

The Impact of Minimum Wage, Inflation, and Labor Force on Open Unemployment in Indonesia

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ABSTRACT

This study aims to analyze the effect of minimum wages, inflation, and the labor force on the Open Unemployment Rate in Indonesia for the period 2009–2024. The study uses secondary time series data from the Central Bureau of Statistics with multiple linear regression analysis methods. The results of the study indicate that partially the minimum wage has a negative and significant effect on the open unemployment rate at a significance level of 10%, while inflation has a negative but insignificant effect and the labor force has a positive but insignificant effect. Simultaneously, the minimum wage, inflation, and the labor force have a significant effect on the Open Unemployment Rate in Indonesia. The coefficient of determination (R^2) value of 44.73% indicates that variations in the open unemployment rate can be explained by these three variables, while the rest is influenced by other factors outside the study.

INTRODUCTION

Employment is one of the fundamental pillars of economic development, particularly in developing countries. A productive labor market contributes to economic growth, improves household welfare, and supports social stability. Conversely, persistent unemployment remains a major economic challenge because it limits the efficient utilization of human resources, increases poverty, and creates various social problems. High unemployment also weakens economic productivity and may hinder sustainable national development (Sinaga & Roziani, 2023; Pujoalwanto, 2014; Khodijah Ishak, 2018).

In Indonesia, unemployment continues to be an important issue despite continuous efforts by the government to improve labor market conditions. One of the primary causes of unemployment is the imbalance between the rapid growth of the labor force and the limited availability of employment opportunities. When labor supply increases more rapidly than labor demand, many individuals are unable to secure jobs, resulting in a higher unemployment rate. Therefore, reducing unemployment remains one of the key indicators of successful economic development and inclusive economic growth (Suwarni, 2016; BPS, 2007).

The Open Unemployment Rate (OUR) is widely used as an indicator to evaluate labor market performance in Indonesia. This indicator measures the proportion of unemployed individuals relative to the total labor force. According to data published by the Central Bureau of Statistics (BPS), Indonesia's Open Unemployment Rate generally declined between 2009 and 2019, falling from 7.87% to 5.23%. However, the COVID-19 pandemic disrupted labor market conditions, causing unemployment to rise to 7.07% in 2020 before gradually declining to 6.49% in 2021, 5.86% in 2022, 5.32% in 2023, and approximately 4.82% in 2024. These fluctuations indicate that the unemployment rate is strongly influenced by changing economic conditions and labor market dynamics.

Several macroeconomic factors are considered to influence the Open Unemployment Rate. One important factor is the minimum wage. The minimum wage represents a government policy intended to protect workers' welfare while maintaining labor market stability. Theoretically, changes in minimum wage levels may affect firms' hiring decisions and labor demand. While higher minimum wages may increase labor costs for employers, they can also improve workers' purchasing power and stimulate economic activity, potentially creating additional employment opportunities (Ghofur, 2020).

Inflation is another macroeconomic variable closely associated with unemployment. Inflation reflects sustained increases in the general price level of goods and services. According to the Phillips Curve, inflation and unemployment tend to exhibit an inverse relationship in the short run. Higher inflation may encourage firms to expand production in response to stronger demand, thereby increasing labor absorption. Nevertheless, persistent inflation can also raise production costs and reduce firms' capacity to employ additional workers, making the relationship between inflation and unemployment highly dependent on prevailing economic conditions (Hartati, 2020; Wahab, 2022).

In addition to minimum wages and inflation, role of labor force related to determining unemployment levels. Labor force including productive individuals category whis is working and also finding job. In this study, labor force variable emphasizes employed productive people as an indicator of labor absorption. An expanding labor force can contribute positively to economic growth when accompanied by high job opportunities. However, if job creation doesn't have capacity to safe pace with labor force growth, unemployment is likely to increase due to an imbalance between labor supply and labor demand (Kartika & Muslim, 2013).

Some studies proved inconsistent results adjust to determinants of unemployment in Indonesia. Aditya et al. (2024) found that minimum wages significantly affect unemployment, whereas Permatasari et al. (2023) reported insignificant influence from inflation. Meanwhile, Hidayatullah and Riyanto (2024) argued that changes in the labor force influence labor market conditions, particularly when employment growth cannot absorb the increasing number of workers. These mixed findings provide correlation of macroeconomic elements with unemployment described inconclusive and deserves further empirical investigation.

