

Examining the Impact of Economic Growth, Poverty and Unemployment on Inflation in Indonesia (2000-2019): Evidence from Error Correction Model

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ABSTRACT:

The study examines the causal relationship of economic growth, poverty, unemployment, and inflation in Indonesia from 2000 to 2019. The data analyzed are sourced from World Bank Indicators from The World Bank. The variables studied were inflation as the dependent variable and economic growth, the level of poverty, and the unemployment rate, inflation, as an independent variable. The results of the Augmented Dicky-Fuller test show that there is a unit root problem because all variables are not stationary at the level, so it is continued by doing first differencing, and stationary data is found in the first difference or I(1). Using the Vector Error Correction Model (VECM), this study found a significant long-term relationship between inflation (INF), economic growth (GDP), the poverty rate (POV), and the unemployment rate (UNEMP). Meanwhile, in the short term, economic growth and poverty rates have a significant adverse effect on inflation. The results have important policy implications, specifically, the urgency of government policies and interventions to encourage the expansion of economic activities that promote economic growth and eradicate poverty.

Keywords: Inflation, unemployment, poverty, economic growth, vector error correction model.

ABSTRAK:

Studi mengkaji hubungan kausal pertumbuhan ekonomi, kemiskinan, pengangguran dan inflasi dalam konteks Indonesia selama tahun 2000 hingga 2019. Data yang dianalisis bersumber dari World Bank Indicators dari The World Bank. Variabel yang diteliti adalah inflasi sebagai variabel dependen dan pertumbuhan ekonomi, tingkat kemiskinan, dan tingkat pengangguran, inflasi, sebagai variabel independen. Hasil uji Augmented Dicky-Fuller menunjukkan bahwa ada masalah akar unit karena semua variabel tidak stasioner pada level, sehingga dilanjutkan dengan melakukan first differencing, dan ditemukan data stasioner pada first difference atau I(1). Menggunakan teknik mekanisme koreksi kesalahan vektor (VECM), studi ini menemukan adanya hubungan jangka panjang yang signifikan antara inflasi (INF), pertumbuhan ekonomi (GDP), tingkat kemiskinan (POV) dan tingkat pengangguran (UNEMP). Sedangkan dalam jangka pendek, pertumbuhan ekonomi dan tingkat kemiskinan berpengaruh signifikan secara negative terhadap inflasi. Studi ini memiliki implikasi kebijakan yang penting, khususnya

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urgensi kebijakan dan intervensi pemerintah untuk mendorong perluasan kegiatan ekonomi yang mendorong pertumbuhan ekonomi dan pengentasan kemiskinan.
Keywords: inflasi, pengangguran, kemiskinan, pertumbuhan ekonomi, *vector error correction model*.

INTRODUCTION

The economies of various countries often face fundamental macroeconomic problems caused by low economic growth, high poverty rate, unemployment, and volatile high inflation ([Van, 2020](#); [de Carvalho, Ribeiro & Marques, 2017](#); [Alem & Ko'hlin, 2014](#)). The relationship between inflation and unemployment has become a famous study departing from a study conducted by [Phillips \(1958\)](#). According to Phillips, as illustrated in the Phillips Curve, there is an inverse relationship between unemployment and inflation. In the Phillips Curve, when inflation is high, the unemployment rate will decrease, and vice versa. Meanwhile, the relationship between economic growth and unemployment can be traced to an idea known as Okun's Law ([Okun, 1963](#)). The law stated that a decrease would follow an increase in economic growth in the unemployment rate. Theoretically, poverty will decrease if economic growth is followed by improved quality, such as job creation and controlled inflation ([Muzaffar & Chowdhury, 2014](#); [Libman, 2020](#); [Alem & Ko'hlin, 2014](#)). On the other hand, poverty will usually increase due to decreased purchasing power ([Labonte, 2016](#)).

Indonesia is included in the category of lower-middle-income countries. As discussed in the following section, Indonesia's economic growth averaged 5.26% over 19 years (2000-2019). The poverty rate is also still one of the critical macroeconomic problems in Indonesia that need attention. The average poverty rate in Indonesia was 17.56% from 2000 to 2019, wherein in 2019, the population below the poverty line reached 9.22%. Meanwhile, Indonesia has experienced relatively low and stable inflation over the last five years in terms of the inflation rate. Currently, inflation has shifted to a low inflation regime due to bet-

ter expectations due to the more credible inflation-targeting framework (ITF) adopted since July 2005 ([Hendar, 2016](#)). However, relatively low inflation has not become a driver for economic growth, unemployment, and poverty.

Various studies show an association between economic growth, poverty, unemployment, and inflation. However, the association or direction between these variables has not been well defined and is still divergent. Stable macroeconomic indicators and environment, including economic growth rates, poverty, and unemployment, can be drivers of achieving a stable inflation trend in an economy ([Quévat & Vignolles, 2018](#)). On the other hand, low inflation can help determine the availability of jobs created by stable economic growth ([Mansi et al., 2020](#); [Mohaddes & Raissi, 2014](#)).

Most studies linking economic growth, poverty rates, and unemployment rates concerning inflation have not consistently found clear and convincing positive and negative evidence for the relationship between these variables. As such, the relationship between those economic variables is far from a consistent conclusion. The different results obtained by previous empirical studies make it difficult to draw firm conclusions on the associations of economic growth, poverty rates, and unemployment and inflation rates. Therefore, studies on the relationship between economic growth, poverty rates, unemployment, and inflation are still open for further study, as indicated by the mixed results. This study aims to fill the gap by examining the causal relationship between economic growth, poverty and unemployment rates, and inflation using a relatively long period (19 years). In addition, this study uses the analysis in this study using a time series with a Vector Error Correction Model for the Indonesian context, which is still limited. Short-term and long-term associations between the variables studied will be obtained with the VECM approach used in this study.

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THE CONTEXT: ECONOMIC GROWTH, POVERTY, UNEMPLOYMENT, AND INFLATION IN INDONESIA

In Figure 1, it can be seen that the average economic growth of Indonesia from 2000 to 2019 was 5.26%. Economic growth of 6.01 percent in 2008 and decreased to 4.63 percent in 2009 was an extreme decline in Indonesia’s economic performance in 2008 to 2018 economic period. During the 2008-2009 period, exports fell due to the global crisis that began with the crisis. In Indonesia, those affected by the global crisis are the real sector and sectors that rely on external (tradable) demand, such as the manufacturing, agriculture, and mining industries. These three sectors contribute more than 50 percent of GDP and absorb more than 60 percent of the national workforce.

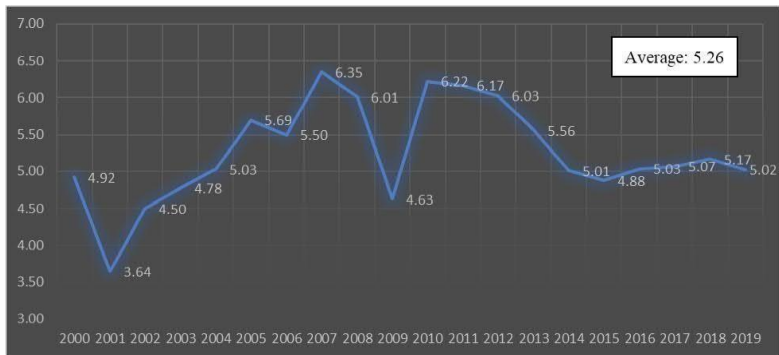


Figure 1. The Trend of Economic Growth in Indonesia, 2000-2019 (%)
Source: World Bank Indicators.

