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The Influence of the Unemployment Rate, Population Size, and Wages on Economic Growth during the Administration of President Joko Widodo

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Abstrak. *Pertumbuhan ekonomi menjadi salah satu indikator keberhasilan suatu pemerintahan. Masa pemerintahan Presiden Joko Widodo selama dua periode memperoleh tanggapan positif oleh beberapa peneliti. Sayangnya belum ada penelitian yang fokus mengkaji pertumbuhan ekonomi pada kedua periode ini. Artikel ini bertujuan untuk menguji pengaruh tingkat pengangguran, jumlah penduduk, dan upah terhadap pertumbuhan ekonomi Indonesia pada masa pemerintahan Presiden Joko Widodo. Penelitian ini menggunakan pendekatan kuantitatif dengan sumber data sekunder yang diperoleh dari laporan Badan Pusat Statistik (BPS) untuk 34 Provinsi di Indonesia selama periode tahun 2016-2024. Analisis data menggunakan metode Regresi Berganda untuk Data Panel dengan perangkat lunak Eviews 12. Hasil penelitian menunjukkan bahwa tingkat pengangguran tidak berpengaruh signifikan terhadap pertumbuhan ekonomi dengan nilai probabilitas 0,344 > 0,05. Sementara jumlah penduduk dan upah berpengaruh signifikan terhadap pertumbuhan ekonomi, masing-masing dengan nilai probabilitas 0,000 < 0,05 dan 0,000 < 0,05. Meskipun berdasarkan penelitian ini tingkat pengangguran tidak berpengaruh negatif terhadap pertumbuhan ekonomi, namun pemerintah tetap perlu terus berusaha untuk menurunkan tingkat pengangguran demi tercapainya kesejahteraan masyarakat.*

Kata kunci: *Pengangguran; Jumlah Penduduk; Upah; Pertumbuhan Ekonomi; Indonesia; Presiden Joko Widodo.*

Abstract. *Economic growth is one indicator of a government's success. President Joko Widodo's two terms have received positive responses from several researchers. Unfortunately, no research has focused on examining economic growth during these two periods. This article aims to examine the influence of the unemployment rate, population, and wages on Indonesia's economic growth during President Joko Widodo's administration. This study uses a quantitative approach with secondary data sources obtained from the Central Statistics Agency (BPS) report for 34 provinces in Indonesia for the period 2016-2024. Data analysis uses the Multiple Regression method for Panel Data with Eviews 12 software. The results of the study indicate that the unemployment rate does not significantly influence economic growth, with a probability value of 0.344 > 0.05. Meanwhile, population and wages significantly influence economic growth, with probability values of 0.000 < 0.05 and 0.000 < 0.05, respectively. Although based on this study, the unemployment rate does not negatively affect economic growth, the government still needs to continue to strive to reduce the unemployment rate to achieve public welfare.*

Keywords: *Unemployment; Population; Wages; Economic Growth; Indonesia; President Joko Widodo.*

Introduction

Economic growth is a prerequisite for societal advancement. Consistent year-on-year economic growth has a positive impact on development. Economic growth is intrinsically linked to the unemployment rate, as an increase in economic growth is typically followed by a rise in societal productivity in the production of goods and services. Unemployment has consistently been a challenging issue to resolve. The continuously growing population in Indonesia, when not matched by a corresponding increase in labor demand, contributes to unemployment (Hasibuan, 2023). Population size exerts influence across various sectors, including economic growth. With a large population, a society should theoretically be able to both produce a significant volume of goods and constitute a substantial consumer base (Darma, 2021). However, high population growth is considered by some economists to be an impediment to development. The high rate of population growth in developing nations like Indonesia can hinder the development process. Economic growth can also be influenced by factors such as unemployment and population increase. This implies that both the unemployment rate and population size may have a significant influence on economic growth (Azulaidin, 2021).

