

Bank Indonesia's Behavior in Response to The Fed's Policy

Kiky Indah Sari¹, Telisa Aulia Falianty²

^{1,2} Department of Economics, Faculty of Economics and Business,
University of Indonesia, Indonesia

E-mail: kiky.indah@ui.ac.id

Received: July 15, 2024; Accepted: April 14, 2025; Published: May 2, 2025

Permalink/DOI: <http://dx.doi.org/10.17977/um002v17i12025p103>

Abstract

Global economic instability is a challenge for the domestic economy, especially for emerging countries. A higher Federal Funds Rate for a longer period affects economic stability. Bank Indonesia plays a role in determining the BI rate to achieve economic goals. Indonesia, as an open economy, needs to consider external aspects in determining monetary policy. The Augmented Taylor Rule framework can facilitate this need to know about the determination of the BI rate. This study aims to identify the behavior of Bank Indonesia in response to the Fed's policy and the phenomenon of higher for longer. The research period was conducted from 2000Q2 to 2023Q4 using secondary data. The results of the analysis show that overall, Bank Indonesia responds to an increase in the BI rate when the inflation gap increases, the output gap increases, and the rupiah depreciates. These conditions follow the Taylor Rule framework. However, in the higher for longer period, there is a change in which the determination of the BI rate depends only on the output gap and the real exchange rate. The inflation gap variable has no significant effect on the determination of the BI rate. In the higher for a longer period, the prioritized economic goal is a comprehensive economic recovery.

Keywords: *Augmented Taylor Rule; Monetary Policy; Two Stage Least Square*

JEL Classification: C26; E43; E52

INTRODUCTION

The development of the economy depends on various sides, both from the global and domestic economies. Each party is interrelated in creating economic stability. Global economic dynamics can provide spillovers to other countries, such as the United States to emerging countries (Chen et al., 2014; Engler, 2023). The influence can occur through various channels, such as signaling, credit spread, trade, and portfolio balance channels. International Monetary Fund (2023b) stated that the economic recovery after COVID-19 and the Russia-Ukraine conflict is still slow and uneven. These conditions expand the growth divergence between regions. The policy response implemented to overcome growth divergence between regions is to tighten monetary policy in the form of increasing interest rates. This is evidenced by the high Fed Fund Rate (FFR) from 2022 - 2024 of 1.28% - 5.33%. The interest rate will be maintained until the first

half of 2024, thus creating a condition of high interest rates lasting for a long time (higher for longer).

The Fed's contractionary monetary policy also affects other macroeconomic variables and the financial sector across countries. The exchange rate responds to an increase in US interest rates (Jin et al., 2022; Shang & Zhou, 2023). The effect of US interest rates on exchange rates can be explained by direct transmission or indirect transmission through export and import variables. An increase in US interest rates increases capital inflow in the United States, resulting in dollar appreciation and RMB depreciation. The depreciation of the RMB harms China's import sector and foreign debt financing in dollars. The exchange rate is also related to financial system stability. The choice of exchange rate regime is adjusted to the source of shocks. The flexible exchange rate is relevant when the source of shocks to financial system stability is from "outside" such as in the case of the Great Depression, and vice versa, if the source of shocks to financial stability comes from "inside" then use the peg exchange rate (Eichengreen, 1998). Indonesia, as a country that gets spillovers from other countries' policies, especially the United States, is suitable for a flexible exchange rate. Indonesia, since August 1997, began to implement the free-floating exchange rate and its movement is determined by the forces of supply and demand for foreign exchange in the market. The use of the floating exchange rate system in Indonesia follows the stipulation of Law Number 24 Year 1999 on Foreign Exchange Traffic and Exchange Rate System.

Based on a study conducted by Käfer (2014), it is known that financial stability has two perspectives in the context of monetary policy. First, the proactive explains that monetary policy through inflation targeting is related to financial stability, especially after the Global Financial Crisis (GFC) (Woodford, 2012). On the other hand, the reactive explains that the relationship between monetary policy and financial stability is still weak (Posen, 2006). This is because asset price bubbles that illustrate financial instability occur due to irrational conditions, technological developments, and financial deregulation. Therefore, the central bank does not need to be concerned with financial stability. Both perspectives are different when it comes to interest rates. Proactive argues that an interest rate hike does not have to be followed by an economic recession, while reactive argues that an interest rate hike affects financial markets, which then leads to high inflation and output fluctuations (Käfer, 2014).