From these explanations, the purpose of researcher's study is showing influence from minimum wages, inflation, and labor force on Indonesia's Open Unemployment Rate during the 2009–2024 period. By employing recent time-series data, study provides updated empirical evidence regarding the determinants of unemployment or even offer useful insights for policymakers in designing more effective employment strategies.

LITERATURE REVIEW

Unemployment Theory

Unemployment is generally defined as a condition in which individuals that motivated also have capacity to work categorized unable to obtain employment opportunities. From the perspective of labor economics, unemployment arises in position supply of labor higher than demand for labor related to prevailing wage level. Classical economists argue that labor market imbalances are temporary because wage adjustments will eventually restore equilibrium. In contrast, Keynesian theory emphasizes that unemployment may persist due to insufficient aggregate demand, which discourages firms from expanding production and hiring additional workers (Blanchard, 2021).

Furthermore, modern labor economics categorizes unemployment into several forms, even structural, frictional, and also cyclical unemployment. Frictional type appears during the transition of jobs, structural appears when mismatches happens around individual skills with labor market needs, while cyclical is correlated with fluctuations in economic activity. These forms of unemployment demonstrate that labor market conditions are influenced not only by labor supply but also by broader macroeconomic factors (Mankiw, 2023).

Empirical evidence also supports the relationship between macroeconomic conditions and unemployment. Annastasya et al. (2025) found that economic instability, particularly changes in inflation and economic growth, significantly influences space of labor market for people to work in. Likewise,

Khodijah Ishak (2018) emphasized that persistent unemployment contributes to poverty and various social challenges, highlighting the importance of employment policies in supporting sustainable economic development.

Minimum Wage

This element represents government policy created for establishing the lowest acceptable wage that employers are legally required to pay workers. From the perspective of classical labor market theory, setting wages higher than market equilibrium may decrease labor demand because firms attempt to minimize production costs, potentially leading to higher unemployment (Neumark & Wascher, 2008).

However, this perspective differs from the efficiency wage theory, which suggests that higher wages can improve employee motivation, productivity, and work commitment. Better compensation may encourage workers to perform more effectively, thereby increasing productivity and partially offsetting higher labor costs (Mankiw, 2023).

Previous empirical studies have reported mixed findings regarding the relationship between minimum wages and unemployment. Aditya et al. (2024) concluded that increases in minimum wages significantly affect unemployment because higher labor costs may reduce firms' willingness to hire additional workers. In contrast, Ghofur (2020) argued that appropriate minimum wage policies can improve workers' welfare and strengthen purchasing power, ultimately supporting economic activity. These differing studies showed influence from minimum wages based from regional economic level, labor productivity, also firms' capacity to adjust to wage changes.

Inflation

This element represents continuous raise of general price related to goods or even services in unpredictable period. Within macroeconomic theory, inflation is closely linked to labor market performance. The Phillips Curve explains that inflation and unemployment tend to exhibit an inverse relationship in the short run. Rising inflation may reflect stronger aggregate demand, encouraging firms to expand production and increase labor recruitment, thereby reducing unemployment (Blanchard, 2021).

Nevertheless, this relationship is not always consistent. According to modern macroeconomic theory, inflation expectations weaken long period of comparison of inflation with unemployment (Mankiw, 2023). Moreover, increasing inflation may raise production costs, reducing firms' profitability and limiting their ability to employ additional workers (Huruta, 2024).

Empirical findings also vary. Permatasari et al. (2023) reported that inflation does not significantly affect unemployment in Indonesia, suggesting that inflation alone cannot fully explain labor market conditions. Similarly, Hilmi et al. (2022) argued that uncontrolled inflation may weaken purchasing power and reduce production activities, while Wahab (2022) emphasized that rising production costs caused by inflation may encourage firms to reduce employment. These studies suggest that the influence of inflation depends on broader economic circumstances.

Labor Force

This element represents individuals in productive age level whether actively working and seeking job. In labor economics, labor force reflects opportunity of human resources participating in economic activities. An expanding labor force generally indicates a greater supply of labor within an economy.

Theory about classical economic explained labor supply increases and encourages wage adjustments until labor market equilibrium is achieved. However, if employment opportunities fail to grow at the same pace as the labor force, unemployment is likely to increase because the labor market cannot absorb all available workers (Mankiw, 2023).

