one-unit increase in population will increase the open unemployment rate by 2.071 percent, assuming HDI remains constant. The significance value of 0.013 (<0.05) indicates a significant effect. Thus, it can be concluded that, partially, both HDI and population have significant effects on the open unemployment rate in Enrekang Regency.

d. Hypothesis Testing

1) Partial Test (t-Test)

Table 11. Partial Test (t-Test)

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	22,215	10,644		2,087	0,075
	Human Development Index (HDI)	-3,794	1,269	-2,190	-2,989	0,020
	Population (Persons)	2,071	0,631	2,407	3,284	0,013
a. Dependent Variable: Open Unemployment Rate (Percent)						

Source: Processed secondary data 2026, SPSS.25

The t-statistic test is used to determine whether each independent variable individually has a significant effect on the dependent variable. In other words, this test aims to determine whether each independent variable can meaningfully explain changes occurring in the dependent variable. If t-calculated > t-table, H0 is accepted (significant), and if t-calculated < t-table, H0 is rejected (not significant). The significance level used in the t-test is 0.05 or 5%, meaning that the researcher accepts a 5% possibility of error in decision-making. In addition, the direction of the effect of the independent variable on the dependent variable can be observed from the sign of the t-value. If the t-value is positive, it indicates that the independent variable has a positive, unidirectional effect on the dependent variable. Conversely, if the t-value is negative, it indicates that the independent variable has a negative, opposite-direction effect on the dependent variable.

a) The X1 variable (HDI) obtained a calculated t-value of -2.190, which is smaller than the t-table value of 1.894. Meanwhile, the significance level obtained was 0.020, which is smaller than 0.05. This means that the X1 variable (HDI) has a significant effect on variable Y (Open Unemployment) in a negative direction, meaning that H0 is accepted.
b) The X2 variable (Population) obtained a calculated t-value of 3.284, which is greater than the t-table value of 1.894. This means that the X2 variable (Population) has a significant effect on variable Y (Open Unemployment). Meanwhile, the significance level obtained was 0.013, which is smaller than 0.05. This means that the X2 variable (Population) has a significant positive effect on variable Y (Open Unemployment), meaning that H0 is accepted.
c)

2) Simultaneous Test (F-Test)

Table 12. Simultaneous Test (F-Test)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0,728	2	0,364	5,463	,037[b]
	Residual	0,467	7	0,067		
	Total	1,195	9			

a. Dependent Variable: Open Unemployment Rate (Percent)

b. Predictors: (Constant), Population (Persons), Human Development Index (HDI)

Source: Processed data 2026, secondary SPSS.25

Based on the decision-making criteria:

- If the probability value (Sig.) ≤ 0.05, the independent variables simultaneously affect the dependent variable.
- If the probability value (Sig.) > 0.05, the independent variables do not simultaneously affect the dependent variable.

The results show that the Sig. value is 0.037, which is smaller than 0.05 (5%). Thus, it can be concluded that Population and the Human Development Index jointly have a significant effect on the Open Unemployment Rate.

3). Statistical Analysis of R^2 (Coefficient of Determination)

Table 13. Statistical Analysis of R^2

Model Summary[b]						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	Durbin-Watson
1	,781[a]	0,610	0,498	0,25819	0,610	2,067
a. Predictors: (Constant), Population (Persons), Human Development Index (HDI)						
b. Dependent Variable: Open Unemployment Rate (Percent)						

Source: Processed secondary data 2026, SPSS.25

Based on the output of the Coefficient of Determination (R^2) Test in the *Model Summary* table, the following values were obtained:

- R = 0.781
- R Square (R^2) = 0.610
- Adjusted R Square = 0.498
- Std. Error of the Estimate = 0.25819

The coefficient of determination (R^2) test is used to determine the extent to which the independent variables are able to explain the dependent variable. In this study, the independent variables are Population (Persons) and the Human Development Index (HDI), while the dependent variable is the Open Unemployment Rate (Percent).

The R Square value of 0.610 indicates that the two independent variables are able to explain 61.0% of the variation in the Open Unemployment Rate. Meanwhile, **31.0%** of the variation in the Open Unemployment Rate is explained by other factors outside the research model.