Theoretically, when economic growth accelerates, unemployment should decline (Fahrudin & Sumitra, 2020). Changes in the wage structure within the labor market are a crucial component of the evidence for a reciprocal relationship between economic growth and human capital growth (Mincer, 1996). Following the 2008 crisis, several countries sought new pathways to growth. A primary solution employed was wage increases. The expectation was that these increases would boost aggregate demand, which in turn would positively affect GDP (Lupu et al., 2023). Economic growth represents an increase in the overall income of a society within a specific region. The rate of economic growth is commonly used to assess the success of development over a given period. It is an important sign of how well an economy is doing, especially when looking at the results of a country's or its leaders' economic development efforts (Azulaidin, 2021). Joko Widodo won a second term as president of the Republic of Indonesia in the 2019 presidential election. On October 20, 2019, he was inaugurated alongside Vice President K.H. Ma'ruf Amin for the 2019–2024 term of office (Cabui, 2022). Statistical data indicates that during the early period of President Joko Widodo's administration, Indonesia's economy in 2014, as measured by Gross Domestic Product (GDP) at current prices, grew by 5.02 percent (BPS, 2015). Subsequently, when the COVID-19 pandemic swept the globe, Indonesia's economy recorded its worst performance in 2020, experiencing a contraction of 2.07 percent (BPS, 2021). Nevertheless, towards the end of President Joko Widodo's administration, the economy resumed its growth, expanding by 5.03 percent in 2024 (BPS, 2025). Although this rate was not substantially higher than when he first took office, it signifies that during his tenure, the government successfully navigated the economic downturn caused by the COVID-19 pandemic, rebounding from a contraction of over 2 percent to achieve a growth rate of over 5 percent. According to Hardjanti (2024), while not yet optimal, President Jokowi's two-term administration can be considered effective.

This is partly because the government was highly focused on infrastructure development as a means to stimulate economic growth. Similarly, Kamila (2024) states that despite encountering numerous obstacles, the objectives of justice and utility derived from policies were fulfilled during Joko Widodo's two-term leadership. Numerous investigations have been carried out to look at how different macroeconomic factors affect economic growth. However, there is a specific lack of research investigating the influence of these variables during the administration of President Joko Widodo, who served two terms and is generally perceived as having performed well. This study is to investigate the impact of the population size, wages, and unemployment rate on Indonesia's economic growth under President Joko Widodo's administration.

Research Methodology

This study employs a quantitative approach to examine the cause-and-effect relationship between independent and dependent variables (Sugiyono, 2019). The analytical model used is multiple regression, which involves one dependent variable influenced by several independent variables (Yusi & Idris, 2020). The Ordinary Least Squares (OLS) method is utilized to derive the regression line, ensuring that the predicted values are as close as possible to the actual data (Widarjono, 2019). This research utilizes panel data regression, as it combines cross-sectional data from several variables with time-series data over several years. Three models are considered for panel data regression analysis: the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM). The most appropriate model is selected through three diagnostic tests: the Chow Test, the Hausman Test, and the Lagrange Multiplier Test (Djami et al., 2024). The classical assumptions are a set of requirements that must be met for a regression model estimated using the Ordinary Least Squares (OLS) method. The objective is to produce parameter estimates that are accurate representations of the true values, ensuring the parameters are characterized as the Best, Linear, Unbiased Estimator (BLUE). A regression model using OLS will theoretically yield correct parameter estimates if it satisfies the assumptions of (i) no multicollinearity, (ii) no autocorrelation, (iii) homoscedasticity, and (iv) normal distribution of residuals. The multiple regression analysis is conducted using the statistical software Eviews 12. Eviews, an abbreviation for Econometrics Views, is a software package specifically designed for econometric analysis (Wahyudi, 2016). This study uses secondary data spanning the 9-year period of President Joko Widodo's administration (2016-2024), obtained from the official website of Central Statistics Agency (BPS) for 34 provinces in Indonesia. The authors investigated nine of the ten years of President Joko Widodo's administration due to the unavailability of complete provincial data on the official website of Indonesian Central Statistics Agency (BPS) for the 2011–2015 period.

