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The Effectiveness of Monetary Policy Transmission on Economic Growth in North Sumatra

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Abstract. *This study aims to determine the effect of monetary policy on economic growth. This study uses the Vector Autoregression method by completing the assumption test and estimation on the research variables of inflation, investment, credit, interest rates and gross regional domestic product. Time series research data from 2003-2022 sourced from the Central Bureau of Statistics of North Sumatra (BPS) SUMUT with the results obtained are inflation and interest rates give the results that inflation is influenced by investment and credit, until investment affects gross regional domestic product. Then credit also affects inflation and interest rates and gross regional domestic product is influenced by investment and credit. Thus, in determining policies that encourage economic growth the government must consider a more coordinated monetary policy strategy to deal with the dynamics of strengthening interest rates, controlling inflation, can be measures that support economic stability.*

Keywords *Monetary Policy, Gross Regional Domestic Product, Inflation*

1. INTRODUCTION

Economic growth and stability are two important requirements for the prosperity and well-being of a nation. With sufficient growth, a country can continue its development and provide good services to its people. Development and economic growth that runs well is a form of good economic stability. Efforts to maintain economic stability are carried out through certain steps to strengthen the resilience of the domestic economy to various fluctuations that arise, both from within and outside the country (Harahap & Harahap, 2018). The monetary policy transmission mechanism described by the central bank of a country can affect various economic activities. The monetary policy transmission mechanism begins with central bank actions using monetary instruments. The monetary policy transmission mechanism (MKTM) provides an explanation of how changes in monetary policy instruments affect economic and financial activity through monetary and financial policy transmission channels, monetary policy will affect interest rates, exchange rates and stock prices. Meanwhile, in the real sector monetary policy will affect the development of consumption, investment to economic growth and inflation. (Halim Burhani, 2014).

To influence economic activity in a country, it must choose factors that can influence economic activity that can be controlled by the government, namely monetary policy with this monetary policy can be used in achieving economic growth targets (Sihoro Teguh, 2010).

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Sumatra Island is the sixth largest island in the world located in Indonesia. Sumatra Island is the source of economic growth after Java Island. Sumatra Island has 10 provinces in it with different natural potential and technology use, one of which is North Sumatra province (Andhiani & Bhakti, 2018). Economic growth in North Sumatra Province has carried out a lot of infrastructure development, but whether growth has been inclusive and how the effects of development in North Sumatra Province. Based on data from the Central Bureau of Statistics, North Sumatra Province experienced a contraction of 1.07%. This causes the economy of North Sumatra to be unstable. The changes that occurred were influenced by the Covid-19 pandemic. Since Covid-19, North Sumatra's economic recovery is believed to continue because BI also supports it with various policies and programmes. To maintain economic growth in North Sumatra, inflation should be suppressed. In 2022, North Sumatra's inflation is expected to be higher than in 2021. Amid the covid-19 pandemic, the economy in North Sumatra in 2020 was classified as no better than the achievement in 2019. Based on the records of the Central Statistics Agency, economic improvement began to occur after about two years of being hit by the Covid-19 pandemic. And according to BPS, North Sumatra's growth is still recorded above a number of other provinces in Sumatra. North Sumatra began to show positive growth. However, the rate has not touched the growth in the pre-pandemic period (Batubara, 2022).

