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Relationship Between Inflation, Unemployment And Economic Growth In Indonesia

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Abstract: *Economicgrowth, inflation, and unemployment are threeindicatorsthat are important concerns of the people of the world economy. Over the pasthalf century, public interest in the world economy has led to ways to accelerate national economicgrowth. This studyempiricallyanalyzes the causal relationshipbetweeneconomicgrowth, inflation, and unemployment. The results show that there is a one-way relationship between unemployment and economic growth, and inflation and unemployment, but there is no causal relationship between economic growth and inflation.*

Keywords: *Growth, Inflation, Unemployment, Vector Autoregression*

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I. Introduction

Along with the times, the problems that occur today are very complex. Over the past half century, public interest in the world economy has led to ways to accelerate national economic growth. Inflation, unemployment and economic growth are the three main indicators in the economy and they are seen as the main determinants of backwardness in any country, including Indonesia. the three indicators have a prominent relationship in macroeconomic theory and have been found to be a handle for several countries.[1]–[3]Several studies have also tried to estimate some of the differences in these relationships in various countries. [4]–[7]

Kuznets (1955)argues that economic growth is formed from the increase in production capacity of the country concerned. From this view, it can be concluded that GDP is one indicator of economic growth in a country Indonesia's economic growth during the study period fluctuated with an average growth of 9.63 percent. In 1987 to 1996 was a fantastic period, with the implementation of trade liberalization, many important international trade policies were taken: including duty drawback facilities, tariff reductions, and a more transparent quota allocation system, and the replacement of non-tariff barriers to export taxes.[9] Duty drawback facility is implemented with the aim of reducing the abuse of office between officer and importer or exporter. Some trade policies were taken by the government, including the January 1987 package, the November 1988 Package, and the May 1990 Package. The January 1987 package included the regulation of industrial sector quotas and transparency of the tender system. The November 1988 package was directed at the elimination of the cotton import monopoly, while the May 1990 package led to the elimination of non-tariff barriers in the electronic sector.[10] During the period of 1990 to 1996, the average Indonesian economic growth was 7.14 percent with a peak in 1995 of 8.1 percent. Some trade policies taken by the government were implemented in June 1991, July 1992, October 1993, June 1994, May 1995 and June 1996. All of these policies are supported by the Real Effective Rates of Protection policy.[11]

Entering 2007 there was a change in the trend of economic growth from positive to negative. the economic crisis in 1998 caused a decline in economic growth reaching -13 percent. The crisis also caused the rupiah to depreciate more than 80 percent in less than 12 months between 1997 and 1998.[12] During the same period inflation also occurred at 77.6 percent and there was a very large form of withdrawal of funds.[13], [14] Since 2000, Indonesia's economic growth has returned positive again. Average economic growth of 5% during 2000-2010. During this period, economic growth was driven by a number of macroeconomic packages, known as the White Paper.[15] in the past 7 years economic growth slowed from 6.8% in 2010 to 3.61% in 2017.

Inflation is closely related to the Indonesian economy, because if the inflation rate rises, it certainly affects economic growth. According to Abimanyu (2011)inflation will hinder economic growth, even if the lack of adequate supply and infrastructure distribution can lead to the emergence of an output gap. From 1987-1997 the average inflation in Indonesia was 8.13 percent. Entering 1998 inflation increased to 77.63 percent, at which time the value of the rupiah weakened from Rp 2,909, - per US dollar (1997) to Rp 10,014, - per US dollar (1998). Then in 1999 the government carried out a very strict policy that reached the lowest number of 2.01 percent. The surge in world oil prices in 2005 had the effect of increasing inflation to 17.11 percent. The high world oil price caused the government to remove fuel subsidies. However, from 2005-2010 the government succeeded in suppressing the inflation rate by becoming 6.96 percent in 2010. The inflation rate in 2012 was the lowest number in the last 7 years, namely 4.3 percent, lower than the inflation rate of the year 2010-2017 of 5.22 percent. This is due to the absence of an increase in fuel prices for the year.

High unemployment is an important problem in various countries, both developing countries and developed countries. Based on Okun (1962)the amount of unemployment is negatively related to the level of economic growth of a country. According to BPS data (2018) Indonesia's unemployment rate in the last 31 years reached 6.04 percent. The rapid increase in unemployment in Indonesia since the 1997 crisis was caused by various factors which simultaneously and influentially compounded it. The unemployment rate increased from 4.68 percent in 1998 to 11.2 percent in 2005. The inability of the labor market to provide employment and the inability of labor market growth to offset the growth in the number of the labor force was the main factor causing unemployment. On the other hand, the government's policy of increasing fuel prices in 2005 caused economic shocks which resulted in an increase in the unemployment rate.

II. Literature Review

many empirical and theoretical studies that explain the relationship between inflation, unemployment and economic growth. The results of these studies vary based on the period and group of countries studied. Some studies provide results that inflation does not have an effect on economic growth.[18], [19] The study conducted byChowdury (2002), Rapach (2003) and Sarel (1995)states that inflation has a positive influence on economic growth, while studies conducted by Kormendi dan Meguire (1985)provide results that inflation has a negative influence on growth economy.

Khan and Senhaji (2013)examined the effect of inflation and economic growth from 140 industrial countries and developed during the 1960-1998 period. They provide a threshold of 1-3 percent for developing countries and 11-12 percent for industrialized countries. The results of their study state that the inflation rate above these values provides a negative relationship to economic growth, while the inflation rate below these values does not have an effect.Munir et al. (2009)examined the relationship between inflation and Malaysia's economic growth during the period 1970-2005 by using endogenous threshold autoregressive (TAR). Their results indicate the fact that inflation can increase economic growth if it is below the 3.89 percent threshold. But inflation has a negative effect on economic growth if it crosses the threshold.

Kremer et al. (2013)examined the effect of inflation on long-term economic growth in 124 industrial and non-industrial countries in the period between 1950-2004. They estimate the inflation limit of 2 percent for industrialized countries and 17 percent for non-industrial countries. The results of their conclusions are that the inflation rate above the threshold has a negative influence on economic growth, while the inflation rate below the threshold has a non-significant effect. These results provide support for the contribution of inflation in developing countries

ome studies empirically examine the relationship between unemployment and economic growth.[22]–[24] most of these studies reveal the relationship between output and the unemployment rate. However, the Okun coefficient estimates vary in several countries. A study conducted byMoosa (2008) on the validity of Okun in four Arab countries: Algeria, Egypt, Morocco, and Tunisia found that output growth did not change the Okun coefficient statistically.

Bouaziz (2015)studied the validity of Okun in Tunisia during the period 1990-2014 by using an error correction mechanism (ECM). The research findings indicate an inverse relationship between unemployment and output in the short and long term, and the Okun law applies to the Tunisian economy, but with an Okun less coefficient than required. Prachowny (2012)found that when the output gap is estimated for the US economy with a production function approach, using two different data sets for output potential and NAIRU, the marginal contribution of 1 point unemployment reduction is only about 2/3% increase in output.