Modern labor economics further emphasizes that labor quality, including education, skills, and productivity, is equally important in determining employment outcomes. The International Labour Organization (2023) highlights that improving workforce quality enhances labor competitiveness and employment opportunities. Supporting this view, Khoirina et al. (2025) found that rapid labor force growth without sufficient job creation tends to increase unemployment. Therefore, labor force expansion should be accompanied by policies promoting investment, industrial development, and employment creation to achieve balanced labor market conditions.

METHODOLOGY

Researcher applied quantitative type with causal associative design to explain influence from minimum wages, inflation, and the labor force for Open Unemployment Rate (OUR) in Indonesia on 2009–2024. This quantitative was selected because it allows the relationships among variables to be analyzed objectively through statistical procedures.

The research utilized annual secondary time-series data collected from official publications issued by BPS or Central Bureau of Statistics. The dataset consisted of information on provincial minimum wages, inflation rates, labor force, also OUR in Indonesia. Data were gathered through documentation techniques by compiling statistical reports and publications relevant to the variables under investigation.

To analyze correlation of independent with dependent elements, this study applied multiple linear regression analysis estimated using Ordinary Least Squares. This technique was chosen because it is appropriate for examining simultaneous or even partial influence from several independent elements for a single dependent factor.

The regression employed in researcher's study expressed below:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e_i$$

Information:

Y	= Open Unemployment Rate (%)
X ₁	= Minimum Wage (rupiah)
X ₂	= Inflation (%)
X ₃	= Labor Force (people)
α	= Constant

$\beta_1, \beta_2, \beta_3$ = Regression coefficient

e_i = Error term

Before estimating the regression model, several classical assumption applied to make sure OLS estimator satisfied BLUE criteria or Best Linear Unbiased Estimator. These tests within normality, multicollinearity by Tolerance also VIF score, heteroscedasticity with Glejser, even autocorrelation with a LM method called Breusch Godfrey Serial Correlation.

Hypothesis testing was then carried out through three statistical procedures. Partial test evaluates individual effect of each independent element for its dependent. Simultaneous examined whether all independent elements jointly affected its dependent. Finally, R^2 applied to assess OUR variation's proportion which is explained by regression model.

RESEARCH RESULT

Results of Multiple Linear Regression Analysis

This analysis applied to explain correlation of independent such as minimum wage, inflation, also labor force – and dependent factor, namely Open Unemployment Rate in Indonesia. This analytical approach allows the simultaneous estimation of the contribution of each explanatory variable while controlling for the effects of the others.

Table 1. Results of Multiple Linear Analysis

Dependent Variable: Y				
Method: Least Squares				
Date: 04/14/26 Time: 15:15				
Sample: 2009 2024				
Included observations: 15				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.843721	1.106731	7.087288	0.0000
X1	-6.65E-07	2.87E-07	-2.318035	0.0407
X2	-0.120739	0.184305	-0.655102	0.5259
X3	4.15E-06	6.33E-05	0.065563	0.9489
R-squared	0.447372	Mean dependent var		6.074000
Adjusted R-squared	0.296655	S.D. dependent var		0.838620
S.E. of regression	0.703314	Akaike info criterion		2.357151
Sum squared resid	5.441152	Schwarz criterion		2.545964
Log likelihood	-13.67863	Hannan-Quinn criter.		2.355140
F-statistic	2.968298	Durbin-Watson stat		1.159972
Prob(F-statistic)	0.078725			

Source: Eviews Data Processing 12.

By estimation results, the formula below:

$$Y = 7.843721 - 6.65E-07X_1 - 0.120739X_2 + 4.15E-06X_3$$

Information:

Y = OUR (%)

X₁ = Minimum Wage (rupiah)

X₂ = Inflation (%)

X₃ = Labor Force (millions of people)

e = error term

Table provides 10% significance, which is minimum wage factor has a prob score 0.0407 below the specified sig limit. This proves significantly negative correlation of minimum wage with OUR. This estimated coefficient of $-6.65E-07$ explains raise of Rp100,000 in this factor is related to an estimated decline of approximately 0.0665% in the Open Unemployment Rate, assuming any explanatory factor categorized constant.

