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Analysis of The Impact of Taylor's Monetary Policy Provisions on Indonesian Economic Growth

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ABSTRACT

Taylor's provisions use investment credit interest rates, inflation gaps and output gaps as variables. This study seeks to analyze how the Taylor Rules variable is applied when used in Indonesia, as well as to determine the impact on economic growth in Indonesia. The purpose of this study was to determine the effect of Taylor's monetary policy variables on Indonesia's economic growth. This research method uses primary data and uses the Vector Error Correction Model (VECM) method. The results of the study show that investment credit interest rates, inflation GAP, GDP GAP, inflation and GDP have an effect on economic growth.

Keywords: Taylor Provision, Economic Growth

INTRODUCTION

One of the things the government has done is implementing monetary policy to achieve sustainable economic growth. In accordance with Law no. 23 of 1999 concerning Bank Indonesia and has been amended to become Law no. 3 of 2004, Economic growth is an indicator of a country whether the country is successful in implementing policies in the economy. Increasing national income every year is the goal of every country. Economic growth must go hand in hand, namely with good cooperation between the government, the public and the central bank as a determinant of monetary policy within a country. The measurement of national income, namely Gross Domestic Product, is by calculating the value of goods and services produced by a country in one year. Positive economic growth indicates an increase in the economy whereas if it is negative it indicates a decline (A.Mahendra, 2008). Economic growth is also known as a long-term increase in the ability of a country to provide more and more goods to its population, this ability increases according to technological and other advances (Kuznetz, 2005).

Indonesia's monetary policy is intended to be able to influence the country's goal of stabilizing the exchange rate and maintaining its stability which implies price stability (inflation rate) and stability of the rupiah exchange rate so that later after achieving the intended target it will also have an impact on economic growth. Monetary policy is essentially part of macroeconomic policy aimed at supporting various national development goals, namely maintaining money stability and encouraging smooth

production and development in order to increase people's living rates (Pohan, 2011). The monetary policy mechanism is a channel that can link the performance of monetary policy to the economy (Taylor, 1996). So monetary policy itself can affect the real sector and inflation. In addition, financial and economic activities will also be influenced so that the ultimate goal set by the central bank can be achieved through monetary policy (Pohan, 2011). During the period from 1970 to July 1997, Bank Indonesia established exchange rates, and under these conditions the policies that could be implemented were limited. The main objective of monetary policy measures is to maintain the stability of the rupiah exchange rate, which is only allowed to move within a certain threshold.

Currently, the use of monetary policy provisions in the formulation of monetary policy implementation has been widely applied by central banks because it requires firm objectives and long-term commitment. The existence of provisions (rule) helps the central bank in long-term goals when in the short term there are deviations. Several countries use a provision, namely the Taylor Provisions, some of these countries include Canada, America, Germany, Italy, Japan and so on. Taylor's provisions have shown the world that the concept of policy based on provisions has broken the concept of pure discretion or policy determination only looking at current events without calculations or clear boundaries with econometric form specifications (Orphanidez, 2007). Taylor's provisions recommend interest rates based on four factors, namely current core inflation, real interest balances, inflation gap and GDP gap.

Taylor Rule, which is a systematic provision that regulates how the central bank must determine the short-term interest rate, so that the reaction function is to changes in the inflation gap and the output gap (Taylor, 1996). Taylor uses the Monetary Policy Rule model approach which contains a relatively simple system of equations that uses interest rates as a reaction function of the inflation gap and output gap. Many countries use this interest rate instrument. Indonesia is meant to be able to influence the country's goal of stabilizing the exchange rate and maintaining its stability which implies price stability (inflation rate) and stability of the rupiah exchange rate so that later after achieving the intended target it will also have an impact on economic growth.

METHODS

The data used is secondary data. This data is sourced from Bank Indonesia, Central Bureau of Statistics. Apart from that, related books are also usedreferences that can support this research. The data used is time series data starting from 2005.1-2014.4. The data analysis method used in this paper is a quantitative analysis method using the Vector Error Correction Model (VECM) to determine the effect of the independent variables on the dependent variable. By using the functional model, the following equation is obtained (Gujarati, 2003).