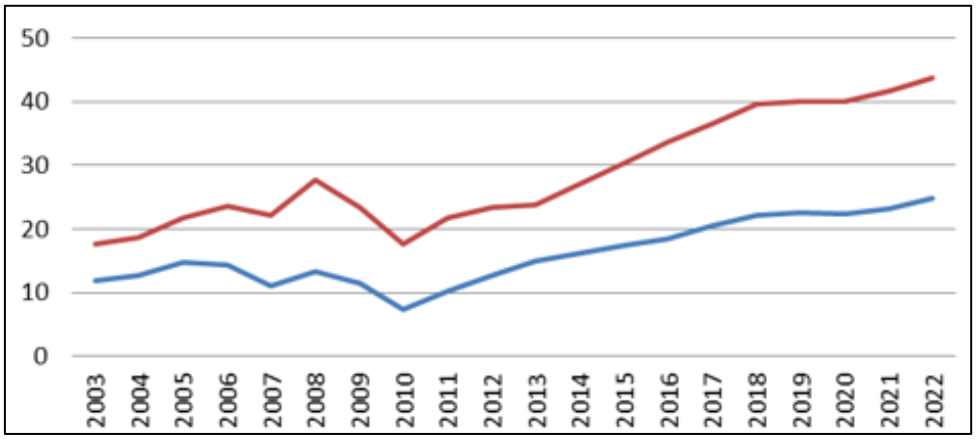

Figure 1. GRDP and Inflation data from 2003-2022

Based on the data, it can be explained that the movement of economic growth and inflation in North Sumatra continues to experience fluctuations up and down, as in 2013 it can be seen that inflation rose by 10.18 from the previous year of 3.67, causing economic growth to fall by 6.08 from the previous year of 6.45. Different from the previous year, in 2020 during the covid-19 pandemic, it can be seen that economic activities experienced shocks as seen in the data of 1.96 for the inflation rate and -1.07 for economic growth. Government policies were taken to restore economic stability so that the development of the rupiah exchange rate strengthened and showed stability in recent years. The government also uses monetary policy

to maintain economic stability. Monetary policy conducted by the government is by controlling interest rates (Yusri, Chairina, & Dara, 2023) This is due to Bank Indonesia's decision as a follow-up to the policy synergy of the Financial System Stability Committee in an integrated policy package to increase business financing in order to accelerate economic recovery (Ascarya, 2012). The transmission mechanism of monetary policy is defined as the path travelled by a monetary policy to affect economic conditions, especially national income and the rate of change in prices, the basic concept of monetary policy transmission mechanism starts from policy instruments that affect operational targets, intermediate targets and final targets.

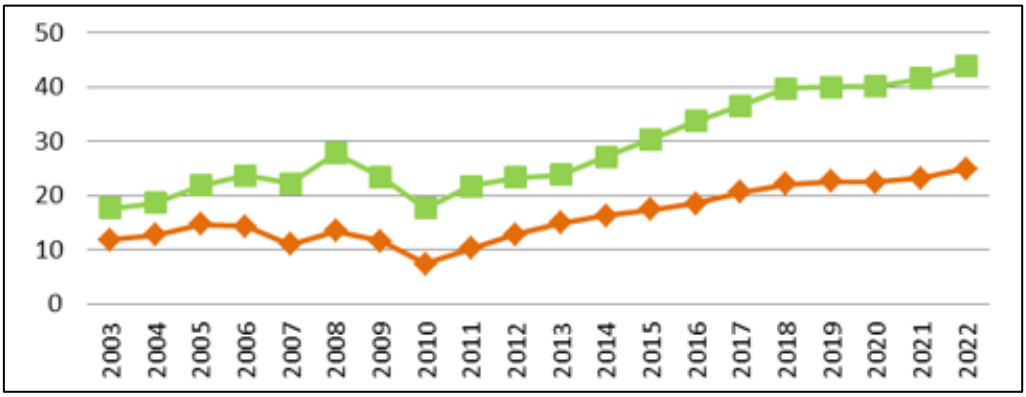

Figure 2. Credit and Investment Data for 2003-2022

The size of profit sharing depends on the investment and financing activities carried out in the real sector. The results of investments and financing made by banks in the real sector determine the size of profit sharing in the monetary sector. This means that the monetary sector depends on the real sector. Monetary policy transmission affects economic and financial activity through various channels such as interest rate channel, credit channel, exchange rate channel, asset price channel, and expectation channel. Thus, understanding the transmission of monetary policy is key in order to direct monetary policy to influence the direction of future developments in the real economy and prices. Thus, monetary policy strongly influences various important elements in economic growth (Prihatin, Arintoko, & Siharno, 2019). People often confuse the notion of economic growth with economic development, even though the two terms have different meanings. Development is broader and more complex than economic growth. Economic growth only includes material aspects. Meanwhile, development includes material and non-material aspects (Halim, 2018). Economic growth and development have different definitions, namely economic growth is the process of continuous increase in output per capita in the long term. Economic growth is one indicator of successful development. Thus,

the higher economic growth is usually the higher the welfare of the community, although there are other indicators, namely income distribution (Candrono, Sarwedi, & Yuliati, 2015).

