https://doi.org/10.54371/jms.v5i2.1385

The Influence of Gross Domestic Product and Remittances on Indonesia's Economic Growth, 2010–2024

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Article Info
Article History
Submission: 2026-04-01
Accepted: 2026-06-17
Published: 2026-06-29

Keywords:
Economic growth; Gross domestic product; Remittances; Macroeconomic analysis; Indonesia.

Abstract
Economic growth is one of the primary indicators used to assess a country's economic performance and development success. In Indonesia, economic growth is influenced by various macroeconomic factors, including Gross Domestic Product (GDP) and remittances from migrant workers. This study aims to examine the effects of GDP and remittances on Indonesia's economic growth during the period 2010–2024. The study employs a quantitative explanatory approach using secondary data obtained from Statistics Indonesia (BPS) and Bank Indonesia (BI). The data were analyzed using multiple linear regression with the assistance of SPSS version 25. Prior to regression analysis, classical assumption tests, including normality, heteroscedasticity, multicollinearity, and autocorrelation tests, were conducted to ensure the validity of the model. The results indicate that GDP has a statistically significant relationship with economic growth ($p = 0.021$), whereas remittances do not have a significant effect ($p = 0.221$). Simultaneously, GDP and remittances significantly influence economic growth, as indicated by an F-statistic significance value of 0.042. The coefficient of determination (R^2) shows that the independent variables explain 41.1% of the variation in economic growth, while the remaining 58.9% is explained by other factors outside the model. Although GDP was found to have a negative coefficient, this result should be interpreted cautiously due to the conceptual proximity between GDP and economic growth as well as the characteristics of the data used. The findings suggest that strengthening domestic productive capacity remains essential for sustaining economic growth, while efforts are needed to encourage the productive utilization of remittances to enhance their contribution to national economic development.

I. INTRODUCTION

Economic growth is widely recognized as one of the most important indicators of a country's development performance because it reflects the ability of an economy to generate output, create employment opportunities, and improve societal welfare. For developing countries such as Indonesia, sustaining economic growth remains a major policy objective due to its role in supporting poverty reduction, income generation, and long-term economic development. However, economic growth is influenced by various macroeconomic factors whose contributions may vary across different economic conditions and development stages.

One of the primary determinants of economic growth is Gross Domestic Product (GDP), which represents the total value of goods and services produced within an economy during a specific period. According to the Solow Growth Model (Solow, 1956), economic growth is driven by capital accumulation, labor expansion, and technological progress, all of which are reflected in the productive capacity of an economy. As a measure of aggregate economic activity, GDP provides important information regarding a country's production performance and economic strength (Mankiw, 2019). An increase in GDP generally indicates expanding economic activity, higher income levels, and greater employment opportunities, which collectively contribute to economic growth.

In addition to domestic economic performance, external financial flows also play an important role in supporting economic growth. One of the most significant sources of external financial inflows for developing countries is remittances sent by migrant workers to their home countries. Remittances contribute to household income, increase consumption expenditure, support savings and investment, and improve access to education and healthcare. From a Keynesian perspective, increased household consumption stimulates aggregate demand, which subsequently promotes economic growth (Keynes, 1936). Furthermore, when utilized productively, remittances can support entrepreneurship, human capital development, and long-term economic development (Todaro & Smith, 2020).

Despite their potential contribution, empirical findings regarding the relationship between remittances and economic growth remain inconclusive. Several studies have reported positive effects of remittances on economic growth through increased consumption, investment, and economic activity (Cazachevici et al., 2020). However, other studies have found insignificant or limited impacts because remittances are frequently used for

household consumption rather than productive investment. For example, Annisa and Akhmad (2024) reported that remittances did not significantly affect Indonesia's economic growth, while Ukhtiyani and Indartono (2020) argued that the dominance of consumption-oriented remittance utilization reduces its contribution to productive economic activities. These mixed findings suggest that the economic effects of remittances may depend on national economic conditions, institutional quality, and the effectiveness of remittance utilization.

