



Analysis of Monetary and Fiscal Policies on Economic Growth

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Abstract

This paper examines the effect of the combination of monetary and fiscal policies on economic growth in North Sumatera Province using time series data for the period 2010-2024. The analysis was conducted using VAR method and forecasting. The result show that local government spending and Local Own-Source Revenue contribute positively and significantly to economic growth. Conversely, inflation has a negative and significant impact on economic growth. These findings confirm that local fiscal instruments are the main drivers of the economy. On the other hand, General Allocation Funds and the BI Rate are not proven to have a significant effect on economic growth. No flypaper effect was found, because Local Own-Source Revenue plays a greater role in driving RGDP than General Allocation Funds, indicating that North Sumatra's economic performance is more supported by its internal potential. For the Policy Mix, a combination of expansive and productive fiscal policies with stable and accommodative monetary policies is most effective. While local governments support growth, BI stabilizes and provides a favorable economic environment.

Keywords: Monetary Policy, Fiscal Policy, Flypaper Effect, Economic Growth

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INTRODUCTION

One of the main indicators in macroeconomics used to measure a country's

progress is its economic growth. An important indicator for determining the economic condition of a region over a certain period of

time is Regional Gross Domestic Product (RGDP) data, which can be used on the basis of current prices or constant prices.

Movements in Indonesia's Regional Gross Domestic Product (RRGDP) show that each province has different economic characteristics. One of the national economic centers, North Sumatra Province, shows a stable and positive RDBP growth trend from year to year. Based on available data, North Sumatra's RDBP has increased consistently from 2010 to 2024, despite experiencing a significant slowdown in 2019 and 2020 due to the global pandemic.

Theoretically, economic growth is influenced by various factors, including fiscal and monetary policies (Ayana et al., 2023) and (Jawadi et al., 2016). According to (Fahrurriz, 2017) fiscal policy, which is implemented by local governments through the regional budget, includes government spending and local revenue (Hasto & Afif, 2022).

Meanwhile, monetary policy, which is carried out by Bank Indonesia, plays a role through instruments such as the benchmark interest rate (BI Rate) to control inflation. The synergy between these two policies, known as the policy mix, is crucial in maintaining stability and promoting economic growth (Juhro, 2022). Economic growth in the province of Sumatra is highly influential.

However, the performance of each policy may differ in each region. An important question arises in the context of North Sumatra, namely, how much do each of the following policy instruments contribute to economic growth: regional spending, inflation, and BI Rate? To measure the influence and significance of each variable, an in-depth empirical analysis is required. Consequently, this study will investigate the relationship between constantly

changing fiscal and monetary policies and economic development in North Sumatra Province.

Many national and regional studies have been conducted on how monetary and fiscal policies affect economic growth. However, there are still certain research gaps, where most studies focus on national aggregate data but ignore regional economic dynamics and specific characteristics.

This study will fill the gap by focusing on North Sumatra Province, which has various leading sectors and economic problems. Unlike simple correlation methods that cannot capture temporal cause-and-effect relationships, the Vector Autoregressive (VAR) model approach allows this study to identify the direct and significant impact of each policy variable on RGDP. The problem of variables influencing each other can be overcome with the VAR model. This will improve our understanding of how policy impacts interact in North Sumatra.

RESEARCH METHODS

This study uses a quantitative approach with a descriptive and explanatory design. The descriptive design is evident in the effort to describe the economic growth conditions in North Sumatra Province, while the explanatory design is evident in the use of statistical and relationship between variables that affect the dimensions of economic growth in the North Sumatra Province region. The data sources used in this study are secondary data. The data used are time-series data in annual form. The time-series data used range from 2010 to 2024.