Y= f(X1,X2,X3,...Xn)

The functional function model can be formulated as follows:

Taylor's Terms:

GDP= (RINV, GAPINF, GAPGDP)

TR = Taylor rule version of SBI interest rate (%) RINV = Investment interest rate i(%)

GAPINF = Core Inflation - Inflation Target (%)

GAPGDP = GDP – potential GDP (billions of Rp)

The general econometric model is as follows:

Taylor *Rule* (TR)

$$GDP = \alpha_0 + \alpha_1 \text{ RINV} + \alpha_2 \text{GAPINF} + \alpha_3 \text{ GAPGDP} + \varepsilon_t$$

The analytical tool used in this research is VECM. The model used in the regression equation that uses time series data is related to the problem of stationarity and cointegrity between the variables in it. The analysis begins with testing the non-stationarity of each variable using the test developed by Augmented Dickey Fuller and Phillips Perron. In econometric models, stationary data is data that has the same mean, variance, and autovariance at the time the data was formed. In addition, one of the model requirements in time series data is stationary data. The data used in the regression were subjected to a unit root test based on the ADF critical limit value. The results of the unit root test by comparing the results of t-count with McKinnon's critical value.

The unit root test and cointegration test conducted to produce cointegrated data, the next step is to carry out the Vector Error Correction Model (VECM) test. The VECM specification restricts the long-term behavioral relationship between existing variables so that it converges into a cointegration relationship but still allows dynamic changes in the short term

The VECM models in this study are:

$$GDP_t = \alpha_0 + \sum_{i=1}^{n} \alpha_1 RINV_{t-1} + \sum_{i=1}^{n} \alpha_2 GAPINF_{t-1} + \sum_{i=1}^{n} \alpha_3 GAPGDP_{t-1} + \alpha_4 ec_{t-1}$$

t-1 = year t-n

Impulse Response Function tracking the response of endogenous variables in the VAR system due to shocks or changes in the disturbance variable (Widarjono, 2007). This variance decomposition analysis provides a different method in describing the dynamics of the VAR system compared to the previous analysis. This analysis illustrates the relative importance of each variable in the VAR system due to shocks, useful for predicting the percentage contribution of each variable due to certain changes in the VAR system (Widarjono, 2007).

FINDING AND DISCUSSION

Table 1. RINV Unit Root Test Results with Augmented Dickey-Fuller Test on the order level for the Taylor period 2009:01-2014:12

Variable	Iintercept	Iintercept and Trends	No Interception and Trends	Order

GDP	4.287330**	0.345766	4.263677**	1(0)
RINV	-2.988620**	-0.782641	-0.782641	1(0)
GAPINF	-2.875026	-0.782641	-1.486140	1(0)
GAPGDP	-8.774480**	-8.718955**	-5.519145**	1(0)

** Significant with 95% confidence level

The results of the unit root test were carried out by formulating intercept, intercept and trend elements and without intercepts and trends with a 95% level of confidence. The test results show that there is a statistical value of the Augmented Dickey-Fuller test that is greater and less than the Mac Kinnon critical value which indicates that not all variables contain unit roots or in other words not all data are stationary at the order level.

BerdaSuggest the results of the unit root test in table 4 Taylor's provisions for the period 2009:01- 2014:12 it can be seen that not all variables contain unit roots or are not stationary in the intercept, intercept and trend elements, and without intercept and trend. In the GDP variable only the intercept and without intercepts and trends that are stationary. In RINV it contains unit roots or not stationary at intercepts and trends and without intercepts and trends. While the GAPINF variables all contain unit roots or are not stationary. Because the results of the unit root test not all data/variables contain unit roots, if this kind of data is used to estimate an equation, a lancing regression will occur. To overcome this, the next step will be a first difference test.

Table 2. Unit Root Test Results with the Augmented Dickey-fuller Test on the first difference order for the Taylor Provisions for the period 2009:01- 2014:12

Variable	Iintercept	Iintercept and Trends	No Interception and Trends	Order
GDP	-7.330369**	-1.125054**	-1.342823**	1(1)
RINV	-5.621409**	-7.037362**	-5.441789**	1(1)
GAPINF	-5.441789**	-7.026362**	-5.431729**	1(1)
GAPGDP	-9.955993**	-14.73009**	-14.86094**	1(1)

** Significant with 95% confidence level

The results of the unit root test at first difference order I(1) in Taylor's terms show that all variables are stationary and are segmented at order I(1). Then all variables have been avoided from spurious regression and can be used in further analysis.

Lag Optimum Determination

Some economic events cannot directly affect other economic variables. It takes time (lag) for an economic variable to respond to shocks or shocks that occur in other variables. In determining the optimum lag can be done by using some information criteria. In this study using the Akaike Information Criterion, which is based on the shortest lag from the smallest AIC standard. In addition, the use of optimum lag is also very important because in the system of equations it will be used as an exogenous variable. The use of optimum lag length is very useful for eliminating autocorrelation problems in VAR. The optimum lag test results are as follows:

Table 3. Optimum Lag Test Results for Taylor and ITF Terms

Persame	AIC	Lag
Taylor's Provisions	38.59785*	3

From the results using the Akaike Information Criterion (AIC) method, it can be seen that Taylor's provisions indicate that all variables have an effect on economic growth. Based on the results of the optimum lag test, the model has an optimum lag in the Taylor rule, together with exogenous variables affecting endogenous variables in the endogenous model. Based on the results of the optimum lag test 3 on the Taylor Provisions. This indicates that simultaneously exogenous variables influence endogenous variables in the equation model for 3 periods. Likewise, the ITF has an optimum lag of 3, this indicates that simultaneously the exogenous variables affect the endogenous variables in the equation model for 3 periods.

