Jurnal Riset Multidisiplin dan Inovasi Teknologi
E-ISSN 3024-8582 P-ISSN 3024-9546
Volume 2 Issue 03, September 2024, Pp. 670-679
DOI: https://doi.org/10.59653/jimat.v2i03.1078

Analyzing how population size, GRDP growth, and workforce size impact the unemployment rate in Jember Regency

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Abstract

The purpose of this research is to evaluate the relationship between the Population, Gross Regional Domestic Product (GRDP), and Workforce Size with the unemployment rate in Jember Regency. This study uses secondary data in the form of time series data collected from the Central Statistics Agency of Jember Regency from 2008 to 2023. The analytical methods used include descriptive statistical analysis and multiple linear regression. Hypothesis testing includes partial tests (t-tests), simultaneous tests (F-tests), and the coefficient of determination (R2). Additionally, classical assumption tests are conducted, which consist of normality, multicollinearity, heteroscedasticity, and autocorrelation tests. The results of this study indicate that the variables of Population, GRDP, and Workforce Size have a positive and significant effect on the unemployment rate in Jember Regency.

Keywords: GRDP, Labor Force, Population

Introduction

Economic growth is a crucial aspect that requires serious attention from countries, especially those in the development stage, considering its significant impact on global economic dynamics. The current patterns in developing countries show that the current pace of economic development is still inadequate in effectively creating job opportunities in line with the rate of population growth. The concept of economic development involves a comprehensive assessment of a country's economic progress, including the innovation of economic models used. The approach to significantly increasing income is not the only focus of economic development but also on modernizing economic sectors, such as transforming the agricultural sector from its traditional nature and addressing important issues like accelerating economic growth and equitable income distribution.

Economic development is the process where private industries partner with local governments to manage resources and create new job opportunities across various sectors, with

the aim of promoting the growth of economic activities. Additionally, these efforts aim to ensure the sustainability of life and the equitable welfare of society, as well as to foster social justice in a region (Hanly Fendy D. S., 2019). Economic growth can be understood as the evolution of economic activities or processes within an economy that lead to the involvement of society, as one of the factors of production, in the production of goods and services. The output of this production is then sold in local markets or exported abroad, with the aim of improving the standard of living and prosperity of the people in the region (Sukirno, 2017).

According to the Regent of Jember, the economic growth rate in this region has surpassed the East Java average, even reaching its peak at one point. However, there has been a significant change in the current growth trend. Jember is now known as a developing educational hub due to its friendly environment and affordable living costs. Additionally, the universities in Jember Regency can compete with those in other cities. The high unemployment rate in this city is quite concerning, as Jember Regency ranks seventh among all regencies/cities in East Java, as shown by the data from the East Java Central Bureau of Statistics. The increasing unemployment rate in recent times has become one of the challenges faced by the government of Jember Regency. There were 45,619 unemployed people in this region in 2013 compared to 31,472 people in 2010.

Uraian	2010	2011	2012	2013
Angkatan Kerja	**1 162 067**	**1 208 660**	**1 128 504**	**1 150 396**
- Bekerja	1 130 595	1 160 941	1 084 407	1 104 777
- Pengangguran Terbuka	31 472	47 719	44 097	45 619
Bukan Angkatan Kerja	**589 080**	**542 974**	**631 123**	**617 226**
- Sekolah	93 929	120 123	111 710	112 226
- Mengurus Rumah Tangga	394 996	332 754	418 703	393 789
- Lainnya	100 155	90 097	100 710	111 211
Penduduk Usia 15 Tahun Keatas	**1 751 147**	**1 751 634**	**1 759 627**	**1 767 622**
TPAK	**66,36**	**69,00**	**64,13**	**65,08**
TPT	**2,71**	**3,95**	**3,91**	**3,97**

Figure 1. Employment Indicators of Jember Regency for the Years 2010-2013
Source: Central Statistics Agency of Jember Regency

The issue of unemployment in Jember Regency requires an effective solution within the context of the local economy. The consistent annual population growth contributes to more people seeking jobs, which means more jobs need to be available. The significant growth in population in Jember Regency can lead to an increase in the unemployment rate if steps are not taken to create adequate job opportunities. This puts the local government in a challenging position to address unemployment issues, meet the basic needs of the community, and create sufficient job opportunities. Therefore, the government needs to be actively involved and play a proactive role in finding effective solutions to tackle these problems.

