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ANALYSIS OF THE IMPACT OF MSMES, WAGE LEVELS, POPULATION SIZE, AND EDUCATION LEVELS ON UNEMPLOYMENT IN EAST JAVA PROVINCE

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Abstract

Unemployment remains a significant socioeconomic concern, diminishing both productivity and income while potentially triggering broader societal issues. This study investigates how Micro, Small, and Medium Enterprises (MSMEs), wage levels, population size, and education levels affect unemployment rates across districts and cities in East Java Province from 2019 to 2023. Utilizing secondary data sourced from the Central Bureau of Statistics (BPS), this research applies panel data analysis, integrating time series data from 2019 to 2023 with cross-sectional data from 39 districts and cities. Three regression models Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) were examined, with the Fixed Effect Model (FEM) determined as the most suitable approach. Findings reveal that the independent variables collectively influence unemployment rates, as evidenced by an F-statistic of 10.87244 and a p-value of 0.000000, signifying strong statistical relevance. Further analysis reveals that wage levels negatively affect unemployment, implying that higher wages reduce unemployment rates. Meanwhile, population size and education levels positively influence unemployment, suggesting that an increasing population and higher education levels do not necessarily lead to lower unemployment. Interestingly, the study finds that MSMEs do not significantly impact unemployment rates in East Java.

Keywords: Education, MSMEs, Population, Unemployment, Wages

INTRODUCTION

Indonesia, as a developing country, is experiencing economic growth to achieve societal welfare. However, the challenge lies in ensuring that the economic growth is accompanied by job creation and an equitable distribution of income. In Indonesia, the growth of job opportunities has not kept pace with the rapid expansion of the labor force, resulting in higher unemployment rates (Kurniawan et al., 2023). Unemployment is a significant concern because it hampers productivity and household income, which can, in turn, lead to a variety of social problems. Unemployment is technically defined as the segment of the working-age population without work, either salaried or self-employed, but actively seeking employment (Anwar, 2023).

According to Aswanto (2021), every country, whether developed or developing, faces the challenge of unemployment. However, developed nations tend to offer unemployment benefits to their citizens, whereas such provisions are often absent in developing countries. In Indonesia, the Open Unemployment Rate (TPT), as provided by the Central Statistics Agency (BPS), is a key indicator for measuring the proportion of the workforce not absorbed by the labor market. As of February 2020, the TPT stood at 4.99%, indicating that approximately 5 out of every 100 individuals in the workforce were unemployed (BPS, 2020).

East Java, with a population of 39.5 million in 2018, is one of the most populous provinces in Indonesia, second only to West Java. This large population, if not matched by commensurate economic growth, poses significant challenges, especially in terms of employment. Unemployment is closely linked to the population growth rate; as the number of job seekers increases, the ability to create enough jobs to match this growth becomes more difficult, leading to higher unemployment rates (Sari, 2022). This issue is particularly evident in East Java, where the unemployment rate has fluctuated in recent years. In 2019, it reached a low of 3.82%, but the rate spiked to 5.84% in 2020. While it began to decrease in 2021 and continued its decline through 2023, with a reduction of 0.61% from 2022, unemployment remains a significant concern.

This high unemployment rate in East Java is partly attributed to the region's dense population and the concentration of industries, particularly in Surabaya. Despite the rapid

industrial development in Surabaya, the region continues to face high unemployment rates, exacerbated by factory closures and layoffs (Hanifah Noviandari, 2022).

REVIEW OF LITERATURE

Unemployment

According to Mankiw (2020), unemployment refers to individuals actively seeking employment after being previously employed but later dismissed. The Indonesian Bureau of Statistics (BPS., 2010) defines an unemployed person as someone without a job, willing to work, and actively searching for employment, based on the 1986-2000 national labor force survey. However, since 2001, the definition has expanded to include those preparing for self-employment, those who have been offered jobs but have not yet started, and individuals who are no longer searching for work due to the belief that securing a job is unattainable.

Previous studies have explored various aspects of unemployment, such as its causes and impacts on the economy. For instance, Dongoran et al. (2016) identify two major causes of unemployment based on Classical Theory: (1) Wage rigidity, where labor unions resist wage cuts. If unions were willing to accept lower wages, the demand for labor might rise, potentially reducing unemployment. (2) Market rigidity, where large employers, with increased monopolistic power, set prices that hinder the proper allocation of labor.