For inflation, a prob score with 0.5259, proves statistically insignificant with 10% significance. Although the estimated coefficient is negative (-0.120739), the statistical evidence suggests that changes in inflation were not sufficient to produce a meaningful change in unemployment during the study period.

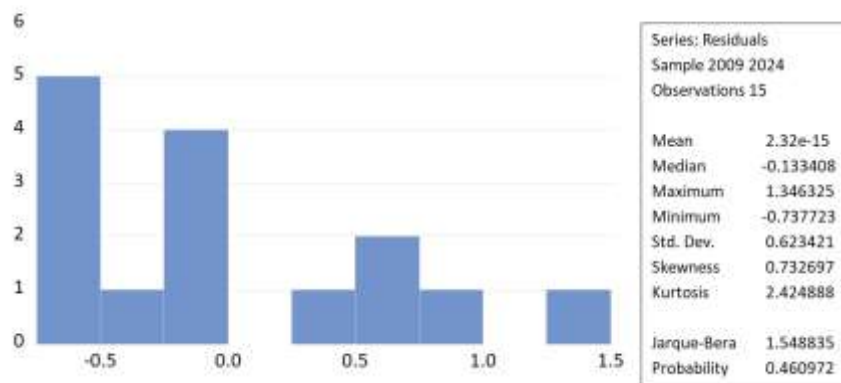
Similarly, labor force has prob score with 0.9489, proves insignificantly influence OUR. Its positive coefficient ($4.15E-06$) suggests a positive relationship; however, the magnitude of the coefficient is very small and lacks statistical significance. This result indicates that increases in the labor force are not automatically followed by higher unemployment because labor market absorption may continue to accommodate additional workers.

Overall, these findings demonstrate from 3 explanatory elements inside model, minimum wage is the only factor shows positive partial influence for OUR, whereas inflation and labor force do not show significant individual influences during the observation period.

Classical Assumption Test

a. Normality

Table 2. Normality Results



Source: Eviews Data Processing 12

This normality evaluated by Jarque-Bera method. Obtained Jarque-Bera statistic was 1.548835, including prob. score 0.460972, that exceeds 10% sig. limit. Therefore, hypothesis (H_0) on residual distribution cannot be rejected. In addition, the skewness score 0.732697 indicates a slight positive asymmetry, while kurtosis score 2.424888, which is close to benchmark score of 3, proves residuals including distribution that is reasonably close to normal. Consequently, this regression filled normality assumption criteria related to estimation of OLS.

b. Multicollinearity

Table 3. Multicollinearity Results

Variance Inflation Factors
Date: 04/14/26 Time: 15:21
Sample: 2009 2024
Included observations: 15

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	1.224853	37.14301	NA
X1	8.23E-14	12.60367	2.240263
X2	0.033968	17.27295	2.730805
X3	4.01E-09	15.14048	4.385053

Source: Eviews Data Processing 12

This test represents VIF score which is 2.240263 for minimum wage, 2.730805 for inflation, and 4.385053 for labor force. Since all factors show substantially low scores commonly accepted limit, 10, it all doesn't show indication of multicollinearity on its factors. These values confirm each independent elements describe information for regression, allowing reliable estimation of their respective effects on the Open Unemployment Rate.

c. Heteroscedasticity

Table 4. Heteroscedasticity Results

Heteroskedasticity Test: Glejser
Null hypothesis: Homoskedasticity

F-statistic	1.834226	Prob. F(3,11)	0.1992
Obs*R-squared	5.001622	Prob. Chi-Square(3)	0.1717
Scaled explained SS	2.890019	Prob. Chi-Square(3)	0.4089

Source: Eviews Data Processing 12.

This test applied to examine model without heteroscedasticity. Obtained Obs*R-squared prob score which is 0.1717 above 10% sig. limit, indicating H0 cannot be rejected. Accordingly, variance of residual shows unchanged condition, suggesting this model doesn't have heteroscedasticity and satisfies one of the important assumptions underlying the OLS method.

d. Autocorrelation

Table 5. Autocorrelation Results

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	1.702412	Prob. F(2,9)	0.2360
Obs*R-squared	4.117138	Prob. Chi-Square(2)	0.1276

Source: Eviews Data Processing 12.

