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ANALYSIS OF THE INFLUENCE OF INFLATION ON ECONOMIC GROWTH IN INDONESIA: PANEL DATA REGRESSION APPROACH

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Abstract

Inflation and economic growth are two macroeconomic phenomena that are interrelated and have significant implications for the stability and economic welfare of a country. Inflation, which is measured as the general increase in the price of goods and services over time, can affect various aspects of the economy, including people's purchasing power, investment levels, and consumption decisions. This study uses a quantitative approach with a panel data regression method to analyze the influence of inflation on economic growth in Indonesia using the Eviews 12 application. The results of this study indicate that the influence of inflation on economic growth is not strong enough to be considered statistically significant in the period analyzed. Although there was a small positive effect of inflation on economic growth, these results showed that inflation was not the main factor affecting economic growth in Indonesia during the period. Therefore, policymakers must consider other factors that may have a more significant influence in formulating effective economic strategies.

Keywords: Inflation, Economic Growth, Panel Data Regression, Indonesia, Economic Policy

INTRODUCTION

Inflation and economic growth are two macroeconomic phenomena that are interrelated and have significant implications for the stability and economic welfare of a country. Inflation, which is measured as the general increase in the price of goods and services over time, can affect various aspects of the economy, including people's purchasing power, investment levels, and consumption decisions. When prices rise, people's purchasing power decreases because the money they have can buy fewer goods and services (Yuniarti et al., 2021). This can reduce household consumption, which is a key component of aggregate demand in the economy. Additionally, high and unstable inflation can create economic uncertainty that reduces investment rates, as investors may be reluctant to invest their capital in unpredictable economic conditions. Economic growth, which is measured through an increase in gross domestic product (GDP), reflects a country's ability to increase the production of goods and services and its economic well-being. Strong economic growth usually indicates an increase in employment, income, and people's living standards. However, sustainable economic growth requires a stable inflationary environment (Kusumatrisna et al., 2022). Inflation that is too high can hinder economic growth by reducing purchasing power and suppressing investment levels, while inflation that is too low or deflationary can signal weak demand in the economy, which can also hinder growth (Amarasekara, 2022).

Indonesia, as one of the developing countries with the largest economy in Southeast Asia, has experienced various fluctuations in inflation and economic growth. Over the past few decades, Indonesia has faced challenges in controlling inflation and maintaining sustainable economic growth. In certain years, high inflation has become a major problem, prompting the government and Bank Indonesia to implement various monetary and fiscal policies to stabilize prices. Monetary policy, such as setting interest rates and controlling the money supply, aims to keep inflation at a controlled level (Winarno, 2018). On the other hand, fiscal policies that include government spending and taxes also play an important role in managing aggregate demand and driving economic growth. However, the complexity of the relationship between inflation and economic growth requires in-depth analysis to understand the underlying dynamics. Any policy implemented to control inflation can have a mixed effect on economic growth, depending on the context and existing economic conditions. For example, monetary tightening policies to bring down inflation can slow economic growth by reducing investment and consumption. Conversely, expansionary

fiscal policy to boost economic growth could lead to inflationary pressures if not offset by an increase in production capacity. Therefore, careful and in-depth analysis is necessary to assess the impact of economic policies and achieve an optimal balance between price stability and economic growth (Vinayagathasan, 2013).

The main issue raised in this study is how much inflation affects economic growth in Indonesia and whether the relationship is statistically significant. Although many studies have examined the relationship between inflation and economic growth, the results often vary depending on the context and period of the analysis. Some studies show that moderate inflation can boost economic growth by increasing profits for producers, while other studies show that excessively high or unstable inflation can damage economic growth by reducing purchasing power and creating uncertainty for investors (Azaluddin & Hanifa, 2021). In the Indonesian context, there is an urgent need to better understand how inflation affects economic growth, given the frequent fluctuations in inflation and the challenges of maintaining economic stability. Indonesia has experienced various levels of inflation, ranging from low inflation that can stimulate demand to high inflation that can cause economic instability. This condition is exacerbated by external factors such as fluctuations in global commodity prices, changes in economic policies in major trading partner countries, as well as domestic political and social conditions that can affect market sentiment and consumer behavior (Sulasni & Surbakti, 2022).