Ireland (1999)found cointegration of inflation and unemployment, when testing the Barro-Gordon hypothesis, it was determined the fact that unemployment caused inflation. Shadman-Mehta (2001)also found cointegration of inflation and unemployment, the results of the study found evidence that inflation causes unemployment.

III. Methodology

3.1. The Model

The VAR model assumes that all economic variables are interdependent with another.[29]We will form a VAR model with three endogenous variables namely: Inflation, Unemployment and GDP. the equation of the VAR model can be written as follows:

$$Y_{1t} = \beta_{01} + \beta_{11}Y_{1t-1} + \ldots + \beta_{n1}Y_{1t-p} + \alpha_{11}Y_{2t-1} + \ldots + \alpha_{n1}Y_{2t-p} + X_{11}Y_{3t-1} + \ldots + X_{n1}Y_{3t-p} + e_{1t} \quad (1)$$

$$Y_{2t} = \beta_{02} + \beta_{12}Y_{2t-1} + \ldots + \beta_{n2}Y_{2t-p} + \alpha_{12}Y_{1t-1} + \ldots + \alpha_{n2}Y_{1t-p} + X_{12}Y_{3t-1} + \ldots + X_{n2}Y_{3t-p} + e_{2t} \quad (2)$$

$Y_{3t} = \beta_{03} + \beta_{13}Y_{3t-1} + \ldots + \beta_{n3}Y_{3t-p} + \alpha_{13}Y_{1t-1} + \ldots + \alpha_{n3}Y_{1t-p} + X_{13}Y_{2t-1} + \ldots + X_{n3}Y_{2t-p} + e_{1t}(3)$

Where :
Y1 = Inflation
Y2 = Unemployment
Y3 = GDP (Gross Domestic Product)
p = length of lag

Equations (1) - (3) can be simplified to be:
$Y_{1t} = \beta_{01} + \sum_{i=1}^{p}\beta_{i1}Y_{1t-i} + \sum_{i=1}^{p}\alpha_{i1}Y_{2t-i} + \sum_{i=1}^{p}X_{i1}Y_{3t-i} + e_{1t}(4)$
$Y_{2t} = \beta_{02} + \sum_{i=1}^{p}\beta_{i2}Y_{2t-i} + \sum_{i=1}^{p}\alpha_{i2}Y_{1t-i} + \sum_{i=1}^{p}X_{i2}Y_{3t-i} + e_{2t}(5)$
$Y_{1t} = \beta_{03} + \sum_{i=1}^{p}\beta_{i3}Y_{3t-i} + \sum_{i=1}^{p}\beta_{i3}Y_{1t-i} + \sum_{i=1}^{p}\alpha_{i3}Y_{2t-i} + e_{3t}(6)$

In general the VAR model with n endogenous variables can be written as follows:
$Y_{2t} = \beta_{02} + \sum_{i=1}^{p}\beta_{i1}Y_{1t-i} + \sum_{i=1}^{p}\alpha_{i1}Y_{2t-i} + \ldots + \sum_{i=1}^{p}\eta_{i2}Y_{nt-i} + e_{1t}(7)$
$Y_{2t} = \beta_{02} + \sum_{i=1}^{p}\beta_{i2}Y_{1t-i} + \sum_{i=1}^{n}\alpha_{i2}Y_{2t-i} + \ldots + \sum_{i=1}^{p}\eta_{in}Y_{nt-i} + e_{1t}\,(8)$

3.2 Stationary Test
The VAR model is a regression equation model using time series data. The first step in estimating the VAR model is to test the Stationarity of data by using the Augmented Dickey-Fuller (ADF) root test. The ADF formula can be written as follows:
$\Delta Y_t = \gamma Y_{t-1} + \sum_{i=2}^{p}\beta_1\Delta Y_{t-1+1} + e_t(9)$
$\Delta Y_t = \alpha_1 + \gamma Y_{t-1} + \sum_{i=2}^{p}\beta_1\Delta Y_{t-1+1} + e_t(10)$
$\Delta Y_t = \alpha_0 + \alpha_1 T + \gamma Y_{t-1} + \sum_{i=2}^{p}\beta_1\Delta Y_{t-1+1} + e_t(11)$

Where
Y = observed variable
$\Delta Y_t = Y_t - Y_{t-1}$
T = time trend

The way to determine data stationarity is by comparing ADF statistical values with mackinnon critical value. The data tested are data at the first level of differentiation. If the absolute value of the ADF statistic is smaller than the absolute value of Mackinnon critical value, it means there is a unit root or the data is said to be stationary. Conversely, if the absolute value of ADF statistics is greater than the absolute value of Mackinnon critical value, it can be concluded that the data does not contain unit root.

3.2 Cointegration Test

Engle dan Granger (2012)state that the existence of stationary variables causes the possibility of a long-term relationship between variables in the VAR system. Cointegration test is used to determine the existence of relationships between variables. With this step, it will be known whether the model built is VAR if there is no cointegration and VECM if there is cointegration. Cointegration tests are carried out using the Johansen method based on the likelihood ratio (LR) test. If the LR calculated value is greater than the critical value of LR, we get a cointegration of a number of variables and vice versa if the calculated value LR is smaller than the critical value, there is no cointegration.

The critical value of LR is obtained from the table developed by Johansens and Juselius. The LR calculated value is calculated based on the formula as follows:

$$Q_t = -T\sum_{i=r+1}^{k}\log(1-\lambda_i)$$

3.4 Impulse Response Analysis

We use the Impulse Responses Analysis to see the impact of the shock of a standard deviation of the new variable on the present value and the future value of the observed variable. Impulse Responses gives an overview of the variable shock rate with one another over a period of time, so we can see the length of influence until it returns to the equilibrium point. Analysis of Impulse Response function can be written in the form of Vector Moving Average (VMA) from the standard form of VAR with the following formula:
$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} a_{10} \\ a_{20} \end{bmatrix} + \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}\begin{bmatrix} Y_{t-1} \\ Z_{t-1} \end{bmatrix} + \begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix}(11)$

Or it can be written with

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}^i \begin{bmatrix} e_{1,t-i} \\ e_{2,t-1} \end{bmatrix} \qquad (12)$$

Y_t and$Z_t$in the formula above has a relationship with e_{1t}, e_{2t} in sequence. By using matrix algebra operations the error vector can be written as follows:

$$\begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} = \frac{1}{1-b_{12}b_{21}} + \begin{bmatrix} 1 & -b_{1Z} \\ -b_{21} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{yt-i} \\ \varepsilon_{yt-1} \end{bmatrix} \qquad (13)$$

By combining equations (11) and (12), we will get:

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y_t} \\ \bar{z_t} \end{bmatrix} + \frac{1}{1-b_{12}b_{21}} \sum_{i=1}^{\infty} \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \begin{bmatrix} e_{1t-i} \\ e_{2t-i} \end{bmatrix} \quad (14)$$