The Indonesian economy provides an interesting context for examining these relationships. During the period 2010–2024, Indonesia experienced substantial changes in both domestic economic activity and international labor migration dynamics. According to Statistics Indonesia (BPS), real GDP at constant 2010 prices increased from IDR 6,422,918.20 billion in 2010 to IDR 12,115,687.70 billion in 2024. Nevertheless, economic growth fluctuated throughout the period, including a contraction of 2.07% in 2020 due to the COVID-19 pandemic before recovering in subsequent years. At the same time, remittance inflows generally exhibited an upward trend, reflecting the continuing contribution of Indonesian migrant workers to the national economy. These developments indicate that increases in GDP and remittances do not automatically translate into stable economic growth, highlighting the need for further investigation into the relationship among these variables.

Although previous studies have examined the role of remittances and macroeconomic factors in economic growth, several research gaps remain. First, existing studies have predominantly focused on the partial effect of remittances on economic growth without simultaneously considering GDP and remittances within a single empirical framework. Second, limited research has examined the Indonesian case over the period 2010–2024, which encompasses major economic disruptions, including the COVID-19 pandemic and the subsequent recovery period. Third, the extraordinary economic shock caused by the pandemic may have altered the relationship between remittances, economic activity, and growth, creating a need for updated empirical evidence. Consequently, understanding how GDP and remittances jointly influence economic growth during this period remains an important research issue.

Based on these considerations, this study aims to analyze the effects of Gross Domestic Product and remittances on Indonesia's economic growth during the period 2010–2024. The study contributes to the economic growth literature by providing updated evidence from a period characterized by significant economic fluctuations and structural changes. From a practical perspective, the findings are expected to provide insights for policymakers regarding the optimization of remittance utilization and the strengthening of domestic economic productivity as strategies for promoting sustainable and inclusive economic growth in Indonesia.

II. METHOD

This study employed a quantitative explanatory approach to examine the effects of Gross Domestic Product (GDP) and remittances on Indonesia's economic growth during the period 2010–2024. A quantitative approach was selected because it enables the objective measurement of relationships among variables through statistical analysis and facilitates hypothesis testing based on empirical evidence. The explanatory design was considered appropriate because the study sought to determine the extent to which GDP and remittances contribute to variations in economic growth.

The study utilized secondary data obtained from official government institutions. Data on economic growth and Gross Domestic Product (GDP) at constant prices were collected from publications issued by Statistics Indonesia (BPS), while remittance data were obtained from Bank Indonesia (BI). The observation period covered annual data from 2010 to 2024, resulting in 15 observations. The use of official statistical sources ensures the reliability, validity, and consistency of the data employed in the analysis.

Economic growth served as the dependent variable, while GDP and remittances were treated as independent variables. Economic growth was measured using the annual growth rate of the Indonesian economy, GDP was measured using Gross Domestic Product at constant prices, and remittances were measured using annual remittance inflows received from Indonesian migrant workers abroad. The relationship among these variables was estimated using a multiple linear regression model expressed as follows:

$$EG = \alpha + \beta_1 GDP + \beta_2 REM + \varepsilon$$

Where *EG* represents economic growth, *GDP* denotes Gross Domestic Product, *REM* represents remittances, α is the intercept, β_1 and β_2 are the regression coefficients, and ε is the error term.

Data analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 25. Prior to estimating the regression model, several classical assumption tests were performed to ensure the validity of the regression estimates. These included the normality test using residual distribution analysis supported by histogram and Normal P–P Plot examination, the heteroscedasticity test using the Glejser method, the multicollinearity test using Tolerance and Variance Inflation Factor (VIF) statistics, and the autocorrelation test using the Durbin–Watson statistic. These procedures were conducted to verify that the regression model satisfied the assumptions required for multiple linear regression analysis.

After the classical assumptions were fulfilled, multiple linear regression analysis was performed to assess the partial and simultaneous effects of GDP and remittances on economic growth. Partial effects were evaluated using the t-test, while the simultaneous effect of the independent variables was assessed through the F-test. Furthermore, the coefficient of determination (R^2) was used to measure the proportion of variation in economic growth explained by the independent variables. The results of these analyses were subsequently interpreted to determine the contribution of GDP and remittances to Indonesia's economic growth during the study period.