The main instrument in monetary policy to achieve economic stability is interest rates. The concept of determining interest rates can be done using the Taylor Rule framework by Taylor (1993). The use of the Taylor Rule can guide the central bank in determining the interest rate target. The interpretation of this rule states that when output exceeds its natural rate and inflation exceeds the target, the central bank should respond by raising real interest rates above the long-run equilibrium level (Romer, 2012). The traditional Taylor Rule only focuses on price and output stability. However, along with the dynamics of the economy in the form of the importance of financial stability, the Augmented Taylor Rule has been developed by discussing exchange rate variables, asset prices, credit or leverage, and credit spreads. Given the existence of economic developments that require financial stability, central banks need to know the aspects that must be considered in determining monetary policy, especially in

determining interest rates in the era of global challenges in the form of the phenomenon of higher for longer.

The study aims to identify the behavior of Bank Indonesia in determining the BI rate based on the Fed policy and the phenomenon of higher for longer. This makes this research different from previous studies. The monetary policy reaction function in Indonesia becomes a very necessary thing when Indonesia often gets spillover effects from the economic decisions of the United States.

LITERATURE REVIEW

The Taylor Rule is one of the rules that play an important role in policymaking, introduced by Taylor (1993). Taylor Rule explains the response of interest rate to the development of output and inflation, which can be written as equation (1).

$$i_t = i^* + \Delta p_t^a + \alpha(\Delta p_t^a - \pi^*) + \beta(y_t - y^*) \quad (1)$$

where i_t is the short-term interest rate, i^* is the long-term equilibrium interest rate, Δp_t^a or π_t is the average inflation, π^* is the inflation target, y_t is the real output, y^* is the potential output. Then α and β are parameters to see the effect of inflation and real output developments on the development of interest rates.

The Taylor Rule equation (1) only explains the interest rate response to output gap deviation and inflation deviation at the same time or contemporaneously. Taylor Rule modification is also done by Taylor (2001) by adding exchange rate variables that can be simplified as equation (2). The exchange rate is an important instrument in the evaluation model. The exchange rate also affects the trade and import-export sectors. Therefore, the exchange rate plays an important role in determining monetary policy, especially in the era of economic openness.

$$i_t = i^* + \rho i_{t-1} + \alpha(y_t - y^*) + \beta(\pi_t - \pi^*) + \lambda_0 e_t + \lambda_1 e_{t-1} \quad (2)$$

where e_t is the real exchange rate and λ is the reaction of the exchange rate to the interest rate. The existence of e_{t-1} describes the dynamics that occur in the exchange rate so that λ_0 describes the initial reaction of the exchange rate, which is then followed by subsequent reactions (λ_1). Equation (2) is constructed without an intercept, which explains that the inflation target is zero, and interest rates and exchange rates are calculated based on a long-run steady-state value perspective.

Modification by adding an exchange rate has an impact on the economy in Turkey (Soybilgen & Eroğlu, 2019). This needs to be done especially when the exchange rate depreciates in the inflation targeting period. The study of Soybilgen & Eroğlu (2019) provides relevant results by using time-variant monetary policy in the form of the time-varying endogenous model. The results obtained will be more consistent than using a time-invariant monetary policy. The effectiveness of the exchange rate in the Taylor Rule model presented by Soybilgen & Eroğlu (2019) was contradicted by Mna & Kilani (2023), who conducted research in Tunisia. The addition of foreign effects in the form of exchange rates and foreign interest rates does not affect interest rates. The results showed that the domestic

aggregate (inflation and output gap) plays an important role in determining interest rates. The findings of Mna & Kilani (2023) state that the economy in Tunisia, especially inflation behavior, does not work under the Taylor Rule framework. This is because the inflation gap has a negative relationship with interest rates, while the Taylor Rule framework uses the opposite framework. Several factors can encourage this to happen, such as politics, economic instability, independence and credibility of the central bank, and uncertainty in pricing. Then the empirical results related to the output gap are consistent with the Taylor Rule framework, which has a positive relationship to interest rates.