Literature Review

Employment Theory

Lewis (1959) in his study stated that an excess of labor can actually be considered an opportunity rather than a problem. The surplus of workers in a particular sector can have a beneficial impact on the labor supply and output growth in other industries. The term "human resources," or commonly referred to as "sumber daya manusia" in Indonesian, refers to the population size. In the context of production factors, it is important to remember that not all of the population can serve as a factor of production. This understanding aligns with Suparmoko's (1997) view regarding the population as a production factor in the context of economic production.

Theory of Unemployment

The serious issues that have a significant impact on the economy of a country or region are inflation and unemployment. Unemployment refers to individuals who have the ability to work but have not yet succeeded in finding a job and are actively seeking employment opportunities. This term encompasses the state of someone experiencing joblessness, both in the macroeconomic context as part of the labor force that has not been absorbed, and in the microeconomic context as individuals willing to work but have not yet found employment (Suroto, 1992). According to Simanjuntak (1998), a person is considered unemployed if they work no more than two days per week or not at all.

Gross Regional Domestic Product (GRDP)

According to the Central Statistics Agency (BPS), Gross Regional Domestic Product (GRDP) is an economic statistic that measures the total value of goods and services produced in a region over a specific period, often one year. Gross Regional Domestic Product (GRDP), which also shows the contribution of various economic sectors to value addition, can be used to gauge the level of economic activity in a region. GRDP calculated using current prices reflects the value added based on current prices, while GRDP calculated using constant prices reflects the value added based on constant prices. Gross Regional Domestic Product, calculated using current prices, represents the value added by products and services. Gross Regional Domestic Product (GRDP) at constant prices serves as an annual benchmark for assessing economic growth (Sukirno, 2005).

Population Growth Theory

The increase in the number of inhabitants over a certain period relative to the previous number is called population growth. This process involves factors that contribute both positively and negatively to the population size. These factors include births, which continuously add to the population, but simultaneously, there are also mortality factors that affect various age groups. In addition, migration influences both the growth and decline of the population. Sukirno (1997) argues that population growth has a dual impact on development. Firstly, it increases the number of available labor. Secondly, it expands the market, as the size of the market for goods and services depends on per capita income and population size. However, population growth can also hinder development with the potential for decreased

productivity and increased unemployment rates. In the process of a country's economic development, the role of human resource economics is very significant. Ghofari (cited in Soerato, 2010) identifies two main concepts related to human resources. Initially, this concept includes activities or services that can be provided in the production process. The workforce, also referred to as the working-age population, is crucial in supplying human resources for the economy.

Research Method

This explanatory research aims to test the established hypothesis and explain how the variables are related to each other, based on theoretical studies and empirical data to reach valid conclusions. This study focuses on analyzing the influence of the variables of population size, Gross Regional Domestic Product (GRDP), and the number of the workforce on the unemployment rate in Jember Regency. The subject of this research is Jember Regency as the research location. Data sourced from the official website of the Central Bureau of Statistics (BPS) from 2008 to 2023 is used in the data collection process.

Secondary data is used as the primary source of this research. Information collected through intermediaries is referred to as secondary data, such as historical reports, records, or published documents, and is not directly gathered by the researcher (Daryanto, Arif, and Yundy H, 2005). The secondary data for this research was obtained from the Central Statistics Agency (BPS) of Jember Regency.

Result

Multiple Linear Regression Analysis

Variabel	Beta
(Constant)	2,730
Jumlah Penduduk	1,665
PDRB	2,493
Jumlah Angkatan Kerja	0,045

Figure 2. Multiple Linear Regression Analysis
Source: SPSS (Data is processed)

The table shows that the constant beta is valued at 2.730. Each of the independent variable betas in the table is as follows: the beta for the Population variable is 1.665, the beta for the GDP variable is 2.493, and the beta for the Labor Force variable is 0.045.

Normality Test

One-Sample Kolmogorov-Smirnov Test	
	Unstandardized Residual
Asymp. Sig. (2-tailed)	0,200

Figure 3. Normality Test
Source: SPSS (Data is processed)

The data used in the Kolmogorov-Smirnov test table for this study is normally distributed with a significance value of 0.200 > 0.05.

Multicollinearity Test

Model	Tolerance	VIF
Jumlah Penduduk	0,083	8,076
PDRB	0,104	9,602
Jumlah Angkatan Kerja	0,367	2,727

Figure 4. Multicollinearity Test
Source: SPSS (Data is processed)

The results obtained after conducting a multicollinearity test with the dependent variable Open Unemployment Rate against the independent variables are as follows: Population with a tolerance value of 0.083 and VIF of 8.076, GDP with a tolerance value of 0.104 and VIF of 9.602, and Workforce with a tolerance value of 0.367 and VIF of 2.727. All variables produced a Tolerance value ≥ 0.10 and a VIF value ≤ 10, indicating that there is no multicollinearity present.

