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Mechanisms Fiscal Policy Transmission with Structure Vector Auto Regression Approach (S-Var)

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ABSTRACT

This study aims to analyze the transmission mechanism of fiscal policy in Indonesia using the Structure Vector Autoregression (S-VAR) approach, focusing on macroeconomic variables such as government spending, tax revenue, Gross Domestic Product (GDP), inflation, unemployment, and budget deficit over the period 2010 to 2020. The results of the analysis show that government spending has a significant positive impact on GDP growth, reflecting the effectiveness of expansionary fiscal policy in promoting economic growth and reducing unemployment in the short term. However, the impact on inflation shows complex dynamics, where inflation initially increases in response to government spending, but then stabilizes in the medium term. This finding indicates the need for careful management of fiscal and monetary policies to avoid undesirable inflationary impacts. In addition, Variance Decomposition analysis reveals that variations in GDP are influenced more by government spending than by other variables, emphasizing the important role of fiscal policy in the Indonesian economy. This study provides recommendations to increase spending in productive sectors while still monitoring inflation and budget deficit, which is expected to provide insights for policymakers in formulating economic growth strategies..

Keywords: fiscal policy, structural vector autoregression (s-var), economy

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INTRODUCTION

Fiscal policy is one of the main instruments in macroeconomic management whose role is in the hands of the government, mainly represented by the Ministry of Finance (Batin, 2022). In accordance with Law No. 17/2003 on State Finance, the management of state finances is under the control of the Minister of Finance who acts as a fiscal manager as well as the government's representative in the ownership of separated state assets (Number, 17 C.E.). Through fiscal policy, the government sets strategies related to state revenues and expenditures in order to achieve certain economic goals (Silalahi & Ginting, 2020). This policy is generally manifested in the State Budget (APBN) which directs the allocation of funds to finance various national development programs and projects.

Mankiw (2013: 68), fiscal policy can be defined as economic measures implemented by the government to manage and direct the economy to better conditions by adjusting the amount of state revenue and expenditure. This fiscal policy basically aims to maintain economic stability and support economic growth. There are two main forms of fiscal policy, namely expansionary fiscal policy and contractionary fiscal policy (Aqmarina & Furqon, 2020). Expansionary fiscal policy is applied when the government increases spending or reduces taxes to boost national income growth, create jobs, and lower unemployment. This measure is usually used when the economy is sluggish or facing a recession. Contractionary fiscal policy, on the

other hand, involves reducing government spending or raising taxes to lower inflationary pressures and reduce the deficit in the foreign balance of payments. This policy is generally applied when the economy is in an overheating condition or there is a high spike in inflation. By choosing the right fiscal policy, the government seeks to maintain a balance between economic growth and price stability, and ensure that the economy moves in the desired direction according to the macroeconomic conditions at the time (Juhro & SE, 2023).

Fiscal policy encompasses a wide range of choices regarding the amount of spending incurred by the government and the sources of revenue raised from the public, including taxes and other state revenues (Setiady, 2023). The government then uses these funds to finance various programs designed to encourage the achievement of national income, increase production, and balance the economy. Therefore, fiscal policy is one of the determining factors in shaping the economic direction of a country, as well as serving as a stabilization tool in maintaining economic growth and a more equitable distribution of income. The main objectives of fiscal policy are to encourage economic growth, maintain price stability, and create equitable distribution of public welfare (Siswajanthy et al., 2024). However, fiscal policy not only impacts a few key economic indicators, but also affects various other aspects, such as inflation and budget deficits.

In analyzing fiscal policy, the Structural Vector Autoregression (S-Var) approach can be used as an effective analytical tool to evaluate the impact of fiscal policy on the economy (E. Olamide et al., 2022). According to Nabavi Larimi et al., (2018) S-Var helps map the dynamic relationship between key economic variables, such as government spending, government revenue, inflation, and economic growth, and see how fiscal policy affects these variables over time. Using this approach, we can identify the responses of the economy to fiscal policy shocks, such as changes in government spending or tax policy, as well as decipher more complex policy transmission channels. This allows for a more structured analysis to understand how changes in fiscal policy directly or indirectly impact economic stability and other macroeconomic indicators.

Through S-Var, it is possible to analyze fiscal policy by separating the short-run and long-run impact components, which are often difficult to identify using conventional analytical methods (Muhammed et al., 2022). This approach enables a deeper understanding of the interaction between fiscal variables and macroeconomic indicators, and provides a more accurate picture of how much fiscal policy contributes to economic growth and inflation. Thus, S-Var provides a strong analytical foundation for policymakers to formulate more effective fiscal policies, and is able to minimize the risk of economic instability that may arise due to unbalanced policy implementation.