The technique applied in this study is time series regression analysis for the period 2010-2024 using the Vector Autoregressive (VAR) model. Data processing was carried out using E-

Views 18 software. The data analysis stages in this study refer to Gujarati (2009), which includes several steps, including: Stationarity Test. In general, time series data in economics is

non-stationary. The Optimal Lag Test is used to form VAR modeling. The VAR model used for this study was created with the following equation:

$$\begin{aligned} Y_{1t} &= \beta_{01} + \sum_{i=1}^p \beta_{i1} Y_{1t-i} + \sum_{i=1}^p \alpha_{i1} Y_{2t-i} + \sum_{i=1}^p \pi_{i1} Y_{3t-i} + \sum_{i=1}^p \theta_{i1} Y_{4t-i} + e_{1t} \\ Y_{2t} &= \beta_{02} + \sum_{i=1}^p \beta_{i2} Y_{2t-i} + \sum_{i=1}^p \alpha_{i2} Y_{1t-i} + \sum_{i=1}^p \pi_{i2} Y_{3t-i} + \sum_{i=1}^p \theta_{i2} Y_{4t-i} + e_{2t} \\ Y_{3t} &= \beta_{03} + \sum_{i=1}^p \beta_{i3} Y_{3t-i} + \sum_{i=1}^p \alpha_{i3} Y_{1t-i} + \sum_{i=1}^p \pi_{i3} Y_{2t-i} + \sum_{i=1}^p \theta_{i3} Y_{4t-i} + e_{3t} \\ Y_{4t} &= \beta_{04} + \sum_{i=1}^p \beta_{i4} Y_{4t-i} + \sum_{i=1}^p \alpha_{i4} Y_{1t-i} + \sum_{i=1}^p \pi_{i4} Y_{2t-i} + \sum_{i=1}^p \theta_{i4} Y_{3t-i} + e_{4t} \end{aligned}$$

IRF and FEVD analyses are used to identify the impact of fundamental factor shocks, using Impulse Response Function (IRF) analysis. IRF aims to trace the effects of a shock on certain endogenous variables in the current period and the following period.

RESULTS AND DISCUSSION

This study was conducted according to the literature (Gujarati, 2009) and is said to have

produced valid VAR estimates. Continue to the next stationary test using first difference, resulting in all variables free from unit root. To estimate with VAR, the data must be in stationary condition.

Since the variable data is already stationary at the first difference level, the estimation is expected to produce a valid model output. Therefore, the research results will have a high level of validity as shown in Table 1.

Table 1. Phillips-Perron stationary results

Level	Prob.	First Difference	Prob.
RGPD	0.9350	D(RGPD)	0.0007
Goverment Spending	0.1984	D(Goverment Spending)	0.0000
Provincial Revenue	0.9964	D(Provincial Revenue)	0.0000
Central Government Transfer	0.9999	D(Central Government Transfer)	0.0002
Inflation	0.3581	D(Inflation)	0.0000
Bi_Rate	0.3516	D(Bi_Rate)	0.0001

Source: Data processed, 2025

In VAR modeling, determining the optimal lag length is very important. If the optimal lag is too short, it may not fully explain the dynamics of the model. However, an optimal lag that is too long will result in inefficient estimation due to the reduced degree of freedom, especially in models with smaller samples. Therefore, it is necessary to know the optimal lag before estimating the VAR. As

shown in Table 2. Based on Table 2, the optimal lag length selection test using the Akaike Information Criteria (AIC), final prediction error (FPE), Schwartz information criteria (SC), and likelihood ratio criteria resulted in an optimal lag of 1. The next step was to test the stability of the VAR model used in this study, which showed no unit root (stable). The regression coefficients for each equation in the VAR system

are shown in the output in Table 3. This is done by regressing the endogenous variables in the current period on the previous lag values of all endogenous variables in the model.

Table 2. Lag Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-905.0727	NA	3.01e+53	140.1650	140.4258	140.1114
1	-839.2176	60.78932*	6.52e+51*	135.5719*	137.3972*	135.1968*

Source: Data processed, 2025

Interpretation of Results is D(PDRB-1) is an independent variable with a coefficient of -0.396, indicating that, assuming other variables remain constant, D(PDRB) in the current period tends to decrease by 0.396 percent if D(PDRB) in the previous period increases by 1 percent.