Further research by Smith (2020) found that wage rigidity significantly impacts unemployment rates in developing economies, as labor unions often play a powerful role in negotiating wages, preventing necessary adjustments. Similarly, Williams and Thomson (2020) argued that market rigidity, particularly in monopolistic industries, contributes to structural unemployment, as it limits the flexibility of labor markets in responding to changing demands. These studies corroborate the ideas proposed by Dongoran et al. (2016) and provide a broader context for understanding unemployment within different economic frameworks.

Micro, Small, and Medium Enterprises (MSMEs)

Law No. 20 of 2008 defines micro enterprises as productive businesses operated by individuals or private entities, with a net worth not exceeding IDR 50 million (excluding land and buildings) or annual revenue under IDR 300 million. Small enterprises are independent

economic activities conducted by individuals or private entities that are not subsidiaries or branches of larger companies. They fall within the criteria of having a net worth between IDR 50 million and IDR 500 million or annual sales ranging from IDR 300 million to IDR 2.5 billion. Medium enterprises, on the other hand, have a net worth between IDR 500 million and IDR 10 billion or an annual turnover between IDR 2.5 billion and IDR 50 billion. Meanwhile, the Indonesian Central Bureau of Statistics (BPS) classifies MSMEs based on workforce size into four categories: (1) Household industries with 1–4 workers, (2) Small industries with 5–9 workers, (3) Medium industries employing 10–99 workers, and (4) Large industries with more than 100 workers (Budiarto, 2015).

The development of MSMEs plays a crucial role in reducing unemployment rates, especially in regions like East Java, where MSMEs account for a significant portion of the workforce. Previous studies have shown that MSMEs are an essential source of employment, particularly in developing regions. For example, a study by Yulianto & Hartanto (2019) found that the expansion of MSMEs in East Java directly contributed to job creation, which in turn helped to reduce the regional unemployment rate. MSMEs often act as a buffer in times of economic uncertainty, providing jobs to individuals who may otherwise struggle to find employment in larger companies.

Furthermore, research by Aji & Wirawan (2020) indicates that the growth of MSMEs is positively correlated with a decrease in unemployment rates, particularly in areas where large industries are scarce. The ability of MSMEs to absorb labor and their adaptability to local economic conditions make them a vital component in tackling unemployment issues. Therefore, it is hypothesized that as the development of MSMEs continues to thrive in East Java, the unemployment rate in the region will experience a notable reduction, contributing to the region's economic stability and growth.

Wages

Wages are a crucial component of labor systems within organizations. The structure and amount of wages require close attention, as they can significantly impact the overall operational effectiveness of the company (Firdhania, 2016). The Indonesian Labor Law No. 13 of 2003 defines wages as the monetary compensation received by employees from employers for their work. These wages are established through employment agreements,

mutual consent, or legal regulations and include benefits for employees and their families for services rendered or to be rendered.

In the context of East Java, the relationship between wages and unemployment rates is an important area of study. Previous research has indicated that wage levels can influence unemployment rates, as higher wages may reduce the incentive for individuals to remain unemployed, while lower wages might lead to higher unemployment as job seekers may not find the offered wages attractive enough. A study by Wardiansyah et al., (2017) found that in regions with higher wages, the unemployment rate tends to be lower due to the increased demand for labor. Conversely, lower wages can result in a mismatch between job expectations and the available workforce, contributing to higher unemployment rates (Mahihody et al., 2018).

This study aims to explore how wages in East Java relate to the region's unemployment rates. By examining the wage structures and the labor market dynamics in East Java, we aim to understand the broader economic factors contributing to employment levels. Understanding this relationship could provide insights into policies that balance wage offerings with sustainable employment growth in the region.

Population Size

The population size is a key indicator of a country's development, influencing various economic factors, including labor force participation and employment levels. Population growth is influenced by factors such as birth rates, mortality rates, and migration patterns, which, in turn, impact the available workforce in a region. Classical economists, led by Adam Smith, viewed population as a potential resource that could increase the output of households or businesses, with a larger population leading to a larger labor force and potentially higher production (Mulyono & Rohaeni, 2023).

In the context of East Java, the relationship between population size and the unemployment rate is particularly relevant, as the growing population could either reduce or increase the unemployment rate depending on the availability of jobs and economic development. A larger population may create more job opportunities, but it may also result in higher unemployment rates if the economy cannot absorb the growing labor force. Previous research by Brown, (2021) found that in regions with high population growth, there

was a significant increase in the unemployment rate due to insufficient job creation. On the other hand, studies by Jhon, (2022) have shown that in regions with effective economic planning and investment, population growth can contribute to economic expansion and a lower unemployment rate.

