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Monetary Policy Collision and Banking Index: Perspective Study of InfoBank15 Index in Indonesia Stock Exchange

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Abstract

This paper reveals evidence on the nexus between monetary policy and banking index performance in Indonesia Stock Exchange. Specifically, this study examines the effect of interest rate, inflation, money supply, and exchange rate as monetary policy variables. The dependent variable is measured by infobank15 index. This research employed secondary data covering period 2015-2020. The VAR/VECM method was used to demonstrate the causality dan co-integration of studied variables. The outcomes suggest that money supply has positive significant with infobank15 index both in short-term and long-term relationship. Further, the statistical results indicates that inflation gives biggest shock in the long-term. This paper helps in giving suggestions to the central bank, researchers, banking companies and other financial institutions to look into monetary policy rates and central bank also can concern on the macro-economic situation in the country.

Keywords
monetary policy; banking performance; banking index

I. Introduction

The financial system has an extraordinary role in funneling funds. Financial sector reforms contribute to enormous economic growth and development. The main component in the financial system is Banks. Banks play an active role in the economy. Banks are the intermediary in circulating money in economic activities, and Banks will also balance between people who have excess funds for investment and people who need money. Thus, Banks that experience profits will ensure the continuity of economic growth in line with the financial system's stability.

The growth of the banking sector can be seen from the movement of the InfoBank15 index, which contains 15 banking stocks that have been selected based on good fundamentals and have high liquidity compared to other banking stocks in the banking sector. The InfoBank15 index is well known within the market; therefore, investors or the general public can analyze and determine investment decisions in banking sector stocks.

From fact sheet index data, the historical movement of the InfoBank15 index recorded a return above the IDX Composite and the LQ45 index of 227.02% for ten years (IDX InfoBank15, 2021). The InfoBank15 index's growth becomes a reference for investors in investing and an illustration of how far the growth of the banking sector in Indonesia is.

The basic view is that fundamentally, macroeconomic conditions affecting banking operations and dynamics are nothing new in finance and economic studies. The results of an empirical study by (Abaidoo & Anyigba, 2020) stated that expectations of inflation and

economic uncertainty tend to be significant obstacles in influencing the performance of the banking sector in the U.S.

Indonesian banking regulators are under the Bank of Indonesia (B.I.) and the Financial Services Authority (OJK) supervision. Bank of Indonesia certainly regulates the circulation of money and price liquidity in the economy and focuses on controlling the inflation rate in the market. Various monetary policy measures are applied to banks to regulate the money supply and price liquidity in economic activity. The rate of monetary policy varies based on the financial situation of the economy and when it is necessary. Some key economic factors include the consumer price index, unemployment rate, gross domestic product, stock price index, corporate taxes, and interest rates (Shu et al., 2013).

The monetary policy includes (Islam et al., 2021) several policies carried out by a country in controlling the circulation of money to achieve macroeconomic goals. The role of monetary policy has a significant impact on economic growth in developing countries through the cost and availability of credit, inflation management, and payment stability (Bondarchuk & Raboshuk, 2020; Nyorekwa Twinoburyo & Odhiambo, 2018).

Empirical research by (Islam et al., 2021) stated that monetary policy has a long-term effect on economic growth. When linked to the movement of the Infobank15 index, any monetary policy implementation implemented by the government will impact the performance of the banking sector and the movement of banking stocks.

In developing countries, the main aspect of monetary policy is price stability. Price stability is achieved when the inflation rate is continuously low and stable (Li et al., 2010). In addition, in the context of external factors, it is generally believed that GDP growth, real interest rates, regulations, and financial structures are significant external factors that can affect bank profitability (Al-Harbi, 2019).

Banks and the financial sector have a vital role in capital markets in many countries, including Indonesia. By the end of December 2019, the total market capitalization of the financial sector reached 2,507.47 trillion rupiahs (IDX Financials, 2021). Meanwhile, market capitalization on the Infobank15 Index reached 1,933.62 trillion rupiahs (IDX InfoBank15, 2021).

The growth of the banking sector from the movement of the Infobank15 index certainly gains the influence or stimulus from the government's monetary policy. The state of a country's capital market is determined by the policies made by the government and the applicable regulations (Asongu, 2014). This circumstance raises interest in how the performance of the infobank15 index is based on the monetary policy that the government has implemented.

The dominant role of banks is to provide credit facilities to the private sector of the economy, where the main source of funding for the private sector is banks. Then, banks also certainly face obstacles in terms of regulations from the Central Bank and government policies in the economy. This study aims to identify the impact of monetary policy on the performance of the infobank15 index on the Indonesia Stock Exchange.

The update of this research discusses the important implications of monetary policy in the economy and its impact on the banking index on the IDX. This study profoundly discusses the monetary indicators that significantly impact the movement of the infobank15 index, which is still under-researched.