Figure 2 shows that the poverty rate of 39.3 percent in 2000 was the highest poverty rate experienced by Indonesia from 2000 to 2019, with an average of 17.56 per year. With the increase in the unemployment rate, per capita income will also decrease, and the poverty rate will increase. Because the crisis that occurred was a global crisis, the abroad workers also felt the impact. Furthermore, the soaring price of imported raw materials due to the drop in the rupiah exchange rate against the US dollar made production costs swell up to 20 percent. The textile industry, a labor-intensive industry, immediately terminates employment to

its workers so that unemployment increases and the poverty rate increases. Furthermore, Factors driving the decline in the poverty rate in 2017 include maintained inflation in 2017, the increase in real wages for farmworkers, and the integration of poverty programs, including the cash social assistance program from the government, which grew by 87.6 percent. The growth in average expenditure per capita/month for households in the bottom 40 percent of the stratum during the end of 2017 also contributed to poverty reduction in Indonesia.

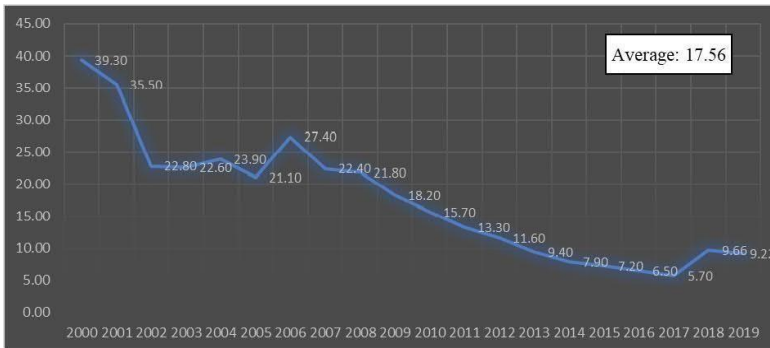


Figure 2. The Trend of Poverty Rate in Indonesia, 2000-2019 (%)
Source: World Bank Indicators.

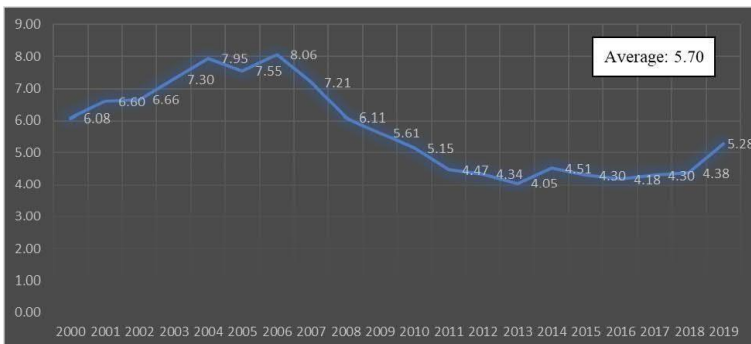


Figure 3. The Trend of Unemployment Rate in Indonesia, 2000-2019 (%)
Source: World Bank Indicators.

The average unemployment rate from 2000 to 2019 was 5.7% in Indonesia (Figure 3). The unemployment rate of 8.6 percent in 2006 was the highest unemployment rate experienced by In-

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Indonesia from 2000 to 2019. The 2008 economic crisis was the leading cause of the high unemployment rate due to the decrease in consumption and production decreased, resulted in a decrease in the absorption of labor and layoffs. In addition, the global crisis has a relatively more powerful impact on rural households than urban households. However, because the rural jobmarket is more flexible, the impact of the crisis on the rural unemployment rate has been relatively weaker.

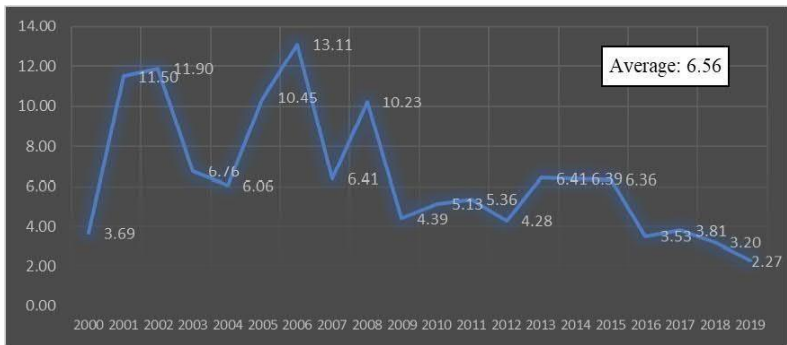


Figure 4. The Trend of Inflation in Indonesia, 2000-2019 (%)
Source: World Bank Indicators.

The inflation rate that reached 10.23 percent in 2008 was the highest inflation rate experienced by Indonesia in the economic period 2008 to 2018, with an average rate of 5.37%. The global crisis in the United States in 2007 was increasingly felt throughout the world, including Indonesia in 2008. In the financial market, the risk spread of Indonesian securities experienced a significant increase which prompted capital outflows from the investment of foreign exchange on the stock exchange, Government Securities (SUN), and Bank Indonesia Certificates (SBI). The impact of this process is pressure on the rupiah exchange rate. During November 2008, the average exchange rate weakened by 13.8 percent, higher than the previous month's 6.5 percent. The depreciation was accompanied by increased volatility, mainly triggered by negative market sentiment (market confidence) amid increasingly limited domestic foreign exchange sup-

ply conditions. Furthermore, the low inflation rate of 3.53 percent in 2016 was not due to a decrease in people's purchasing power but was caused by decreased cost structure or price structure of some basic needs. Household consumption growth of 5 percent in 2016 shows that people's purchasing power is still stable.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

A number of studies discusses the impact of inflation, unemployment, and poverty on a country's economic growth, but discussions of the interrelationships of these variables are still diverse. The relationship between inflation, unemployment, poverty, and economic growth is influenced by various factors, including monetary policy, market structure, and labor. For example, [Cuong \(2011\)](#) examines the relationship between inflation and poverty based on food consumption in Vietnam. Cuong used three Vietnamese Household Living Standards Surveys (VHLSSs) in 2002, 2004, and 2006 to estimate poverty in 2008 and 2010. Using panel data from the 2004 and 2006 VHLSSs, the study predicts the relationship between income in 2006 and assets and income in 2004.

Still for developing countries, [Fujii \(2011\)](#) examines the relationship between inflation and poverty rates in the Philippines. In the study, Fujii examined the impact of the actual increase in food prices between June 2006 and June 2008 on poverty using non-parametric regression. In particular, the research aimed at treating heterogeneity explicitly on changes in food prices, consumption, and production patterns by combining expenditure survey datasets and price datasets at the provincial level. The results showed that the increase in headcount index was more significant for non-agricultural households than agricultural households. In addition, poverty gaps and poverty severity were also found, because poor agricultural households are very vulnerable to inflation from the food sector.

[Alem and Kohlin \(2014\)](#) examined the impact of Food Price

Inflation on Subjective Well-being in Ethiopian urban areas. Their study used an ordered probit regression approach using data from the Ethiopian Urban Socio-Economic Survey (EUSS) for 2000, 2004, and 2009. Their results concluded that food prices that cause inflation significantly and negatively impact households in urban Ethiopia. Many other household-level variables were also found to impact life satisfaction in urban Ethiopia significantly. The probit regression results also show that households receiving international remittances report higher levels of life satisfaction. The policy implication they propose is the importance of keeping inflation lower to ensure economic growth that can significantly support the welfare of urban households. This is pursued because economic growth can lead to an increase in stable job creation that will positively affect household welfare.