The debate on the results of testing the exchange rate in the Taylor Rule framework illustrates that the exchange rate needs to be tested again regarding its effectiveness in determining interest rates. The exchange rate variable is endogenous and can be influenced by several variables, one of which is the global interest rate. Jin et al. (2022) explained that the influence of US interest rates on the China-US exchange rate can occur through direct and indirect transmission. Direct transmission is explained under the theory of interest rate parity. An increase in interest rates will cause capital to flow to countries with high interest rates. This has an impact on decreasing the spot exchange rate and increasing the forward exchange rate. Meanwhile, the indirect transmission is explained through several channels. An increase in global interest rates may lead to a decrease in consumption or an increase in savings. This will result in increased exports and may lead to a decline in the spot exchange rate. Another impact that can be felt due to an increase in interest rates is a decrease in credit, which will then lead to a declining liquidity market and a decrease in commodity prices. In the end, the domestic exchange rate strengthens and the exchange rate of other countries weakens. The relationship between the rise in US interest rates and the weakening of China's exchange rate was emphasized by Shang & Zhou (2023).

METHOD

Data

The research is conducted in Indonesia by dividing into two groups, namely the full sample (2000Q2 - 2023Q4) and the subsample (2013Q1 - 2023Q4). The use of subsamples is done to explain the behavior of Bank Indonesia in responding to the phenomenon of higher for longer. The type of data used in this study is secondary data obtained from Bank Indonesia (BI), International Monetary Fund, Federal Reserve Board (FED), CEIC, and Bank for International Settlements (BIS), with the period 2000Q2 - 2023Q4. The data collected includes the BI rate, Consumer Price Index (CPI), inflation target, real GDP growth, Real Effective Exchange Rate (REER), and federal funds rate.

Model Specification

This study adopts the research model of Taylor (2001), which discusses the use of exchange rates in the Taylor Rule for determining interest rates, which can be seen in equation (1). Under an open economy, monetary policy also needs to consider external aspects. The exchange rate can affect prices between domestic and foreign markets and can be a channel for explaining foreign disturbances such as foreign inflation, foreign interest rates, and others (Svensson, 2000). In addition, the exchange rate is also one of the indicators in measuring financial

stability. Gadanez & Jayaram (2009) explained that financial stability can be measured from six sectors, namely the real sector, corporate sector, household sector, external sector, and financial sector. The exchange rate is part of the external sector. Therefore, the research model used in this study is like equation (3).

$$i_t = \beta_0 + \beta_1 \tilde{\pi}_t + \beta_2 \tilde{y}_t + \beta_3 le_t + \mu_t \quad (3)$$

where i_t is the interest rate, $\tilde{\pi}_t$ is the *inflation gap*, \tilde{y}_t is the *output gap*, and le_t is the real exchange rate.

The variables in the Taylor Rule are endogenous, one of which can be influenced by the Federal Fund Rate (FFR). Some previous studies have proven that the FFR can affect the exchange rate through both direct and indirect channels (Jin et al., 2022; Shang & Zhou, 2023). The addition of foreign interest rates in the Taylor Rule framework also follows the research model used by Mna & Kilani (2023). The endogeneity problem contained in the Taylor Rule is solved by using Two-Stage Least Square (2SLS). The instrument variables used include lag inflation gap ($\tilde{\pi}_{t-1}$), lag output gap (\tilde{y}_{t-1}), lag exchange rate (le_{t-1}), and federal fund rate (FED_t).

The first stage of 2SLS is to find the fitted value of each variable: inflation gap, output gap, and real exchange rate. The fitted value of the inflation gap can be seen from equation (4).

$$\tilde{\pi}_t = \tau_0 + \tau_1 \tilde{\pi}_{t-1} + \tau_2 \tilde{y}_{t-1} + \tau_3 le_{t-1} + \tau_4 FED_t + v_t \quad (4)$$

Meanwhile, the fitted value of the output gap can be seen from equation (5).

$$\tilde{y}_t = \gamma_0 + \gamma_1 \tilde{\pi}_{t-1} + \gamma_2 \tilde{y}_{t-1} + \gamma_3 le_{t-1} + \gamma_4 FED_t + v_t \quad (5)$$

Then the fitted value of the real exchange rate can be seen from equation (6).

$$le_t = \alpha_0 + \alpha_1 \tilde{\pi}_{t-1} + \alpha_2 \tilde{y}_{t-1} + \alpha_3 le_{t-1} + \alpha_4 FED_t + v_t \quad (6)$$

The next step is to substitute the fitted value into equation (3) into equation (7).

$$i_t = \beta_0 + \beta_1 \hat{\tilde{\pi}}_t + \beta_2 \hat{\tilde{y}}_t + \beta_3 \hat{le}_t + \delta_1 \hat{v}_t + \delta_2 \hat{v}_t + \delta_3 \hat{v}_t + \mu_t \quad (7)$$

where i_t is the interest rate, $\hat{\tilde{\pi}}_t$ is the fitted value of the inflation gap, $\hat{\tilde{y}}_t$ is the fitted value of the output gap, \hat{le}_t is the fitted value of the real effective exchange rate, $\beta_{1,2,3}$ are the variable coefficients, β_0 is an intercept, $\delta_{1,2,3}$ are the error term coefficients, \hat{v}_t is the error term in the first stage, and μ_t is the error term.