Equation (14) we simplify with a 2 x 2 matrix with the elementΦ_i with the element Φ_jk like the following equation:

$$\Phi_i = \frac{A_1^i}{(1-b_{12}b_{21})} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \qquad (15)$$

So that we get the form of the matrix equation for the impulse response function, namely:

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix} + \sum_{i=1}^{\infty} \begin{bmatrix} \Phi_{11}(i) & \Phi_{12}(i) \\ \Phi_{21}(i) & \Phi_{22}(i) \end{bmatrix} \begin{bmatrix} e_{1t-i} \\ e_{2t-i} \end{bmatrix} \qquad (16)$$

Where $\Phi_{11,12,21,22}(i)$ mis a structural effect of shocks of Y and Z. So that it can be simplified to be:

$$X_t = \mu + \sum_{i=0}^{\infty} \Phi_t e_{t-1} \qquad (17)$$

3.5 Forecast Error Variance Decomposition

Variance Decomposition provides information about innovation variables that are relatively more important in VAR. This test is used to compile an estimate of the error variance of a variable, namely how much the difference between the variables before and after the shock, both the shock of the self and the shock of other variables

3.6 Granger Quality Test

Granger Causality Test is used to test whether an independent variable improves forecasting performance from independent variables. Whether or not this causality is tested through the F test or looking at the probability value

IV. Results

4.1 Root Unit Test and determination of Optimum Lag

Table.1 ADF Test Results

Variable	ADF Statistics Value	Mackinnon Critical Value			Prob.	Information
		1 %	5 %	10 %		
GDP	-1.971519	-2.644302	-1.952473	-1.610211	0.0480	Stationary at level
INF	-3.872928	-2.644302	-1.952473	-1.610211	0.0004	Stationary at level
UN	-2.270887	-2.650145	-1.953381	-1.609798	0.0248	Stationary in differentiation I

the ADF test in table 1 concludes that at the alpha level 5% the stationary GDP variable at the level, stationary GDP variable at the level and UN variable stationary at the differnsi level I, where the ADF value statistic of the three is absolutely smaller than the critical value of 5% . Thus, the data is suitable for use in VAR analysis.

After doing stationarity test, the next step is to determine the length of the optimal lag. The benefit of determining the optimal lag in the VAR model is to eliminate the problem of autocorrelation in the VAR system because this lag in endogenous variables in the system of equations will be made as an exogenous variable. Determination of optimal lag can be seen from the value of Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterin (AIC), Schwarz Information Criterion (SIC), and Hannan Quin Criterion (HQ).

Table 2: Optimum Lag Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-159.2727	NA	87.20927	12.98181	13.12808	13.02238
1	-123.6636	59.82329*	10.46226	10.85309	11.43815*	11.01536
2	-117.1005	9.450859	13.20373	11.04804	12.07189	11.33201
3	-108.6420	10.15021	15.17455	11.09136	12.55401	11.49703
4	-92.75591	15.25061	10.64276	10.54047	12.44192	11.06785
5	-79.33380	9.663921	10.82778	10.18670	12.52695	10.83579
6	-57.45764	10.50055	7.848094*	9.156611*	11.93565	9.927398*

From the optimum lag results in table 4.2, the lag chosen is lag six as the optimal lag. The use of lag 6 as the optimal lag means that all variables influence each other not only in the same period but in the previous six periods, so that the lag is determined as the optimum lag and is used at all stages of the next VAR analysis.

4.2 Root Unit Test and determination of Optimum Lag

Cointegration tests are conducted to find out whether there is a balance in the long term, namely the presence or absence of similarities in movement and stability of relations between the variables studied. The Johansen's Cointegration test method was used to test the presence or absence of cointegration in this study. The following is a table of cointegration test results.

Table 3: Cointegration Test Results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	TraceStatistic	0.05 Critical Value	Prob.**
None	0.448848	28.98023	29.79707	0.0619
At most 1	0.280466	11.70365	15.49471	0.1717
At most 2	0.071720	2.158242	3.841466	0.1418

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.448848	17.27657	21.13162	0.1593
At most 1	0.280466	9.545413	14.26460	0.2435
At most 2	0.071720	2.158242	3.841466	0.1418

Based on table 3 we can see that the values of the trace statistic and max-eigen value are smaller than the critical value at the 5% significance level, furthermore, the results of the cointegration test above do not find any indication of the probability value that is less than the real level of 5 %. The results of the cointegration test above can be interpreted that the three variables used in this study have no long-term balance.

4.3 Vector Autoregression (VAR) Model

From several test results that have been done before, there are stationary variables in the first differentiation but there is no cointegration in the cointegration test stage. This can be interpreted that the model equation in this study is the VAR estimation model in difference.

Table 4: VAR estimation in difference (VARD)

	GDP	INF	UN
GDP(-1)	1.316302	-2.766760	0.023768
	(0.66606)	(2.51572)	(0.02255)
	[1.97626]	[-1.09979]	[1.05396]
GDP(-2)	-0.534291	1.735685	-0.040476
	(0.70590)	(2.66622)	(0.02390)
	[-0.75689]	[0.65099]	[-1.69359]
GDP(-3)	0.559636	0.552383	-0.008814
	(0.87142)	(3.29138)	(0.02950)
	[0.64221]	[0.16783]	[-0.29873]
GDP(-4)	-0.112834	-0.724683	-0.012586
	(0.86652)	(3.27289)	(0.02934)

	[-0.13022]	[-0.22142]	[-0.42901]
GDP(-5)	-0.217773	2.287735	0.035764
	(0.71093)	(2.68523)	(0.02407)
	[-0.30632]	[0.85197]	[1.48583]
GDP(-6)	-1.150396	2.359449	-0.029287
	(0.47764)	(1.80405)	(0.01617)
	[-2.40852]	[1.30786]	[-1.81105]
INF(-1)	0.202422	-0.575832	0.008306
	(0.22468)	(0.84862)	(0.00761)
	[0.90094]	[-0.67855]	[1.09185]
INF(-2)	0.106102	-0.299322	-0.008658
	(0.19922)	(0.75245)	(0.00674)
	[0.53260]	[-0.39780]	[-1.28367]
INF(-3)	0.111741	0.294508	-0.003154
	(0.26185)	(0.98903)	(0.00887)
	[0.42673]	[0.29777]	[-0.35579]
INF(-4)	0.101224	-0.375788	0.000616
	(0.25855)	(0.97655)	(0.00875)
	[0.39151]	[-0.38481]	[0.07040]
INF(-5)	-0.068560	0.421719	0.011508
	(0.19530)	(0.73765)	(0.00661)
	[-0.35105]	[0.57170]	[1.74042]
INF(-6)	-0.392690	1.047424	-0.002817
	(0.15365)	(0.58033)	(0.00520)
	[-2.55581]	[1.80488]	[-0.54145]
UN(-1)	11.53205	-16.57113	0.023271
	(11.5999)	(43.8133)	(0.39274)
	[0.99415]	[-0.37822]	[0.05925]
UN(-2)	4.140943	-20.03298	0.673440
	(8.87933)	(33.5376)	(0.30063)
	[0.46636]	[-0.59733]	[2.24009]
UN(-3)	-11.44469	11.77367	0.343054
	(14.1477)	(53.4366)	(0.47900)
	[-0.80894]	[0.22033]	[0.71618]
UN(-4)	-38.51156	139.8937	-0.175092
	(12.1371)	(45.8423)	(0.41093)
	[-3.17305]	[3.05163]	[-0.42609]
UN(-5)	39.12382	-129.0826	-0.239166
	(13.7074)	(51.7733)	(0.46409)
	[2.85422]	[-2.49323]	[-0.51534]
UN(-6)	-1.327348	4.565126	0.001735
	(9.21976)	(34.8234)	(0.31216)
	[-0.14397]	[0.13109]	[0.00556]
C	-0.902178	2.089040	0.809774
	(16.4070)	(61.9699)	(0.55550)
	[-0.05499]	[0.03371]	[1.45775]