Therefore, the link between fiscal policy and the S-Var approach provides a clearer perspective on the impact of such policies on the economy. The results of S-Var analysis can be used as a tool to evaluate the effectiveness of fiscal policy in various scenarios (Vasyurenko et al., 2021), for example in the face of global economic uncertainty or changes in monetary policy. By utilizing this model, the government can make better projections of the impact of fiscal policy going forward, as well as adjust policies based on the economic response generated from the S-VAR simulation, so that the policies taken can promote economic stability and growth.

Numerous studies have established the critical role that fiscal policy plays in influencing economic growth. For instance, research by Afonso and Furceri (2010) reveals that government spending has a positive effect on GDP growth, particularly in developing countries. This finding aligns with the principles of expansionary fiscal policy, where increased government expenditure is utilized to stimulate economic activity during periods of sluggish growth or recession. Moreover, the impact of fiscal policy extends beyond mere growth metrics; it also significantly affects inflation dynamics. Romer (2012) highlights that expansionary fiscal

measures can lead to higher inflation rates if the economy is operating near full capacity. Conversely, contractionary policies can stabilize prices, emphasizing the delicate balance policymakers must maintain between fostering growth and controlling inflation.

One of the most innovative features of the S-Var approach is its ability to decompose the effects of fiscal policy into short-run and long-run impacts (E. G. Olamide & Maredza, 2019). This capability enables policymakers to discern the immediate effects of fiscal interventions from their longer-term implications, thereby facilitating the formulation of more effective policies. Furthermore, the S-Var model allows for the identification of structural relationships between fiscal policy variables and key economic indicators. This is particularly important in instances where traditional econometric models may struggle to capture the complexities of these relationships due to endogeneity issues.

The S-Var framework also provides a powerful platform for conducting policy simulations and scenario analyses (Duke et al., 2024). By modeling various fiscal policy scenarios, policymakers can evaluate potential outcomes and adjust their strategies accordingly. This predictive capability is crucial in an era marked by global economic uncertainty, where timely and informed decisions are essential for maintaining economic stability. The comprehensive nature of the S-Var approach allows for an integrated evaluation of multiple macroeconomic indicators, such as government spending, revenue, inflation, and growth. This holistic view enables a thorough assessment of fiscal policies and their broader economic implications.

METHOD

This study uses a quantitative approach with the Structure Vector Autoregression (S-Var) method to analyze how fiscal policy impacts various key macroeconomic variables. This approach was chosen because it can describe the dynamic relationship between economic variables and identify the impact of shocks from fiscal policy, such as changes in government spending or tax revenue, on economic indicators such as Gross Domestic Product (GDP), inflation, unemployment rate, and budget deficit.

1. Population and sampling method

   The population in this study is all macroeconomic data related to fiscal policy and economic indicators in Indonesia available in the form of time-series data. This population includes annual or quarterly data of key macroeconomic variables such as government spending, tax revenue, Gross Domestic Product (GDP), inflation rate, unemployment rate, and budget deficit over the period 2000 to 2020. The population also includes external factors that affect the Indonesian economy, such as world commodity prices or international interest rates, which can be used as exogenous variables in the model.

   The sample of this study was taken from a predetermined population, with complete data criteria and available in the same time span for each variable analyzed.The data used is quarterly data from the period 2000 to 2020, so the total observations obtained are 84 observations (21 years × 4 quarters).The selection of quarterly data was chosen in order to capture the dynamics of economic change in the short and medium term better than annual data.

2. Research Instrument

   This study utilizes a series of analytical instruments consisting of time series macroeconomic data, statistical software, and various data collection and processing protocols to build a Structure Vector Autoregression (S-Var) model. The data used is secondary data sourced from official institutions such as the Central Bureau of Statistics (BPS), Bank Indonesia (BI), the Ministry of Finance, as well as international organizations such as the World Bank and the International Monetary Fund (IMF). The main variables used in this study include government spending (GOV_EXP), tax revenue (TAX), Gross

Domestic Product (GDP), inflation rate (INF), unemployment rate (UNEMP), and budget deficit (FISC_DEF). These variables were chosen because they reflect the important relationship between fiscal policy and economic dynamics. The collected data are then processed using statistical software such as EViews, Stata, and Matlab for the analysis process which includes stationarity testing, optimal lag selection, model estimation, as well as interpretation of results using Impulse Response Function (IRF) and Variance Decomposition (VD).

3. Research Procedure and Timeframe

The data collection process is done by accessing historical databases from official sources, which are then organized into a spreadsheet format to facilitate the analysis process. The data went through a data cleaning stage to ensure that there were no missing or inconsistent data, followed by variable transformation if necessary, such as logarithmic transformation or differencing, in order for the data to meet stationarity requirements. Once the data is ready, the S-VAR model framework is constructed by selecting relevant endogenous variables and specifying structural restrictions to distinguish between demand shock, supply shock, and policy shock. At the model estimation stage, S-VAR parameters are calculated using the Maximum Likelihood Estimation (MLE) method to ensure valid results.