III. RESULTS AND DISCUSSION

A. Results

1. Descriptive Statistics

Descriptive statistical analysis was conducted to provide an overview of the characteristics of the research variables, namely economic growth, Gross Domestic Product (GDP), and remittances during the observation period of 2010–2024. The analysis includes the minimum value, maximum value, mean, and standard deviation of each variable. The results are presented in Table 1.

Table 1. Descriptive Statistics

Variable	N	Min	Max	Mean	Std. Deviation
Economic Growth (%)	15	2.07	6.50	50.567	106.947
GDP	15	2,314, 458.80	12,920, 281.70	8,103, 753.09	4,139, 808.55
Remittances	15	6.74	15.70	100.189	270.841

Table 1 shows that Indonesia's economic growth during the period 2010–2024 had an average value of 5.06%, with a standard deviation of 1.07. This relatively low standard deviation indicates that economic growth remained fairly stable throughout the observation period, despite fluctuations caused by economic shocks such as the COVID-19 pandemic.

Gross Domestic Product (GDP) recorded an average value of 8,103,753.09 with a standard deviation of 4,139,808.55. The relatively large variation reflects the continuous expansion of Indonesia's economic output during the study period, accompanied by differences in economic performance across years. The minimum GDP value was recorded at 2,314,458.80, while the maximum value reached 12,920,281.70.

Meanwhile, remittances showed an average value of 10.0189 and a standard deviation of 2.70841. The difference between the minimum and maximum values indicates that remittance inflows experienced noticeable fluctuations over time. These fluctuations may be associated with changes in global economic conditions, labor market dynamics in destination countries, and the mobility of Indonesian migrant workers.

Overall, the descriptive statistics suggest that economic growth exhibited a relatively stable pattern, whereas GDP and remittances showed greater variability during the observation period. This variation indicates the presence of changing economic conditions that warrant further examination through inferential statistical analysis.

2. Normality Test

The normality test was conducted to determine whether the residuals of the regression model were normally distributed. In multiple linear regression analysis, the normality assumption applies to the residuals rather than to the individual research variables. Therefore, the assessment of normality was based on the Normal P–P Plot and the histogram of standardized residuals generated from the regression model.

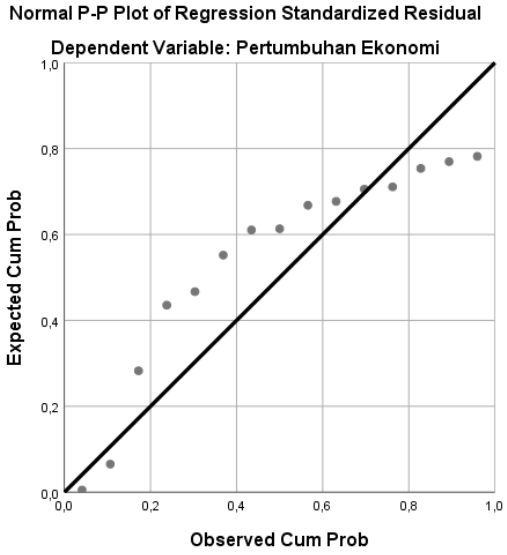

Figure 1. Normal P–P Plot of Standardized Residuals

The Normal P–P Plot shows that the standardized residuals generally follow the diagonal reference line. Although several observations deviate slightly from the line, the deviations are not substantial and do not indicate a systematic departure from normality. The overall pattern suggests that the residuals are reasonably distributed around the expected normal distribution.