Method

The Instrumental Variable (IV) or 2SLS method was chosen because the model found omitted variables or endogeneity problems. Wooldridge (2013) discussed that the use of IV must fulfill two assumptions, namely instrument exogeneity and instrument relevance. The instrument exogeneity assumption describes that the observed variable (z) is not correlated with u or $Cov(z, u) = 0$.

While instrument relevance explains that the observed variable (z) is correlated with the explanatory variable (x) or $Cov(z, x) \neq 0$.

IV or 2SLS estimation is done using two stages. The first stage is to estimate the endogenous explanatory variables such as equations (4), (5), and (6) to obtain the fitted value. The second stage is to substitute the fitted value into equation (3) to become equation (7) and then perform OLS regression. In addition, 2SLS estimation also needs to perform an endogeneity test and an overidentification test. Endogeneity tests can be conducted using the Wu-Hausman Test. Hausman (1978) suggested directly comparing the OLS and 2SLS estimates to determine their significance. Then, the overidentification test is conducted using the Sargan Test. If the chi-square value exceeds the critical value of 5%, then the null hypothesis is not rejected and illustrates that the instrument used is valid.

IV or 2SLS estimation still requires a classical assumption test to ensure that the estimator used is valid, especially in the first stage of 2SLS estimation. Heteroscedasticity testing is conducted to determine the variance of the error term on the independent variable. Heteroscedasticity on instrumental variables is tested through Pagan-Hall Tests. In the model equation, it is necessary to fulfill the normality assumption on errors or residuals. This study conducted a normality test through the Shapiro-Wilk W Test. In this test, there are two stages, namely calculating the residual value of the IV model, and then testing the hypothesis of the Shapiro Wilk-W Test. Multicollinearity occurs when independent variables are related to other variables. This condition makes it difficult to identify the relationship between the dependent and independent variables. The method used to test multicollinearity is the Variance Inflation Factor (VIF). All aspects of the classical assumptions may not be met. The solution that can be done is to use heteroskedasticity robust standard error or Weighted Least Square (WLS) (Wooldridge, 2013). Robust standard error is done by adjusting the standard error of the regression coefficient to keep it valid. Adjusting the covariance matrix on the regression coefficients will be able to identify heteroscedasticity to produce valid standard errors even though there is heteroscedasticity in the errors.

RESULTS AND DISCUSSION

Higher for Longer

Higher for longer is a condition where interest rates are high and last for a long time. The term higher for longer emerged when the Fed began to raise the FFR continuously since 2022Q1 until now, due to several global instabilities that occurred, such as the Russia-Ukraine conflict, the cost of living crisis, and the slowdown in China (International Monetary Fund, 2022). This has an impact on emerging countries, including Indonesia. Therefore, the BI rate since 2022Q3 has shown a continuous increase. It is known that the high BI rate over a long period not only occurred in 2022Q3 but was also found in 2013Q2.

Bank Indonesia conducted six contractionary policies to control economic stability (Table 1). Based on this, it can be shown that two periods can be categorized as higher for longer because the BI rate increase occurred more than two years. The duration of more than two years indicates that there is persistent inflation or economic recovery after the crisis. Meanwhile, an increase in the BI rate with a duration of less than two years is categorized as a contractionary

monetary policy that is usually carried out by Bank Indonesia when there is an increase in inflation or exchange rate instability.