Research on the role of inflation in the Indonesian economy was conducted by [Yolanda \(2017\)](#). In that study, inflation is seen in the Human Development Index and poverty in Indonesia. The research formulates that inflation impacts economic activity and causes the low purchasing power of money seen from the influence of the Bank Indonesia (BI) rate, foreign exchange rates, money supply, oil prices, and gold prices on inflation on the Human Development Index (HDI) as well as poverty in Indonesia for the period 1997 to 2016. The analysis results show that there are significant variables that simultaneously affect the inflation rate in Indonesia. These variables are the BI Rate, foreign exchange rates, money supply, oil prices, and gold prices.

In a similar study, [Alo, Satiawan, and Arsyad \(2018\)](#) examined the impact of changes in food prices, including rice, shallots, and garlic, on the welfare of farmers. The data analyzed is taken from the 2014 National Socio-Economic Survey (SUSENAS), covering 285,400 households in Indonesia. The analysis is carried out by estimating the demand function for food commodities and Compensating Variation (CV) to estimate the impact of price changes in the short term. This study indicates that an increase in income leads to an increase in rice, shall-

lots, and garlic. The dynamics of income, self-price, and cross-price elasticity varies, depending on demographics, socioeconomic conditions, and geographic location of households. The short-term impact of imported products on welfare changes is more significant than the direct impact. This study also suggests that government policies on food must consider demographic and geographical elements because households in rural areas are more responsive to price changes than households living in urban areas.

The impact of inflation on unemployment differs across economies. As reviewed by [Quévat and Vignolles \(2018\)](#), they analyzed the consistency of the relationship between unemployment rates and inflation in France and America by separating the effect of unemployment on wages on the one hand and the transmission of wages on prices on the other. They also measured the direct impact of productivity on wages and prices using quarterly data on unemployment rates, average wages per year for 1994-2016 in the United States. The analysis was carried out using a regression approach and an analysis of the correlation between the unemployment rate and the average wage per capita growth. Their results show a negative correlation between unemployment and inflation. Wages transmit this negative correlation. Slowing wages, especially since the crisis led to inflation.

[Vermeulen \(2015\)](#) examines the impact of inflation on employment in South Africa through inflation on output to determine whether high inflation can contribute to job creation. Using the Engle-Granger Error-Correction approach, long-term trends, and short-term dynamics of the relationship between inflation and unemployment in the South African economy, the results show a long-term and positive cointegration relationship between labor and output variables. Research also shows negative impacts on output (such as high inflation) and impair job creation. The results of Vermeulen study also provide evidence that there is no significant relationship in the short term between the inflation rate and job creation.

[Abu \(2019\)](#) analyzed the trade-off of the Phillips Curve with economic stability in terms of inflation and unemployment rates in Nigeria for 1980 to 2016. Abu uses the natural logarithm of inflation and unemployment with an Autoregressive Distributed Lag (ARDL) limit testing approach. Other estimation techniques used are Fully Modified Ordinary Least Square (FMOLS), Dynamic Ordinary Least Square (DOLS), static Ordinary Least Square (OLS), and Canonical Cointegrating Regression (CCR) to ensure consistency and robustness of the results. The cointegration test results reveal a long-term relationship between inflation and unemployment in Nigeria. Furthermore, the ARDL, FMOLS, DOLS, OLS, and CCR estimates show a trade-off between variables. Higher unemployment leads to lower inflation in the long run. At the same time, the results of the standard Granger causality test and the Toda Yamamoto approach show a unidirectional causality from inflation to unemployment. Thus, it is concluded that there is a Phillips trade-off curve occurring in Nigeria. Emmanuel (2019), identified a relationship between unemployment and inflation in Nigeria by estimating unemployment, inflation, and GDP for 1981 – 2017. Their study adopts Fully Modified Least Square Regression (FMOLS), starting with the stationarity test of the data to avoid biased interpretation of the results because the time series data are mostly unstable in their natural form. Adopted Philip-Perron (PP) and Elliot-Rothenberg-Stock DF-GLS stationarity tests, the study established long-term and short-term dynamics and coefficients of elasticity. A country's economic growth is also related to the inflation rate in that country, where high inflation is often associated with lower growth ([Ha, Kose, & Ohnsorge, 2019](#)). One of the seminal discussions that discuss the relationship between inflation and economic growth is the study of [Barro \(1995\)](#). According to Barro, Central Banks in various countries have emphasized price stability by using interest rates or monetary aggregate growth to achieve low and stable inflation. Barro then examined the relationship between inflation and economic performance, investment, eco-

conomic growth of 100 countries from 1960 to 1990 using a panel data approach. The results of Barro's study show that there is a significant negative impact of inflation on economic growth and investment. In the long run, inflation is economic growth and investment and ultimately dramatically affects people's living standards.

While evaluating a developing country, [Mohaddes and Raissi \(2014\)](#) analyzed the non-linear effect of inflation on economic growth in India and investigated whether rising inflation rates (significantly above a certain threshold) can slow economic growth in the long run. Their study looked at the real gross domestic product, economic growth, inflation, and consumer price index of 14 Indian states during 1989-2013, using the Cross-section Augmented Distributed Lag (CSDL) and ARDL approaches. They find that there is a negative long-run relationship between inflation and economic growth in India on average. A relatively recent study, [Van \(2020\)](#) examines the relationship of inflation from the amount of money supply (money supply) to economic growth using time series data from the money supply, inflation), economic growth in Vietnam and China for the period 2012-2016. The basis of the analysis is the economic theory of Fisher, Friedman, and the econometric model is applied to analyze the relationship between the money supply and inflation. The study analyzed the consumer price index, inflation index, and GDP. Van's study found that a continuous increase in the money supply can lead to inflation in the long run, but not inflation in the short run.

This study is, therefore, aims to identify the effect of economic growth, poverty rate, and unemployment rate on inflation in Indonesia. Based on the research objectives, the following hypotheses were developed:

H1: Economic growth has a positive effect on the inflation rate in Indonesia.

H2: The poverty rate has a negative effect on the inflation rate in Indonesia.

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- H3: The unemployment rate has a negative effect on the inflation rate in Indonesia.
- H4: There is a short-term relationship between the rate of economic growth, the poverty rate, the unemployment rate, and Indonesia's inflation rate.
- H5: There is a long-term relationship between the rate of economic growth, poverty rate, and unemployment rate with the inflation rate in Indonesia.

RESEARCH METHOD VARIABLES AND DATA SOURCES

This study uses data on the unemployment rate, inflation rate, real economic growth, and Indonesia's poverty rate from 2000 to 2019, so the time series analyzed are 20-time points. The unemployment rate is the number of disruptive people as a percentage of the total workforce, which is the part of the labor force that is not working but available for and looking for work. Inflation is measured by a consumer price index that reflects the annual percentage change in costs to the average consumer in acquiring a basket of goods and services that can be improved or changed at specific intervals. The economic growth rate is Real GDP growth. The poverty rate is the ratio of the poverty rate, which is the percentage of the population living on less than \$1.90 per day at international prices in 2011. All data used are secondary data from World Bank Indicators. Table 1 presents descriptive statistics of the variables used in this time series model: inflation (INF), GDP growth (GDP), poverty (POV), and unemployment (UNEMP).

Table 1. Descriptive Statistics of Data (before log-transformed): 2000-2019.