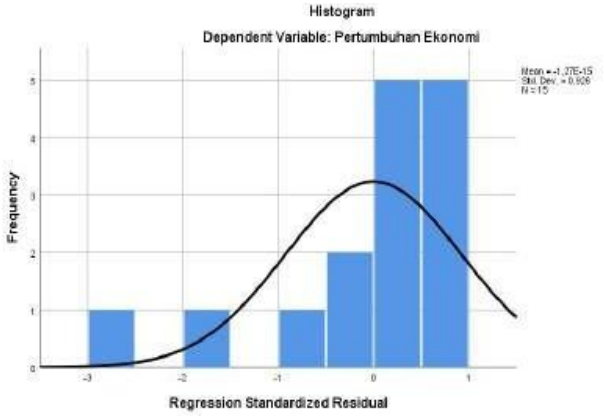

Figure 2. Histogram of Standardized Residuals

The histogram of standardized residuals exhibits a distribution that approximates a bell-shaped curve with a mean close to zero. While a few observations appear in the tails of the distribution, the overall shape remains relatively symmetric and does not indicate severe skewness or kurtosis. Such a pattern is generally considered acceptable for satisfying the normality assumption in regression analysis.

Based on the visual assessment of both the Normal P–P Plot and the histogram, the residuals can be considered approximately normally distributed. Therefore, the normality assumption of the multiple linear regression model is regarded as fulfilled, allowing the analysis to proceed to subsequent classical assumption tests and regression estimation.

3. Heteroscedasticity Test

The heteroscedasticity test was conducted using the Glejser method by regressing the absolute residual values (ABS_RES) on the independent variables, namely Gross Domestic Product (GDP) and remittances. The purpose of this test is to determine whether the variance of the residuals remains constant across observations. The results of the Glejser test are presented in Table 2.

Table 2. Glejser Test Results

Variable	t-value	Sig.
GDP	0.574	0.577
Remittances	-0.708	0.493

As shown in Table 2, the significance value of GDP is 0.577, while the significance value of remittances is 0.493. Both values exceed the significance threshold of 0.05, indicating that neither independent variable significantly affects the absolute residuals. Therefore, no evidence of heteroscedasticity is detected in the regression model.

These findings suggest that the residual variance remains relatively constant across observations, satisfying the homoscedasticity assumption required for multiple linear regression analysis. Consequently, the regression model can be considered free from heteroscedasticity problems and suitable for further analysis.

4. Multicollinearity Test

The multicollinearity test was conducted to determine whether strong correlations existed among the independent variables included in the regression model. Multicollinearity can affect the stability and accuracy of regression coefficient estimates, thereby reducing the reliability of the model. This study assessed multicollinearity using the Tolerance and Variance Inflation Factor (VIF) statistics. The results are presented in Table 3.

Table 3. Multicollinearity Test Results

Variable	Tolerance	VIF
GDP	0.422	2.372
Remittances	0.422	2.372

Table 3 shows that both GDP and remittances have tolerance values of 0.422 and VIF values of 2.372. These results satisfy the commonly accepted criteria for the absence of multicollinearity, namely tolerance values greater than 0.10 and VIF values below 10. Therefore, the independent variables do not exhibit excessive correlations with one another.

The findings indicate that multicollinearity is not present in the regression model, allowing each independent variable to contribute uniquely to the explanation of economic growth. Consequently, the model satisfies the multicollinearity assumption and is suitable for subsequent regression analysis.

5. Autocorrelation Test

The autocorrelation test was conducted to determine whether the residuals of the regression model were correlated across observation periods. Because the data used in this study are annual time-series data covering the period 2010–2024, testing for autocorrelation is essential to ensure that the regression estimates remain unbiased and efficient. The Durbin–Watson (DW) statistic was employed to detect the presence of serial correlation in the residuals. The results are presented in Table 4.

Table 4. Durbin–Watson Test Results

Model	Durbin–Watson
Regression Model	1.646

Table 4 shows that the Durbin–Watson statistic is 1.646. This value falls within the commonly accepted range of 1.5 to 2.5, indicating the absence of significant autocorrelation in the regression residuals. Therefore, the residuals do not exhibit systematic correlations across observation periods.

The findings suggest that the regression model satisfies the autocorrelation assumption, meaning that the residuals are independent from one period to another. Consequently, the model is considered suitable for further regression analysis and hypothesis testing.

