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ANALYSIS OF RISK-TAKING POLICY CHANNEL ON INDONESIAN BANKING

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Abstract

The purpose of this study is to explore how monetary policy influences the risk-taking of banks their performance in Indonesia. The study measures the risk-taking policy channel, which is the way that monetary policy affects the risk preferences and actions of banks. The study uses five indicators: ROA, FDR, BOPO, NPL, and M2. The study applies VECM to examine the data from 2010 to 2021. The findings reveal that Variables ROA, FDR AND BOPO have short-run and ROA, NPL, M2, and FDR correlated with each other in the long run. The findings also show BOPO is only significantly correlated with M2 in the long run. This means that loose monetary policy lowers the profitability, liquidity, and efficiency of banks, and raises the credit risk. The study recommends that monetary policymakers should take into account the risk-taking of banks when setting monetary policy, and that banks should handle their risks carefully to sustain their performance.

Keywords: Risk-Taking,Monetary Policy, Banks, Performance, VECM

INTRODUCTION

The Indonesian economy relies heavily on the banking sector. Banks play a crucial role in connecting savers and borrowers, and in carrying out the monetary policy decided by Bank Indonesia (BI), the central bank. The monetary policy can influence how banks manage their risks, such as the risk of default, the risk of cash shortage, and the risk of price fluctuations. These risks can affect how well banks perform, both in terms of earning profits and maintaining stability.

The risk-taking channel of monetary policy describes how the policy interest rate influences the willingness and behavior of financial intermediaries, such as banks, to take risks. (Abbate & Thaler, 2023). By lowering the interest rate, the central bank makes borrowing cheaper and lending more profitable (Guttmann, Lawson, & Rickards, 2020). The central bank's interest rate policy influences the risk-taking behavior of banks. When the interest rate is low, banks can borrow cheaply and lend profitably (Acosta Smith, 2018; Meuleman & Vander Vennet, 2020). According From them this encourages them to lend more to riskier borrowers or invest more in riskier assets. When the interest rate is high, banks face higher borrowing costs and lower lending profits This discourages them from lending to riskier borrowers or investing in riskier assets.

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One of the advantages of the risk-taking policy channel in banking in Indonesia is that it can assess how much monetary policy affects the financial system's stability (Bruno & Shin, 2015; Octavira, 2021; Rumondor & Bary, 2020). According book (International Monetary Fund, 2014) the objective is to motivate banks to adopt optimal risk-taking policies, which can enhance their efficiency and growth in the financial sector. A new case of risk-taking policy is studied by Fadili from UNEJ, who examines Bank Syariah Indonesia (BSI), the merged entity of Bank BNI Syariah, Bank Syariah Mandiri, and Bank BRI Syariah. BSI implements LTV/FTV that matches the customers and collateral's risk profile, which enables BSI to improve its credit risk management (Komputer & Jember, 2017).

The theory of risk-taking behavior describes how a person acts in risky situations, which involve uncertainty and potential loss (Dewani, Rahmi, & Rahayuningsih, 2022). A well-known theory of risk-taking behavior is the theory of risk-taking channel of monetary policy transmission. This theory shows how the interest rate changes can influence the banks willingness and behavior to take risks in lending through the interest rate channel, balance sheet channel, and credit channeling channel (Nguyen & Boateng, 2015; Pricillia, 2015). From performance perspective, theory of financial intermediation describes how banks function as intermediaries between parties that have surplus and require funds (Purwoko & Sudityatno, 2013). According from (Isnaini, Haryono, & Muhdir, 2021) The variables using for risk-taking channel are ROA, FDR, BOPO, NPL, and M2.