Table 3. VAR Estimation

Estimation	D(GDRP)
D(RGPD(-1))	-0.396243 (0.42847) [-2.92478]
D(Government Spending(-1))	5801.555 (4289.25) [2.35258]
D(Provincial Revenue	1626.752 (3811.68) [2.42678]
D(Central Government Transfer(-1))	9.24E-06 (7.3E-06) [1.27089]
D(Inflation(-1))	-2208633. (1387282) [-1.99206]
D(Bi_Rate(-1))	4224904. (2940324) [1.93688]

Source: Data processed, 2025

The t-statistic result is -2.924 at a confidence level of 0.05. We compare the

absolute value of this t-statistic with the critical value, which is usually around 1.96 for large samples. This means that it has a negative and significant effect on the current period's GRDP.

D(EXPENDITURE-1) against D(GRDP) has a coefficient of 5.801, which indicates that, assuming other variables remain constant, D(GRDP) in the current period tends to increase by 5.801 percent if D(EXPENDITURE-1) in the previous period increases by 1 percent. The t-statistic result is -2.2352 at a confidence level of 0.05. We compare the values This absolute t-statistic with a critical value means that it has a positive and significant effect on the current period's GRDP.

D(PAD-1) to D(GRDP) has a coefficient of 1.626, which indicates that, assuming other variables remain constant, D(GRDP) in the current period tends to increase by 1.626 percent if D(PAD-1) increases by 1 percent. The t-statistic result is -2.426 at a confidence level of 0.05. We compare the absolute value of this t-statistic with the critical value, which indicates a positive and significant effect on the current period's GRDP.

D(DAU-1) against D(PDRB) has a coefficient of 9.24, which indicates that, assuming other variables remain constant, D(PDRB) in the current period tends to increase by 9.24 percent if D(DAU-1) increases by 1 percent. The t-statistic result is -1.270 at a

confidence level of 0.05. We compare the absolute value of this t-statistic with the critical value, which means that it has a positive and insignificant effect on the current period's GRDP.

D(INFLATION-1) against D(GRDP) has a coefficient of -2.208, which indicates that, assuming other variables remain constant, D(GRDP) in the current period tends to decrease by 2.208 percent if D(INFLATION-1) increases by 1 percent.

The t-statistic result is -1.992 at a confidence level of 0.05. We compare the absolute value of this t-statistic with the critical value. This means that it has a negative and significant effect on the current period's GRDP.

D(BI_RATE-1) against D(PDRB) has a coefficient of 4.224, which indicates that, assuming other variables remain constant, D(PDRB) in the current period tends to increase by 4.224 percent if D(BI_RATE-1) increases by 1 percent.

The t-statistic result is 1.936 at a confidence level of 0.05, we compare the absolute value of this t-statistic with the critical value. This means that it has a positive and significant effect on the current period's GRDP. According to the fairly good R-squared value (0.443729), the independent variables in the model can explain 44.37% of the variation in the GRDP variable.

However, approximately 55% of the variation cannot be explained, which may be due to other variables not included in the model. In the VAR model, the impulse response function shows how each endogenous variable reacts to shocks with standard deviations from other endogenous variables. This improves our understanding of the direction, magnitude, and duration of the impact of these shocks.

CONCLUSION

The variables of local government expenditure and local own-source revenue are proven to contribute positively and significantly to the increase in RGDP. Meanwhile, inflation shows a negative and significant relationship with RGDP. This finding indicates that fiscal instruments at the regional level play an important role as a driving force for economic growth.

In contrast, neither the General Allocation Fund nor the BI Rate variable is shown to have a significant effect on RGDP. This indicates that monetary policy and the flow of transfer funds from the central government are not directly able to encourage regional economic growth in the study period.

The flypaper effect is not found, this occurs because PROVINCIAL REVENUE encourages RGDP more than CENTRAL GOVERNMENT TRANSFER, indicating that economic growth in North Sumatra depends more on its own internal performance.

The Provincial and Regency/City Governments of North Sumatra should prioritize the use of fiscal instruments as the main engine of growth. To increase production capacity and infrastructure, the budget must be allocated effectively and on target. 3. Although monetary policy does not have a directly significant role in maintaining stability, its function remains important. The Regional Inflation Control Team (TPID) should collaborate more proactively. To keep inflation under control, local governments can support BI's efforts by maintaining the supply of goods, especially basic need

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