Similarly, the study was limited to 34 of Indonesia's 38 provinces, as four new provinces were only officially established in 2022, meaning their historical data from 2016 onwards was not available. However, with a sample size that constitutes approximately 90% of the total population, this research is believed to yield sufficiently accurate predictions. The variables used in this research are as follows: (1) Independent Variables: Unemployment Rate (X1), Population Size (X2), and Wages (X3); and (2) Dependent Variable: Economic Growth (Y). This research is structured according to the following design:

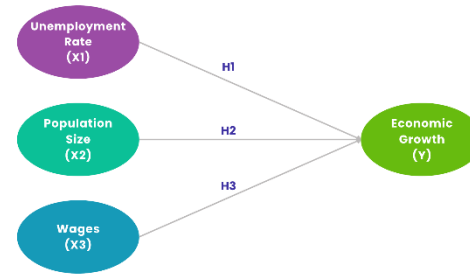

Figure 1. Research Design and Hypotheses

From the research design, three hypotheses will be tested:

1) The Unemployment Rate has a significant effect on Economic Growth.
2) Population Size has a significant effect on Economic Growth.
3) Wages have a significant effect on Economic Growth.

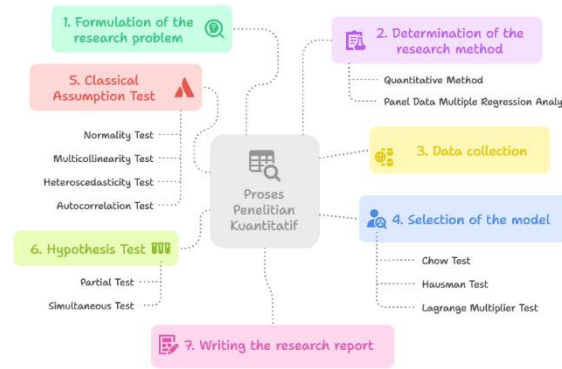

Figure 2. Research Stages

The stages of this research are as follows:

1) Formulation of the research problem.
2) Determination of the research method:
   a) Quantitative Method.
   b) Panel Data Multiple Regression Analysis.

3) Data collection.
4) Selection of the appropriate model (CEM, FEM, or REM) using 3 tests:
   a) Chow Test.
   b) Hausman Test.
   c) Lagrange Multiplier Test.
5) Classical Assumption Testing, which includes four tests:
   a) Normality Test.
   b) Multicollinearity Test.
   c) Heteroscedasticity Test.
   d) Autocorrelation Test.
6) Hypothesis Testing, which includes two tests:
   a) Partial Test (t-test).
   b) Simultaneous Test (F-test).
7) Writing the research report.

Results and Discussion

Results

This study utilizes multiple linear regression analysis with panel data. Therefore, prior to hypothesis testing, it is necessary to perform model selection and classical assumption tests on the dataset.

Model Selection

The following are the results of the model selection process, which consists of the Chow Test, Hausman Test, and Lagrange Multiplier Test, conducted on the dataset used in this research.

Table 1. Chow Test Results

Effects Test	Statistic	d.f	Prob
Cross-section F	1.424554	(33,269)	0.0688
Cross-section Chi-square	49.285389	33	0.0340

The Chow test results show a probability value for the Cross-section F of 0.068, which is greater than 0.05. This indicates that between the Common Effect Model (CEM) and the Fixed Effect Model (FEM), the CEM is selected.

Table 2. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	24.610204	3	0.0000

The Hausman test results show a probability value for the Cross-section random of 0.000, which is less than 0.05. This indicates that between the FEM and the Random Effect Model (REM), the FEM is selected.

Table 3. Lagrange Multiplier Test Results

Test	Cross-section	Time	Both
Breusch-Pagan	0.563206 (0.4530)	4.421809 (0.0355)	4.985015 (0.0256)

The Lagrange Multiplier test results show a Cross-section Breusch-Pagan value of 0.453, which is greater than 0.05. This indicates that between the REM and the CEM, the CEM is selected. The Common Effect Model (CEM) was selected as the best model for the multiple linear regression for panel data and the ensuing classical assumption tests based on the outcomes of these three tests.

Classical Assumption Tests

The following are the results of the Classical Assumption Tests, which include the Normality Test, Multicollinearity Test, Heteroscedasticity Test, and Autocorrelation Test, performed on the dataset.

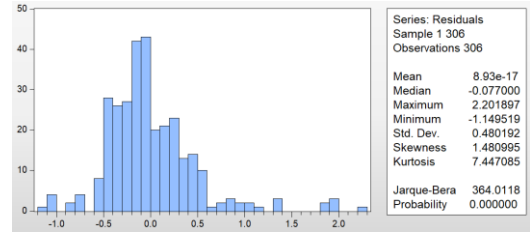

Figure 3. Normality Test Results

The normality test results show a probability value of 0.00, which is less than 0.05, meaning

the dataset is not normally distributed. However, the Central Limit Theorem states that with a large sample size, a distribution will approximate a normal distribution (Tongku et al., 2024). The purpose of the normality test is to determine whether the residual variables in a correlation model have a normal distribution. A correlation equation is considered good if both the independent and dependent variable data are normally distributed or approximate a normal distribution (Zarlin et al., 2025).