II. Review of Literature

2.1 InfoBank15 Index

Through the development of capital market and also as part of financial system, it can affect the stability of banking sector by monitoring stock price index (Wibowo et al., 2022) The movement of the index becomes a reference for investors in investing whether they will sell, buy or hold a certain number of shares. The stock index is also an initial picture for investors of how the stock market trend shows market conditions, whether they are weakening or strengthening. The infobank15 index contains 15 bank stocks that perform with good fundamentals and high liquidity. The infobank15 index was launched for the first time on November 7, 2012, in collaboration with P.T. Info Arta Pratama (publisher of infobank15 magazine). This study examines the Return of the infobank15 index as a description of the stock performance of the banking sector in general in Indonesia.

2.2 Monetary Policies

The Central Bank of a country formulates monetary policy that focuses on long-term interest rates, real exchange rates, and price stability, in line with economic growth, employment opportunities, smooth economic cycles, and preventing financial crises (Islam et al., 2021). Several monetary policy instruments include interest rate policies, foreign exchange reserves, loan interest rates, open market operations, and others that affect economic growth.

Macroeconomic variables such as production index, interest rate, inflation level, gold price, exchange rate, and foreign investment impact stock market performance (Misra, 2018). A country's monetary policy affects all sectors through the cost of debt and the availability of money/credit, affecting a company's ability to access external funding sources (Egbunike & Okerekeoti, 2018).

Bank interest rates and money supply become essential factors in monetary policy (Islam et al., 2021). Interest rates positively influence bank profitability (Al-Harbi, 2019). However, an increase in interest rates causes companies and the public to be reluctant to borrow, affecting the bank's profit rate in the long term (Islam & Nishiyama, 2016).
Hypothesis 1: Interest rates affect the Return of the infobank15 index.

In addition, several studies examine how inflation affects the bank's key performance indicators. (Saeed, 2014) stated that inflation has a negative impact on the bank's main indicators, i.e., ROA and ROE. (Flamini et al., 2009; Karakaya & ayaydın, 2014) generated a negative relationship between inflation and bank profitability under several economic conditions. However, research by (W. A. Khan et al., 2014; Rana-Al-Mosharrafa & Islam, 2021) showed a positive relationship between inflation and bank performance indicators, i.e., ROA, ROE, and NIM.
Hypothesis 2: Inflation affects the Return of infobank15 index

Another impact of monetary policy is the money supply in the economy. An increase in the money supply increases the discount rate, which reduces returns on the stock market; therefore, a high money supply negatively affects the capital market. (J. Khan & Khan, 2018). The positive impact of money supply can be linked to economic expansion because it increases company profits and profits and returns on stocks (Fama, 1981).
Hypothesis 3: Money Supply affects the Return of infobank15 index

The exchange rate is the price at which one country's currency can be exchanged for another country's currency. (Bhattarai et al., 2020)conducted a panel study of VAR that

resulted in U.S. monetary policy having a negative impact on stock prices and exchange rates in 14 emerging market economies. Exchange rate movements affect the condition of the trade balance, which impacts the company's cash flow and stock performance. A study by (Sri Apriani et al., 2020) presented the exchange rate results that BI7RR and PBV affect the Return of the infobank15 index.
Hypothesis 4: Exchange Rate affects the Return of infobank15 index.

III. Research Methods

3.1 Data

To examine the relationship between monetary policy (interest rates, inflation, money supply, and exchange rates) and the Return of the infobank15 index. This study uses secondary data in a monthly form from 2015 to 2020. The research data was extracted from the main website that provides needed data, i.e., Bank of Indonesia, BPS, IDX, CEIC, and yahoofinance.

3.2 Methodology

Observing from the research data, the model used is a time-series model with Vector Auto Regression (VAR) and Vector Error Correction Model (VECM). Vector Autoregression (VAR) which was proposed by (Sims, 1980) and (Bernanke & Blinder, 1992), is a time-series data analysis method as an alternative in macroeconomic analysis. In the VAR method, if a variable with a unit root is found and is not cointegrated with each other, then the variable must be differentiated to make it stationary.

However, if all variables contain a unit root and are cointegrated, the VECM model can be used. When two or more variables seen in an equation at the data level are non-stationary, there may be co-integration in the equation (Veerbek, M, 2017). The VECM model provides a working procedure to separate the long-term and short-term components of the data formation process (Sulistiana et al., 2017). The following stages of VAR/VECM analysis can be carried out as follows;

(1) Data Stationarity Test
(2) Optimal Lag Determination,
(3) VAR Model Stability Test,
(4) Cointegration Test,
(5) Impulse Response Function (IRF) Analysis,
(6) Forecast Error Variance Decomposition (FEVD)

To observe the effect of each variable on the dependent variable, the model formed in this study is the equation of Vector Error Correction Model (VECM) for the long-term period and the Error Correction Model (ECM) for the short-term period.

IV. Discussion

This section will explain the time-series data processing method with the Vector Auto Regression (VAR) approach if the research data is stationary and no co-integration is found or the Vector Error Correction Model (VECM) approach if the research data is found to be non-stationary, but there is co-integration.

4.1 Data Stationarity Test

At the initial stage, a stationarity test was performed to determine whether the data was stationary or not. The stationarity test was performed with a unit root test. If the research data is non-stationary, a further test is carried out to test the degree of integration until it becomes

stationary. The unit root test was performed using the Augmented-Dickey Fuller (ADF) method. This step is to determine the stationarity of the interest rate data (INT), Inflation (INF), Money Supply (M2), Exchange Rate (EXC), and Return of infobank15 index (RET).