6. Multiple Linear Regression Analysis and Hypothesis Testing

After all classical assumption tests were satisfied, multiple linear regression analysis was conducted to examine the effects of Gross Domestic Product (GDP) and remittances on Indonesia's economic growth during the period 2010–2024. The results of the regression analysis are presented in Table 5.

Table 5. Multiple Linear Regression Results

Variable	B	Std. Error	Beta	t-value	Sig.
Constant	5.217	0.958	–	5.445	0.000
GDP	-2,35E-04	0.000	-0.909	-2.664	0.021
Remittances	0.174	0.135	0.440	1.291	0.221

Based on the regression results, the estimated regression equation can be expressed as follows:

$$Economic\ Growth = 5.217 - (2.348 \times 10^{-4})\ GDP + 0.174\ Remittances$$

The regression coefficient of GDP is negative and statistically significant (β = -0.909; p = 0.021), indicating that GDP has a significant relationship with economic growth during the observation period. However, the negative coefficient should be interpreted cautiously because economic growth is conceptually related to GDP, and the observed relationship may be influenced by the characteristics of the data and model specification.

Meanwhile, remittances have a positive coefficient (β = 0.440) but are not statistically significant (p = 0.221). This result indicates that remittances did not significantly contribute to variations in Indonesia's economic growth during the study period. To examine the simultaneous effect of GDP and remittances on economic growth, an F-test was conducted. The results are presented in Table 6.

Table 6. ANOVA Results

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	6.583	2	3.292	4.189	0.042
Residual	9.430	12	0.786		
Total	16.013	14			

Table 6 shows that the regression model produced an F-statistic of 4.189 with a significance value of 0.042. Since the significance value is less than 0.05, GDP and remittances jointly have a significant effect on economic growth. Therefore, the regression model is considered statistically fit for explaining variations in Indonesia's economic growth during the observation period.

The explanatory power of the model was further evaluated using the coefficient of determination (R^2). The results are presented in Table 7.

Table 7. Coefficient of Determination

Statistic	Value
R	0.641
R^2	0.411
Adjusted R^2	0.313
Std. Error of Estimate	0.88645
Durbin–Watson	1.646

Based on Table 7, the R^2 value is 0.411, indicating that GDP and remittances collectively explain 41.1% of the variation in Indonesia's economic growth. The remaining 58.9% is explained by other variables not included in the model. Furthermore, the Adjusted R^2 value of 0.313 indicates that, after adjusting for the number of predictors and sample size, the model explains 31.3% of the variation in economic growth. These findings suggest that GDP and remittances provide a moderate contribution to explaining economic growth, while other macroeconomic factors outside the model continue to play an important role.

B. Discussion

1. Effect of Gross Domestic Product (GDP) on Economic Growth

The results indicate that Gross Domestic Product (GDP) has a significant effect on Indonesia's economic growth during the period 2010–2024. This finding is supported by the t-test results, which show a significance value of 0.021, lower than the 0.05 threshold. However, the relationship identified in this study is negative, which differs from the expectations of conventional economic theory.

According to the Solow Growth Model, economic growth is driven by capital accumulation, labor inputs, and technological progress, all of which contribute to increases in national output and GDP (Solow, 1956). Similarly, Mankiw (2019) explains that GDP reflects a country's production capacity and economic performance. Therefore, increases in GDP are generally expected to be accompanied by higher economic growth. The negative coefficient found in this study should therefore be interpreted cautiously and not directly understood as evidence that GDP reduces economic growth.

One possible explanation is related to the model specification used in this study. Economic growth is commonly measured as the percentage change in real GDP, while GDP itself is included as an explanatory variable. As a result, the relationship between the two variables may be influenced by their conceptual and statistical proximity. In addition, the relatively short observation period, the occurrence of the COVID-19 pandemic, and the subsequent recovery process may have contributed to fluctuations that affected the estimated relationship. Therefore, the negative coefficient is better viewed as an empirical finding that requires further investigation rather than as evidence of an inverse causal relationship between GDP and economic growth.

2. Effect of Remittances on Economic Growth

The results reveal that remittances do not have a significant effect on Indonesia's economic growth. The significance value of 0.221 exceeds the 0.05 threshold, indicating that remittances were not able to explain variations in economic growth during the observation period.