Table 4. Multicollinearity Test Results

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C (Konstanta)	0.041059	106.1338	NA
PENGANGGURAN	0.000417	21.07993	1.351808
PENDUDUK	1.11E-11	2.325403	1.166266
UPAH	7.42E-15	129.9502	1.458201

The Centered VIF value for each independent variable is less than 10, according to the findings of the multicollinearity test. This suggests that multicollinearity is not an issue for any of the independent variables in this study model. To determine if there is a linear relationship between the independent variables in a regression model, the multicollinearity test is utilized (Ekananda, 2019).

Table 5. Heteroscedasticity Test Results

Test	Statistic	Probability	P-value
F-statistic	52.30535	Prob. F(3,302)	0.0000
Obs*R-squared	104.6298	Prob. Chi-Square(3)	0.0000
Scaled explained SS	143.2299	Prob. Chi-Square(3)	0.0000

The heteroscedasticity test results show that the Prob. Chi-Square for Obs*R-squared is less than 0.05, indicating that the model suffers from heteroscedasticity. However, this analysis has employed Robust Standard Errors using the Huber-White covariance method. This approach retains the regression coefficient values but corrects the standard error estimates to ensure they remain valid despite the presence of heteroscedasticity (Lubis et al., 2025). The OLS assumption requires homoscedasticity, where the variance of the residuals is constant across observations (Widarjono, 2019). The presence of heteroscedasticity is not considered a serious issue, as the residuals are not a factor in calculating the parameter coefficients (Rosadi, 2012). Therefore, even with heteroscedasticity, the parameter coefficients remain unbiased and consistent, though they are no longer efficient (Baltagi, 2008).

Table 6. Autocorrelation Test Results

Test	Statistic	Probability	P-value
F-statistic	2.666797	Prob. F(2,300)	0.0711
Obs*R-squared	5.345235	Prob. Chi-Square(2)	0.0691

The autocorrelation test results show that the Prob. Chi-Square for Obs*R-squared is greater than 0.05, meaning there is no problem of autocorrelation in this model.

Table 7. Autocorrelation Test Discussion

Statistic	Value	Interpretation
R-squared	0.017468	Model menjelaskan 1.75% variasi variabel dependen
Adjusted R-squared	0.001093	R^2 yang disesuaikan dengan jumlah prediktor

S.E. of regression	0.479929	Standar error dari regresi
Sum squared resid	69.09967	Jumlah kuadrat residual
Log likelihood	-206.5258	Nilai log likelihood
F-statistic	1.066719	Uji signifikansi model secara keseluruhan
Prob(F-statistic)	0.378878	P-value dari F-statistic

A prerequisite assumption of regression is that the residuals are uncorrelated. If the residuals are correlated, this is known as autocorrelation. The Durbin-Watson method is a simple and frequently used test for detecting autocorrelation. If the Durbin-Watson statistic is close to 2, there is no autocorrelation. Conversely, if the value is close to 0 or 4, positive or negative autocorrelation is suspected, respectively (Widarjono, 2019).

Hypothesis Testing

The statistical analysis for hypothesis testing was conducted using Eviews software, yielding the following results:

Table 8. Hypothesis Testing Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C (Konstanta)	-0.392343	0.202631	-1.936241	0.0538
Pengangguran	0.019337	0.020418	0.947038	0.3444
Penduduk	6.82E-05	3.33E-06	20.45290	0.0000
Upah	4.22E-07	8.62E-08	4.898620	0.0000

The Influence of the Unemployment Rate (X1) on Economic Growth (Y)

The probability value of 0.344, which is greater than the significance level of 0.05, indicates that the unemployment rate does not have a significant influence on economic growth within this model. This finding is in line with Arifin & Fadllan (2021) who stated that the unemployment rate in East Java Province from 2016 to 2018 did not significantly affect economic growth. Conversely, Somba et al. (2021) found that unemployment had a significant influence on the economic growth of North Sulawesi Province. Similar results were found by Kristina et al. (2022) in Bali Province and Putri et al. (2022) in West Java from 2012 to 2021.