Monetary policy is a policy set and based on by Bank Indonesia to achieve and maintain the stability of the value of the rupiah which is done through controlling the money supply or interest rates. Monetary Policy is an attempt to control macroeconomic conditions in order to run as desired through regulating the amount of money circulating in the economy. The effort is made in order to stabilise prices and inflation as well as an increase in equilibrium output. This is because the monetary sector provides benefits faster than the real sector (Latifah, 2015). Monetary policy can also be defined as the policy of the monetary authority (central bank) in the form of controlling monetary aggregates (such as money supply, primary money, or bank credit) to achieve the desired development of economic activity reflected by price stability, economic growth, and available employment opportunities. The process itself is defined as the reaction of the economy to changes in monetary policy, starting with changes in policy instruments and ending with the full adjustment of the economy to monetary policy (Budiyanto & Wibowo, 2021). In order for monetary policy to achieve its goals, it requires a path mechanism called the monetary policy transmission mechanism. The transmission mechanism is a channel that connects monetary policy with the economy, therefore this study will discuss the effectiveness of monetary policy transmission on economic growth in North Sumatra.

2. LITERATURE REVIEW

This review aims to evaluate the effectiveness of monetary policy transmission mechanisms and their impact on economic growth specifically in North Sumatra, Indonesia. Understanding this relationship is crucial for local policymakers and economists to design effective strategies to stimulate regional economic development. North Sumatra, as a key economic region in Indonesia, offers unique insights into how monetary policy impacts economic performance in a diverse and resource-rich area.

This mechanism affects borrowing costs for consumers and businesses, influencing spending and investment. Lower interest rates generally boost economic activity, while higher rates can dampen it. Changes in monetary policy affect bank lending behavior. Easier monetary conditions can lead to increased credit availability, which supports business investment and consumer spending. Fluctuations in exchange rates impact export and import competitiveness, thereby affecting economic growth. A depreciation of the local currency can boost exports but increase import costs. Monetary policy can shape economic expectations, influencing consumer and business confidence and spending decisions.

North Sumatra is a significant economic region in Indonesia with a diverse economy that includes agriculture, industry, and services. Key sectors include palm oil, rubber, and manufacturing. Recent economic performance has shown growth trends, but challenges such as infrastructure deficits and regional disparities persist. Indonesia's central bank, Bank Indonesia (BI), implements monetary policy through interest rate adjustments, reserve requirements, and open market operations. In North Sumatra, these policies impact local financial institutions and economic activities.

3. METHODS

The research method used is descriptive quantitative to explain the economic situation of a country based on its variables. Analysing fiscal policy and monetary policy to realise macroeconomic stability with research variables of taxes, government spending, exchange rates, interest rates, money supply and gross domestic product with time series data from 2008-2022 sourced from the world bank. Using Vector Autoregression as a reason for ease of answering and proving empirically and more complex reciprocal relationships in the long run of variables (Rydland, 2018). In this approach all variables are considered as endogenous variables and estimation can be done simultaneously or sequentially. The Vector Autoregression method will be fulfilled in the presence of several assumptions, namely: (1) Stationary Test known as unit root test (Gujarati N. D., 2003), (2) Optimum Lag Selection based on Akaike Information Criterion (AIC) and Schwarz Information Criterion (SC) (Rangkuty & Nasution, Analysis of Inflation and Imports in Indonesia, 2018), (3) Cointegration Test to see the long-term balance. (4) Causality Test can show the causality relationship between variables in the long term (Basuki A. T., 2016), (5) Vector Autoregression Estimation Test to see the largest contribution of each variable, after the Vector Autoregression estimation is fulfilled, it is continued with testing (6) Impulse Response to see the response (shock) of each variable, (7) Variance Decomposition decomposes the variation between variables.