Table 4above provides statistical information from each variable GDP, INF, and UN. The number in the first parenthesis (()) shows the errot standard while for t count is indicated by the number below that is given brackets ([]). From the above output we can see that the variable economic growth (GDP) is statistically significantly influenced by GDP (-6), INF (-6), UN (-4), and UN (-5) which is shown from the statistical value> 2.048 or <from -2,048. While the constant C does not significantly influence GDP. While the significant inflation variable is only influenced by the UN (-4) and UN (-5), while for the UN variables significantly only influenced by past values.

If the results of the data in the form of the table above are transformed into equations in the VAR, the equation will be obtained as follows:

GDP = C(1,1)*GDP(-1) + C(1,2)*GDP(-2) + C(1,3)*GDP(-3) + C(1,4)*GDP(-4) + C(1,5)*GDP(-5) + C(1,6)*GDP(-6) + C(1,7)*INF(-1) + C(1,8)*INF(-2) + C(1,9)*INF(-3) + C(1,10)*INF(-4) + C(1,11)*INF(-5) + C(1,12)*INF(-6) + C(1,13)*UN(-1) + C(1,14)*UN(-2) + C(1,15)*UN(-3) + C(1,16)*UN(-4) + C(1,17)*UN(-5) + C(1,18)*UN(-6) + C(1,19)

INF = C(2,1)*GDP(-1) + C(2,2)*GDP(-2) + C(2,3)*GDP(-3) + C(2,4)*GDP(-4) + C(2,5)*GDP(-5) + C(2,6)*GDP(-6) + C(2,7)*INF(-1) + C(2,8)*INF(-2) + C(2,9)*INF(-3) + C(2,10)*INF(-4) + C(2,11)*INF(-5) + C(2,12)*INF(-6) + C(2,13)*UN(-1) + C(2,14)*UN(-2) + C(2,15)*UN(-3) + C(2,16)*UN(-4) + C(2,17)*UN(-5) + C(2,18)*UN(-6) + C(2,19)

UN = C(3,1)*GDP(-1) + C(3,2)*GDP(-2) + C(3,3)*GDP(-3) + C(3,4)*GDP(-4) + C(3,5)*GDP(-5) + C(3,6)*GDP(-6) + C(3,7)*INF(-1) + C(3,8)*INF(-2) + C(3,9)*INF(-3) + C(3,10)*INF(-4) + C(3,11)*INF(-5) + C(3,12)*INF(-6) + C(3,13)*UN(-1) + C(3,14)*UN(-2) + C(3,15)*UN(-3) + C(3,16)*UN(-4) + C(3,17)*UN(-5) + C(3,18)*UN(-6) + C(3,19)

VAR Model - Substituted Coefficients:

GDP = 1.3163015578*GDP(-1) - 0.53429134654*GDP(-2) + 0.559636282901*GDP(-3) - 0.112834355895*GDP(-4) - 0.217773344466*GDP(-5) - 1.15039551469*GDP(-6) + 0.202422348413*INF(-1) + 0.106102066591*INF(-2) + 0.111741052697*INF(-3) + 0.101224368817*INF(-4) - 0.0685597836635*INF(-5) - 0.392689533358*INF(-6) + 11.5320526652*UN(-1) + 4.14094303285*UN(-2) - 11.4446884707*UN(-3) - 38.511560184*UN(-4) + 39.1238206536*UN(-5) - 1.32734792844*UN(-6) - 0.902177934505

INF = -2.76675967916*GDP(-1) + 1.7356848417*GDP(-2) + 0.552382578361*GDP(-3) - 0.72468300677*GDP(-4) + 2.28773517333*GDP(-5) + 2.35944943467*GDP(-6) - 0.575832296629*INF(-1) - 0.299321890008*INF(-2) + 0.294508365264*INF(-3) - 0.375788173262*INF(-4) + 0.421718773882*INF(-5) + 1.04742352947*INF(-6) - 16.57112844*UN(-1) - 20.0329753128*UN(-2) + 11.7736678034*UN(-3) + 139.893699183*UN(-4) - 129.082601075*UN(-5) + 4.56512567186*UN(-6) + 2.08904019696

UN = 0.0237677758844*GDP(-1) - 0.0404764829873*GDP(-2) - 0.00881376163347*GDP(-3) - 0.0125863796313*GDP(-4) + 0.0357644903359*GDP(-5) - 0.0292872992651*GDP(-6) + 0.00830574816016*INF(-1) - 0.00865826399779*INF(-2) - 0.00315428992091*INF(-3) + 0.000616257942466*INF(-4) + 0.0115081981711*INF(-5) - 0.00281663755984*INF(-6) + 0.0232706486406*UN(-1) + 0.673439547963*UN(-2) + 0.343053679447*UN(-3) - 0.175092253595*UN(-4) - 0.239165650725*UN(-5) + 0.00173473831688*UN(-6) + 0.809773834354

According to Pyndick (1998) in the characteristics of VAR not all lags are significant in each equation. Therefore the next step is to choose a significant lag for a model of each variable, so that the regression model is obtained as follows:

GDP = -2.40852 GDP(-6) - 2.55581 INF(-6) - 3.17305 UN(-4) + 2.85422 UN (-5)

INF = 3.05163 UN (-4) - 2.49323 UN (-5)

UN = 2.24009 UN (-2)

The equation of the VAR model proposed above can be explained as follows:

a. If the change in GDP 6 years ago increases by 1%, it will cause changes in GDP this year to decrease by 2.40852%.
b. If inflation changes 6 years ago increase by 1% it will cause a decline in GDP this year by 2.6%.
c. If the unemployment change 4 last year was 1%, it would cause a decline in GDP of 3.2% this year.
d. If the change in unemployment in the past 5 years increases by 1%, it will cause an increase in GDP this year of 2.85%.

e. If the change in unemployment 4 years ago increased by 1%, it will cause inflation to increase by 3.05% this year.
f. If the change in unemployment in the past 5 years increases by 1%, it will cause inflation to decline by 2.5% this year
g. If the change in unemployment 2 years ago increased by 1%, it will cause unemployment to increase by 2.24% this year.