The Influence of Population Size (X2) on Economic Growth (Y)

The probability value of 0.000, which is less than 0.05, indicates that population size has a positive and significant influence on economic growth. This finding is consistent with Darma (2021) who stated that population size significantly affected the economic growth of Tebo Regency, Jambi Province, from 2016 to 2020. Similar findings were reported by Darma & Wulansari (2021) for Batang Hari Regency, Jambi, from 2010 to 2020, and by Salsabila et al. (2021) in the Gerbang Kertosusila region; Gresik (Ger), Bangkalan (Bang), Mojokerto (Kerto), Surabaya (Su), Sidoarjo (Si), dan Lamongan (La). In contrast, Desmawan et al. (2023) found that the population size in Tangerang Regency from 2019 to 2020 had a negative relationship with economic growth, implying that population size acted as an impediment to economic growth.

The Influence of Wages (X3) on Economic Growth (Y)

The probability value of 0.000, which is less than 0.05, indicates that wages have a positive and significant influence on economic growth. This study supports earlier empirical research that demonstrated an innate link between economic growth cycles and wages using data from the United States from 1982 to 2013. Governments can optimize employment and social security programs, boost economic growth, and modify minimum salaries in accordance with economic cycle patterns by having a better understanding of this innate relationship (Xu et al., 2015). Research by Suwardi (2021) showed a positive and significant influence of wages on Indonesia's economic growth for the period 2010-2019. Based on the analysis by Lupu et al. (2023), the relationship between GDP and wages was also

positively correlated and supported the economic growth of Eastern European countries across all periods (short, medium, and long term). In contrast, research by Wahab (2022) in South Sulawesi found that wages had no effect on economic growth.

Table 9. Simultaneous Test Results

Statistic	Value	Interpretation
R-squared	0.738441	Model menjelaskan 73.84% variasi variabel dependen
Adjusted R-squared	0.735842	R^2 yang disesuaikan: 73.58%
S.E. of regression	0.482571	Standar error dari regresi
Sum squared resid	70.32817	Jumlah kuadrat residual
Log likelihood	-209.2221	Nilai log likelihood
F-statistic	284.2046	Uji signifikansi model secara keseluruhan
Prob(F-statistic)	0.000000	P-value dari F-statistic
Wald F-statistic	153.3986	Statistik Wald F
Prob (Wald F-statistic)	0.000000	P-value dari Wald F-statistic

The Probability (F-Statistic) value of 0.000, which is less than 0.05, indicates that all independent variables simultaneously have a positive and significant influence on economic growth. The R-squared value of 0.73 indicates a very strong correlation between the three independent variables and economic growth. An R-squared of 0.73 means that 73% of the variation in Economic Growth (Y) can be explained by the Unemployment Rate (X1), Population (X2), and Wages (X3). The remaining 27% is explained by other variables outside this model.

Discussion

The research findings indicate that the unemployment rate does not significantly influence economic growth during President Joko Widodo's administration, with a probability value of 0.344 > 0.05. This finding is consistent with Arifin & Fadllan (2021), who found that the unemployment rate in East Java Province from 2016 to 2018 did not significantly affect economic growth. However, this contradicts the findings of Somba et al. (2021) in North Sulawesi, Kristina et al. (2022) in Bali, and Putri et al. (2022) in West Java, who found significant effects of unemployment on economic growth. The insignificant effect can be explained through several perspectives. First, Indonesia has a large informal sector comprising approximately 60% of total employment, where many individuals statistically recorded as unemployed actually work in the informal sector that contributes to GDP but remains unrecorded. Second, Indonesia's economic growth is more influenced by labor productivity than unemployment numbers, particularly with the Jokowi administration's focus on improving human resource quality through pre-employment card programs and vocational training. Third, Indonesia's economic structure, dominated by service and trade sectors, has high flexibility in labor absorption, making economic growth more driven by domestic consumption and infrastructure investment. Fourth, the research period includes the COVID-19 pandemic (2020-2021), which caused distortions in the traditional relationship between unemployment and economic growth. Despite finding that unemployment does not significantly affect economic growth, the government must still prioritize reducing unemployment due to social welfare aspects, political stability, and achieving inclusive economic growth. The research findings demonstrate that population size has a positive and significant influence on economic growth with a probability value of 0.000 < 0.05. This finding aligns with research by Darma (2021) in Tebo Regency, Darma & Wulansari (2021) in Batang Hari Regency, and Salsabila et al. (2021) in the Gerbang Kertosusila region. The positive influence of population size on economic growth can be explained through several mechanisms. First, Indonesia, with a population exceeding 270 million, represents the largest domestic market in Southeast Asia, where household consumption contributes