VAR Analysis Model with formula:

$$GRDP_t = \beta10+\beta11INF_{t-p}+\beta12Credit_{t-p}+\beta13IR_{t-p}+\beta14INV_{t-p}+ et1$$

$$INF_t = \beta20+\beta21Credit_{-p}+\beta22IR_{t-p}+\beta23INV_{t-p}+\beta24GRDP_{t-p}+ et2$$

$$Credit_t = \beta30+\beta31IR_{t-p}+\beta32INV_{t-p}+\beta33GRDP_{t-p}+\beta34INF_{t-p}+ et3$$

$$IR_t = \beta40+\beta41INV_{t-p}+\beta42GRDP_{t-p}+\beta43INF_{t-p}+\beta44Credit_{t-p}+ et4$$

$$INV_t = \beta50+\beta51GRDP_{t-p}+\beta12INF_{t-p}+\beta53Credit_{t-p}+\beta54IR_{t-p}+ et5$$

Description:

GRDP = Gross Regional Domestic Product

INV = Investment

IR = Interest Rate

INF = Inflation

Credit = Credit (Loan)

β = Regression coefficient

et = Random shocks

p = lag length

4. RESULTS

The results of the Asusmi Test by starting from the stationary test on the unit root test with augmented dicky-fuller (ADF) at the 5% confidence level seen in the t-statistic value and the prob value <0.05 (Gujarati N. D., 2003) variables that have a prob value <0.05 are inflation and gross regional domestic product which are stationary at the next level stationary at 1st difference are investment, credit and interest rate variables. The cointegration test is cointegrated at the 5% level (*) owned by three variables, proving the occurrence of long-term correlation between variables. The causality test (granger causality test) proves the existence of a short-term relationship between investment and inflation, inflation and credit, credit and investment, investment and interest rates, interest rates and credit and credit with gross regional domestic product at a prob value <0.05, but there is no two-way relationship between these variables. With the existing results, only these variables have a short-term relationship because most variables have a long-term relationship, so further test analysis can be carried out (Nachrowi & Hardius, 2006).

Table 1. Vector Autoregression Estimation Results

	INF	INV	CREDIT	PDRB	SB
INF (-1)	-1.266567	0.216804	0.134785	0.108969	-0.177884
	(0.39603)	(0.12971)	(0.11364)	(0.22852)	(0.21813)
INV (-1)	-2.013625	1.088721	0.474283	0.580347	-0.244930
	(0.70326)	(0.23033)	(0.20179)	(0.40580)	(0.38735)
CREDIT (-1)	0.367825	-0.426935	0.467768	-0.675340	-0.048506
	(0.80200)	(0.26267)	(0.23013)	(0.46277)	(0.44174)
PDRB (-1)	-0.714472	0.170623	0.134634	-0.104153	0.017623
	(0.63773)	(0.20887)	(0.18299)	(0.36799)	(0.35126)
SB (-1)	1.816708	-0.588126	-0.962542	0.439424	0.555327
	(0.98792)	(0.32357)	(0.28348)	(0.57006)	(0.54414)

First Largest Contribution Second Largest Contribution

Source: Output Eviews 2024

The contribution results from the Vector Autoregression estimation above show the first largest contribution and the second largest contribution to all variables (Novalina, 2021). For the inflation variable, the first largest contribution is given by the investment and credit variables. For the investment variable, the first contribution is the investment itself and the gross regional domestic product in the second contribution, based on these results that any increase in inflation will also affect the investment issued (Agung, 2010). The first largest contribution to the credit variable is the credit itself and the second contribution by inflation. For the gross regional domestic product variable, the first largest contribution and the second contribution are given by investment and credit, domestic economic growth in these results is in accordance with research that states the largest contributor to the level of the economy is the level of investment and the use of credit by the community (Sembiring, 2016). For the first largest interest rate variable, namely inflation and interest rates. These results prove that interest rates can affect prices set by the government so that the level of public consumption is affected to disrupt economic growth (Chandara & Wahyuningsih, 2021).