4.4 Granger Causality Test

Granger causality test is an analytical technique used to find causality relationships between variables studied. The relationship can be made in the form of a hypothesis, where the null hypothesis (Ho) is no relationship between variables, while the alternative hypothesis (Ha) states there is a relationship between variables. The following are the results of processing among these variables:

Tabel 4.8: Output Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
INF does not Granger Cause GDP	25	0.76001	0.6145
GDP does not Granger Cause INF		0.99501	0.4710
UN does not Granger Cause GDP	25	3.31089	0.0368
GDP does not Granger Cause UN		1.48304	0.2639
UN does not Granger Cause INF	25	5.63480	0.0055
INF does not Granger Cause UN		1.63100	0.2215

From the results obtained from table 4.5 above, we can know that those who have a causality relationship have a probability value smaller than alpha 0.05 so that it can be interpreted that Ho is rejected by the meaning of a variable affecting other variables.The results of the granger causality test show that in the period 1987-2017 there was no causal relationship between economic growth and inflation. The results found are in line with the research conducted by Cameron, Hum, & Simpson (2006), Dorrance (1963), Sidrauski (1967) dan Wai (1959)which states that there is no relationship between inflation and growth. However, the results of this study contrast with Keynesian theory and studies conducted byChowdury Anis & Girijasankar (2002), Shi (1999), dan Tobin (2010)which state that there is a causal relationship between economic growth and inflation.There is no causal relationship of economic growth and inflation is allegedly caused by: first, the condition of the 1998 economic crisis which resulted in the loss of public confidence in the banking sector, coupled with the condition of Indonesian exports that lacked sufficient results because of increasingly expensive imports of raw materials and sectors collapsing banking services. Post-crisis economic growth slowed more than before the crisis, changes in output tended to be constant while inflation tended to increase. Second, inflation in Indonesia is still a monetary phenomenon.Hervino (2011)states that in the long run, the inflation rate in Indonesia is influenced by two sides, namely the fiscal and monetary sides. Fiscal is represented by foreign debt to cover the state budget deficit while the monetary side is represented by the quantity theory of money (money supply). However, the monetary side is more dominant in influencing the volatility of the inflation rate in Indonesia after the 1998 economic crisis than the fiscal side. De Grauwe & Polan (2005)examined the relationship between the amount of money in circulation and inflation using 160 countries as samples over the past 30 years. The results of the study state that there is a strong positive relationship between inflation and money growth.

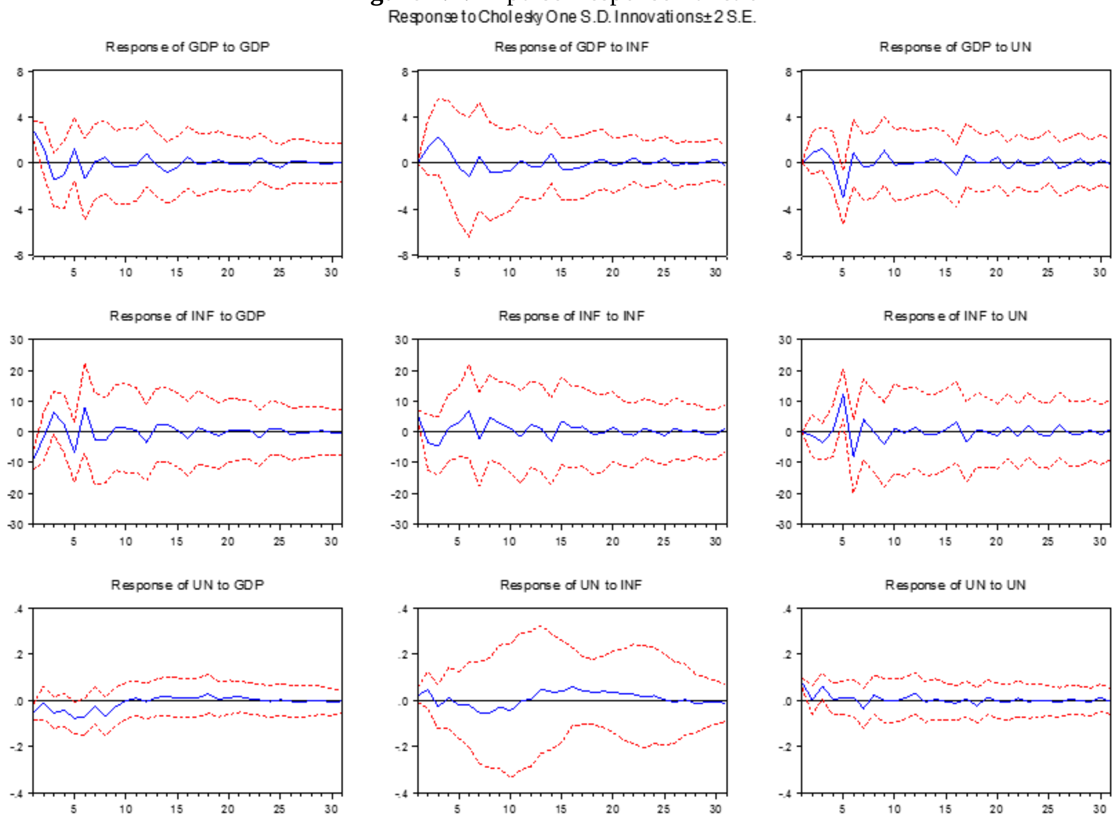
then found the results that economic growth has an effect on unemployment but not vice versa, so that it can be stated that between these two variables there is only a direct relationship. This result is in accordance with the theory put forward by Okun (1962) which states that there is a negative relationship between economic growth and unemployment. The study conducted by Okun provides an explanation that the unemployment rate in the US tends to fall 1% for every increase in GDP. The results of this study also support previous studies where the validity of unemployment relations and output is proven even though there are estimates of the Okun coefficient that vary substantially in several countries and from time to time.[26], [38]–[42]The results of this study are also supported by Salman (2012) who examined the relationship between economic growth and unemployment in Sweden. The results of the study state that economic growth causes unemployment but not vice versa. Hanusch (2013)examined the relationship between economic growth and unemployment in 8 East Asian countries during the period 1997-2011. The results of the study conducted state that economic growth has an effect on unemployment, but there are different variations in each country. There is evidence that employment in the agricultural sector is counter-cyclical, and can function as a shock absorber to reduce the impact of layoffs in the industrial sector. According to Knotek (2007), Okun's law has the ability to be used in practical applications. But interesting facts were found in this study. The results show that the unemployment rate is unresponse to changes in output. The reason for this is due to the existence of frictional unemployment in the Indonesian economy and there are differences in the economic structure between developing countries such as Indonesia compared to developed countries. In developing countries, intensive labor dominates the economy rather than skills labor.The reason that might cause unemployment does not affect economic growth is the existence of capital intensive. Economic growth in Indonesia is more due to capital growth, so increasing economic growth will have an impact on rising unemployment. In another study, Hanusch (2013) stated that in the aggregate condition the effects of Okun have not been able to explain between economic expansion and contraction. Hanusch (2013) added that if there is a shock to the agricultural and non-agricultural sectors, then Okun's law can explain very well to the non-agricultural sector. Whereas in the agricultural sector Okun's Law is inverse, the existence of negative shocks to growth has an impact on increasing employment in the agricultural sector, and vice versa. Even so, Okun's law is still feasible to be used as a tool to find out the relationship between unemployment and economic growth.