Heteroscedasticity Test

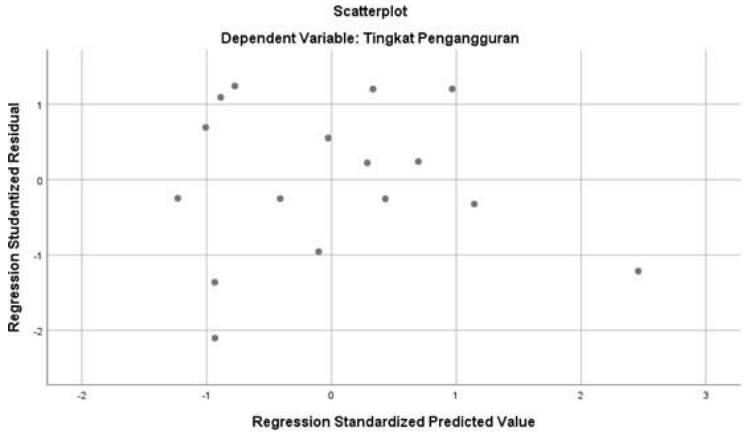

Figure 5. Heteroscedasticity Test
Source: SPSS (Data is processed)

Based on the image above, the Heteroskedasticity test using the Scatter Plot shows a graph displaying sporadic points and an unpredictable pattern. Therefore, it can be said that there are no signs of heteroskedasticity in the data used.

Durbin-Watson Autocorrelation Test

Model Summary	
Durbin-Watson	1.761

Figure 6. Durbin-Watson Autocorrelation Test

Source: SPSS (Data is processed)

In this study, the Durbin Watson (DW) test statistic is used to test for autocorrelation. Using 3 independent variables (k) and a sample size of 16 (n), the DW test table shows dL = 0.8572 and dU = 1.7277. The autocorrelation test shows a DW value of 1.761. Based on the decision criteria, because 4dU < DW > 4dL (2.2723 < 1.1761 > 3.1428), no definite conclusion can be drawn. The resulting DW value falls between 4dU and 4dL, indicating no autocorrelation.

Test the Coefficient of Determination (R^2)

Model Summary[b]			
Model	R	R Square	Adjusted R Square
1	.975[a]	.951	.920

Figure 7. Test the Coefficient of Determination (R^2)

Source: SPSS (Data is processed)

The R^2 value of 0.951 indicates that the dependent variable's ability to affect the independent variables is 95.1%. This means that the Open Unemployment Rate (Y) can be explained by the Population Size (X1), GDP (X2), and Labor Force (X3) by 95.1%. The remaining 4.9% is explained by other factors not included in this study.

Simultaneous Significance Test (F-Test)

ANOVA[a]			
Model		F	Sig.
1	Regression	62.027	.00[b]

Figure 8. Simultaneous Significance Test (F-Test)

Source: SPSS (Data is processed)

From the previous table, it can be concluded that the significance value is 0.000 < 0.05. It is evident that the dependent variable, which is the unemployment rate (Y), is simultaneously influenced by the independent variables: population size, GDP, and the labor force. According to the hypothesis, 62.027 > 3.41, as indicated by the F-statistic value of 62.027 and the F-table value of 3.41. Since H0 is rejected and H1 is accepted, it can be concluded that there is a strong relationship between the independent variables Population Size (X1), GDP (X2), and Labor Force Participation (X3).

Partial Test (t-test)

Coefficients[a]			
Model	Ttabel	Thitung	Sig.
Jumlah Penduduk	2,179	3,403	0,024
PDRB	2,179	2,235	0,010
Jumlah Angkatan Kerja	2,179	4,359	0,030

Figure 9. Partial Test (t-test)
Source: SPSS (Data is processed)