Thus, this study hypothesizes that population size in East Java has a significant impact on the unemployment rate, with larger populations potentially leading to higher unemployment rates unless there are sufficient job creation mechanisms in place.

Education Level

Education level refers to the stages of learning that individuals undergo, based on their developmental phase and the goals they aim to achieve. Higher levels of education enable individuals to absorb new information and integrate it into their daily behavior. Formal education shapes values and plays a pivotal role in helping individuals adopt new ideas (Ilmi, 2021).

In the context of East Java, the relationship between education level and unemployment rate is a crucial issue. Higher education levels are often associated with lower unemployment rates because individuals with better education are generally more competitive in the job market. Previous studies, such as those by (Alfredo Mahihody et al., 2018), show that regions with higher educational attainment tend to have lower unemployment rates, as education equips individuals with the skills required by employers. Conversely, individuals with lower educational attainment often face higher unemployment rates due to a lack of specialized skills. This relationship suggests that improving education levels in East Java could be a strategy for reducing unemployment in the region.

Hypothesis: Higher education levels in East Java are inversely related to the unemployment rate, meaning that an increase in education level leads to a decrease in unemployment rates.

RESEARCH METHOD

This research adopts a quantitative approach using secondary data to analyze the factors influencing the unemployment rate in East Java Province. The data used for this study are sourced from the Central Bureau of Statistics (BPS), which provides reliable and official

statistical data. Secondary data is chosen due to its accessibility, cost-effectiveness, and the fact that it provides a broad overview of various districts and cities within the region, which may be difficult to collect through primary data in a short period. The dataset consists of time series data from 2019 to 2023 combined with cross-sectional data from 39 districts and cities in East Java.

The data collection technique involves utilizing available statistical reports and databases from the Central Bureau of Statistics (BPS), ensuring that the information is accurate and up-to-date. Secondary data is preferred in this case because it offers a comprehensive dataset already collected and processed by reputable government agencies, which can save time and resources in data gathering.

For data analysis, the study employs panel data regression to capture both the cross-sectional (district/city-level) and time series (annual data from 2019 to 2023) aspects of the data. This is crucial as it allows for better examination of both the temporal and spatial variations across districts and cities. The study considers three potential panel data regression models: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (RAM). These models are explored to determine the most appropriate model based on the characteristics of the data.

The Common Effect Model (CEM) assumes that there are no significant differences between the districts and cities in terms of their effects on the unemployment rate, treating all data points as if they come from the same population.

The Fixed Effect Model (FEM) accounts for the individual heterogeneity between districts and cities by allowing for district-specific intercepts, providing a more detailed understanding of each area's impact on the unemployment rate.

The Random Effect Model (RAM) assumes that the differences between districts and cities are random and uncorrelated with the independent variables, offering a more general approach.

The final model chosen will be based on model selection criteria such as the Hausman test, which compares the Fixed and Random Effect Models to determine which best fits the data. This ensures that the model chosen provides the most accurate results for understanding the relationship between independent variables (MSMEs, wage levels, population size, and

education levels) and the unemployment rate. Data analysis is conducted using Eviews-12 for statistical computation and Microsoft Excel for data organization and presentation.

RESULTS AND DISCUSSION

The first step in model selection involved conducting the Chow test. The goal of this test was to determine whether a Common Effect Model (CEM) or a Fixed Effect Model (FEM) was more appropriate for the dataset. The Redundant Test method was applied, where the chi-square statistic was found to be 147.925735 with a p-value of 0.0000. This p-value is smaller than the alpha threshold of 0.01, leading to the rejection of the null hypothesis (H_0), which suggests that the CEM is more appropriate. As a result, we concluded that the Fixed Effect Model (FEM) is a better fit for the data and proceeded with further analysis using this model

Table 1.
Panel Data Regression Results

Variable	Regression Coefficient		
	CEM	FEM	REM
C	0.387256	-60.02784	20.00057
LOG(UMKM)	-1.482584	-0.587926	-1.656479
LOG(TU)	-0.883488	-4.281958	-2.604073
LOG(JP)	1.711993	8.032355	2.028301
TP	12.86403	33.00339	16.25222
R^2	0.487453	0.800225	0.387897
Adjusted R^2	0.473965	0.726624	0.371789
Statistik F	36.13951	10.87244	24.08103
Prob. Statistik F	0.000000	0.000000	0.000000

Source: Processed Data, 2025

Table 2.
Panel Data Estimation Results with the Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	4.696875	(38,114)	0.0000
Cross-section Chi-square	147.925735	38	0.0000

Source: Processed Data, 2025

Based on the Chow test using the Redundant Test method, the chi-square probability value is 0.0000, which is smaller than the alpha value of 0.01, leading to the rejection of H_0. This indicates that the Fixed Effect Model (FEM) is more suitable for hypothesis testing in this study compared to the Common Effect Model (CEM). To refine choices between the

Fixed Effect Model (FEM) and Random Effect Model (REM), the Hausman test was applied. The test results yielded a chi-square statistic of 33.826214 with a probability value of 0.0000, which is also less than 0.01. This indicates the rejection of the null hypothesis (H_0), confirming that the Fixed Effect Model (FEM) is indeed more appropriate for this study compared to the Random Effect Model.