ROA (Return on Assets) is a bank profitability indicator. The higher the ROA, the more profit the bank makes from its assets. Riskier banks tend to lend more money to sectors with higher risk, which can increase their profits. But this also means they face higher credit risk, which can result in bigger losses. FDR (Financing to Deposit Ratio) shows how much of the bank's funds are lent out to customers, compared to the funds it receives from third parties. The higher the FDR, the more the bank has lent out its funds. Riskier banks tend to lend more money, which raises their FDR. BOPO (*Belanja Operasional terhadap Pendapatan Operasional* or Cost-to-Income Ratio) compares the bank's operating expenses and its operating revenue. The higher the BOPO, the more the bank spends on its operations. Riskier banks tend to spend more on their operations, because they need to cover higher costs of lending money. NPL (Non-Performing Loan) measures how much of the bank's credit is problematic, meaning that customers cannot pay it back. The higher the NPL, the more problematic credit the bank has. Riskier banks tend to have more problematic credit, because they give loans to customers with higher risk. M2 (Money Supply) indicates how much money there is in the economy. The higher the M2, the more money there is for spending or investing. Riskier banks tend to lend more money, which raises M2. Variables are selected because they generally have a relationship with the reference interest rate, which is consistent with the theory of risk-

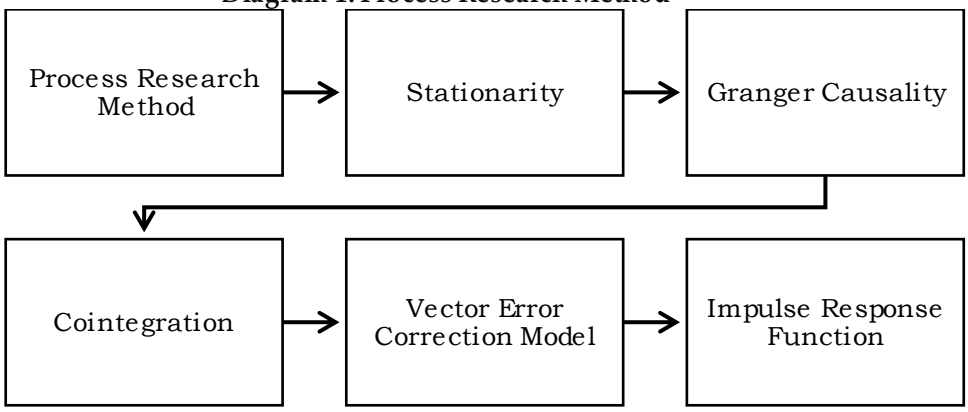
taking channel. The variables also have features that are relevant for banking in terms of policy making.

The purpose of this research is to explore how monetary policy influences the risk-taking of banks their performance in Indonesia. Also measures the risk-taking policy channel, which is the way that monetary policy affects the risk preferences and actions of banks. The research is expected to contribute to the empirical literature on the risk-taking channel in Indonesia, as well as to provide implications for mone

RESEARCH METHODE

This research method aims to analysis of risk-taking policy channel on the Indonesian banking sector using different indicators such as ROA, FDR, BOPO, NPL and M2 from the beginning of 2010 to the end of 2021. The method applied is the Vector Error Correction Model (VECM), which is a quantitative model analysis time series data that do not have a constant mean or variance, but are related in the long run. The VECM model can measure how the variables affect each other in the short run and the long run. that includes tests for Stationarity, Granger Causality, Cointegration, VECM Model Estimation, and Impulse Response Function Test. These tests help to measure the long-run and short-run effects of risk-taking on the performance of Indonesian banking based on its indicators.

Diagram 1. Process Research Method



Formula For VECM

$$\Delta y_t = \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-i} + \epsilon_t$$

According (Zou, 2018) uses Δ to show how much the variables change, yt to show a group of n related variables, Π to show how the variables are connected in the long run, Γi to show how the variables change in the short run, p to show how many past values are used, and ϵt to show the errors. The Π can be split into two parts, α and β, so that $\Pi=\alpha\beta'$, where α shows how fast the system goes back to normal, and β shows the long-

term relationships among the variables. The size of Π, called r, shows how many long-term relationships there are. If r=0, then there is no long-term relationship and the model is a simple VAR with differences. If r=n, then all variables are stable and the model is a simple VAR with levels. If 0<r<n, then there is a long-term relationship and the model can be estimated by VECM.