Variable	Unit	mean	Maximum	Minimum	Std. devs.	Obs.
INF	Percent	6.562	13.108	2.270	3.186	20
GDP	Percent	5.261	6.345	3,643	0.679	20
POV	Percent	17,559	39,300	5700	9,619	20
UNEMP	Percent	5.705	8060	4049	1.393	20

THE MODEL STRUCTURE

Based on the existing literature and research objectives, the basic regression model was formed based on the studies of [Barro \(1995\)](#), [Alem and Kohlin \(2014\)](#), [Quévat and Vignolles \(2018\)](#), and [Obstfeld, Rogoff, and Gregorio \(2019\)](#) as written as follows:

$$INF = f(GDP, POV, UNEMP) \quad (1)$$

$$INF_t = \alpha_0 + \alpha_1 GDP_t + \alpha_2 POV_t + \alpha_3 UNEMP_t + \epsilon_t \quad (2)$$

$$\square\square\square = \square_0 + \square_1\square\square\square + \square_2\square\square\square + \square_3\square\square\square\square\square + \square \quad (3)$$

INF is inflation rate per year, GDP is GDP growth per year, POV is poverty rate per year, and UNEMP is unemployment rate per year, 0 is constant, constant is regression coefficient, t is time (2000-2019), and ϵ is the error term.

ECONOMETRIC ANALYSIS

Empirical analysis of the association of inflation, unemployment, poverty, and economic growth was carried out using the [Toda-Yamamoto \(1995\)](#) approach. The Toda-Yamamoto procedure uses a modified Wald test for limitations on the parameters of the autoregressive vector model (VAR) ([Kaur & Dhiman, 2019](#)). The procedure has an asymptotic Chi-squared distribution with p degrees of freedom within limits when VAR (p + dmax), dmax is the order of maximal integration for the series in the analyzed regression equation. Toda-Yamamoto is used in time series data where the order of integration of one or more variables is higher. Before analyzing the inflation, GDP Growth, poverty, and unemployment associations, diagnostic testing for the analyzed variables were first carried out, which included the Normality Test, autocorrelation test, and checking the stability of the VAR model. The long-term relationship between inflation, GDP growth, poverty, and unemployment rates is carried out through examination cointegration between variables, while the short-term relationship was tested through the Error Vector Correction Model (VECM) ([Bokhari, 2020](#); [Victor, Farkas & Jeeseon, 2018](#)). The empirical steps of data analysis are summarized in Figure 5.

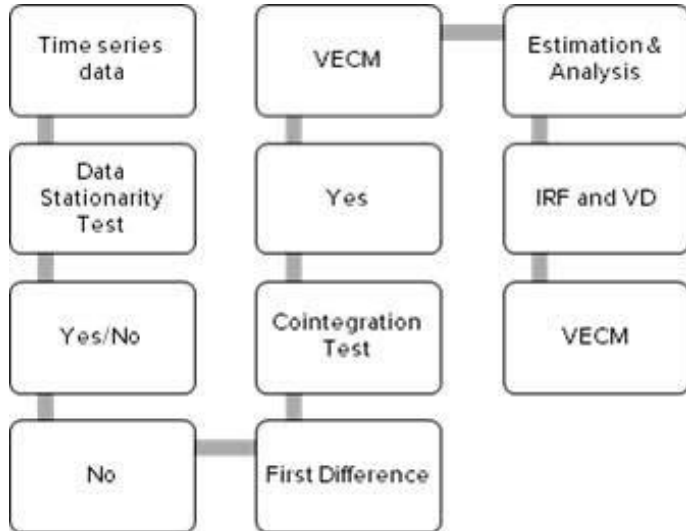


Figure 5. Empirical Steps

RESULT

DIAGNOSTIC TESTING: NORMALITY TEST

The empirical analysis is carried out by first examining the nature of time-series data, namely data normality, autocorrelation, and stationarity, of the inflation rate (INF), GDP growth (GDP), the poverty rate (POV), and unemployment rate (UNE). A normality test is carried out to ensure the fulfillment of the normality assumption. If the analyzed data does not meet the assumption of normality, the study results will result in unreliable inferences and incorrect interpretations ([Mantalos, 2010](#); [Toor & Islam, 2019](#); [Tarongi & Camp, 2010](#)). Normality test was performed using Jarque-Bera Normality Test. Figure 6 shows the results of the Jarque-Bera test for residual normality. The figure shows that the Jarque-Bera value is 1.182485 with a p-value of 0.55, more significant than 0.05, indicating that the model has a normally distributed residual.

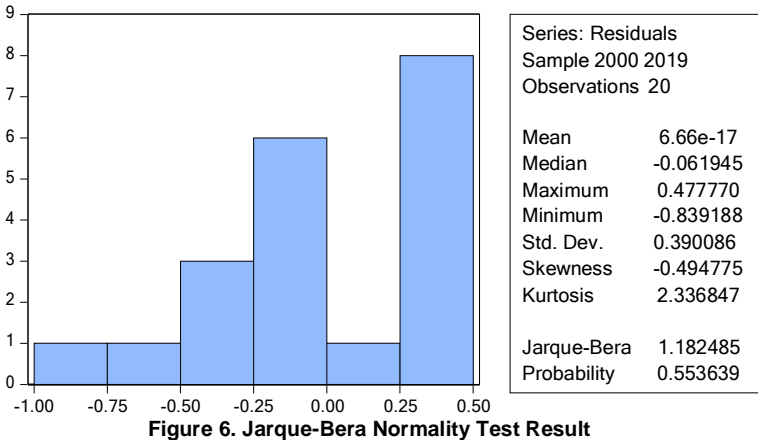


Table 2. Jarque-Bera Normality Test

Variable	Jarque-Bera	Probability
INF	2.1799	0.3362
GDP	0.1721	0.9175
POV	1.5364	0.4638
UNEMP	1.9169	0.3834

DIAGNOSTIC TESTING: TESTING FOR RESIDUAL AUTOCORRELATION

Autocorrelation is a condition that shows a correlation between variables from several observations at different time points (time series data) or correlations between variables from several observations in different spaces (cross-sectional data) (Toor & Islam, 2019; Greene, 2018). If the regression model contains an autocorrelation problem, the estimator is inefficient (Nankervis & Savin, 2010). The autocorrelation test was carried out using the Lagrange Multiplier (LM) test or Breusch-Godfrey (BG) test. Table 2 reports the BG Test, Prob values. Chi-Square, which is the p-value of the Breusch-Godfrey Serial Correlation LM test, which is 0.7451, which is greater than 0.05, indicates no serial autocorrelation problem in the analyzed time series model.

Table 3. Breusch-Godfrey Serial Correlation LM Test

F-statistics	0.2122	Prob. F(2.14)	0.8113
Obs*R-squared	0.5885	Prob. Chi-Square(2)	0.7451

UNIT ROOT TEST: AUGMENTED DICKEY-FULLER TEST

Time series data $Y_t (t = 1, 2)$ is concluded to be stationary if series properties such as mean and variance remain constant over time. The time-series data have (1) constant (mean) for all t ; Constant σ^2 (variance) for all t , and the autocovariance function between X_{t1} and X_{t2} only depends on the interval t_1 and t_2 . If the time series data meets these criteria, then it is said to be white noise, where each time-series data element has an identical distribution (independent: $E[\hat{a}_t] = 0$; mean-zero: $E[\hat{a}_t^2] = \sigma^2$; dan distribution $E[\hat{a}_s \hat{a}_t] = 0$ (Greene, 2018).

In this study, the stationarity test was carried out with the Augmented Dickey and Fuller, written as follows:

$$Y_t = \alpha_0 + \sum_{i=1}^n \alpha_i \Delta Y_{t-i} + e_t \tag{4}$$

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{i=1}^n \alpha_i \Delta Y_{t-i} + e_t \tag{5}$$

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \dots + \alpha_n Y_{t-n} + e_t \tag{6}$$

Y is the time series in the period t , Δ is the first difference operator, α_0 is a constant, n is the optimal number of lags, and e_t is the error term. If the absolute value of the ADF statistic is greater than the critical value, it can be concluded that the time series data is stationary, and otherwise, the data is not stationary.