The results of the Granger test show that there is a unidirectional relationship between inflation and unemployment, where rising inflation affects unemployment, but not vice versa. Several previous studies have provided support for the results that have been found[46]–[50], but the results of this study also contradict some previous studies which state that there is a two-way causality relationship between the two variables. [51]–[53]The findings of this study reveal that the Phillips curve theory can be applied in Indonesia. Increasing inflation in these conditions stimulates producers to increase their production capacity. In an economic context that focuses on intensive labor, efforts to increase production capacity will encourage additional labor. The implementation of the Inflation Targeting program is implemented to keep unemployment at a reasonable level. This effort is based on the NAIRU concept. This is supported by Hu (2003)who stated that inflation targeting would reduce interest rates. Low interest rates encourage the creation of new investments that have an impact on the addition of labor.

4.5 Impulse Response Function (IRF)

The VAR model has disadvantages, which are quite difficult to interpret and quite complicated in reasoning so that it will be easier to see the analysis by looking at the IRF output of the proposed model. The role of the IRF is needed to determine the development of the effects of shocks in the economy. IRF can describe the rate of a variable's shock to other variables and the effect of the shock to the equilibrium point before the economic shock. The following figure is the output of Impulse Response Function.

Figure 4.1: Impulse Response Function



From Figure 4.2 we can see that in the first row in the first column, the GDP variable in the change of one standard deviation of the variable itself responds negatively until the third period. The next period found a positive response and continued with fluctuations until the end of the period. In the second column graph the response from fluctuating economic growth fluctuates since the shock of the inflation variable for fifteen periods, then from the sixteenth to the twenty-first period fluctuations begin to decline in the sense that economic growth is no longer very volatile like the previous period. So we can conclude that it takes about five years for economic growth to reach its equilibrium. In the third column chart, there was an increase in response over three periods from the variable economic growth due to the shock of the inflation variable, until finally a sharp decline in the fifth period, for the following period there was an increase in the sixth period and continued to fluctuate until the tenth period. Starting from the tenth to the fourteenth period the response shown begins to decline and reaches the equilibrium point. However, fluctuating conditions were obtained from the seventeenth period to the end of the period. From the picture we can get the conclusion that to reach the equilibrium point it takes time for four periods, but that does not apply to fluctuations in the next period.

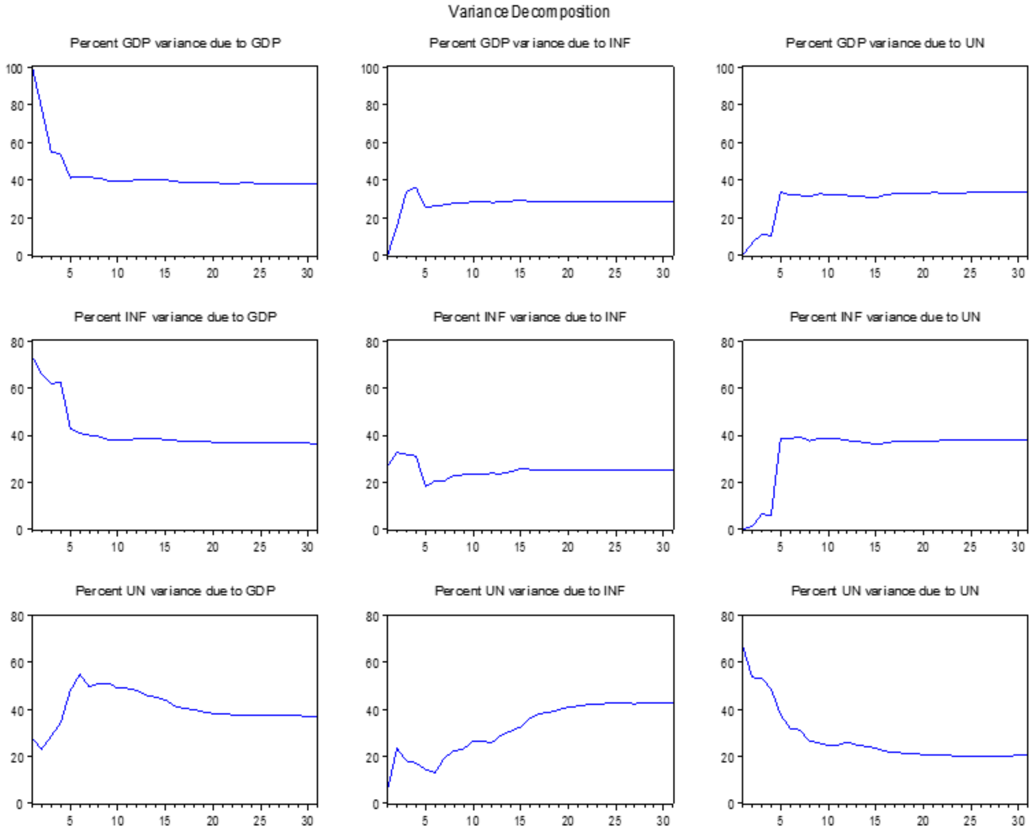
In the second row of the first column we get the response given by inflation due to the shock on the unemployment variable. Inflation provides a fluctuating response with a negative response followed by a fluctuating response from the eighth period to the twenty-sixth period. The inflation equilibrium can be reached from the twenty-seventh period, about four periods. Henceforth, in the second column the response of the variable inflation is shown as a result of the variable shock itself in the past. Since the initial period, inflation has provided a fluctuating response for approximately fifteen periods. Until finally the fluctuating situation decreases until the twentieth period inflation returns to its equilibrium point so that it can be said that it takes around five periods for inflation to return to its equilibrium point. In the third column, the response given to inflation is shown as a result of the shock of the unemployment variable. At the beginning of the period, namely the first period until the seventh period, the inflation response is still volatile. Furthermore, from the eighth period to the twelfth period, fluctuations began to shrink in the sense that inflation was no longer volatile as in the previous period. Starting in the twelfth period and later, inflation returns to balance but with small fluctuations.