RESULTS AND DISCUSSIONS

A. Test Stationertity

A stationarity test is a statistical method that checks if a model is stationary or not. According (Bawdekar & Prusty, 2022) A model is stationary if its statistical characteristics like mean, variance, covariance, and standard deviation of the time series are constant over time, or are independent of time.

Table 1. Result Test Stationarity Individual Variables

Variables	Level	1st difference
ROA	0.8243	0
NPL	0.2282	0
M2	0.2727	0.0208
FDR	0.1257	0.0001
BOPO	0.9668	0

Source: From the results of data processing

Table 2. Result Test Stationarity Group Variables

Group	Prob	Statistic
Levin, Lin & Chu t*	0.0084	-2.39185
Im, Pesaran and Shin W-stat	0	-12.0417
ADF - Fisher Chi-square	0	185.422
PP - Fisher Chi-square	0	344.308

Source: From the results of data processing

The results in table 1 indicate that none of the variables are stationary at level, as the stationarity test using level exceeds 0.05. However, at 1st difference the stationarity test is below 0.05, implying that the variables are stationary at 1st difference level and do not contain a unit root.

The results in table 2 demonstrate that the group variable stationarity is tested by four methods: Levin, Lin, and Chu test, Im, Pesaran, and Shin test, ADF-Fisher test, and PP-Fisher test. All methods reject the null hypothesis of a unit root with probability less than 0.05, suggesting that the group variables are stationary and have a long-term relationship among them.

B. Test Granger Causality

Granger causality is a way of testing whether the past values of one time series have useful information for forecasting the future values of another time series (Hecq, Margaritella, & Smeekes, 2023). It does not mean that there is a true cause and effect relationship, but rather a predictive one. According (Caporale, Lodh, & Nandy, 2017; Hecq et al., 2023; Setyaningsih, Rahardi, & Laos Mbato, n.d.) Granger causality can be used for different kinds of data, such as data that have only one dimension (time series), data that have two dimensions (cross-sectional and time), or data that have more than two dimensions (panel data).

Table 3. Result Test Granger Causality

Hypothesis	Obs	F-Statistic	Prob.
NPL to ROA	143	2.29711	0.1319
ROA to NPL	143	0.25476	0.6145
M2 to ROA	143	7.13010	0.0085
ROA to M2	143	0.03088	0.8608
FDR to ROA	143	5.28628	0.0023
ROA to FDR	143	0.65908	0.4183
BOPO to ROA	143	21.1190	1.00E-05
ROA to BOPO	143	8.18287	0.0049
M2 to NPL	143	0.08750	0.7678
NPL to M2	143	0.31415	0.0576
FDR to NPL	143	1.05742	0.3056
NPL to FDR	143	0.06791	0.7948
BOPO to NPL	143	6.78876	0.0102
NPL to BOPO	143	4.79893	0.0301
FDR to M2	143	0.57192	0.4508
M2 to FDR	143	5.75667	0.0177
BOPO to M2	143	9.16792	0.0029
M2 to BOPO	143	1.16791	0.2817
BOPO to FDR	143	18.3425	3.00E-05
FDR to BOPO	143	18.7386	3.00E-05

Source: From the results of data processing

Note: Prob. < 0.005 is Significant

The granger causality test shows that there are some variables that have causal relationships with each other. ROA causes M2 (0.0085), ROA causes FDR (0.0023), BOPO causes ROA (0.0049), NPL causes BOPO (0.0102), BOPO causes NPL (0.0301), FDR causes

M2 (0.0177) and M2 causes BOPO (0.0029). Based on (Hecq et al., 2023), the variables that have causal relationships have a statistical relationship that indicates that the past values of one variable can be used to predict the future values of another variable.