1. The Effect Population Size Relative to the Unemployment Rate
   The results of the hypothesis test show that the Thitung value for the Population Size variable is 3.403 and the significance level is 0.024. With a significance level of 0.05 and a Ttabel value of 2.179, the Thitung value is greater than Ttabel, that is, 3.403 > 2.179. This indicates a significant effect between the Population Size variable and the Unemployment Rate.
2. The Effect Gross Regional Domestic Product (GRDP) and Its Impact on the Unemployment Rate
   The hypothesis test results show that the calculated t-value (Thitung) for the GDP variable is 2.235 with a significance value of 0.010. The significance level is 0.05, and the critical t-value (Ttabel) is 2.179. Since the calculated t-value (2.235) is greater than the critical t-value (2.179), it indicates that there is a significant effect of the GDP variable on the unemployment rate.
3. The Effect Ratio of the Labor Force to the Unemployment Rate
   The hypothesis test results show that the Thitung value for the variable 'Number of Workforce' is 4.359 and the significance value is 0.030. With a significance level of 0.05 and a T-table value of 2.179, the Thitung value is greater than the T-table value (4.359 > 2.179), indicating a significant effect of the 'Number of Workforce' variable on the Unemployment Rate.

Discussion

The variable of Population Size has a significant impact on the variable of Unemployment Rate in Jember Regency from 2008 to 2023. Based on research, from 2008 to 2023, the variable of Population Size has had a significant and positive impact on the unemployment rate in Jember Regency. The significance value of the Population Size variable is 0.024, which is less than the probability of 0.05. An increase in population size is interpreted as the total number of people or residents in a specific area over a certain period. A relatively constant population growth rate from year to year is preferable. Increasing population expansion will enhance competitiveness in the labor market due to various location-specific issues. Above-average skills are required to compete for suitable jobs. The continuously increasing population growth may lead to a surplus of labor in the regional economic sector, which can exceed the sector's demand. As workers are not absorbed by the industry, the relative unemployment rate in the economy continues to rise.

The variable of Gross Regional Domestic Product has a significant impact on the variable of Unemployment Rate in Jember Regency from 2008 to 2023. Based on research findings, the unemployment rate in Jember district is significantly and positively influenced by the GRDP (Gross Regional Domestic Product) variable. Jember will be exhausted by the year 2023. The significance value of the GRDP variable is 0.010, which is less than the probability of 0.05. Economic growth is considered to have a positive impact; however, unfortunately, this increase is not accompanied by an increase in production capacity. As a result, the unemployment rate continues to rise despite economic growth. This phenomenon occurs because the existing economic growth is more focused on capital intensity. In the context of economic development, priority is given to increasing output and income through production activities, rather than focusing on labor-intensive growth efforts. Economic development functions as a performance indicator that reflects the consequences of realized progress. This indicator is important for regions because it can be used by local governments to evaluate the performance of development projects they have undertaken and to inform future planning and policymaking.

The variable of the labor force size has an insignificant impact on the variable of the unemployment rate in Jember Regency from 2008 to 2023. The significant value of the variable Workforce Size is 0.080, which is higher than the probability of 0.05. The annual increase in the workforce leads to high unemployment rates, primarily due to the limited number of available job opportunities. This situation reflects that not all individuals in the community can be absorbed into existing sectors, leading to a tendency for unemployment rates to rise over time. This is consistent with the hypothesis that unemployment rates and workforce size have a close relationship. The growth of the workforce and the unemployment rate are positively correlated. If there is an increase in the workforce without a corresponding increase in job opportunities or adequate field choices, the number of unemployed individuals in that area will rise. Each year, the size of the workforce is influenced by the growing working-age population, which impacts the increase in the unemployment rate.

Conclusion

The population size has a significant and positive impact on the unemployment rate. In this case, several factors, including birth rate, death rate, and population mobility, contribute to the trend of increasing population in Jember Regency every year. The rising unemployment rate in Jember Regency each year is caused by the continuous growth in population size.

Gross Regional Domestic Product (GRDP) has a significant and positive impact on the unemployment rate. In this context, the GRDP of Jember Regency is growing and positive. However, there is still progress to be made. The growth in manufacturing capacity is insufficient to counterbalance this. Consequently, despite the increase in economic growth, the unemployment rate remains high. Capital-intensive industries are usually the center of economic growth in Jember Regency. Production activities that emphasize increasing income and output indicate this, unlike economic growth concentrated in labor-intensive industries. This condition causes the unemployment rate in Jember Regency to increase every year.

The number of the labor force has a significant and positive effect on the unemployment rate. In this context, the increase in the labor force is considered positive because as this number continues to grow each year or period, the impact of unemployment not being absorbed into the labor market and the lack of job opportunities results in a high and increasing unemployment rate every year. The increasing number of productive age groups leads to an annual increase in the labor force, which eventually can cause a rising unemployment rate. This phenomenon is also observed in Jember Regency, where the unemployment rate increases every year.

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