Table 1. BI Rate Fluctuations

No.	Period	Time	Description
1.	2000Q2 – 2001Q4	21 months	Contractionary monetary policy
2.	2004Q3 – 2005Q4	18 months	Contractionary monetary policy
3.	2008Q2 – 2008Q4	9 months	Contractionary monetary policy
4.	2013Q2 – 2015Q4	33 months	<i>Higher for Longer</i>
5.	2018Q1 – 2019Q2	21 months	Contractionary monetary policy
6.	2022Q2 – 2024Q4	24 months	<i>Higher for Longer</i>

The increase in the BI rate in the period 2013Q2 - 2015Q4 was caused by rising fuel prices and rising food prices (Bank Indonesia, 2013, 2014). Bank Indonesia implemented the BI rate policy preemptively and ahead of the curve to demonstrate Bank Indonesia's credibility in economic stability efforts. The high BI rate continued into 2015 as global uncertainty remained high, supported by the FFR hike and yuan devaluation (Bank Indonesia, 2015). These conditions caused investors to move their funds to low-risk assets (safe haven assets), so that capital inflow in developing countries decreased and exchange rates weakened.

Global economic instability also occurred in 2022, such as slowing global economic growth due to the disruption of the global supply chain after the Russia-Ukraine conflict, increasing global inflation due to rising world energy and food prices, and global portfolio investors tending to change to more liquid tools (Bank Indonesia, 2022). Global uncertainty intensified starting in 2022Q3, which Bank Indonesia then responded to with an increase in the BI rate.

Bank Indonesia's Behavior in Responding to Fed Policy

The estimation results, as shown in Table 2, explain that in the full sample, inflation gap and output gap have a positive and significant effect on the determination of the BI rate. While the real exchange rate has a significant negative effect on the determination of the BI rate. The findings are consistent with the hypothesis used in the Taylor Rule. Therefore, when there is an increase in the inflation gap and output gap by one percent, Bank Indonesia will respond by increasing the BI rate by 0.6% and 0.9%, assuming *ceteris paribus*. Changes in the real exchange rate are responded to differently, namely when there is an appreciation of one percent, the BI rate will decrease by 0.21%, assuming *ceteris paribus*.

In a more specific analysis, namely, the higher for a longer period, it is known that the inflation gap is not significant in determining the BI rate. The output gap variable has a significant positive effect in determining the BI rate so that when there is a one percent increase, the BI rate will increase by 1.1% with the assumption of *ceteris paribus*. Then the real exchange rate has a significant negative effect on the determination of the BI rate, which, when there is an appreciation of one percent, the BI rate decreases by 0.15%, assuming *ceteris paribus*.

Table 2. 2SLS Estimation Result

Variable	Desc.	Full Sample	Subsample
		(2000Q2 – 2023Q4)	(2013Q1 – 2023Q4)
$\hat{\pi}$	Coef.	.606	.177
	Std. Err.	.13	.208
	(prob)	(.000)***	(.395)
\hat{y}	Coef.	.909	1.148
	Std. Err.	.225	.296
	(prob)	(.002)***	(.000)***
lreer	Coef.	-21.51	-15.479
	Std. Err.	2.717	7.361
	(prob)	(.000)***	(.035)**
<i>Endogeneity test</i>		.0064	.0007
<i>Overidentification test</i>		.3436	.0485
<i>F-Statistic</i>			
	$\hat{\pi}$	44.611	23.183
	\hat{y}	2983.669	742.792
	<i>lreer</i>	86.400	6.112

Note: *** p<.01, ** p<.05, * p<.1

This model rejects the null hypothesis in the endogeneity test, which explains that there is an endogeneity problem that needs to be addressed through the 2SLS method. The 2SLS estimation must ensure that the instrument variables used are strong. The prerequisite has been met as evidenced by the F-statistic value greater than 10 following the provisions of the rule of thumb on weak instrument testing. Based on the classical assumption test results (Table 3), this model in the full sample has heteroscedasticity that needs to be corrected using robust standard errors. The subsample has met the assumption of homoscedasticity. The entire sample has met the assumption of normality. However, multicollinearity is found in the entire research sample due to endogenous variables.

Table 3. Classical Assumption Test Results

Classical Assumption	Type	Full Sample	Subsample
		(2000Q2 – 2023Q4)	(2013Q1 – 2023Q4)
Heteroscedasticity	<i>Pagan-Hall Test</i>	.0240	.4517
Normality	<i>Shapiro-Wilk W Test</i>	.06933	.25983
Multicollinearity	<i>Variance Inflation Factor (VIF)</i>	26.75	37.15

The direction of the relationship between variables in the 2SLS estimation is consistent with the results of the OLS estimation (Table 4). This also illustrates that the 2SLS estimation results follow the basic model and are well done. The selection of the real exchange rate model as the final model instead of the bilateral exchange rate is due to two factors. First, the behavior of variables in the real exchange rate model follows the Taylor Rule framework, which can explain why the Taylor Rule concept is more relevant to be identified when using real exchange rate indicators. Second, the real exchange rate is a relevant variable because the real exchange rate analyzes the economy comprehensively by considering the exchange rate against several trading partner currencies and taking

into account the difference in price levels (inflation) between the home country and trading partner countries. Meanwhile, the bilateral exchange rate only considers two currencies and does not take into account differences in price levels between countries.