Vector Error Correction Model (VECM) estimation

a. VECM estimation results on Taylor Conditions

The results of the unit roots test suggest that all natural data in this study are not stationary in the level order but stationary in the first difference order, so the estimate using OLS cannot be used. This study uses the VECM model as an analytical model to determine the effect of the independent variables on the dependent variable in the long term. The following is the result of the VECM estimation against Taylor's terms:

Table 4. Taylor Stipulation VECM Estimation Results

Miscellanybell	Long-term	Short Term (-1)	Short Term (-2)
GDP	0.001922	-0.707961	0.004407
	[6.38519]	[-5.67202]	[0.43681]
RINV	0.006207	0.018410	-0.010993
	[0.88409]	[1.09588]	[-0.64100]
GAPINF	1.000000	0.055841	-0.178391
		[0.42704]	[-1.35494]
GAPGDP	-0.466315	-0.295871	-0.249888
	[-3.99097]	[-3.06112]	[-2.43839]

To see whether the variables used in Taylor's provisions have an effect on long-term economic growth, it can be done with t-statistics with t-table. The t-table value obtained is 1.671 for the one way test. The null hypothesis (H0) is rejected and Ha is accepted if t-statistics > t-table, the variable relationship is significant at the 5% level. From the estimation results, it can be seen that all independent variables have a significant effect on economic growth.

Table 5. Impulse Response Function Test Results for Taylor's Terms

IRF	GAPGDP	GAPINF	PDB	RINV
1	4567194	0.000000	0.000000	0.000000
2	1312924	-314.3635	753.6968	-508.8279
3	1657,693	-414.3115	548.5845	-2344,386
4	2149,795	136.6026	424.9759	-959.9717
5	1847.343	-283.7605	783.2485	-703.6711
6	1751,440	-176.0677	296.3325	-1128905
7	1755,883	98.33205	398.2606	-1008985
8	1755,278	-38.27817	656.4047	-919.6209
9	1618.260	-5.614798	398.3870	-930.8965
10	1593,346	122.1143	385.3021	-900.7342

Based on the results of testing the impulse response functions on Taylor's provisions, we can see that in 2 months if shocks occur in the GAPGDP and GAP INF, GDP will respond positively with response values of 4567,194 and 1312,924 respectively, while in the second month the GDP variable responds to shocks of core inflation was 753.6968.

Variance Decomposition Analysis of the Taylor Terms Equation

Variance decomposition analysis is used to find out how much the percentage contribution of investment interest rates and other variables to the Taylor Provisions used in this study influences economic growth and Indonesia. Variance Decomposition results in the following table:

Table 6. Taylor's Terms of Variance Decomposition Results

VD	S.E.	GAPGDP	GAPINF	PDB	RINV
1	4567194	100,0000	0.000000	0.000000	0.000000
2	4848589	96.06195	0.420372	2.416365	1.101314
3	5676752	78.60535	0.839330	2.696633	17.85869
4	6161813	78.88917	0.761534	2.764459	17.58483
5	6524551	78.37785	0.868360	3.906731	16.84706
6	6857,882	77.46627	0.851911	3.722898	17.95892
7	7162,402	77.02911	0.799859	3.722243	18.44879
8	7460499	76.53193	0.739849	4.204848	18.52338
9	7700852	76.24507	0.694440	4.214096	18.84640
10	7925690	76.02208	0.679337	4.214729	19.08386

Based on the results of the variance decomposition referred to in the table above, it can be concluded that in the application of the Taylor Provisions, the GAPGDP movement is most influenced by the GAPGDP itself, which reaches 100 percent.

CONCLUSION

The results obtained from the VECM estimation on the Taylor Provisions on economic growth are as follows:

a. Investment credit interest rates have a significant and positive effect on economic growth. If investment credit interest rates rise, economic growth will also increase.
b. The inflation gap has a significant and positive effect on economic growth. The difference between inflation and the inflation target determines economic growth if the smaller the difference, the economic growth will increase.
c. The GDP gap has a significant and positive effect on economic growth. The smaller the difference, the economic growth will increase

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