C. Test Cointegration

A cointegration test is a statistical method that examines and evaluates the long-run economic linkage among variables that are integrated and cointegrated internationally (Yussuf, 2022; Zou, 2018). A cointegration test makes a vector error correction model that incorporates an error correction term to capture the long-run linkage among variables that are integrated and cointegrated. A cointegration test also applies unit root test and cointegration test to check the stationarity and cointegration of variables. According from (Yussuf, 2022; Zou, 2018) A cointegration test is useful for exploring the economic connection between nations, markets, commodities, or macroeconomic measures.

Table 4. Result Test Cointegration

CE(s)	Trace Statistic	Critical Value	Prob
0	292.5727	69.81889	0.0001
1	203.4871	47.85613	0.0000
2	138.4914	29.79707	0.0001
3	79.95696	15.49471	0.0000
4	30.30153	3.841466	0.0000

Source: From the results of data processing

The cointegration test results show that from hypothesis 0 to 4, the probability values are below 0.05. This means (Zou, 2018) that the variables that have been tested for cointegration have a long-term relationship, and then variables can be further tested using the VECM model.

D. Test Vector Error Correction Estimation Model

A vector error correction model (VECM) is a kind of statistical model that can be applied to examine the long-run linkage between variables that are integrated and cointegrated. Variables that are integrated are those that are not constant over time, but become constant after taking differences. Variables that are cointegrated are those that have a steady equilibrium relation in their levels, even if they are individually non-constant. A VECM can account for both the short-term and long-term changes of the variables by adding an error correction term that indicates the deviation from the equilibrium (Zou, 2018).

Table 5. Result VECM Short Term

Variabel	CointEq1
D(ROA,-1)	1.000000**

D(NPL,-1)	0.78566
D(M2,-1)	0.34781
D(FDR,-1)	2.06139**
D(BOPO,-1)	2.51849**
C	-0.011905

Source: From the results of data processing

Table 6. Result VECM Long Term

EC	ROA	NPL	M2	FDR	BOPO
CEQ1	1.29	0.94	5.75*	-7.47*	-9.84*
ROA	-4.54*	0.47	-0.35	0.53	1.47
NPL	-0.47	-4.61*	1.01	-0.46	-0.19
M2	-0.02	-0.89	-4.58*	0.01	0.25
FDR	0.15	0.34	0.66	-2.55*	0.13
BOPO	-0.06	-0.31	-2.71*	2.94*	0.2
C	0	0.1	0.04	-0.28	-0.04

Source: From the results of data processing

Note: ** For The Short Run, * For The Long Run

To determine the short-term and long-term relationships between variables in a VECM, we use the t-statistic. According (Fadili, Zainuri, & Priyono, 2019) The t-statistic is a measure of the statistical significance of a correlation coefficient. If the t-statistic is greater than 1.645 / -1.645 or equal to the critical value, then the correlation coefficient is considered to be significant.

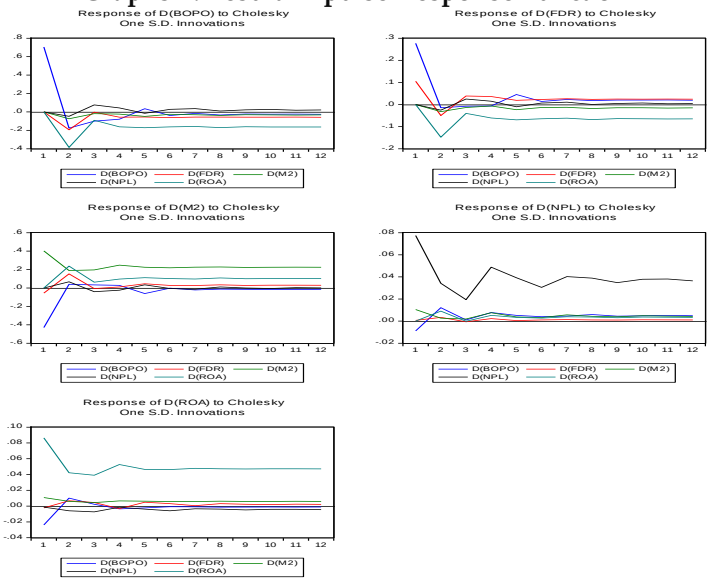
The results of the VECM for the short-term show that ROA, FDR, and BOPO are significantly correlated with each other. In the long term, ROA, NPL, M2, and FDR are also significantly correlated with each other. However, BOPO is only significantly correlated with M2 in the long term.