Table 4. Comparison of Real Exchange Rate Models Based on 2SLS and OLS Estimation

Variable	Desc.	OLS		2SLS	
		Full Sample	Subsample	Full Sample	Subsample
$\hat{\pi}$	Coef.	.451	.2	.606	.177
	(prob)	(.000)***	(.089)*	(.000)***	(.395)
\hat{y}	Coef.	.983	1.07	.909	1.148
	(prob)	(.000)***	(.000)***	(.002)***	(.000)***
lreer	Coef.	-19.795	-8.732	-21.51	-15.479
	(prob)	(.000)***	(.02)**	(.000)***	(.035)**

The findings in this study are relevant to several previous studies and the Taylor Rule framework in determining interest rates. The significance of the inflation gap further strengthens the review of interest rate determination based on the inflation gap in emerging countries, including Indonesia (Baroroh, 2012; Caporale et al., 2018; Vincent, 2021). The higher inflation gap encourages Bank Indonesia to raise interest rates to deal with inflationary pressure and return inflation to its original target. High interest rates will reduce lending and consumption will also fall, thereby reducing demand-pull inflation.

The output gap has a significant positive effect on determining the BI rate following Vincent (2021) research on the response of the central bank in determining interest rates in South Africa. A high output gap implies that the level of output exceeds potential output. This can adversely affect the economy through rising inflation. When the output gap is high, workers try to take a salary increase, which will affect the behavior of companies, which will increase commodity prices. This condition triggers inflation. Bank Indonesia responds to this by increasing the BI rate so that inflationary pressures do not occur persistently and can return to the predetermined inflation target. Fluctuations in the output gap can be influenced by various factors that make the output gap more fluctuating, such as structural changes or shocks from the supply side.

The next variable, namely the real exchange rate, has a significant influence on determining the BI rate, but the direction of the relationship is negative. These findings are consistent with the results of Syarifuddin (2017) which states that exchange rate depreciation will encourage domestic interest rates to increase in the long term. When the rupiah depreciates, Bank Indonesia will respond by increasing the BI rate to avoid inflationary pressure. The price of Indonesian products is relatively cheaper in the United States, so the US export demand for Indonesian products increases. This encourages an increase in Indonesian exports, which can increase aggregate demand, so that the inflation rate also increases. In the event of high inflation, Bank Indonesia attempts to control it through an increase in the BI rate.

The real exchange rate has the smallest contribution compared to other variables. This is because the deviation of the exchange rate from purchasing power parity cannot be offset by changes in interest rates. The necessary changes

in interest rates will have a detrimental impact on real output and inflation that may be worse than changes in the exchange rate itself (Taylor, 2001). In addition, the exchange rate influences the determination of interest rates indirectly. Exchange rate fluctuations do not have much influence on inflation expectations, so they have little impact on determining interest rates. Therefore, in this study, the influence of the exchange rate is smaller than the inflation gap and output gap.

Based on Taylor (1993), it can be stated that Indonesia applies the Taylor Rule because the significance and direction of the relationship between the inflation gap, output gap, and real exchange rate variables follow the hypothesis. The Taylor Rule is a guide that is not fixed, but this approach can be flexible to become a policy guide in determining interest rates (Caglayan & Astar, 2010). Therefore, the Taylor Rule approach can be modified with other monetary variables and will produce different findings according to the economic conditions in the country.

Analysis was also carried out to respond to the higher-longer phenomenon that occurred due to the turmoil caused by Covid-19 and the Russia-Ukraine conflict. The Fed seeks to increase the federal funds rate so that the United States economy runs stably. The increase in FFR in the 2015Q4 – 2019Q1 period was due to the United States starting to normalize monetary policy after the GFC, while in the 2021Q4 – 2023Q4 period it was a response following the economic recovery due to the pandemic and the Russia-Ukraine conflict. The higher for longer in the United States in 2021Q4 – 2023Q4 has an impact on the occurrence of higher for longer in Indonesia, namely starting in 2022Q2 – 2023Q4.