Table 3.
Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	33.826214	4	0.0000

Source: Processed Data, 2025

The Hausman test results show a probability value of 0.0000, which is less than the alpha value of 0.01, so H_0 is rejected. Following the results from the Chow and Hausman tests, the Fixed Effect Model (FEM) was used to estimate the regression equation and evaluate the impact of the independent variables (MSMEs, Wage Level, Population Size, and Education Level) on the dependent variable (unemployment). The regression equation for the Fixed Effect Model is.

Table 4.
Fixed Effect Model (FEM) Estimation Results

$$PNG_{it} = -60{,}0278 - 0{,}5879\ logUMKM_{it} - 4{,}2819\ logTU_{it} + 8{,}0323\ logJP_{it} + 33{,}0033 TP_{it}$$

(0,3765) (0,0000)* (0,0502)*** (0,0027)*

$R^2 = 0{,}800225\ ;\ DW = 2{,}432171\ ;\ F = 10{,}87244\ ;\ Prob.F = 0{,}000000$

R^2 = 0.800225 ; DW = 2.432171 ; F = 10.87244 ; Prob. F = 0.000000
Source: Processed Data, 2025

The F-test is used to examine the existence of a model and to determine whether all independent variables collectively affect the dependent variable. If the Prob. F statistic is less than the alpha value, it can be concluded that the independent variables significantly influence the dependent variable. Based on the Fixed Effect Model (FEM) estimation table, the Prob. F-statistic is 0.000000, indicating that the variables MSMEs, Wage Level (TU), Population Size (JP), and Education Level (TP) have a simultaneous effect on unemployment in the districts and cities of East Java Province.

The coefficient of determination (R^2) for the Fixed Effect Model (FEM) estimation is 0.800225, meaning that 80.02% of the variation in unemployment is explained by the variations in MSMEs, Wage Level (TU), Population Size (JP), and Education Level (TP), while the remaining 19.98% is attributed to factors outside the model.

Table 5.
Validity Test Results for the Impact of Independent Variables

Variable	Coefficient	Sig, t	Criterion	Conclusion
LOG(UMKM)	-0.5879	0.3765	> 0.1	Not Significant
LOG(TU)	-4.2819	0.0000	< 0.1	Significant
LOG(JP)	8.0323	0.0502	< 0.1	Significant
TP	33.0033	0.0027	< 0.1	Significant

Source: Processed Data, 2025

Based on the validity test results presented in Table 5, the independent variables that significantly impact unemployment include Wage Level (TU), Population Size (JP), and Education Level (TP). The Wage Level (TU) has a regression coefficient of -4.2819 with a log-linear relationship, indicating that a 1% increase in the Wage Level (TU) leads to a 4.2819% decrease in unemployment, while a 1% decrease in Wage Level results in a 4.2819% increase in unemployment. The Population Size (JP) has a coefficient of 8.0323 with a log-linear relationship, meaning a 1% increase in Population Size (JP) causes an 8.0323% rise in unemployment, and a 1% decrease leads to an 8.0323% decrease in unemployment. The Education Level (TP) has a coefficient of 33.0033 with a linear relationship, suggesting that a 1% increase in Education Level (TP) will lead to a 33.0033% increase in unemployment, and a 1% decrease results in a 33.0033% reduction in unemployment. Meanwhile, the MSMEs variable does not have a significant impact on unemployment in the 39 districts and cities of East Java Province.

Wage Rate and Unemployment

The panel data estimation reveals a negative relationship between wage rates and unemployment in East Java's regencies/cities. This suggests that as wages increase, individuals are more motivated to seek employment, leading to an increase in labor supply. The growing labor supply could, in turn, contribute to reducing the unemployment rate. This outcome aligns with the findings of (Aswanto, 2021), who demonstrated a similar negative correlation between wages and unemployment in East Java from 2003 to 2014. Theoretically,

the increase in wages could serve as an economic incentive for people to enter the labor market, which is a basic economic principle of labor supply responding to wage incentives.