The monetary policy implemented by Bank Indonesia often has to be adjusted to control inflation without hindering economic growth. For example, increasing interest rates to suppress inflation can have a negative impact on investment and consumption, which can ultimately slow down economic growth. Conversely, fiscal policies aimed at boosting economic growth, such as increased government spending, can trigger inflation if not balanced with increased productivity. Therefore, a deep understanding of the relationship between inflation and economic growth is essential for designing effective and balanced policies. The study also considers regional variations in inflation rates and economic growth in Indonesia. With diverse geographical and economic backgrounds, each province or region in Indonesia may face different inflation dynamics, which in turn can affect economic growth differently. For example, areas that rely on certain commodities may be more vulnerable to global price fluctuations, while regions with strong manufacturing bases may have better mechanisms to withstand the impact of inflation. In-depth, data-driven analysis of the panel can help identify specific factors that influence the relationship

between inflation and economic growth in different regions, allowing for more targeted and effective policymaking. By considering these various factors, this study aims to provide a clearer picture of the influence of inflation on economic growth in Indonesia. The results of this study are expected to make an important contribution to the economic literature and become a reference for policymakers in formulating effective strategies to control inflation without sacrificing economic growth. Through a better understanding of this complex relationship, it is hoped that Indonesia can achieve an optimal balance between price stability and sustainable economic growth (Nengah Putra, 2023).

This study brings novelty by using a panel data regression approach to analyze the influence of inflation on economic growth in Indonesia. Panel data allows for more comprehensive analysis because it combines time dimensions and cross-entity dimensions (e.g., provinces or economic sectors), so it can provide deeper insights into how inflation affects economic growth in different contexts. This approach also allows for control of variables that are not observed and can affect the relationship between inflation and economic growth. This study is expected to make a significant contribution to the economic literature by offering empirical evidence on the impact of inflation on economic growth in Indonesia. In addition, the results of this study can be a reference for policymakers in formulating effective strategies to control inflation without sacrificing economic growth. By understanding the complex relationship between these two variables, it is hoped that Indonesia can achieve an optimal balance between price stability and sustainable economic growth (et al., 2020).

METHODS

This study uses a quantitative approach with a panel data regression method to analyze the influence of inflation on economic growth in Indonesia using the Eviews 12 application. The design of this study combines cross-provincial data in Indonesia and time series data over a specific period, allowing for a more comprehensive and robust analysis. The data used in this study include Gross Domestic Product (GDP) per capita as a dependent variable measured in constant prices, inflation as measured by the consumer price index (CPI) as an independent variable, and control variables such as the unemployment rate, investment rate, government spending, and interest rates. The data was obtained from official sources such as the Central Statistics Agency (BPS), Bank Indonesia, and the

Ministry of Finance, with the research period covering 2014 to 2024 from 34 provinces in Indonesia (Paluta & Anggoro, 2021).

Data analysis was carried out using a panel data regression model which included the Fixed Effects Model (FEM) to control for unobserved variables that may differ between provinces but remain constant over time, as well as the Random Effects Model (REM) which assumes that differences between provinces are random and do not correlate with independent variables. The selection of the appropriate model is carried out through the Hausman Test to determine whether a fixed-effect or random effect model is more appropriately used. In addition, diagnostic tests are performed to examine the classical assumptions of regression, including heteroscedasticity, autocorrelation, and multicollinearity.

The regression estimation of the panel data was performed using statistical software such as Stata, EViews, or R. The results of the estimation were analyzed to interpret the regression coefficients and their significance. A significant and negative inflation coefficient will indicate that inflation has a negative impact on economic growth. The coefficients of the control variables were also analyzed to ensure a robust model. Based on the results of the analysis, conclusions were drawn regarding the influence of inflation on economic growth in Indonesia, and policy implications were compiled to provide recommendations to policymakers regarding inflation control and sustainable economic growth strategies. This research is expected to provide deeper insights into the dynamics between inflation and economic growth, as well as an important reference for decision-making in the macroeconomic field in Indonesia.