If the unit root test results obtain a probability value greater than 5%, then the variable is non-stationary, and vice versa; if the probability value is less than 5%, then the variable is stationary. The unit root test was carried out one by one on each variable, both the independent variable and the dependent variable. Suppose all variables are non-stationary at the level. In that case, it must proceed to the degree of integration test to meet the criteria to proceed to the Error Correction Model test stage. Stationary test results can be seen in table 1.

Table 1. Unit Root Test

Variable	Level		First Difference	
	t-statistic	**Probability**	**t-statistic**	**Probability**
Interest Rate (INT)	-0.680477	0.8288	-5.929727	0.0000
Inflation (INF)	-0.363616	0.9089	-6.336346	0.0000
Money Supply (M2)	-2.557753	0.1066	-9.810715	0.0000
Exchange Rate (EXC)	-2.287824	0.1788	-8.548533	0.0000
Return of Infobank15 Index (RET)	-8.664172	0.0000	-15.39746	0.0001

Source: Eviews 10 Output Results, Processes Secondary Data

Table 1 shows that interest rates (INT), Inflation (INF), Money Supply (M2), Exchange Rates (EXC) are non-stationary at the level because the probability value of all variables is greater than α = 5%. It must proceed with the degree of integration test at the first difference level. The test results at the first difference level found that all dependent and independent variables were stationary at the first difference level at α = 5%, which means the probability value is smaller than = 5%. From the test results at the first difference level, the data above is stationary in the first difference. Then it is assumed that there will be co-integration or a long-term relationship. Thus the next test can proceed to the optimal lag test and co-integration.

4.2 Determination of Optimal Lag

At this stage, model estimation and optimum lag selection will be carried out on the model using information criteria, i.e., sequential modified L.R. test statistics (each test at 5% level) (L.R.), Final prediction error (FPR), Akaike Information Criteria (AIC) and Schwarz Criteria (SC). The following summarizes the results of determining the optimum lag with L.R., FPR, AIC, and S.C criteria. The results obtained are as follows:

Table 2. Lag Optimum Results

VAR Lag Order Selection Criteria
Endogenous variables: Y X1 X2 X3 X4
Exogenous variables: C
Date: 01/22/22 Time: 11:21
Sample: 1 72
Included observations: 66

Lag	LogL	LR	FPE	AIC	SC
0	-1526.909	NA	9.96e+13	46.42147	46.58736
1	-1207.386	580.9500	1.33e+10	37.49655	**38.49185***

2	-1179.974	45.68708	1.25e+10	37.42345	39.24816
3	-1151.270	**43.49135***	**1.16e+10***	37.31120	39.96533
4	-1126.046	34.39524	1.23e+10	**37.30444***	40.78798
5	-1109.294	20.30619	1.76e+10	37.55436	41.86731
6	-1080.881	30.13532	1.89e+10	37.45092	42.59330

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

Based on table 2 above, it can be seen that the lag with the most (*) sign is found in lag 3; thus, the lag that will be used for further data processing is Lag 3.

4.3 Model Stability Test

The stability test of the model is seen from the modulus value obtained by each variable. The model is stable if the modulus value is at radius < 1 and unstable if the modulus value > 1. The largest modulus is less than one and is at the optimal point; then, it is already optimal and stable.

Table 3. Test Results of Model Stability

Roots of Characteristic Polynomial
Endogenous variables: Y INT INF M2 EXC
Exogenous variables: C
Lag specification: 1 2
Date: 01/22/22 Time: 11:43

Root	Modulus
0.985367	0.985367
0.941587	0.941587
0.778748 - 0.215407i	0.807990
0.778748 + 0.215407i	0.807990
0.150669 - 0.436328i	0.461609
0.150669 + 0.436328i	0.461609
-0.402118 - 0.147716i	0.428391
-0.402118 + 0.147716i	0.428391
0.325759	0.325759
0.096230	0.096230

No root lies outside the unit circle.
VAR satisfies the stability condition.

The output results did not find root and modulus values more than 1, which means that the estimated model is considered stable. The VECM model is stable if all the roots have a modulus less than 1 (Gujarati, D.N, 2013).

4.4 Granger Causality Analysis

The causality test was conducted to determine whether an endogenous variable was treated as an exogenous variable. The causality test can be carried out using various methods. Meanwhile, this research uses Granger's Causality method and the Error correction Model Causality.