Autocorrelation was assessed by Breusch-Godfrey SC-LM. Both F-statistic score (0.2360) with Obs*R-squared score (0.1276) exceed 10% sig. limit. These

findings prove absence of serial correlation in this residual. Therefore, all residuals from one observation are independent of those from previous observations, confirming this model filled autocorrelation assumption.

e. Hypothesis Testing

1. Partial or T

Partial focused on proving influence from each independent elements for dependent factor individually, namely OUR. Test assessed by comparing (Prob.) score with sig. limit of 10% ($\alpha = 0.10$). If score is lower than its limit, 0.10, means significant influence from factors on OUR. From testing, prob. score of minimum wage is $0.0407 < 0.10$ proves significantly negative influence for OUR. It means increase in minimum wage tends to reduce the OUR in this country. Meanwhile, prob. score of inflation variable is $0.5259 > 0.10$ proves insignificantly negative influence for OUR. Prob. score of labor force is $0.9489 > 0.10$ proves insignificantly positive influence for OUR. Thus, only minimum wage factor shows its partial significant influence for OUR.

2. Simultaneous or F

Simultaneous focused on proving all independent elements, namely minimum wages, inflation, and workforce jointly affect the dependent factor. comparing (Prob.) score with sig. limit of 10% ($\alpha = 0.10$). From testing, prob. score is $0.078725 < 0.10$. This shows all elements significantly influence OUR in Indonesia simultaneously. Thus, these 3 elements together describe changes in OUR.

3. Determinant Coefficient (R²)

R² focused on proving extent to which independent elements that describe dependent factor on model. This score between range of 0 and 1. If R² goes higher, explanation capability from independent will be claimed greater. From testing, R² score is 0.447372.

The score explains 44.73% from OUR variation especially between 2009–2024 in Indonesia describes by all independent factors. Meanwhile, 55.27% left was described by external elements beside this study, such as economic growth, investment, education level, labor productivity, industrial sector development, government policies, and other economic factors that can influence the Open Unemployment Rate in Indonesia.

DISCUSSION

The Effect of Minimum Wage on the Open Unemployment Rate

The empirical findings prove minimum wage has a statistically significant negative effect on Indonesia's OUR during 2009–2024 observation period. This conclusion is supported by the estimated regression coefficient of $-6.65E-07$ and a prob score which is 0.0407, below 10% significance level. All results suggest that increases in the minimum wage are associated with a reduction in the unemployment rate.

One possible explanation is that higher minimum wages improve workers' purchasing power, leading to stronger household consumption. Increased

consumer spending encourages firms to expand production in response to rising demand, which may create additional employment opportunities. Consequently, although higher wages increase labor costs, they may also stimulate economic activity that supports job creation when implemented under favorable economic conditions.

These findings are consistent with studies from Aditya Ramadan et al. (2024) and Ghofur (2020), both of which reported that minimum wage policies has crucial position in influencing unemployment. However, the impact of minimum wages may differ across regions depending on labor productivity, business competitiveness, and firms' capacity to adjust to changes in labor costs. Therefore, minimum wage policies should be formulated by considering both workers' welfare and the sustainability of employment.

The Effect of Inflation on the Open Unemployment Rate

That test reveals that inflation has a negative but statistically insignificant relationship with OUR. Although the estimated coefficient is negative (-0.120739), probability score 0.5259 exceeds the selected significance limit, proving inflation did not significantly influence unemployment during the study period. This finding suggests that fluctuations in inflation alone cannot adequately explain changes in unemployment in Indonesia. Inflation may influence labor demand indirectly through changes in production costs, purchasing power, and aggregate demand; however, these effects appear to have been offset by other macroeconomic conditions during the observation period. As a result, the relationship between inflation and unemployment remains relatively weak.

The present results related to Permatasari et al. (2023), Hilmi et al. (2022), and Wahab (2022), who also concluded that inflation doesn't exert a significant influence on unemployment. This evidence implies that maintaining price stability is important for economic performance, but additional factors such as investment, industrial expansion, and labor market conditions are likely to play a greater role in determining employment outcomes.

The Effect of the Labor Force on the Open Unemployment Rate

Labor force variable exhibits a positive but statistically insignificant relationship with OUR. That reflected by the estimated coefficient which is $4.15E-06$ and its prob. score which is **0.9489**, proves observed relationship is not statistically meaningful. Although labor force expands supply of available workers, it does not necessarily result in higher unemployment. The labor market is capable of absorbing additional workers when employment opportunities expand simultaneously through economic growth, investment, and business development. Therefore, labor force growth should not automatically be interpreted as a source of unemployment.