3.2 Discussions

a. The Effect of the Human Development Index (HDI) on Open Unemployment in Enrekang Regency

The analysis results indicate that, in general, the strength of the relationship between the independent variables and Open Unemployment is reflected in the correlation coefficient (R) of 0.781, indicating a strong relationship. The coefficient of determination (R^2) of 0.610 indicates that only 61.0% of the variation in Open Unemployment can be explained by the model, while the remaining 39.0% is influenced by other factors outside the variables examined. Simultaneously, the F-test results show a significance value of 0.037 (<0.05), indicating that the regression model is statistically significant. This confirms that the variables included in the model have adequate predictive capability with respect to Open Unemployment.

Partially, the t-test results show that the HDI has a significance value of 0.020 (<0.05), indicating that it has a statistically significant effect on Open Unemployment. Although the regression coefficient indicates a negative relationship, and the comparison between the t-table and t-calculated values is -2.190 < 1.894, this relationship is consistent with supporting the research hypothesis. Theoretically, HDI represents the quality of human development through the dimensions of education, health, and purchasing power. From the perspective of economic development theory, improvements in human resource quality should increase productivity and labor absorption. This may indicate an improvement in the quality of human resources and the structure of employment opportunities available in Enrekang Regency, such that an increase in HDI is converted into greater labor absorption.

b. The Effect of Population on Open Unemployment in Enrekang Regency

In general, the R value (0.781) and R^2 value (0.610) also reflect that the Population variable has a substantial contribution to explaining variations in Open Unemployment. The model developed in this study demonstrates a high explanatory power, indicating that demographic factors represented by population size are able to significantly explain labor market dynamics.

The F-test results, with a significance value of 0.037 (<0.05), indicate that the independent variables in the model simultaneously have a significant effect on Open Unemployment. This demonstrates that, structurally, the combination of human development factors and population growth constitutes a strong determinant of changes in the Open Unemployment rate. Partially, the t-test results show that Population has a significance value of 0.013 (<0.05), indicating a significant effect on Open Unemployment. The regression coefficient indicates a positive direction, meaning that when the population increases, unemployment also increases, and vice versa. From the perspective of population and labor economics theories, population growth is often associated with an increase in the size of the labor force, which may increase unemployment if it is not accompanied by the creation of employment opportunities. Therefore, the results of this study demonstrate empirically that population dynamics in Enrekang Regency during the study period directly affected the unemployment rate.

4. Conclusion and Recommendation

4.1 Conclusion

Based on the results of the data processing and discussion that have been conducted, several conclusions can be drawn as follows:

a. The Human Development Index (HDI) has a negative and significant effect on the Open Unemployment Rate. This is indicated by the results of the data analysis, in which the regression coefficient of the HDI variable is -3.794, indicating a negative relationship. In addition, the significance value of 0.020 is lower than the significance level of 0.05. Therefore, it can be concluded that HDI has a negative and significant effect on the Open Unemployment Rate in Enrekang Regency.
b. Population has a positive and significant effect on the Open Unemployment Rate, as indicated by the regression coefficient of 2.071, which indicates a positive relationship, and a significance value of 0.013, which is lower than the significance level of 0.05. In addition, the comparison between the calculated t-value and the t-table value shows that the calculated t-value of 3.284 is greater than the t-table value of 1.984. It can therefore be concluded that Population has a positive and significant effect on the Open Unemployment Rate.
c. Simultaneously, HDI and Population jointly have a significant effect on the Open Unemployment Rate. This is indicated by the significance value of the F-test of 0.037, which is lower than the p-value of 0.05. In addition, the coefficient of determination (R^2) of 0.610 indicates that the two independent variables are able to explain 61.0% of the variation in the Open Unemployment Rate, while the remaining 39.0% is influenced by other factors outside the research model.

4.2 Recommendation

Based on the conclusions presented above, the following recommendations are proposed:

a. The local government of Enrekang Regency is expected to continue improving the quality of the Human Development Index (HDI) by strengthening access to and the quality of education, health services, and community purchasing power. Since HDI has been proven to have a negative effect on unemployment, improvements in human resource quality will help significantly reduce the unemployment rate.
b. Regarding population growth control, considering that population size has a positive effect on the Open Unemployment Rate, the government needs to strengthen population growth control programs, such as disseminating information about family planning (KB) programs and increasing public awareness of the importance of family planning.

c. For future researchers, it is recommended that this study be developed by incorporating additional variables that may affect the Open Unemployment Rate, such as economic growth, investment, minimum wages, and poverty rates, in order to obtain more comprehensive research findings with stronger explanatory power.

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