The results of the ADF test are shown in Table 4. LINF, LGDP, LPOV, and LUNE each show the variables of inflation, GDP growth, poverty, and unemployment in logarithmic form. All variables used in this study have been transformed into logarithmic form to ensure the stationarity of the variables. At the 1st difference level, the results of the ADF test show that all variables are stationary at the 5% level, so it can be concluded that all variables are stationary at $I(1)$. Inflation variable is stationary at 5% level with absolute value of ADF t -statistic $-6.3327 > -1.9614$.

GDP variable is stationary at 5% level with absolute value of ADF t-statistic $-6.704 > -1.9614$. Poverty variable is stationary at 5% level with absolute value ADF t-statistic $-3.8948 > -1.9614$ and unemployment variable is stationary at 5% level with absolute value ADF t-statistic $-2.5454 > -1.9614$.

Table 4. Unit Root Test: Augmented Dickey-Fuller

Variable	Test Form	ADF Value	5% Critical Value	10% Critical Value	Results
LINF	(C,N,0)	-2.0825	-3.0299	-2.6551	Unstable
LINF	(N, N, 0)	-6.3327	-1.9614	-1.6066	Stable
LGDP	(C,N,0)	-2.4893	-3.0299	-2.6551	Unstable
LGDP	(N, N, 0)	-6.7043	-1.9614	-1.6066	Stable
LPOV	(C, T, 3)	-2.8611	-3.7332	-3.3103	Unstable
LPOV	(N, N, 0)	-3.8948	-1.9614	-1.6066	Stable
LUNEMP	(C, T, 0)	-1.2356	-3.6736	-3.2773	Unstable
LUNEMP	(N, N, 0)	-2.5454	-1.9614	-1.6066	Stable

Notes: C, T, and K in the test form (C, T, K) separately represent the constant term, trend term, and lag order.

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*stationary. Critical value: 1% = -3.80; 5% = 0.46; 10% = 0.34.

Note: The ADF test examines the null hypothesis of a unit root against the alternative hypothesis stationarity.

Source: Author's estimation using EViews 10.

SELECTING THE OPTIMAL LAG LENGTH (*p*) OF THE VAR

In the VAR analysis, the optimal lag (*p*) is carried out to see the behavior and relationship of each variable, where the response is said to be significant if the number of lags used is already the optimal lag. Optimal lag selection will produce residuals that are free from autocorrelation and heteroscedasticity problems (Cernat-Cernat, 2009; Fidora et al., 2020). The length is unknown; the estimated *p* sequence of the VAR model can be done using the final prediction error (FPE) and the Akaike information criterion (AIC) criteria (Razek & McQuinn, 2021; Cernat-Cernat, 2009; Niedzwiecki & Ciolek, 2017). Referring to Liew (2004), these two criteria are better than other lag determination criteria if the observed time series is less than 60 because FPE and AIC minimize the possibility of underestimation while maximizing the chance of getting the proper lag length. Other than

42 that, the determination of the optimal lag aims to overcome autocorrelation in the VAR system. Table 4 shows the optimum results of the most optimal lag order used, namely lag 2.

Table 5. The Johansen Test: Optimal Lag Length Selection

lag	LogL	LR	FPE	AIC	SC	HQ
0	11.71300	NA	4.99e-06	-0.857000	-0.659139	-0.829717
1	50.26271	55.68292*	4.32e-07	-3.362523	-2.373221*	-3.226112
2	71.95876	21.69605	3.21e-07*	-3.995418*	-2.214675	-3.749878*

Notes: * indicates lag order selected by the criterion. LR: sequential modified LR test statistics (each test at 5% level). FPE: Final prediction error. AIC: Akaike information criterion. SC: Schwarz information criterion. HQ: Hannan-Quinn information criterion.

Table 4 shows the lag order of VAR in five criteria. Choosing the optimal lag is necessary to pay attention to the smallest value indicated by one of the lag criteria. Because of this, looking at the results shown in the table above, it can be concluded that the optimal lag for this VAR model is two as shown by the Akaike information criterion.

JOHANSEN COINTEGRATION TEST

A cointegration test is conducted to determine whether there is a long-term relationship between variables or not. The analysis continued to examine the degree of integration of the variables through the Johansen test, which was based on the criteria for the eigenvalue test and the trace test. This test has the advantage of allowing more than one cointegration relationship between series ([Kaur & Dhiman, 2019](#); [Zou, 2018](#); [Razek & McQuinn, 2021](#)). If the variable has cointegration, then there is a possibility that the variable has a long-term relationship between variables and causality between variables. Johansen’s cointegration was carried out in two stages. First, determine the VAR order and then test the existence of a cointegration vector with the null hypothesis being no cointegration.

The rejection of the null hypothesis, namely no cointegration ($r = 0$ and $r d'' 1$) can be obtained by examining the maximum eigenvalue test and the trace test ([Johansen, 1988](#)). Johansen’s

test is based on checking the matrix p , where p is considered as a long-term coefficient matrix. The test for cointegration between variables is calculated by looking at the degree/rank of the matrix p through the eigenvalues of the matrix p can be defined as the product of two matrices $\pi = \alpha\beta'$. The matrix is a cointegration vector a , is the sum of each cointegration vector, the VECM equation (Razek & McQuinn, 2021; Menegaki, 2019). There is a difference between the eigenvalue test and the trace test. The null hypothesis in the trace test is the number of cointegration vectors r . A separate test is conducted on the individual eigenvalues with the null hypothesis for the maximum eigenvalue test: the number of cointegration vectors is r , against the alternative $(r + 1)$. The maximum eigenvalue test and the trace test can be written as:

$$\lambda_{\max}(\lambda) = -\lambda \sum_{i=\lambda+1}^n \lambda_i (1 - \lambda_i) \tag{7}$$

$$\lambda_{\text{Trace}}(\lambda, \lambda + 1) = -\lambda \ln(1 - \lambda_{\lambda+1}) \tag{8}$$

Table 6. Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CEs	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob. **
None *	0.911688	72.77381	47.85613	0.0001
At most 1	0.545991	29.08991	29.79707	0.0602
At most 2	0.452201	14.87643	15.49471	0.0618
At most 3 *	0.11181	4.043174	3.841466	0.0443
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CEs	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob. **
None *	0.911688	43.68391	27.58434	0.0002
At most 1	0.545991	14.21348	21.13162	0.3478
At most 2	0.452201	10.83325	14.26460	0.1628
At most 3 *	0.11181	4.043174	3.841466	0.0443

Notes: * denotes rejection of the hypothesis at 0.05 level. ** MacKinnon-Haug-Michelis (1999) p-values. CEs: Cointegrating Equation(s).

A cointegration test is carried out using the optimal lag of VAR minus one so that the optimal lag for the cointegration test is one. Table 6 shows the results of the Johansen cointegration test. According to the results shown, there is one cointegrating

equation from both the trace and max-eigenvalue tests. The Johansen Cointegration test results show a trace statistic value of 72.77381 > a critical value of 47.85613. The max-eigenvalue statistic is 43.68391 > critical value 27.58434. These results show the cointegration and long-term relationship between INF, GDP, POV and UNE.