In the third row of the first column in Figure 4.1, the response of the unemployment variable is presented as a result of the shock of the GDP variable. The first period begins with a negative response until the eleventh period. Furthermore, the response given by the unemployment variable returns to the equilibrium point starting in the thirteenth period. It takes a short time for two periods so that the unemployment variable reaches the equilibrium point again. In the second column the response of the unemployment variable is presented as a result of inflation variable shocks. The response that decreases from positive to negative is obtained in the initial period since the shock of the inflation variable. This situation continued for almost 10 periods, until finally returning to a positive trend in the thirteenth period. It takes about 15 periods so that the unemployment variable can return to the equilibrium point. The third column shows the response obtained from the unemployment variable as a result of the variable shock itself in the past. Since the first period up to the ninth period the response given is fluctuating, then from the nine to twenty-third period the fluctuations begin to shrink. Then starting from the twenty-third period to the next, unemployment again reaches its equilibrium point.

4.5 Forecast Error Variance Decomposition

The next step of analysis is forecast error variance decomposition to see the characteristics of the model after analyzing the dynamic behavior of the impulse response. Variance Decomposition will give information about the magnitude and how long the shock proportion of a variable is to the variable itself and then looks at the magnitude of the shock proportion of other variables to that variable. The following results will be presented from Forecast Error Variance Decomposition.

Figure 4.2: Results of Forecast Error Variance Decomposition



From Figure 4.2 we can see that in the initial period GDP was strongly influenced by the variable shock itself of 100%, while in the same period the shock from inflation and unemployment still had no effect. Starting from period one to eleven periods, the GDP shock ratio for the variable itself decreases little by little to 40.1%. On the other hand, inflation and unemployment shocks have an increasing contribution throughout the period, even from the thirty-first period of the shock from the unemployment variable contributing more than 33%, while the shock from the inflation variable contributes around 28% to GDP. In other words, it can be concluded that the shock of the unemployment variable is greater for GDP than the shock of the inflation variable.

Furthermore, in the first period the inflation variable is strongly influenced by the GDP variable shock of 73%, greater than the inflation variable shock itself of 26.5%, while for the unemployment variable in that period it has not had an effect on the inflation variable. Starting from the second to fourth period the shock ratio of the inflation to the variable itself has increased by 31%, this is similar to the shock given by the unemployment variable which is increasing by 6%. Meanwhile the shock of the GDP variable began to decline by 62%. Starting from the sixth period until the last period of the shock from the unemployment variable tends to be stable at 38%, it is greater than the shock given by the GDP variable and the inflation variable with the proportion of shocks of 36% and 25% respectively.

In the first period the unemployment variable is strongly influenced by the variable shock itself of 66%, in that period the shock given by the GDP variable is greater than the shock given by the inflation variable with 27% and 5.7% respectively. The shock of the unemployment variable continues to decline to the end of the period by 20%. The shock of the inflation variable against the unemployment variable has increased continuously from the eighth period to the thirty-first period by 42%, higher than the shock given by the GDP variable of 37% and the unemployment variable itself at 21%.

V. Conclusion

the results of the study show that there is a one-way relationship between economic growth and unemployment, and between inflation and unemployment, but there is no causal relationship between economic growth and inflation.We recommend a number of suggestions for related agencies or institutions related to and concerned with problems in this research. The government should encourage growth in the real sector and provide education, training, and assistance in the field of entrepreneurship for groups of workers who have not been absorbed in the industrial sector.Furthermore, the central bank must be very careful in determining its inflation target so that targeted inflation does not deviate far from actual inflation. If this can be fulfilled, then the public can rely on the inflation target determined by BI in making economic decisions.