approximately 55-58% to GDP, creating high aggregate demand for goods and services that drives production and investment. Second, the 2016-2024 period represents Indonesia's demographic bonus phase with a productive age proportion reaching approximately 70%, providing abundant labor to support economic activities. Third, a large population enables companies to achieve optimal production scale with lower per-unit costs, making infrastructure built by the Jokowi administration more efficient. Fourth, a large population increases the probability of emerging talents, innovators, and entrepreneurs, evidenced by the development of Indonesia's startup ecosystem producing several unicorns such as Gojek, Tokopedia, and Bukalapak. Despite the positive influence, challenges remain including the need for human resource quality improvement through education and health investment, addressing regional development disparities between Java-Bali and other regions, and managing environmental pressures from massive infrastructure requirements.

The research findings show that wages have a positive and significant influence on economic growth with a probability value of 0.000 < 0.05. This finding is consistent with research by Xu et al. (2015), Suwardi (2021), and Lupu et al. (2023), who found positive correlations between wages and economic growth. The positive influence can be explained through several transmission mechanisms. First, wage increases raise disposable income, encouraging household consumption as the largest component of Indonesia's GDP, creating a multiplier effect where increased consumption drives production and creates new jobs. Second, according to efficiency wage theory, higher wages increase worker motivation and productivity, reduce employee turnover, and attract high-quality workers. Third, the Jokowi administration consistently raised minimum wages annually with an average of 8-10% per year for 2016-2019, and Government Regulation No. 36 of 2021 provides a more measurable and predictable formula. Fourth, higher wages enable workers to invest in family education and health, creating a positive cycle of long-term economic growth. The impact of wage policy is evident from poverty rates declining from 10.7% in 2016 to 9.03% in 2024, and household consumption remaining the main pillar of the economy. Policy implications include maintaining predictable wage formulas, enforcing labor laws, providing subsidies for MSMEs, increasing labor productivity through vocational training, and strengthening social safety nets. The simultaneous test results show a Prob(F-Statistic) value of 0.000 < 0.05, indicating that the three independent variables simultaneously have a significant influence on economic growth. The coefficient of determination (R^2) value of 0.73 indicates that 73% of the variation in economic growth can be explained by unemployment rate, population size, and wages, while the remaining 27% is explained by other variables such as inflation, investment, exports and imports, Human Development Index, infrastructure development, bureaucratic quality, political stability, and global economic conditions. The R^2 value of 0.73 demonstrates that this regression model has strong predictive capability and provides a solid empirical basis for economic policy formulation during the Jokowi administration.

Conclusion

This study finds that all variables simultaneously have a positive and significant influence on economic growth. However, on a partial basis, the unemployment rate has no significant influence on economic growth. The population size variable has a positive and significant influence on economic growth. The research also finds that wages positively and significantly influence economic growth. These findings indicate that although the unemployment rate does not affect economic growth, the government must continue to manage Indonesia's large population effectively to prevent negative impacts on economic growth. This can be achieved by regularly providing entrepreneurship mentoring and business incubation training for Micro, Small, and Medium Enterprises (MSMEs). The hope is that the unemployment rate can be reduced and more Indonesians can achieve economic independence. Furthermore, ensuring decent minimum wages for all public and private sector

employees must remain a priority to guarantee their welfare. The R-squared value of 0.73 obtained in this study, which leaves 27% of the variance in economic growth unexplained, can serve as a starting point for future researchers. Subsequent studies could investigate other potential variables that may influence economic growth, such as inflation, the Human Development Index (HDI), education levels, poverty rates, investment, exports, and external debt, employing more complex analyses that incorporate mediating or moderating variables.

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