VECTOR ERROR CORRECTION MODEL

Following prior literature, the cointegration between variables in the same order becomes the basis for using VECM. VECM is a form of VAR when the data is not stationary but has a cointegration relationship ([Engle & Granger, 1987](#); [Sahoo & Sethi, 2017](#); [Naka & Tufte, 1997](#); [Fidora et al., 2020](#)). In VECM, the variable is non-stationary at its level, but only stationary in the first difference (Y_{t-1}) or cointegrated in the same order I(1), thus providing long-term relationships as well as short-term dynamics of endogenous variables ([Sahoo & Sethi, 2017](#); [Hamilton, 1994](#); [Lütkepohl, 2005](#)). The existence of cointegration between variables illustrates a long-term relationship in the series, so VECM is appropriate to use to determine the long-term relationship and short-term relationship in the series ([Greene, 2018](#)). VECM is a particular form of VAR, namely unrestricted VAR, which can ensure cointegration of variables, examining the impact between variables in both the short and long term ([Das & Chavan, 2020](#)).

In VECM, if the error correction term is negative and significant, it can be concluded that short-term fluctuations between the dependent and independent variables will lead to a stable long-term relationship ([Arnold & Glushko, 2021](#)). VECM analysis was performed through two procedures ([Razek & McQuinn, 2021](#)). According to the VAR formulation, first, perform the maximum likelihood procedure to estimate the long-term relationship between inflation, GDP growth, poverty, and unemployment. Furthermore, after obtaining an estimate of the

cointegration relationship, it is used to construct a disequilibrium term to predict VECM in the VECM equation. VECM analysis will show whether there is a positive or negative relationship between variables or even no relationship at all. The relationship between variables in VECM can be seen through short and long relationships ([Arnold & Glushko, 2021](#); [Victor, Farkas & Jeeseon, 2018](#)).

Based on the cointegration test results, the analysis continued with VECM ([Arnold & Glushko, 2021](#); [Victor, Farkas & Jeeseon, 2018](#); [Bokhari, 2020](#)). Inflation rate as the dependent variable, economic growth, poverty rate, and unemployment rate are independent variables.

The short term relationship is written as:

$$INF_t = \alpha_0 + \alpha_1 GDP_{t-1} + \alpha_2 POV_{t-1} + \alpha_3 UNEMP_t + U_t \quad (9)$$

The long term relationship is written as:

$$INF_t = \beta_1 GDP_t + \beta_2 GDP_{t-1} + \beta_3 POV_t + \beta_4 POV_{t-1} + \beta_5 UNEMP_t + \beta_6 UNEMP_{t-1} + U_t \quad (10)$$

The ECM model as a combination of long-term and short-term relationships, is written:

$$X_t = \delta + \lambda X_{t-1} + X_t + ECT_{t-1} + t \quad (11)$$

Where δ is the symbol of the difference operator, X_t shows the 2×1 vectors, namely economic growth, poverty rate, and unemployment rate. t is the vector residual, the 2×1 vector of residuals. At the same time, X_{t-1} is the error correction term (ECT). ECT must be negative and significant, indicating the degree of balance adjustment. VECM analysis was performed using the optimal VAR minus one because VECM is a VAR method in first difference, so the optimal lag for VECM is one (optimal lag two minus 1).

SHORT-TERM EFFECTS OF ECONOMIC GROWTH, POVERTY AND UNEMPLOYMENT ON INFLATION.

Table 7 shows the t-statistic value obtained from the estimation of the VECM model using lag 1. Based on the short-term

VECM estimation table, changes in economic growth (GDP) in the previous period have a significant effect on changes in the inflation rate, as evidenced by the t-statistic value of $-1.93900 > 1.7291$ (significant at 10% level). The value of the coefficient $D(GDP(-1))$ is -1.268031 , ceteris paribus. When there is an increase in economic growth in the previous period of 1 unit, the inflation rate will decrease by 1.268031 percent. Economic growth reduces inflation and improves people's purchasing power, and improved economic growth leads to an improvement in real income. Another significant variable is the level of poverty. The t-statistic value of the poverty rate in the t-1 period is $-2.89376 >$ from the t-table at the level of 1%, 5%, or 10%. The poverty rate regression coefficient at t-1 is -1.321505 indicating, all other things remain the same. When there is an increase in poverty in the previous period of 1 unit, the inflation rate will decrease by 1.321505 percent. Even though the coefficient of the unemployment rate is not statistically significant, but the regression coefficient is positive, implying a unidirectional relationship between unemployment and inflation.

Table 7. Short-run Vector Error Correction Estimates

Variable	LINF	LGDP	LPOV	LUNEMP
CointEq1	-0.995739 [-3,31526]	0.036882 [0.33445]	-0.330762 [-1.76178]	0.112713 [1.18689]
D(LINF)(-1)	0.285910 [1.24740]	-0.083181 [-0.98843]	0.130633 [0.91179]	-0.034631 [-0.47786]
D(LGDP)(-1)	-1.268031 [-1.93900]	-0.256334 [-1.06758]	0.142871 [0.34951]	0.182541 [0.88282]
D(LPOV)(-1)	-1.321505 [-2.89376]	-0.058072 [-0.34634]	-0.340139 [-1.19156]	0.157574 [1.09129]
D(LUNEMP)(-1)	1.653061 [1.68364]	0.679132 [1.88391]	0.612847 [0.99857]	0.204852 [0.65988]
C	-0.157137 [-1.93940]	0.025810 [0.86759]	-0.089558 [-1.76831]	0.002823 [0.11020]

Value of t table 10%: 1.7291

Value t table 5%: 2.093

Value of t table 1%: 2.8609

Numbers in the curly brackets are the t-statistics.

Model 1 of the VECM estimation results above shows a negative error correction term ($ECT_{t,j}$) value, which is -0.995739 and a statistically significant t of -3.31526. The $ECT_{t,j}$ coefficient indicates the speed of adjustment from short-run to long-run equilibrium. The statistically significant $ECT_{t,j}$ coefficient with a negative sign proves a long-term stable relationship of inflation, economic growth, poverty, and unemployment in Indonesia. The $ECT_{t,j}$ value also shows that the empirical model analyzed has good specifications so that the VECM results can be used to see the long-term effect of economic growth, poverty, and unemployment on inflation. In the long term, economic growth was found to have a negative and significant effect on economic growth. The poverty rate also has a significant effect negatively, while the unemployment rate does not have a significant effect on inflation. In model 2, economic growth becomes the dependent variable, and it is found that only the unemployment rate significantly affects economic growth at the level of = 10%. While in Models 3 and 4, none of the independent variables significantly affect the dependent variable.

The short-term relationship between inflation, GDP growth, poverty rate, and unemployment rate can be written as follows:

1. $\Delta \pi_{t,j} = -0.1571 + 0.2859 \Delta \pi_{t,j,t-1} - 1.2680 \Delta \pi_{t,j,t-1} - 1.3215 \Delta \pi_{t,j,t-1} + 1.6531 \Delta \pi_{t,j,t-1} - 0.9957 \pi_{t,j}$
2. $\Delta \pi_{t,j} = 0.0258 - 0.0831 \Delta \pi_{t,j,t-1} - 0.2563 \Delta \pi_{t,j,t-1} - 0.0581 \Delta \pi_{t,j,t-1} + 0.6791 \Delta \pi_{t,j,t-1} + 0.0368 \pi_{t,j}$
3. $\Delta \pi_{t,j} = -0.0895 + 0.1306 \Delta \pi_{t,j,t-1} + 0.1428 \Delta \pi_{t,j,t-1} - 0.3401 \Delta \pi_{t,j,t-1} + 0.6128 \Delta \pi_{t,j,t-1} - 0.3307 \pi_{t,j}$
4. $\Delta \pi_{t,j} = 0.0028 - 0.0346 \Delta \pi_{t,j,t-1} + 0.1825 \Delta \pi_{t,j,t-1} + 0.1575 \Delta \pi_{t,j,t-1} + 0.2048 \Delta \pi_{t,j,t-1} + 0.1127 \pi_{t,j}$

THE LONG-TERM EFFECT OF ECONOMIC GROWTH, POVERTY AND UNEMPLOYMENT ON INFLATION.