Table 4. VAR Model Stability Test

Pairwise Granger Causality Tests
Date: 01/22/22 Time: 11:48
Sample: 1 72
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
INT does not Granger Cause RET	69	0.70318	0.5537
RET does not Granger Cause INT		1.36132	0.2629
INF does not Granger Cause RET	69	2.15954	0.1018
RET does not Granger Cause INF		0.83626	0.4791
M2 does not Granger Cause RET	69	0.64639	0.5882
RET does not Granger Cause M2		9.63228	3.E-05
EXC does not Granger Cause RET	69	0.70293	0.5539
RET does not Granger Cause EXC		1.18805	0.3217
INF does not Granger Cause INT	69	0.46209	0.7098
INT does not Granger Cause INF		1.82365	0.1521
M2 does not Granger Cause INT	69	1.17437	0.3268
INT does not Granger Cause M2		1.18865	0.3214
EXC does not Granger Cause INT	69	1.15211	0.3353
INT does not Granger Cause EXC		0.12286	0.9463
M2 does not Granger Cause INF	69	0.16477	0.9197
INF does not Granger Cause M2		4.21311	0.0089
EXC does not Granger Cause INF	69	1.34078	0.2693
INF does not Granger Cause EXC		0.24532	0.8644
EXC does not Granger Cause M2	69	3.00240	0.0371
M2 does not Granger Cause EXC		1.10365	0.3545

The causality test results show that there is no reciprocal relationship (two-way relationship). This can be seen from the Prob. value of Interest rate (INT), Inflation (INF), Money Supply (M2), Exchange Rate (EXC) does not Granger Cause Return of infobank15 index (RET), and Return of infobank15 index (RET) does not Granger Cause INT, INF, M2 and EXC whose value is above the alpha level of 0.05 (5%). Meaning that interest rates (INT), Inflation (INF), Money Supply (M2), Exchange Rates (EXC) do not significantly affect the Return of the infobank15 index (RET), and the Return of infobank15 index (Y)

does not significantly affect interest rates (INT), Inflation (INF), Money Supply (M2), and Exchange Rates (EXC).

4.5 Johansen Cointegration Test

A co-integration test was conducted to provide an initial indication that the research model used has long-term co-integration. A co-integration test was carried out by ensuring that all variables used in the research model have the same degree of integration. The results of the co-integration test processing can be explained as follows:

Table 5. Johansen Cointegration Test

Date: 01/22/22 Time: 11:11
Sample (adjusted): 3 72
Included observations: 70 after adjustments
Trend assumption: Linear deterministic trend
Series: Y X1 X2 X3 X4
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.437628	84.00083	69.81889	0.0024
At most 1	0.308270	43.70944	47.85613	0.1162
At most 2	0.140521	17.91023	29.79707	0.5727
At most 3	0.086066	7.310209	15.49471	0.5418
At most 4	0.014331	1.010405	3.841466	0.3148

Source: Eviews 10 Output Results, Processes Secondary Data

In the Johansen Cointegration Test table above, the Trace Statistic value is 84,00083 and is greater than the Critical value of 69,81889. It can be interpreted that the model rejects H0 or there is cointegration between variables. Thus, the appropriate model to be used in this study is the Vector Error Correction Model (VECM).

4.6 VECM Empirical Model

After undergoing a series of pre-estimation stages, i.e., data stationarity test, determination of lag length, co-integration test, and VECM stability, the analytical model used was VECM (Vector Error Correction Model). The use of VECM estimation follows the problem in this study, particularly to identify the short-term and long-term relationship of the influence of the independent variable on the dependent variable. VECM estimation in this study can explain the long-term and short-term effects between interest rates (INT), Inflation (INF), Money Supply (M2), Exchange Rates (EXC) as independent variables, and Return of infobank15 index (RET) as dependent variables. The t-test was carried out at the level of significant (α) % 5 with t table = 1,974. The results of the VECM estimation of the economic growth equation with a lag = 3 can be seen in Table 6 below.

Table 6. VECM Estimated Result in Long-run

	Coefficient	t-statistic	Results
D(*Return*)	1.000000		
D(INT)	0.300351	[0.52590]	Insignificant

D(INF)	45.94103	[0.94982]	Insignificant
D(M2)	0.004225	[2.92195]	Significant
D(EXC)	-1.22E-06	[-0.89203]	Insignificant

Table 6 of the results of the VECM analysis for the long term shows that the Interest Rate Variable (INT) has a positive but insignificant effect on the Return of the infobank15 index (RET). It is known from the t-statistic value of [0.52590], which is smaller than the 5% t-table level of significant (α) value of 1.974. The regression coefficient value of the interest rate variable (INT) is positive; this shows that the interest rate variable has a positive influence on the Return of the infobank15 index. A study by (Nikhil & Deene, 2021) stated that interest rates significantly impact banking performance in India, especially in terms of collecting deposits and loans. Undoubtedly, the interest rate becomes a crucial monetary policy because it controls the money flow in the economy. Monetary experts use interest rates as a tool to increase people's attractiveness to save, and a decrease in interest rates will encourage investors to seek higher returns on other assets (Egbunike & Okerekeoti, 2018).

The inflation variable (INF) has a positive but insignificant effect on the Return of the infobank15 index. It is known from the t-statistic value of [0.94982], which is smaller than the value of the t-table level of significant (α) 5%value of 1.974. The regression coefficient value of the inflation variable (INF) is negative. (Abaidoo & Anyigba, 2020) provided result that inflation has a significant impact on banking profitability. This shows that the inflation variable positively affects the Return of the infobank15 index, in line with the research results of (Rana-Al-Mosharrafa & Islam, 2021).