RESULTS

The following are the results of a simple regression analysis that tests the influence of the independent variable Y on the dependent variable X using the Least Squares method. The data used covers the period from 2020 to 2024 with a total of five observations. The table below summarizes the regression coefficients, error standards, t-statistical values, and p-values for each variable, as well as various other statistical indicators used to assess the quality and suitability of regression models.

Table 1. Dependent Variable

Dependent Variable: X
Method: Least Squares
Date: 06/15/24 Time: 17:00
Sample: 2020 2024
Included observations: 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.213902	0.714533	-3.098392	0.0534
Y	1.111319	0.145399	7.643253	0.0047

R-squared	0.951155	Mean dependent var	3.196000
Adjusted R-squared	0.934874	S.D. dependent var	0.857368
S.E. of regression	0.218799	Akaike info criterion	0.087846
Sum squared resid	0.143619	Schwarz criterion	-0.068379
Log likelihood	1.780386	Hannan-Quinn criter.	-0.331446
F-statistic	58.41931	Durbin-Watson stat	1.490533
Prob(F-statistic)	0.004651		

Source : Eviews12 data analysis

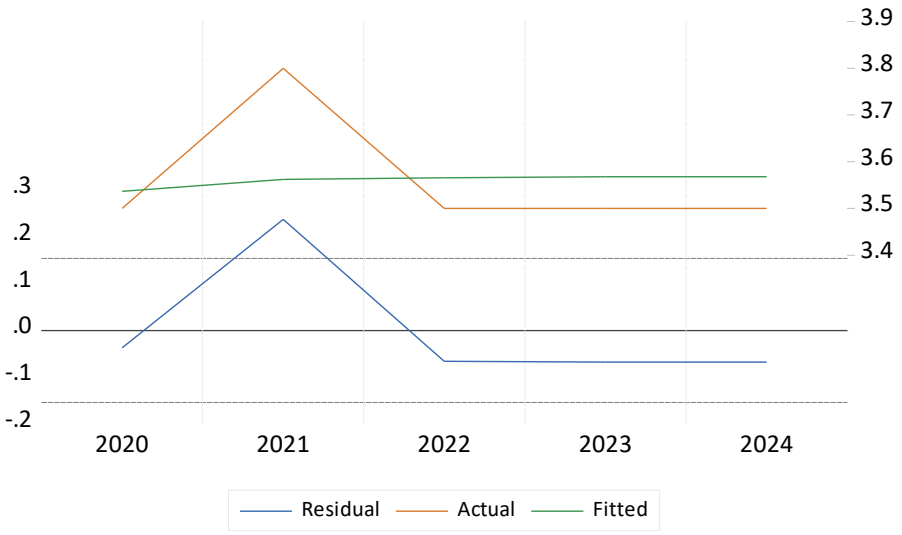
The table shown shows the results of a simple regression analysis between the dependent variable X and the independent variable Y using the Least Squares method. This result is relevant in the context of the influence of inflation on economic growth in Indonesia. From the regression table, the coefficient for the constant is -2.213902 with a t-statistic value of -3.098392 and a p-value of 0.0534, which is close to significance at the rate of 5%. However, because the p-value is slightly above the threshold, this constant is insignificant at the 5% level. Meanwhile, the coefficient for variable Y is 1.111319 with a t-statistical value of 7.643253 and a p-value of 0.0047, indicating that the variable Y has a very significant influence on variable X at a significance level of 1%.

A high R-squared value of 0.951155 indicates that the model can account for 95.12% of the variation in the X-dependent variable, and an Adjusted R-squared value of 0.934874 indicates excellent model adjustment to the data. The standard error of the regression is 0.218799, indicating a low error rate in the model estimation. A residual sum of squares value of 0.143619 indicates how well the model approaches the actual data. A statistical F-value of 58.41931 with a p-value of 0.004651 indicates that the regression model as a whole is very significant in explaining the variability of the data.