References

[1]. Chowdury Anis and M. Girijasankar, "Inflation, government expenditure and real income in the long-run," J. Econ. Stud., vol. 29, no. 3, pp. 240–250, 2002.
[2]. M. S. Khan and A. S. Senhaji, "Threshold effects in the relationship between inflation and growth," Palgrave Macmillan Journals, vol. 48, no. 1, pp. 1–21, 2013.
[3]. R. C. Kormendi and P. G. Meguire, "Macroeconomic determinants of growth: Cross-country evidence," J. Monet. Econ., vol. 16, no. 2, pp. 141–163, 1985.
[4]. S. Kremer, A. Bick, and D. Nautz, "Inflation and growth: New evidence from a dynamic panel threshold analysis," Empir. Econ., vol. 44, no. 2, pp. 861–878, 2013.
[5]. C. D. MacRae, "The Relation Between Unemployment and Inflation in the Laffer-Ranson Model," J. Bus., vol. 45, no. 4, pp. 513–518, 1972.
[6]. I. Moosa, "Economic growth and unemployment in Arab countries: Is Okun's law valid?," J. Dev. Econ. Policies, vol. 10, no. 2, pp. 7–24, 2008.
[7]. Q. Munir, K. Mansur, and F. Furuoka, "Inflation and Economic Growth in Malaysia — A Threshold Regression Approach," ASEAN Econ. Bull., vol. 26, no. 2, p. 180, 2009.
[8]. S. Kuznets, "Economic Growth and Income Inequality," Am. Econ. Rev., vol. 45, pp. 1–28, 1955.
[9]. M. Pangestu, Economic Reform, Deregulation, and Privatization: The Indonesian Experience. jakarta: Centre for Strategic and International Studies, 1996.
[10]. R. Prawiro, Indonesia's Struggle for Economic Development. Kuala Lumpur: Oxford University Press, 1998.
[11]. G. Fane and T. Condon, "Trade reform in Indonesia, 1987-95," Bulletin of Indonesian Economic Studies, vol. 32, no. 3. pp. 33–54, 1996.
[12]. J. S. Djiwandono, "Bank Indonesia and the recent crisis," Bull. Indones. Econ. Stud., vol. 36, no. 1, pp. 47–72, 2000.
[13]. H. Soesastro, "Survey of Recent Developments," Bull. Indones. Econ. Stud., vol. 34, no. 1, pp. 3–54, 1998.
[14]. H. Hill, The Indonesian Economy in Crisis: Causes, Consequences and Lessons. Singapura: Institute of Southeast Asian Studies, 1999.
[15]. H. Soesastro, "Comment on 'Indonesia After the Asian Crisis,'" Asian Econ. Policy Rev., vol. 2, no. 1, pp. 142–143, 2007.
[16]. A. Abimanyu, Refleksi dan Gagasan Kebijakan Fiskal. jakarta: PT Gramedia Pustaka Utama, 2011.
[17]. A. Okun, "Potential GNP: Its Measurement and Significance," in Proceedings of the Business and Economic Statistics, 1962, pp. 98–103.
[18]. U. T. Wai, "The relation between inflation and economic development: a statistical inductive study," Staff Pap. - Int. Monet. Fund, vol. 7, no. 2, pp. 302–317, 1959.
[19]. M. Sidrauski, "Inflation and Economic Growth," J. Polit. Econ., vol. 75, no. 6, pp. 796–810, 1967.
[20]. D. E. Rapach, "International Evidence on the Long-Run Impact of Inflation," J. Money. Credit. Bank., vol. 35, no. 1, pp. 23–48, 2003.
[21]. M. Sarel, "Nonlinear Effects of Inflation on Economic Growth," Int. Monet. Fund. Staff Pap. - Int. Monet. Fund, vol. 43, no. 1, p. 199, 1995.
[22]. J. Lee, "The robustness of Okun's law: Evidence from OECD countries," J. Macroecon., vol. 22, no. 2, pp. 331–356, 2000.
[23]. M. Virén, "The Okun curve is non-linear," Econ. Lett., vol. 70, no. 2, pp. 253–257, 2001.
[24]. L. Sögner and A. Stiassny, "An analysis on the structural stability of Okun's law-A cross-country study," Appl. Econ., vol. 34, no. 14, pp. 1775–1787, 2002.
[25]. C. E. A. and R. Bouaziz, "Is the Okun's law valid in Tunisia? Chifaa," Munich Pers. RePEc Arch., no. 67998, 2015.
[26]. M. F. J. Prachowny, "Okun ' s Law : Theoretical Foundations and Revised Estimates Author (s): Martin F . J . Prachowny Reviewed work (s): Source : The Review of Economics and Statistics , Vol . 75 , No . 2 (May , 1993), pp . 331-336 Published by : The MIT Press Stable U," vol. 75, no. 2, pp. 331–336, 2012.
[27]. P. N. Ireland, "Does the time-consistency problem explain the behavior of inflation in the United States?," J. Monet. Econ., vol. 44, no. 2, pp. 279–291, 1999.
[28]. F. Shadman-Mehta, "A Re-Evaluation of the Relation between Wages and Unemployment in the United Kingdom," Economica, vol. 68, no. 272, pp. 567–586, 2001.
[29]. A. Widarjono, Econometrics: Theory And Application For The Business Economy, 2nd ed. Yogyakarta: Ekonisia, 2007.
[30]. R. F. Engle and C.W.J Granger, "Cointegration And Error Correction : Representing, Estimation, And Testing," vol. 55, no. 2, pp. 251–276, 1987.
[31]. R. S. Pyndick, Economic Models and Econometric Forecast, 4th ed. New York: McGraw Hill, 1998.
[32]. N. Cameron, D. Hum, and W. Simpson, "Stylized Facts and Stylized Illusions: Inflation and Productivity Revisited," Can. J. Econ., vol. 29, no. 1, p. 152, 2006.
[33]. G. S. Dorrance, "The Effect of Inflation on Economic Development," Staff Pap. - Int. Monet. Fund, vol. 10, no. 1, pp. 1–47, 1963.
[34]. S. Shi, "Search, inflation and capital accumulation," J. Monet. Econ., vol. 44, no. 1, pp. 81–103, 1999.
[35]. J. Tobin, "Money and Economic Growth," Econometrica, vol. 33, no. 4, pp. 671–684, 2010.
[36]. A. D. Hervino, "Volatilitas inflasi di indonesia : fiskal atau moneter?," Financ. Bank. J., vol. 13, no. 2, pp. 669–672, 2011.
[37]. P. De Grauwe and M. Polan, "Is inflation always and everywhere a monetary phenomenon?," Scand. J. Econ., vol. 107, no. 2, pp. 239–259, 2005.
[38]. R. J. Gordon and P. K. Clark, "Unemployment and Potential Output in the 1980s," Brookings Pap. Econ. Act., vol. 1984, no. 2, p. 537, 2006.
[39]. C. E. Weber, "Cyclical and Output , Cyclical Unemployment , a New Approach," J. Appl. Econom., vol. 10, no. 4, pp. 433–445, 1995.
[40]. I. A. Moosa, "A Cross-Country Comparison of Okun ' s Coefficient 1 The term Okun ' s law refers to the empirical regularity that seems to hold between the output and unemployment gaps , or between cyclical unemploy-," J. Comp. Econ., vol. 356, pp. 335–356, 1997.
[41]. I. A. Moosa, "Cyclical output, cyclical unemployment, and Okun's coefficient; A structural time series approach," Int. Rev. Econ. Financ., vol. 8, no. 3, pp. 293–304, 1999.
[42]. C. L. . F. . Attfield and B. Silverstone, "OKUN ' S COEFFICIENT : A COMMENT," Rev. Econ. Stat., vol. 57, no. 1990, pp. 326–

329, 1997.
[43]. A. K. Salman, "Testing the Causal Nexus between Output and Unemployment: Swedish Data," Int. Bus. Res., vol. 5, no. 10, pp. 29–45, 2012.
[44]. M. Hanusch, "Jobless Growth? Okun'S Law in East Asia," J. Int. Commer. Econ. Policy, vol. 04, no. 03, p. 1350014, 2013.
[45]. E. S. Knotek, "How Useful is Okun's Law?," Fed. Reserv. Bank Kansas City, pp. 73–103, 2007.
[46]. M. Škare and G. M. Caporale, "Short- and Long-Run Linkages Between Employment Growth, Inflation and Output Growth: Evidence From a Large Panel," Technol. Econ. Dev. Econ., vol. 20, no. 3, pp. 554–575, 2014.
[47]. F. Furuoka, "Does the 'Phillips curve' really exist? New empirical evidence from Malaysia," Econ. Bull., vol. 5, no. 16, pp. 1–14, 2007.
[48]. C. Ştefan and A. Bratu, "The Inflation-Unemployment Tradeoff in a Macroeconometric Model," Br. J. Econ. Financ. Manag. Sci., vol. 12, no. 1, pp. 22–31, 2016.
[49]. Y. Mahmood, R. Bokhari, and M. Aslam, "Trade-off between Inflation, Interest and Unemployment Rate of Pakistan: A Cointegration Analysis," Pakistan J. Commer. Soc. Sci., vol. 7, no. 3, pp. 482–492, 2013.
[50]. K. Zaman, M. M. Khan, M. Ahmad, and W. Ikram, "Inflation, Unemployment and the NAIRU in Pakistan (1975-2009)," Int. J. Econ. Financ., vol. 3, no. 1, pp. 245–254, 2014.
[51]. I. Arshad and I. Sukkur, "Examining Relationship between Macroeconomic Variables Using Var Approach," Proc. 2014 Int. Conf. Ind. Eng. Oper. Manag., no. 2001, pp. 2393–2401, 2014.
[52]. A. Thayaparan, "Impact of Inflation on Economic Growth in Sri Lanka: A Study of Time Series Analysis," Glob. J. Manag. Bus. Res. B Econ. Commer., vol. 13, no. 5, pp. 45–54, 2014.
[53]. K. Bhattarai, "Unemployment-inflation trade-offs in OECD countries," Econ. Model., vol. 58, pp. 93–103, 2016.
[54]. Y. Hu, "Empirical Investigations of Inflation Targeting," Work. Pap. WP- 03-6, no. July, 2003.

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