The Money Supply (M2) variable has a positive and significant effect on the Return of the infobank15 index. It is known from the t-statistic value of [2.92195], which is greater than the value of the t-table level of significant (α) 5% of 1.974. The value of the variable coefficient of Money Supply (M2) is positive. This shows that the Money Supply variable has a positive and significant effect on the Return of the infobank15 index. (Islam et al., 2021) stated that the money supply positively affects economic growth. Conditions of economic expansion impact increasing profits on company profits and affect stock returns and performance in the capital market.

The Exchange Rate (EXC) variable has a negative but insignificant effect on the Return of the infobank15 index. It is known from the t-statistic value of [-0.89203], which is smaller than the value of the t-table level of significant (α) 5% of 1.974. The regression coefficient value of the Exchange Rate variable (EXC) is negative. This shows that the Exchange Rate variable has a negative effect on the Return of the infobank15 index, in line with research by (Arfaoui & ben Rejeb, 2017). Exchange rate fluctuations certainly affect stock performance in the capital market in general, including the banking sector, in line with the research results by (Egbunike & Okerekeoti, 2018).

Table 7. VECM Estimated Result in Short-run

	Coefficient	**t-statistic**	**Results**
D(INT(-1))	0.6516	[-0.41679]	Insignificant
D(INT(-2))	-3.972209	[-1.13292]	Insignificant
D(INT (-3))	-0.366737	[-0.10081]	Insignificant
D(INF(-1))	69.67636	[0.35565]	Insignificant
D(INF (-2))	-262.1568	[-1.32643]	Insignificant
D(INF (-3))	23.37873	[0.11931]	Insignificant

D(M2(-1))	0.004507	[1.50286]	Insignificant
D(M2(-2))	0.007238	[2.40700]	Significant
D(M2(-3))	0.010324	[3.32526]	Significant
D(EXC(-1))	2.29E-05	[1.80811]	Insignificant
D(EXC(-2))	2.08E-07	[0.01497]	Insignificant
D(EXC(-3))	-9.66E-06	[-0.74854]	Insignificant
C	1.757708	[1.43162]	
CointEq1	-1.688388	[-5.65706]	

The results of the VECM estimation in Table 7 above show that in the short term, the Interest Rate Variable (INT) has an insignificant effect on the Return of infobank15 index at lag 1, lag 2, and lag 3. Variable of Inflation (INF) has an insignificant effect on Return of infobank15 index at lag 1, lag 2, and lag 3. Money Supply (M2) variable significantly affects the Return of infobank15 index on lag 2 and lag 3. Variable Exchange Rate (EXC) has an insignificant effect on Return Index on Infobank15 on lag 1, lag 2, and lag 3.

4.7 Analysis of Impulse Response Function (IRF)

IRF analysis sees the impact of shocks that occur in one variable to other variables, both in the short and long term. The analysis stage shows the long-term response when a variable experiences a shock. Analysis of Impulse Response Function also shows how long the effect lasts. The results of the IRF analysis are as follows:

a. Response of Return of infobank15 index (Y) towards Shock of Interest Rate (INT)

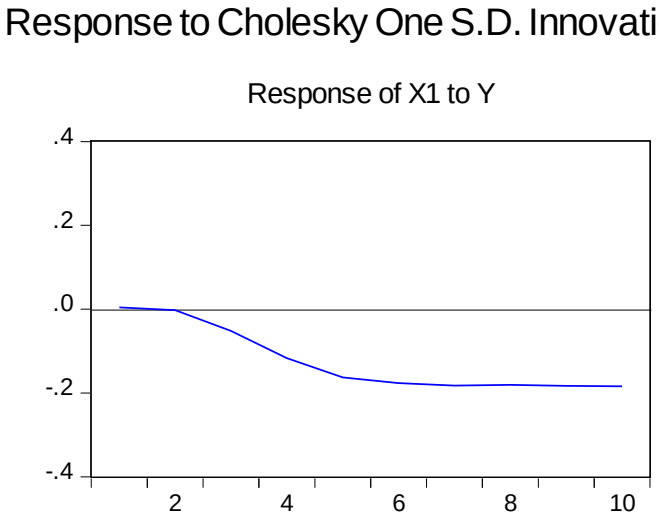

Figure 1. *Return of infobank15 index towards Shock of Interest Rate*

The figure above concludes that shocks that occur in interest rates will be responded as stagnant in the initial period and responded negatively in the long term. An increase in interest rates can affect loan interest rates, which can impact the performance of banking companies because it increases the cost of capital for companies that borrow money from banks.

b. Response of Return of infobank15 index (Y) towards the shock of Inflation (INF)