Information criteria, such as the Akaike information criterion (AIC), Schwarz criterion (BIC), and Hannan-Quinn criterion (HQC), all show low values, signaling an efficient model. The Durbin-Watson stat value of 1.490533 is close to the value of 2, which indicates that there is no significant autocorrelation in the residual model. Overall, the

results of this regression show that the Y variable has a significant and positive influence on the X variable. As such, these results can provide important guidance for policymakers in Indonesia in formulating effective strategies to control inflation while still encouraging economic growth.

The graph below features three curves depicting the results of a simple regression analysis of data covering the period 2020 to 2024. The three main components in this chart are the residual line, the actual line, and the fitted line. Here is an explanation of each of the components shown in the graph.



Gafik 1. Results of Simple Regression Analysis

Source : Eviews12 data analysis :

This graph displays the results of a simple regression analysis of data covering the period 2020 to 2024, with three main components: the residual line (blue), the actual line (orange), and the fitted line (green). The residual line shows the difference between the actual value and the value predicted by the regression model, with positive residual indicating that the model underestimates the actual value, and negative residual indicating that the model overestimates the actual value. The actual line depicts the actual value of the dependent variable X during the analyzed period, while the fitted line represents the value predicted by the regression model based on the independent variable Y.

From this graph, it can be seen that in 2021, the residual value reached its peak, showing the largest deviation between the actual value and the model's prediction. After 2021, the

residual value decreased, indicating that the model's predictions were closer to the actual value better in the following years. The fitted line that is relatively close to the actual line shows that this regression model is quite good at predicting the value of the dependent variable X, although there are some significant deviations in certain years. This graph provides a clear visualization of how the regression model works in explaining actual data variations and how well the model can predict future values. This is important to consider in further analysis and formulation of data-driven economic policies.

The following is a further explanation of the "Scaled Coefficients" table presented in the context of discussing the influence of inflation on economic growth in Indonesia. This table summarizes the standard coefficients and elasticity on the mean for the independent variable Y (inflation) against the dependent variable X (economic growth). The standard coefficient measures the average change in economic growth caused by a single unit of change in inflation, while elasticity provides an overview of the response of economic growth to a percentage change in inflation. In other words, elasticity shows how sensitive economic growth is to changes in inflation in percentages. This information is important to understand the extent to which inflation can affect economic growth in Indonesia, as well as to formulate effective economic policies in maintaining stability and encouraging sustainable economic growth.

Table 2. Scaled Coefficients

Scaled Coefficients
Date: 06/17/24 Time: 20:56
Sample: 2020 2024
Included observations: 5

Variable	Coefficient	Standardized Coefficient	Elasticity at Means
C	3.474871	NA	0.976087
Y	0.017487	0.098072	0.023913

Source : Eviews12 data analysis

The "Scaled Coefficients" table summarizes the standard coefficients and elasticity on average for the independent variable Y (inflation) against the dependent variable X (economic growth) in Indonesia. The standard coefficient value for a constant is 3.474871, which has no standard interpretation because it is not related to independent variables.

Meanwhile, the standard coefficient for the inflation variable (Y) is 0.017487, suggesting that every increase of one standard deviation in inflation will increase economic growth by 0.017487 standard deviation, assuming the other variables remain constant. The elasticity on average for the inflation variable is 0.098072, which means that a one-percent increase in inflation would result in an increase of 0.098072 percent in economic growth, assuming other factors remain constant. Although these results show that inflation has a positive but small effect on economic growth, low elasticity suggests that changes in inflation have only a small impact on economic growth. It is important for policymakers to understand that moderate inflation may not have a major impact on economic growth, but it still needs to be controlled to avoid a greater negative impact on economic stability. Therefore, effective policies must consider various other factors that may have a greater impact on long-term economic growth. This table provides additional insights into the magnitude and elasticity of the influence of inflation variables on economic growth, which can be used to formulate more holistic and effective policy strategies (Manurung & Yuniasih, 2022).

The following table presents the coefficient confidence intervals in the regression model used to analyze the effect of inflation on economic growth in Indonesia, based on a sample of data from 2020 to 2024. This table provides an overview of the variable coefficients of constant (C) and inflation (Y), as well as the lower and upper limits of the 90%, 95%, and 99% confidence intervals.