However, while this result suggests a positive outcome, it also raises questions about the sustainability of such an effect. An increase in wages may not always translate to a proportional reduction in unemployment if the demand for labor does not keep pace with the growing supply. For instance, if wages increase in an environment where job creation is stagnant or lagging, the surplus labor might not find jobs, thereby neutralizing the effect of higher wages. Furthermore, the quality and type of jobs available are essential factors. If wage increases are concentrated in low-skilled, low-productivity jobs, the reduction in unemployment may not result in improved economic stability or growth. Thus, policies should focus on wage increases that are coupled with strategies for expanding job opportunities and improving job quality.

Population Size and Unemployment

The analysis of population size and unemployment reveals a positive correlation, indicating that a growing population can exacerbate unemployment in East Java's regencies/cities. Rapid population growth often outpaces the capacity of local economies to generate enough employment opportunities, leading to increased competition for available jobs. This aligns with the research by (Satya, 2024), who also found a positive relationship between population growth and unemployment in the region. From a demographic perspective, a larger population intensifies the demand for goods and services but may also strain infrastructure and public services, making it harder for governments and businesses to meet the rising needs of the population.

Additionally, a rapid increase in population may affect economic development in the region, especially in developing areas where capital and resources are limited. The economic theory of population growth suggests that without corresponding investments in human capital, infrastructure, and industry, a rapidly growing population can hinder development and raise unemployment rates. This calls for policies that not only manage population growth but also focus on improving the quality of economic opportunities. Effective urban planning, investment in infrastructure, and targeted job creation strategies are essential to mitigating the negative impact of population growth on unemployment.

Education Level and Unemployment

The panel data estimation suggests that a higher level of education positively influences unemployment, highlighting a mismatch between the skills acquired through formal education and the demands of the labor market in East Java. This finding supports the work of (Wahyu, 2022), who noted the high unemployment rates among graduates with higher education degrees. The mismatch may stem from an educational system that is not fully aligned with the needs of employers, particularly in vocational education. Many graduates from vocational schools (SMKs) are not adequately prepared for the workforce, exacerbating the unemployment problem, as they struggle to find employment in their field of study.

This issue underscores the importance of aligning educational curricula with industry needs. While higher education is essential for personal development, it must also be adapted to ensure that graduates are equipped with the skills required by the labor market. This could involve closer collaboration between educational institutions and industry sectors, so that the curriculum is designed to prepare students for the evolving demands of the job market. Moreover, continuous professional development and lifelong learning opportunities can help graduates remain competitive, reducing the mismatch and improving their chances of finding suitable employment.

MSMEs and Unemployment

Contrary to expectations, the analysis indicates that MSMEs (Micro, Small, and Medium Enterprises) do not have a significant effect on unemployment in East Java's regencies/cities. While MSMEs are often seen as key drivers of job creation, especially in developing regions, the results of this study suggest that their impact on unemployment may be more nuanced. Tri and Wajuba et al., (2021) highlighted that although MSMEs can absorb labor and reduce unemployment in the long term, their immediate effect may not be as pronounced. MSMEs often require specialized skills or capital investment that may not be accessible to a large portion of the unemployed population, particularly in areas with limited access to education or training.

Furthermore, the expansion of MSMEs may be constrained by challenges such as limited access to finance, inadequate infrastructure, and regulatory barriers. These factors

can hinder the growth of MSMEs, limiting their ability to generate employment opportunities. Therefore, while MSMEs play a crucial role in the economy, policies aimed at supporting their growth should address these constraints. For instance, facilitating access to capital, improving business regulations, and promoting skill development programs would enable MSMEs to expand and absorb a larger segment of the workforce, ultimately helping to reduce unemployment in the region.

CONCLUSION

The findings of this research highlight key implications for addressing unemployment in East Java. The negative relationship between wage levels and unemployment suggests that increasing wages could reduce unemployment by making jobs more attractive and improving living standards, thereby encouraging greater workforce participation. Additionally, the positive correlation between population size and unemployment indicates that larger populations require policies to expand employment opportunities, particularly in densely populated areas. The positive impact of education levels on unemployment emphasizes the need for improving access to quality education and vocational training to enhance employability. Although MSMEs did not significantly affect unemployment in this study, further research may explore how specific MSME policies could foster job creation. Overall, the research suggests that targeted policies focused on wages, education, and population growth are essential to reduce unemployment, while calling for more investigation into the role of MSMEs in local economic development.

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