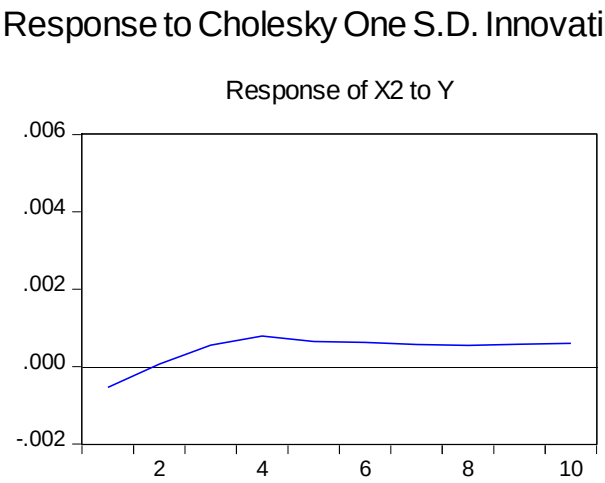

Figure 2. *Return of infobank15 Index towards Shock of Inflation*

The Return of infobank15 index response toward shock from inflation was negative. From the 1st period to the 2nd period, then from the 3rd to the 5th period, it increased, while it was stagnant in the 5th to the 10th period. It can be seen that the IRF line tended to stagnate until the end of the horizontal line. It was concluded that the positive (+) response of the Return of infobank15 index towards the shock from inflation lasted in the long term.

c. Response of Return of infobank15 index (Y) towards Shock of Money Supply (M2)

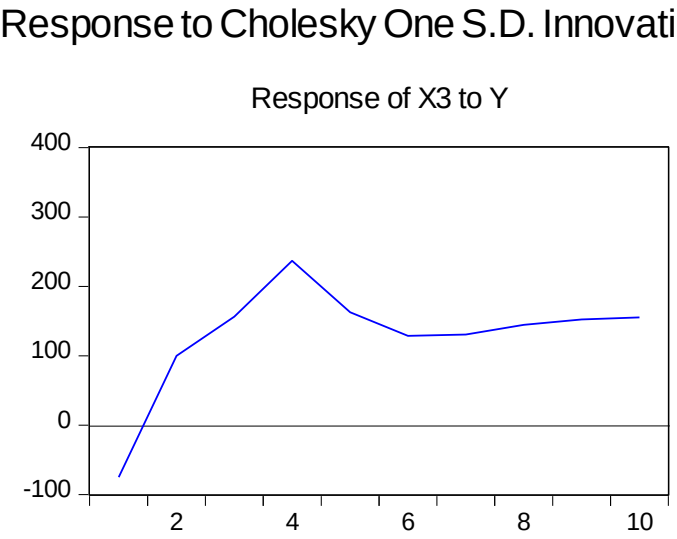

Figure 3. *Return of infobank15 index Towards Shock of Money Supply*

The Return of infobank15 index response towards shock from the Money Supply was negative from the first period and tended to increase in the long term. This was indicated by the IRF line, which tended to stagnate until the end of the horizontal line. From the explanation above, it can be concluded that the positive (+) response of the Return of infobank15 index toward the shock from Money Supply in the long term tended to fluctuate in a positive direction.

d. Response of Return of infobank15 index (Y) towards Shock of Exchange Rate (EXC)

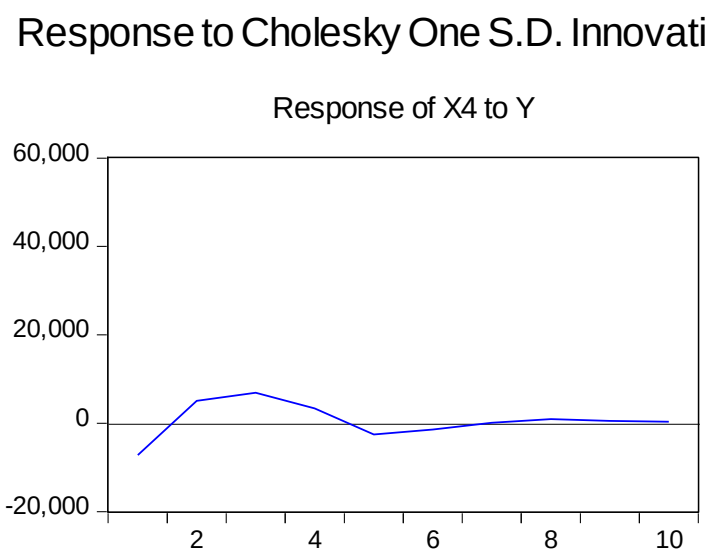

Figure 4. *Return of infobank15 index towards Shock of Exchange Rate*

The Return of infobank15 index response toward shocks from the Exchange Rate was negative from the initial period, and in the long term, it fluctuated positively and negatively. This was indicated by the IRF line, which tended to increase in stagnant until the end of the horizontal line. From the explanation above, it can be concluded that the positive (+) Return of infobank15 index response toward shocks from the Exchange Rate happened in the short term but tended to be negative in the long term.

4.8 Analysis of Variance Decomposition

Analysis of Variance Decomposition was conducted to measure the magnitude of the composition or contribution of the influence of the independent variable on the dependent variable. This study focuses on looking at the effect of the independent variables (Interest Rate (INT), Inflation (INF), Money Supply (M2), Exchange Rate (EXC) on the dependent variable, i.e., Return of infobank15 index (RET). The results of the Variance Decomposition analysis can be shown in table 8 below.