Based on the results of the VECM test, in the long term, GDP growth has a negative and significant effect on inflation. The same finding also exists on the unemployment rate, which has a negative and significant effect on inflation. In contrast, the poverty rate is concluded to have a positive and significant effect on inflation. In the long term, the economic growth rate negatively

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affects inflation by -1.577418, meaning that if there is an increase of one percent in the previous year, it will reduce inflation by 1.577418 in a particular year. The poverty rate positively affects

inflation by 0.479657, which means that every 1 percent increase in the poverty rate in the previous period will increase inflation by 0.479657 in a particular year. Unemployment negatively affects inflation by -2.282436. If the unemployment rate in the previous year rose by 1%, then inflation would decrease by 2.282436. The constant of 3.379506 explains that in the long term, when the economic growth (GDP), poverty rate, and unemployment rate are 0, then inflation will continue to decline by 3.3795 percent. Thus, it can be concluded that in the long-term VECM, economic growth, poverty rates, and unemployment rates have a significant effect on inflation, and the unemployment rate is 0, then inflation continues to decline by 3.3795 percent. Thus, it can be concluded that in the long-term VECM model, economic growth, poverty rates, and unemployment rates have a significant effect on inflation. The unemployment rate is 0; then inflation continues to decline by 3.3795 percent. Thus, it can be concluded that in the long term, economic growth, poverty rates, and unemployment rates significantly affect inflation.

Table 8. Long-run Vector Error Correction Estimates

	Regression coefficients	t-statistics
LGDP(-1)	-1.577418	-5.82445
LPOV(-1)	0.479657	4.28727
LUNEMP(-1)	-2.282436	-9.22715
C	3.379506	

The error correction model for the short-term relationship between inflation, GDP growth, poverty rate, and the unemployment rate can be written as follows:

$$LINF_t = 3.3795 - 1.5774LGDP_t + 0.4796LPOV_t - 2.2824LUNEMP_t$$

Based on the value of Adj. R-squared in Table 8, in the short-term VECM equation model, the variables of changes in economic growth (GDP), poverty rates, and unemployment rates can explain variations in the variable changes in the inflation rate of 0.384734 or 38.47 percent. The remaining 61.54 percent is explained by other changing variables outside the research model.

IMPULSE RESPONSE FUNCTION (IRF)

IRF analysis is carried out to analyze the impact of shock or shock from a variable to other variables in a certain period ([Adedokun, 2018](#); [Tsioumas, Smirlis & Papadimitriou, 2021](#); [Michael, 2020](#)). IRF also predicts the response of a variable in the future to one other variable so that information is obtained on how long the shock effect of a variable has on other variables and which variable will give the most significant response to a shock. Figure 7 shows the IRF of each variable as a response. Within this study, the author aims to see the shock of the inflation rate, economic growth, poverty, and unemployment rates for the 20 years studied to see the each variable's response. At VECM, the effect of the shock is permanent, and the impulse response does not return to equilibrium. The vertical axis is the standard deviation value that measures how much response a variable will give in the event of a shock to other variables. The horizontal axis shows the period (years) of the response given to the shock. When the response is above the horizontal axis, the shock will have a positive effect. The response to the innovation of a dependent variable occurs when a shock occurs through the standard deviation of a variable by one standard deviation.

Figure 7 shows the impulse response of inflation to shocks that occur in the inflation variable itself. In general, the response shown is positive, with large fluctuations in the first seven periods. After passing through the eighth period, the response of the inflation variable began to appear stable. The impulse response of economic growth or GDP to shocks from the inflation variable is shown in Graph 7. The figure shows that the response of economic growth to inflation is generally favorable.

50 In the second period, the response from GDP growth almost touched equilibrium (the horizontal line is zero), but the response spiked again before fluctuating until the eighth period. After passing through this period, the response of the variable of economic growth to inflation turned stable.

The lower left graph shows the impulse response of the poverty variable to shocks from inflation. Different from the previous two charts, this time, the response shown is negative. Large fluctuations occurred in the first five periods before finally becoming relatively stable after the sixth period. The last graph at the bottom right shows the impulse response of unemployment to shocks in the inflation variable. Once again, a positive response was found. Starting from a close response to the horizontal line of zero, the impulse response from this unemployment spikes in the third period and fluctuates until the sixth period. The response began to change steadily after the seventh period until the end of the studied period.

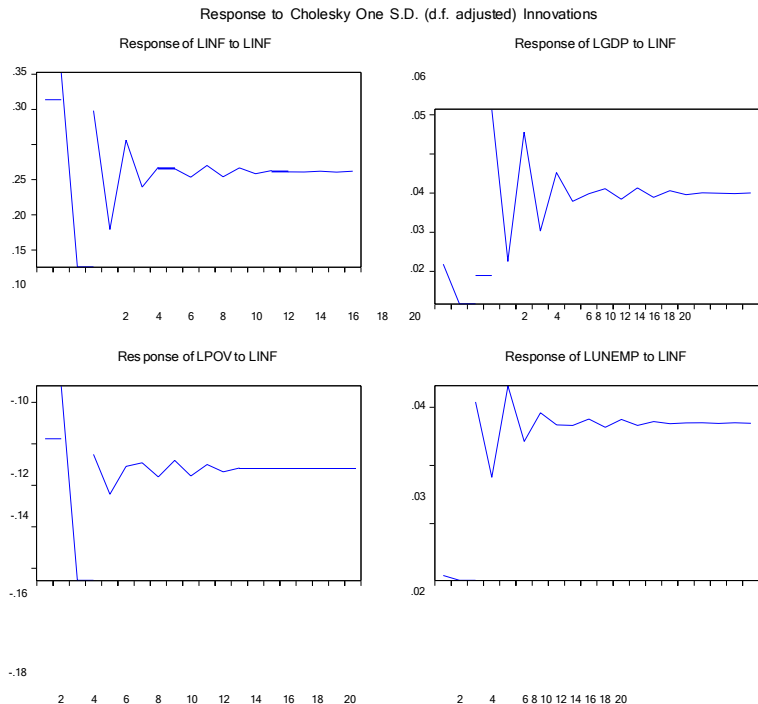


Figure 7. Result of Impulse Response Function

VARIANCE DECOMPOSITION (VD)

Variance decomposition is examined to see the estimated error variance of a variable. It reveals the difference before and aftershocks, both from the variables themselves and other variables ([Adedokun, 2018](#)). By using the variance decomposition method of the VECM model (inflation, economic growth, poverty, and unemployment with one lag) that has been done previously, the analysis of variance decomposition is carried out as one of the robustness check processes. Fluctuations in inflation are mostly explained by the impact of the variable itself and unemployment. GDP growth appears to be strongly endogenous, or the variable itself mainly explains its fluctuation. Poverty is explained mainly by poverty itself and inflation; meanwhile, fluctuations in unemployment are explained mainly by unemployment and poverty.