Although the regression coefficient is positive, the effect is statistically insignificant. This suggests that remittance inflows have not yet become a major driver of national economic growth. One possible explanation is that remittances are primarily utilized for household consumption, education, healthcare, and other welfare-related expenditures rather than productive investments capable of generating broader economic multipliers.

This finding is consistent with previous studies. Nirmala et al. (2022) found that remittances in ASEAN countries are predominantly used to support household needs, education, and health expenditures. Likewise, Fahrudin and Aji (2021) reported that remittances do not significantly contribute to increases in per capita income when they are not allocated to productive economic activities. Laitupa et al. (2025) further demonstrated that while remittances improve household welfare, their contribution to regional economic growth remains limited. Therefore, the findings of this study suggest that remittances alone are insufficient to stimulate economic growth unless accompanied by policies that encourage their productive utilization.

3. Simultaneous Effect of Gross Domestic Product (GDP) and Remittances on Economic Growth

The results of the F-test indicate that GDP and remittances jointly have a significant effect on economic growth, as evidenced by the significance value of 0.042, which is below the 0.05 significance level. This finding suggests that economic growth is influenced by a combination of domestic economic performance and external financial inflows.

GDP reflects the productive capacity of the economy and serves as a key indicator of national economic activity, whereas remittances represent an additional source of financial resources originating from migrant workers abroad. Although remittances were not significant individually, their inclusion alongside GDP improved the explanatory

power of the model, indicating that both variables collectively contribute to explaining variations in economic growth.

This result is supported by Jamaludin et al. (2025), who emphasized that remittances can contribute to economic development when supported by inclusive financial systems and productive investment opportunities. Similarly, Ramompas and Putra (2023) found that domestic economic indicators and remittance inflows jointly influence economic growth in ASEAN countries. Furthermore, the meta-analysis conducted by Cazachevici et al. (2020) concluded that the economic impact of remittances depends heavily on the structural characteristics of individual countries. Therefore, the findings underscore the importance of strengthening domestic productive capacity while simultaneously promoting policies that encourage the productive use of remittance inflows to support sustainable economic growth.

4. Research Limitations

Several limitations should be acknowledged in interpreting the findings of this study. First, the regression model includes only two independent variables, namely GDP and remittances, which may not fully capture the complex determinants of economic growth. Second, the relatively small number of observations limits the statistical power and generalizability of the results. Third, the study does not incorporate stationarity testing, raising the possibility of spurious regression due to the time-series nature of the data. Fourth, the observation period includes the COVID-19 pandemic and the subsequent economic recovery phase, both of which may have influenced the relationships among the variables. Finally, differences in measurement units, base years, and data transformations may also affect the results. Future research is therefore encouraged to employ longer observation periods, include additional macroeconomic variables, and utilize more advanced time-series analytical techniques to obtain more robust findings.

IV. CONCLUSION

This study concludes that Gross Domestic Product (GDP) and remittances collectively have a significant effect on Indonesia's economic growth during the period 2010–2024. Partially, GDP exhibits a significant relationship with economic growth, whereas remittances do not show a statistically significant effect. Although GDP was found to have a negative coefficient in the regression model, this finding should be interpreted cautiously due to the close conceptual relationship between GDP and economic growth, as well as the characteristics of the data and model specification employed in the study. Meanwhile, the insignificant effect of remittances suggests that remittance inflows have not yet become a major determinant of Indonesia's economic growth, possibly because a substantial proportion of remittances is directed toward household consumption rather than productive investment activities. The coefficient of determination indicates that GDP and remittances explain 41.1% of the variation in economic growth, while the remaining variation is influenced by other macroeconomic factors outside the model. The findings imply that sustainable economic growth requires not only strong domestic economic performance but also policies that encourage the productive utilization of remittance inflows. Future studies are recommended to incorporate additional macroeconomic variables, extend the observation period, and employ more advanced time-series techniques to provide more robust evidence regarding the determinants of economic growth in Indonesia.

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