Table 8. Variance Decomposition

Variance Decomposition of Y:						
Period	S.E.	RET	INT	INF	M2	EXC
1	6.141829	100.0000	0.000000	0.000000	0.000000	0.000000
2	6.311652	95.18897	1.188342	0.011916	0.384389	3.226385
3	6.683829	86.31262	1.143056	6.394085	0.591821	5.558421
4	6.797617	84.34119	1.422154	6.487677	1.897067	5.851915
5	6.814789	83.92364	1.593488	6.702494	1.956120	5.824258
6	6.877616	82.90656	1.847288	7.399672	2.010276	5.836205
7	6.932556	82.61583	2.001762	7.370673	2.234012	5.777728
8	6.962584	82.25994	2.171730	7.399463	2.440610	5.728256
9	6.990154	81.88997	2.364433	7.476892	2.573314	5.695391
10	7.011962	81.57978	2.606955	7.443967	2.709262	5.660037

From table 8, it can be explained that in the first period, the Return of infobank15 index (Y) was strongly influenced by the shock of the Return of infobank15 index itself by 100 percent. This means that the shock contribution was also influenced by the price of banking shares included in the infobank15 index itself from the 1st to the 10th period. Meanwhile, in the first period, the variables Interest Rate (INT), Inflation (INF), Money Supply (M2), Exchange Rate (EXC) have not affected the Return of Infobank15 Index.

The variables that provided the largest to the smallest contribution to the Return of Infobank15 Index were the infobank15 index itself, inflation, exchange rates, money supply, and interest rates. Research by (Islam et al., 2021) found that monetary policy has a long-term relationship to economic growth. Low and stable inflation rate is essential for sustaining in surviving the banking system (Hossain, 2016). From this study, the variables of interest rates, inflation, money supply, and exchange rates contributed to the shock of the movement of the banking index (infobank15).

Based on the variance decomposition analysis, inflation provided the biggest shock among other variables, i.e., the biggest shock in the 9th period. Then the Money Supply (M2) variable contributed to the shock, which increased until the 10th period. Meanwhile, interest rates (INT) and exchange rates (EXC) contributed to the shock, which fluctuated in each period. This explains that the movement of the infobank15 index was influenced by the performance of each bank issuer, while the inflation variable, in general, and dominated in the largest contribution of shocks.

V. Conclusion

Monetary policy has an active role in stabilizing the economy. This study explores the impact of monetary policy on the financial sector; in this study is the performance of the infobank15 index. The movement of Return of infobank15 index was positively and significantly influenced by the money supply in the short and long term. The inflation variable contributed the biggest shock to the Return of the infobank15 index movement. However, the interest rate and exchange rate variables had a positive and insignificant negative impact on the Return of the infobank15 index movement.

Monetary policy is certainly beyond the control of the company's management, which undoubtedly can hamper banking performance. The banking sector requires optimal performance and company characteristics to deal with the impact of the monetary policy implemented by the government, especially paying attention to the condition of the money supply and the inflation rate in the economy.

Indonesia's economic conditions show volatility in the determination of monetary policy, which is beyond the banking system's control. Based on the findings of this study, recommendations for policymakers, particularly solely controlling the money supply, are insufficient to generate and stimulate the expected economic activities in the banking sector. Monetary policymakers should implement other monetary policy tools that can control the money supply and ensure that these policies effectively stimulate the desired economic activity of the banking sector. In addition, controlling the inflation rate is required to stabilize the currency and interest rates.

References

Abaidoo, R., & Anyigba, H. (2020). Bank performance variability and strands of inflationary conditions. European Journal of Management and Business Economics, 29(3), 235–253. https://doi.org/10.1108/EJMBE-09-2018-0100

Al-Harbi, A. (2019). The determinants of conventional banks profitability in developing and underdeveloped OIC countries. Journal of Economics, Finance and Administrative Science, 24(47), 4–28. https://doi.org/10.1108/JEFAS-05-2018-0043

Arfaoui, M., & ben Rejeb, A. (2017). Oil, gold, US dollar and stock market interdependencies: a global analytical insight. European Journal of Management and Business Economics, 26(3), 278–293. https://doi.org/10.1108/EJMBE-10-2017-016

Asongu, S. A. (2014). Government Quality Determinants of Stock Market Performance in African Countries. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2493176

Bernanke, B. S., & Blinder, A. S. (1992). The Federal Funds Rate and the Channels of Monetary Transmission. The American Economic Review, 82(4), 901–921. http://www.jstor.org/stable/2117350

Bhattarai, S., Chatterjee, A., & Park, W. Y. (2020). Global spillover effects of US uncertainty. Journal of Monetary Economics, 114, 71–89. https://doi.org/10.1016/J.JMONECO.2019.05.008

Bondarchuk, V., & Raboshuk, A. (2020). The Impact of Monetary Policy on Economic Growth in Ukraine.

Egbunike, C. F., & Okerekeoti, C. U. (2018). Macroeconomic factors, firm characteristics and financial performance: A study of selected quoted manufacturing firms in Nigeria. Asian Journal of Accounting Research, 3(2), 142–168. https://doi.org/10.1108/AJAR-09-2018-0029

Fama, E. F. (1981). Stock Returns, Real Activity, Inflation, and Money. The American Economic Review, 71(4), 545–565. http://www.jstor.org/stable/1806180

Flamini, V., Mcdonald, C., & Schumacher, L. (2009). The Determinants of Commercial Bank Profitability in Sub-Saharan.