Table 5. Analysis Results When Higher for Longer

Variable	Subsample (<i>Higher for Longer</i>)
<i>Inflation Gap</i>	Not Significant
<i>Output Gap</i>	Positive Significant
Real Effective Exchange Rate	Negative Significant

The estimation results for higher for longer show that the inflation gap does not influence determining the BI rate because the goal to be achieved is economic recovery. The Covid-19 pandemic has had a comprehensive impact on the economic sector, so massive policies are needed to achieve the goal of economic recovery. The output gap in this period has a significant positive effect on determining the BI rate. This is because the output gap reflects economic balance so when there is a decrease in the output gap, Bank Indonesia responds by lowering the BI rate. This policy has an impact on increasing levels of borrowing and investment which will improve the economy.

The real exchange rate which was depreciated as a result of the Russian-Ukrainian crisis was responded to by Bank Indonesia by increasing the BI rate. This is also a form of Indonesia's response to higher for longer carried out by the Fed. When the FFR increases, the rupiah depreciates which makes Indonesian commodities relatively cheaper for the US. This encourages an increase in Indonesia's exports which in turn leads to an increase in aggregate demand and inflation. Bank Indonesia responds to the condition by increasing the BI rate so that inflationary pressures can be controlled. Therefore, it can be concluded that when higher for longer, the output gap and the real exchange rate have an important role in determining the BI rate, especially in explaining the role of FFR

in the domestic economy. Therefore, it can be concluded that when shocks have a large impact on the real sector, the output gap and the real exchange rate have an important role in determining the BI rate. This also illustrates that the Taylor rule does not apply in Indonesia when it is higher for longer.

When there is an economic shock, it also has an impact on the increase in people's expectations and certain policies are needed to solve it. The discretion that occurs will be related to time inconsistency and will later impact the credibility of Bank Indonesia. Efforts made to maintain Bank Indonesia's credibility are through inflation targeting. Indonesia implements the Flexible Inflation Targeting Framework (Flexible ITF) to maintain financial system stability with a mandate to achieve price stability. Elements that must be considered in the Flexible ITF are i) inflation targeting, ii) integration of monetary and macroprudential policies, iii) the role of exchange rate policy and capital flows, iv) coordination between Bank Indonesia and the government, and v) strengthening communication strategies. In addition, Bank Indonesia determines the BI rate preemptively or ahead of the curve to mitigate greater risks from economic instability.

CONCLUSION

Based on the overall Fed policy in the research period 2000Q2 - 2023Q4, Bank Indonesia responded to increase the BI rate when the inflation gap increased, the output gap increased, and the rupiah depreciated. This behavior follows the Taylor Rule framework. Partially, the influence of the federal funds rate on the determination of the BI rate occurs through the output gap variable. When the Fed policy is higher for longer, the determination of the BI rate by Bank Indonesia depends on the output gap and the real exchange rate. Bank Indonesia will increase the BI rate when the output gap increases and the rupiah depreciates. The inflation gap variable has no significant effect in determining the BI rate. Partially, the federal funds rate has a significant effect in determining the BI rate through the output gap and the real exchange rate.

REFERENCES

- Bank Indonesia. (2013). *Laporan Perekonomian Indonesia 2013*.
- Bank Indonesia. (2014). *Laporan Perekonomian Indonesia 2014*.
- Bank Indonesia. (2015). *Laporan Perekonomian Indonesia 2015*.
- Bank Indonesia. (2022). *Laporan Perekonomian Indonesia 2022*.
- Baroroh, U. (2012). Pengaruh Guncangan Output Gap dan Inflasi Terhadap Suku Bunga sebagai Sasaran Operasional Kebijakan Moneter di Indonesia. *Signifikan*, 1(2), 93–108.
- Caglayan, E., & Astar, M. (2010). Taylor Rule: Is it an Applicable Guide for Inflation Targeting Countries? *Journal of Money, Investment and Banking*, 18.
- Caporale, G. M., Helmi, M. H., Çatık, A. N., Menla Ali, F., & Akdeniz, C. (2018). Monetary policy rules in emerging countries: Is there an augmented nonlinear taylor rule? *Economic Modelling*, 72(January), 306–319. <https://doi.org/10.1016/j.econmod.2018.02.006>
- Chen, J., Mancini-Griffoli, T., Sahay, R., Blanchard, O., Bayoumi, T., Faruquee, H., Habermeier, K., Kose, A., Meier, A., Milesi-Ferretti, G.-M., Pradhan, M.,