The impulse response function is performed after Vector Autoregression estimation to see the shock between each research variable (Gujarati D., 2006) In the figure that shows the response of a variable as a result of the response that occurs in the variable in a certain period (Basuki & Prawoto, 2016).

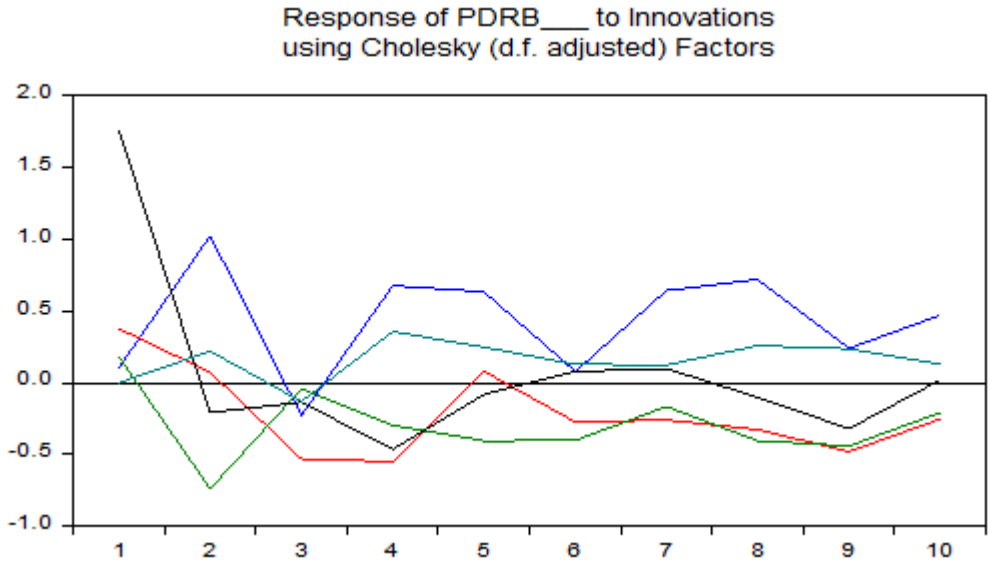

Figure 3. Impulse Response Function

It can be seen in the figure that changes to one standard deviation of gross regional domestic product can be responded by all other variables (Nachrowi & Hardius, 2006). It can be seen in the figure that the effect of each variable inflation, credit, investment, interest rates and gross regional domestic product has a movement close to the line 0 (zero). The standard

deviation response of the variable shows the tendency of the response direction at the convergent point in the form of positive or negative responses in the short, medium, and long term (Afrizal, 2020). The stability of a stable response is due to the movement of gross domestic product that is responded to by other variables.