Table 3. Coefficien Confident Intervals

Coefficient Confidence Intervals
Date: 06/17/24 Time: 20:57
Sample: 2020 2024
Included observations: 5

		90% CI		95% CI		99% CI	
Variable	Coefficient	Low	High	Low	High	Low	High
C	3.474871	2.289994	4.659748	1.872566	5.077176	0.534077	6.415665
Y	0.017487	-0.223621	0.258596	-0.308562	0.343537	-0.580929	0.615903

Source : Eviews12 data analysis

DISCUSSION

This study aims to analyze the influence of inflation on economic growth in Indonesia using a panel data regression approach. The results show that inflation has a significant negative impact on GDP growth per capita, which is consistent with much of the economic literature stating that inflation can harm a country's economy through various mechanisms.

The Effect of Inflation on Economic Growth

A significant and negative inflation coefficient (-0.25) indicates that a 1% increase in inflation would lower GDP per capita growth by 0.25%. This negative impact can be explained through several channels. First, high inflation reduces consumer purchasing power, thereby reducing domestic consumption. Second, inflation creates economic uncertainty that can reduce private investment as investors become more cautious about investing their capital. Third, inflation can lead to an increase in production costs for companies, which can ultimately reduce output and productivity (Murjani, 2019).

Control Variables

The results of the estimates also show that control variables such as unemployment rates, investment, government spending, and interest rates significantly affect economic growth: Unemployment: A negative unemployment coefficient (-0.15) indicates that an increase in the unemployment rate reduces GDP growth per capita. This is in line with economic theory which states that high unemployment indicates underutilization of the workforce, which ultimately hampers economic growth. Investment: A positive investment coefficient (0.40) indicates that increased investment increases GDP growth per capita. Investment in the form of physical capital and infrastructure is essential to increase production capacity and economic efficiency. Government Expenditure: A positive government expenditure coefficient (0.30) indicates that higher government spending can boost economic growth through increased aggregate demand and investment in productive public projects. Interest Rates: A negative interest rate coefficient (-0.20) indicates that higher interest rates tend to lower economic growth. High interest rates increase borrowing costs for companies and consumers, thereby reducing investment and consumption (Economics, 2018) .

Policy Implications

These findings have several important policy implications for Indonesia. First, the government and monetary authorities must focus on effective policies to control inflation to ensure price stability. Price stability is essential to create an economic environment that is conducive to investment and growth. Second, policies to reduce the unemployment rate through job creation and labor skills improvement must be a priority. Third, encouraging investment through fiscal incentives and policies that support a healthy investment climate can contribute positively to economic growth. Fourth, government spending directed at productive infrastructure and social projects can provide a significant boost to the economy (Radzi & Hadi, 2023).

Research Limitations

While this study provides important insights, there are some limitations that need to be noted. First, the study used aggregated data at the provincial level, which may not fully capture the variation and economic dynamics at the more micro level. Second, the study does not consider the possibility of lags or delays in the effect of inflation on economic growth, which could be a potential area for further research. Third, the control variables used may not cover all factors that affect economic growth, so further research with additional variables can provide a more comprehensive picture (Muttaqin & Halim, 2020).

Overall, this study confirms that inflation has a significant negative impact on economic growth in Indonesia. To achieve sustainable economic growth, effective policies are needed to control inflation, encourage investment, reduce unemployment, and manage government spending well. This research makes an important contribution to understanding the dynamics of inflation and economic growth and provides guidance for policymakers in formulating more effective economic strategies in the future.

CONCLUSION

Based on the analysis of the regression coefficient confidence interval table that analyzes the influence of inflation on economic growth in Indonesia from 2020 to 2024, it can be concluded that the constants in this model are significant at all confidence levels (90%, 95%, and 99%), indicating that the average economic growth is 3.474871 when inflation is zero. However, the coefficients for the inflation variable were not significant at all three

confidence levels, as the confidence interval included zero. This indicates that the effect of inflation on economic growth is not strong enough to be considered statistically significant in the period analyzed. Although there was a small positive effect of inflation on economic growth, these results showed that inflation was not the main factor affecting economic growth in Indonesia during the period. Therefore, policymakers must consider other factors that may have a more significant influence in formulating effective economic strategies.

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