This result supports the findings reported by Hidayatullah and Riyanto (2024), Khoirina et al. (2025), and Kartika and Muslim (2013), who argued that labor force expansion alone is insufficient to explain unemployment dynamics. human resources quality, labor productivity, also employment creation policies are equally important in determining labor market performance.

Simultaneous Effect of Minimum Wage, Inflation, and Labor Force on the Open Unemployment Rate

The simultaneous testing results demonstrate that minimum wage, inflation, and labor force jointly influence OUR in this country. Its obtained F-statistic prob score which is 0.078725, below 10% sig. limit, confirms 3 explanatory factors collectively contribute to explaining variations in unemployment. Furthermore, $R^2 = 0.447372$ means approximately 44.73% of OUR variation described by factors in regression model. 55.27% left is attributable to other determinants that were not incorporated into this study, including economic growth, investment, education, labor productivity, technological development, and government employment policies.

Overall, results explain unemployment got influenced by multiple macroeconomic factors rather than a single variable. Effective employment policies therefore require an integrated approach that simultaneously considers wage policy, macroeconomic stability, labor market conditions, and job creation strategies. This conclusion is similar to study of Annastasya et al. (2025), who emphasized unemployment is determined by various economic factors interaction rather than by isolated variables.

CONCLUSION

Researcher's study examined influence from minimum wages, inflation, and the labor force for Open Unemployment Rate or OUR in Indonesia with annual time-series data between 2009–2024. The empirical findings reveal that minimum wage is the only factor shows statistically influence for OUR. The negative regression coefficient means minimum wages increases and correlated to lower unemployment, suggesting that an appropriate wage policy may contribute to improving labor market conditions.

In contrast, inflation exhibits insignificant negative correlation of OUR, implying that fluctuations in inflation alone were insufficient to explain changes in unemployment during the observation period. Likewise, labor force element proves insignificant positive influence means increase in the number of workers does not necessarily result in higher unemployment when employment opportunities continue to expand.

The simultaneous test confirms that minimum wages, inflation, and the labor force collectively influence OUR. Furthermore, R^2 demonstrates all independent elements describe 44.73% of unemployment variation, while the remaining variation is attributable to other economic and structural factors not included in this research. From researcher's study, emphasize about unemployment, which is shaped by multiple macroeconomic factors and should therefore be addressed through comprehensive and well-coordinated policy measures.

RECOMMENDATIONS

By this study's findings, researcher share recommendations can be proposed. First, the government should continue implementing minimum wage policies that balance workers' welfare with business sustainability, ensuring that wage adjustments remain aligned with regional economic conditions and labor

productivity. Second, maintaining macroeconomic stability, particularly stable inflation, is essential to support a favorable business environment and preserve household purchasing power. Although inflation was not found to have significant influence for unemployment in this study, price stability remains important for sustaining economic growth and employment.

Finally, expanding employment opportunities should remain a national priority. Policies encouraging investment, industrial development, and the growth of micro, small, and medium-sized enterprises (MSMEs), together with improvements in education, vocational training, and workforce skills, are expected to strengthen labor absorption and contribute to reducing the Open Unemployment Rate in Indonesia.

ADVANCED RESEARCH

Researcher found some limitations which is should be checked during interpreting the findings. First, the analysis only includes three explanatory variables minimum wages, inflation, and the labor force while other important determinants of unemployment, such as economic growth, investment, education, technological progress, and labor productivity, were not incorporated into the regression model. Consequently, the model does not fully capture the complexity of factors affecting unemployment in Indonesia.

Second, the study depends on annual time-series data covering from 2009 to 2024. Although this period provides useful evidence regarding long-term labor market trends, extending the observation period or employing alternative datasets could provide a more comprehensive understanding of unemployment dynamics.

Future studies are therefore encouraged to incorporate additional macroeconomic and socioeconomic variables, apply longer observation periods, or utilize alternative econometric approaches, such as panel data or dynamic time-series models. These improvements are expected to produce more comprehensive evidence and provide deeper insights into the determinants of unemployment in Indonesia.

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