Gujarati, D.N. (2013). Dasar-dasar Ekonometrika, Edisi Kelima. Jakarta: Salemba Empat.

Hossain, A. A. (2016). Inflationary shocks and real output growth in nine Muslim-majority countries: Implications for Islamic banking and finance. Journal of Asian Economics, 45, 56–73. https://doi.org/10.1016/J.ASIECO.2016.06.004

IDX Financials. (2021). IDX Financials.

IDX InfoBank15. (2021). InfoBank15 Index Fact Sheet. Index Fact Sheet.

Islam, M. S., & Nishiyama, S.-I. (2016). The Determinants of Bank Profitability: Dynamic Panel Evidence from South Asian Countries. In Journal of Applied Finance & Banking (Vol. 6, Issue 3). online) Scienpress Ltd.

Islam, Md. S., Hossain, Md. E., Chakrobortty, S., & Ema, N. S. (2021). Does the monetary policy have any short-run and long-run effect on economic growth? A developing and a developed country perspective. Asian Journal of Economics and Banking, ahead-of-print (ahead-of-print). https://doi.org/10.1108/ajeb-02-2021-0014

Karakaya, A., & ayaydın, H. (2014). The Effect of Bank Capital on Profitability and Risk in Turkish Banking. International Journal of Business and Social Science, 5, 252–271.

Khan, J., & Khan, I. (2018). The Impact of Macroeconomic Variables on Stock Prices: A Case Study of Karachi Stock Exchange. www.iiste.org

Khan, W. A., Shahid, M., Bari, R., Anam, W., Shehzad, N., & Siddique, S. (2014). Impacts of Inflationary Trends on Banks' Performance (Large Banks Segment) in Pakistan. International Journal of Accounting and Financial Reporting, 4(1), 296. https://doi.org/10.5296/ijafr.v4i1.6083

Li, Y. D., İşcan, T. B., & Xu, K. (2010). The impact of monetary policy shocks on stock prices: Evidence from Canada and the United States. Journal of International Money and Finance, 29(5), 876–896. https://doi.org/https://doi.org/10.1016/j.jimonfin.2010.03.008

Misra, P. (2018). An investigation of the macroeconomic factors affecting the Indian stock market. Australasian Accounting, Business and Finance Journal, 12(2), 71–86. https://doi.org/10.14453/aabfj.v12i2.5

Nikhil, B., & Deene, S. (2021). Monetary policy collision on the performance of banking sector in India. Vilakshan - XIMB Journal of Management, ahead-of-print (ahead-of-print). https://doi.org/10.1108/xjm-11-2020-0200

Nyorekwa Twinoburyo, E., & Odhiambo, N. (2018). Monetary Policy and Economic Growth: A Review of International Literature. Journal of Central Banking Theory and Practice, 7, 123–137. https://doi.org/10.2478/jcbtp-2018-0015

Rana-Al-Mosharrafa, & Islam, Md. S. (2021). What Drives Bank Profitability? A Panel Data Analysis of Commercial Banks in Bangladesh. International Journal of Finance & Banking Studies (2147-4486), 10(2), 96–110. https://doi.org/10.20525/ijfbs.v10i2.1236

Saeed, M. S. (2014). Bank-related, Industry-related and Macroeconomic Factors Affecting Bank Profitability: A Case of the United Kingdom. In Research Journal of Finance and Accounting www.iiste.org ISSN (Vol. 5, Issue 2). www.iiste.org

Shu, Y., Broadstock, D., & Xu, B. (2013). The heterogeneous impact of macroeconomic information on firms' earnings forecasts. The British Accounting Review, 45, 311–325. https://doi.org/10.1016/j.bar.2013.06.011

Sims, C. A. (1980). Macroeconomics and Reality. In Econometrica (Vol. 48, Issue 1).

Sri Apriani, E., Hamzah, Z., & Sofilda, E. (2020). Pengaruh BI 7-Day Repo Rate, Kurs USD-Idr, Price to Book Value (PBV), dan Cadangan Devisa Indonesia terhadap Return pada Indeks Infobank15. Media Ekonomi, 28(1), 15–24. https://doi.org/10.25105/me.v28i1.7977

Sulistiana, I., Hidayati, & Sumar. (2017). Model Vector Auto Regression (VAR) and Vector Error Correction Model (VECM) Approach for Inflation Relations Analysis, Gross Regional Domestic Product (GDP), World Tin Price, Bi Rate and Rupiah Exchange Rate. IJBE: Integrated Journal of Business and Economics, 17–32. http://ijbe-research.com

Veerbek, M. (2017). A Guide to Modern Econometrics, 5th Edition. New York (US): Wiley.

Wibowo, E., Utami, S. S., Rufti, A., & Dewati, A. (2022). The Effect of Return on Equity, Earning Per Share, and Net Profit Margin on Stock Prices of Banking Companies Listed on the Indonesia Stock Exchange for the Period of 2018-2020. Budapest International Research and Critics Institute-Journal (BIRCI-Journal), 5(1), 162–171. https://doi.org/10.33258/birci.v5i1.3589