Based on (Amijaya & Alaika, 2023; Kang, Guo, & Zhang, 2019) the risk-taking policy channel theory, the performance of Indonesian banks is influenced by several banking variables. The variables have mostly negative rather than positive correlations with each other. However, our results indicate that the variables are significantly correlated on their own rather than together in the long run, which means negative. This is in line with the previous research that applied a different method.

E. Test Impulse Response Function

Impulse Response Function (IRF) is an analysis that aims to measure the response of endogenous variables to disturbances shocks that come from other variables in the VECM model (Function, 2020; Koop, Pesaran, & Potter, 1996). IRF traces the effects of a one-standard-deviation shock to one variable on the response of all variables in the system.

Graphs 1. Result Impulse Response Function



Source: From the results of data processing

D(BOPO) responds positively to shocks from itself and D(FDR), but negatively to shocks from D(M2). This response decreases over time, which means that the impact of the shock will fade away.

D(FDR) responds positively to shocks from itself and D(BOPO), but negatively to shocks from D(M2) and D(NPL). This response decreases over time, which means that the impact of the shock will fade away.

D(M2) responds positively to shocks from itself, D(FDR), and D(NPL), but negatively to shocks from D(BOPO). This response decreases over time, which means that the impact of the shock will fade away.

D(NPL) responds positively to shocks from itself, D(FDR), and D(M2), but negatively to shocks from D(BOPO) and D(ROA). This response decreases over time, which means that the impact of the shock will fade away.

D(ROA) responds positively to shocks from itself and D(M2), but negatively to shocks from D(BOPO), D(FDR), and D(NPL). This response increases over time, which means that the impact of the shock will become stronger

CONCLUSION

The research has found that the bank performance indicators, namely ROA, NPL, M2 and FDR are significantly related to each other in both short-term and long-term, except for BOPO which only has a long-term relationship with M2. The research has also revealed that the bank performance indicators have mostly negative correlations with each other, meaning that lower policy interest rate reduces the profitability, liquidity, and efficiency of banks, and increases the credit risk. The research has confirmed the risk-

taking policy channel theory that suggests that monetary policy affects the risk perception or risk tolerance of banks. The research has shown that the bank performance indicators react differently to shocks from themselves and other variables. The research has also observed that the responses of the bank performance indicators decline over time, except for ROA which rises over time. This implies that the shocks have a transitory effect on the bank performance indicators, except for ROA which has a permanent effect.

The policy recommendations are as follows. The central bank should carefully consider the impact of its monetary policy decisions on bank risk-taking behavior. The central bank should use macroprudential tools to mitigate the risks associated with excessive risk-taking in the banking system. Banks should strengthen their risk management frameworks to ensure that they are able to manage their risks effectively. Policymakers should be mindful of the impact of their monetary and macroprudential policies on the risk-taking behavior of banks. Banking regulators should strengthen their risk management oversight of banks, particularly those that are engaged in riskier lending activities. Banks should develop and implement sound risk management frameworks to mitigate the risks associated with their lending activities.

Future Research Directions is needed to explore this channel in more detail, such as by examining the different types of bank risk that are affected by monetary policy and the specific mechanisms through which monetary policy affects bank risk. Additionally, future research could compare the risk-taking channel in Indonesia to other countries, such as developed countries and other emerging markets.

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