Table 2. Variance Decomposition Result

Variance Decomposition of INF:						
Period	S.E.	INF	INV	CREDIT	PDRB	SB
1	3.142233	100.0000	0.000000	0.000000	0.000000	0.000000
5	5.238491	38.97507	28.96208	8.770997	18.93135	4.360503
10	6.385107	43.18242	23.70331	13.87970	13.74693	5.487647
Variance Decomposition of INV:						
Period	S.E.	INF	INV	CREDIT	PDRB	SB
1	1.029149	12.39403	87.60597	0.000000	0.000000	0.000000
5	2.651608	34.17467	39.65502	16.19183	5.042904	4.935579
10	5.335988	45.23101	22.34140	22.75505	2.393030	7.279515
Variance Decomposition of CREDIT:						
Period	S.E.	INF	INV	CREDIT	PDRB	SB
1	0.901642	15.21068	29.90240	54.88692	0.000000	0.000000
5	4.955964	50.36135	13.11723	26.95202	1.757562	7.811843
10	7.762032	48.34273	17.76485	24.58088	1.661240	7.650298
Variance Decomposition of PDRB:						
Period	S.E.	INF	INV	CREDIT	PDRB	SB
1	1.813153	0.341261	4.297240	0.969926	94.39157	0.000000
5	2.679698	27.42385	10.25369	11.63005	47.14528	3.547136
10	3.135082	32.38585	13.03486	14.49445	35.76048	4.324356
Variance Decomposition of SB:						
Period	S.E.	INF	INV	CREDIT	PDRB	SB
1	1.730732	76.61664	2.256937	12.66371	0.099023	8.363691
5	2.089221	59.12138	16.27553	14.69056	1.608530	8.304008
10	3.091132	54.73489	14.92853	20.77199	1.628533	7.936052

(1) Short Term (5) Middle Term (5) Long Term

Source: Output Eviews 2024

Based on the research results shown in Table 2 above, it is found that inflation in the short term estimates an error variance of 100% which is explained by inflation itself. While other variables, namely investment, credit, gross regional domestic product and interest rates do not respond at all and do not affect inflation in the short term. In the medium term, the estimated error variance of 38.97% is influenced by inflation itself. Other variables affecting it are investment 28.96%, while in the long run inflation 43.18% and investment 23.70%. The

ups and downs of prices and money circulation cause the amount of investment made to vary (Afrizal, 2018).

Capital investment or another meaning of investment in the short and medium term is recommended by the investment itself by 87.60% then 39.65%. Meanwhile, investment is also influenced by inflation in the medium term by 34.17%. It can be seen that the amount of investment will affect the price increase, because every consumption made by society is in accordance with the investment that occurs as well (Asri, 2005). The result reflects that the investment level of a country is influenced by the prevailing price level (Anwar, 2011). Similar to the previous variable, credit is affected by credit and inflation in the short and long term 54.88% and 48.34%. In accordance with the theory that the credit given will affect the amount of prices (Atmadja, 2011).

5. DISCUSSION

Gross regional domestic product affects in the short term 94.39%, medium 47.14% and long 35.76% on investment variables 4.29% for the short term and inflation in the medium term 27.42% and long 32.38% influence. Regional economic growth is strongly influenced by monetary policy, seen from more investment which causes the price level to decrease so that the economy increases (Pamujiningrum & Soebagyo, 2024). However, the interest rate variable shows different contributions, it can be seen that in the short term it is influenced by 76.61% inflation and 12.66% credit, while the medium and long term is influenced by inflation, investment and credit. The results are consistent if interest rates rise, there is also an increase in investment (Imelda & Prasetya, 2021). By increasing income from the investment side, gross regional domestic product can increase (Zahirah, Mandai, & Esya, 2023).

The results of the analysis show that monetary policy affects the economy in North Sumatra, as shown in the cointegration between monetary policy indicators. Monetary policy with its ultimate goal of maintaining a stable rupiah is seen from stable inflation and interest rates (Novalina, 2021) coupled with other indicators such as investment and credit (Afriani, 2023). With this monetary policy being a policy that can describe the economy in North Sumatra, the use and implementation of monetary policy must always be controlled effectively (Warjiyo, Central Bank Policy Mix: Basic Conceptions and Experience of Bank Indonesia, 2016).

6. CONCLUSION

Monetary policy is an attempt to control macroeconomic conditions in order to run as desired. Monetary policy carried out by the North Sumatra regional government in this case controlling inflation and interest rates gives the result that inflation is influenced by investment and credit, until investment affects gross regional domestic product. Then credit also affects inflation and interest rates and gross regional domestic product is influenced by investment and credit. Thus, in determining policies that encourage economic growth the government must consider a more coordinated monetary policy strategy to deal with the dynamics of strengthening interest rates, controlling inflation, can be measures that support economic stability.

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