- & Segoviano, M. (2014). Spillovers from United States Monetary Policy on Emerging Markets: Different This Time? Spillovers from United States Monetary Policy on Emerging Markets: Different This Time? 1 Authors are grateful to. In *IMF Working Papers 14/240*.
- Eichengreen, B. (1998). Exchange Rate Stability and Financial Stability. *Open Economies Review*, 9(1), 569–608. <https://doi.org/10.1023/a:1008373022226>
- Engler, P. (2023). Spillovers to Emerging Markets from US Economic News and Monetary Policy. In *IMF Working Papers 23/107*. <https://doi.org/10.5089/9798400234811.001>
- Gadanecz, B., & Jayaram, K. (2009). Measures of financial stability – a review. In *Measuring Financial Innovation and Its Impact* (Issue 31). Bank for International Settlements.
- Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica*, 46(6), 1251–1271.
- International Monetary Fund. (2022). *World Economic Outlook: Countering the Cost-of-Living Crisis* (Issue May).
- International Monetary Fund. (2023). *World Economic Outlook: Navigating Global Divergences*.
- Jin, C., Wu, Z., & Yu, J. (2022). Analysis on the Influence of FED Interest Rate Adjustment on China's Economy. *Proceedings of the 2022 2nd International Conference on Enterprise Management and Economic Development (ICEMED 2022)*, 656(Icemed), 1127–1135. <https://doi.org/10.2991/aebmr.k.220603.182>
- Käfer, B. (2014). The Taylor Rule and Financial Stability – A Literature Review with Application for the Eurozone. *Review of Economics*, 65(2), 159–192. <https://doi.org/10.1515/roe-2014-0204>
- Mna, A., & Kilani, H. (2023). A monetary policy reaction function through Taylor rule vision: evidence from Tunisia. *SN Business & Economics*, 3(8), 1–18. <https://doi.org/10.1007/s43546-023-00532-2>
- Posen, A. S. (2006). Why Central Banks Should Not Burst Bubbles. In *Institute for International Economics Working Paper No. 06-1*. <https://doi.org/10.2139/ssrn.880450>
- Romer, D. (2012). *Advanced Macroeconomics* (Fourth Edi). McGraw-Hill Companies.
- Shang, Y., & Zhou, C. (2023). The Interest Hike of Fed: How Will It Influence China And The World Economy? *BCP Business & Management*, 38(February 1994), 2961–2966. <https://doi.org/10.54691/bcpbm.v38i.4218>
- Soybilgen, B., & Eroğlu, B. A. (2019). Time-varying taylor rule estimation for Turkey with flexible least square method. *Bogazici Journal*, 33(2). <https://doi.org/10.21773/boun.33.2.3>
- Svensson, L. E. O. (2000). Open-economy inflation targeting. *Journal of International Economics*, 50(1), 155–183. [https://doi.org/10.1016/S0022-1996\(98\)00078-6](https://doi.org/10.1016/S0022-1996(98)00078-6)
- Syarifuddin, F. (2017). Monetary Policy Response on Exchange Rate Dynamics: The Case of Indonesia. *International Conference on Eurasian Economies 2017, June*, 54–64. <https://doi.org/10.36880/c08.01829>
- Taylor, J. B. (1993). Discretion versus policy rule in practice. *Carnegie-Rochester Confer. Series on Public Policy*, 39(C), 215–220.

[https://doi.org/10.1016/0167-2231\(93\)90010-T](https://doi.org/10.1016/0167-2231(93)90010-T)

Taylor, J. B. (2001). The role of the exchange rate in monetary-policy rules. *American Economic Review*, 91(2), 263–267.

<https://doi.org/10.1257/aer.91.2.263>

Vincent, O. (2021). Central Banks' Response to Inflation, Output Gap, and Exchange Rate in Nigeria and South Africa. *Cogent Business and Management*, 8(1). <https://doi.org/10.1080/23311975.2021.1964689>

Woodford, M. (2012). Inflation Targeting and Financial Stability. In *NBER Working Paper*. <http://www.nber.org/papers/w17967>

Wooldridge, J. M. (2013). *Introductory Econometrics A Modern Approach 5th Edition*. South-Western Cengage Learning.

<https://doi.org/10.4324/9781351140768-8>