In the next five years, the variable that is expected to contribute the most to inflation is the variable itself with an average contribution of 76.96%, followed by the unemployment variable with an average contribution of 14.85%, then poverty at 7.03%. Lastly, the average contribution of economic growth is only 1.16%. Economic growth is predicted to be explained by itself over the next five years, with an average contribution of 80.66%. The next most immense contribution is inflation and poverty, which each have an average of 7.12% and 7.69%. Meanwhile, the contribution from unemployment only has an average of 4.53%. The unemployment variable contributes to the variable itself by 66.06% in the next five years. The second-largest contribution came from inflation, with an average of 27.85%. Economic growth and unemployment only have an average contribution of 1.61% and 4.48%, respectively. Finally, the variable that is predicted to contribute the most to unemployment is poverty, with an average contribution of 63.53%. The unemployment variable itself only has an average contribution of 27.2%. Inflation and economic growth contributed to unemployment by 3.37% and 5.91%, respectively.

Table 9. Coefficient of Determination of VECM Estimation

Variance decompositions of LINF					
Period	SE	LINF	LGDP	LPOV	LUNEMP
1	0.314078	100.0000	0.000000	0.000000	0.000000
2	0.527204	80.20135	1.801292	0.109590	17.88777
3	0.566251	71.32950	1.708943	10.59419	16,36737
4	0.676003	69.51193	1.208630	9.297060	19.98238
5	0.724183	63.74966	1.066690	15.17363	20.01002
Variance decompositions of LGDP					
Period	SE	LINF	LGDP	LPOV	LUNEMP
1	0.115317	3.596614	96.40339	0.000000	0.000000
2	0.141386	3.085938	83.52353	7.678182	5.712347
3	0.166718	3.512914	81.41939	10.92365	4.144045
4	0.191106	12.98346	71.12684	9.126435	6.763272
5	0.205632	12,41767	70.82230	10.72544	6.034596
Variance decompositions of LPOV					
Period	SE	LINF	LGDP	LPOV	LUNEMP
1	0.196324	35.80436	0.015353	64.18029	0.000000
2	0.297393	25.18900	1.944889	66.04209	6.824022
3	0.445771	28.57411	1.878596	64.95547	4.591824
4	0.534089	25.38960	2.224211	66.98383	5.402364
5	0.619722	24.27055	1.975070	68.14599	5.603886
Variance decompositions of LUNE					
Period	SE	LINF	LGDP	LPOV	LUNEMP
1	0.099306	1.240100	6.665417	59.38192	32.71257
2	0.156835	0.923896	4.868541	69.31573	24.89183
3	0.207048	4.438556	5.536352	63.18288	26.84221
4	0.246636	4.415079	6.093455	63.90384	25.58763
5	0.280938	5.820185	6.370158	61.85297	25.95669

Cholesky Ordering: LINF LGDP LPOV LUNEMP

DISCUSSION

The unit root test results at the level indicate that the time series data analyzed were not stationary at the level. Therefore, it was continued with the stationary test of the data at the first difference level. All variables are stationary after the first difference because the ADF test statistic value of these variables is greater than the critical value. Based on the results of the stationary test and cointegration test that have been carried out, the five variables have cointegration based on the trace test value greater than 5% critical value. The finding concludes that the

inflation, economic growth, poverty rate, and unemployment rate have a long-term relationship. Furthermore, the optimal lag selection is carried out, aiming to determine how much lag is needed to capture the influence of each variable on other variables. The optimal lag test results show that the optimal lag length is located at lag one so that modeling is considered optimal if it is carried out on lag 1. The lag of lag 1 shows that variable changes are influenced by the previous period. From the empirical procedures for analyzing time-series data, it is concluded that the appropriate empirical analysis used in this study is VECM.

The results of the short-term VECM estimation show that a growing economy has a negative and significant effect on economic growth. As found in many studies, the association of inflation and economic growth is inconclusive, there is evidence of a negative association ([Zivkov, Kovačević & Papić-Blagojević, 2020](#); [Barro, 1995](#); [Mohaddes & Raissi, 2014](#); [Gokal & Hanif, 2004](#); [Aydın, Esen, & Bayrak, 2016](#)). Inflation has a negative association with growth. The reason is that inflation creates conditions of uncertainty. Therefore, the effect of uncertainty on economic growth can be either positive or negative ([Zivkov, Kovačević & Papić-Blagojević, 2020](#)). High and fluctuating inflation rates will have a negative effect and hamper economic growth. At times of high inflation, the private sector has difficulty obtaining investment financing ([Caglayan et al., 2016](#)) and worsens product activity in the economy. The inflation threshold is likely 5% per year; if inflation is above that rate, then a negative association with growth will occur ([Gokal & Hanif, 2004](#)). In this study, inflation was found to have a positive effect on Indonesia's economic growth. This finding substantially aligns with several studies such as [Gokal and Hanif \(2004\)](#), who found that inflation at a low level, for example, 2-3 percent per year, is positively correlated with economic growth. [Aydın, Esen, and Bayrak \(2016\)](#) found that the inflation threshold of having a positive effect on economic growth is below 7%. If we look at Indonesia's average inflation in the analysis period, it is 6.56%.

Inflation and economic growth in Indonesia.

Poverty and inflation have a close relationship; countries with high inflation tend to have high poverty rates. This study also finds that poverty has a significant and negative effect on inflation in Indonesia. Some studies such as [Cuong \(2011\)](#) and [Fuji \(2011\)](#). Poverty with inflation has a two-way causality. In the short term, the poverty rate will drive inflation, but in the long term, people at the poverty line will adjust their real income to ensure their real consumption is guaranteed, and the effect of inflation can be suppressed. The significant and negative effect of poverty on inflation is also related to poverty due to the food crisis, affecting the poor. [Albertus Allo, Satiawan, and Arsyad \(2018\)](#) explain that when poverty falls, there is an increase in income. The increase in income will be followed by an increase in spending, especially in the foodstuff category. An increase in income can also increase the demand for imported goods. The long-term relationship between inflation, economic growth, poverty rate, the unemployment rate was found based on the cointegration test results. As in Table 4.3, the trace statistic and maximum eigenvalue are greater than the critical value with a significance level of 5%. Using VECM, it was found that economic growth, poverty rate, and unemployment rate significantly affect inflation. Economic growth and the unemployment rate harm inflation, while the poverty rate positively affects inflation.

CONCLUSION AND IMPLICATION

This study examines macroeconomic variables that are often the center of attention in economic policymaking. The analysis uses secondary data from the World Bank Indicators for inflation, economic growth rate, poverty rate, and unemployment rate in Indonesia. The period 2000 to 2019, using multivariate time series techniques such as Augmented Dicky Fuller test, optimal lag, Johansen test for cointegration, and vector error correction model. The Augmented Dicky Fuller unit root test results showed that the variables studied were not stationary, so

the first difference was made, and then all became stationary. The vector autoregressive lag model is used based on the LR, FPE, AIC, SC, and HQ criteria determining the optimal lag. Using such approaches, it is found that the optimal lag length as I(1) and continued with Johansen cointegration test. Based on the trace and maximum statistics, it is concluded that there is a cointegration and long-term stability of the balanced relationship between inflation, GDP growth, poverty, and unemployment in Indonesia in the analysis period. The results of the short-term VECM analysis show that economic growth and poverty levels have a significant effect on inflation. In the long term, it is found that economic growth, poverty, and unemployment simultaneously have a significant effect on inflation in Indonesia. Poverty and unemployment in Indonesia in the analysis period. The results of the short-term VECM analysis show that economic growth and poverty levels have a significant effect on inflation. In the long term, economic growth, poverty, and unemployment simultaneously have a significant effect on inflation in Indonesia. The short-term VECM analysis also demonstrates that economic growth and poverty levels have a significant effect on inflation. In the long term, it is found that economic growth, poverty, and unemployment simultaneously have a significant effect on inflation in Indonesia.

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