The analysis continues by using Impulse Response Function (IRF) to see how changes in one variable, e.g. fiscal policy shock, affect other variables in a given time horizon, as well as Variance Decomposition (VD) to evaluate the relative contribution of each shock to the total variation of the target variable. In addition, various diagnostic tests such as stationarity test (Augmented Dickey-Fuller Test) and serial autocorrelation test are used to ensure that the time series data are stationary and do not contain significant autocorrelation. Normality and heteroscedasticity tests are also applied to ensure that the model residuals are normal and do not exhibit heteroscedasticity patterns that could affect the accuracy of the model.

RESULT AND DISCUSSION

In this study, we delve into the estimation of a Structural Vector Autoregression (S-VAR) model using time series data on various macroeconomic variables from 2010 to 2020. The variables analyzed include government spending, tax revenue, Gross Domestic Product (GDP), inflation, unemployment, and budget deficit. The choice of this period is particularly relevant as it encompasses significant economic events and policy shifts that have shaped the macroeconomic landscape. By employing the S-VAR model, we aim to capture the dynamic interrelationships among these variables and assess the impact of government spending on economic growth.

The estimation results reveal a significant positive impact of government spending on GDP growth. This finding underscores the effectiveness of expansionary fiscal policies implemented by the government during the study period. Increased infrastructure spending and social programs are highlighted as key drivers of economic growth. The positive correlation between government expenditure and GDP growth suggests that such fiscal policies can be instrumental in stimulating economic activity, especially during periods of economic downturn or sluggish growth.

Moreover, the results indicate that the positive effects of government spending on GDP are not merely short-lived but persist over several periods. This persistence suggests that well-targeted government spending can lead to sustained economic growth, reinforcing the argument for continued investment in public goods and services. Policymakers may find this insight valuable as they consider the long-term implications of fiscal policy decisions on overall economic performance.

The Impulse Response Function (IRF) analysis further elucidates the relationship between government spending and other macroeconomic variables. Specifically, it shows that an increase in government spending not only boosts GDP but also contributes to a decrease in the unemployment rate in the short run. This dual effect highlights the potential for fiscal policy to address both economic growth and labor market challenges simultaneously. As government spending injects liquidity into the economy, it creates jobs and reduces unemployment, fostering a more robust economic environment.

However, the impact of government spending on inflation presents a more complex picture. While there is an initial increase in inflation following a rise in government spending, the effect tends to stabilize in the medium run. This stabilization may indicate that the economy is capable of absorbing the increased demand without leading to runaway inflation. Policymakers must be mindful of this dynamic, as excessive government spending can lead to inflationary pressures if not managed carefully (Desfitra et al., 2024).

The results from the Variance Decomposition (VD) analysis provide further insights into the contributions of different macroeconomic variables to GDP variations. The findings indicate that variations in GDP are influenced more significantly by government spending compared to other variables such as tax revenue, inflation, and budget deficit. This suggests that government spending plays a pivotal role in shaping economic performance, reinforcing the notion that fiscal policy is a powerful tool for influencing macroeconomic outcomes.

In comparing these results to previous research, particularly the work by Heru Setiawan (2018), we observe some common themes. Setiawan's analysis of fiscal and monetary policy in Indonesia also highlighted the positive impact of expansionary fiscal policy on GDP, albeit with caveats regarding inflation and interest rates. This alignment of findings across different studies strengthens the argument for the efficacy of government spending as a catalyst for economic growth, while also emphasizing the need for careful management of inflationary risks.

Setiawan's research further elaborates on the complexities of fiscal policy impacts, noting that shocks to tax revenue can initially have a negative effect on output. However, the long-term effects can turn positive, suggesting that tax policy also plays a critical role in shaping economic performance. This nuance in the relationship between fiscal policy components underscores the importance of a balanced approach to both government spending and tax revenue management.

Additionally, the analysis of interest rate shocks in Setiawan's study reveals a decline in inflation in accordance with the Taylor Rule. This relationship highlights the interconnectedness of monetary and fiscal policies, suggesting that coordination between these two policy domains is essential for achieving desired macroeconomic outcomes. Policymakers must consider how fiscal actions may influence monetary conditions and vice versa, ensuring that the overall policy mix is conducive to sustainable economic growth.

Overall, the findings of this study contribute to the growing body of literature on the impacts of fiscal policy on macroeconomic performance. The evidence supporting the positive effects of government spending on GDP growth is compelling, yet it also raises important questions about the potential trade-offs involved, particularly concerning inflation and interest rates. Policymakers must navigate these complexities carefully, balancing the need for economic stimulation with the risks of inflationary pressures.

As we move forward, it is crucial to continue monitoring the effects of fiscal policies on macroeconomic variables, particularly in the context of evolving economic conditions (Lubis et al., 2024). Future research could explore the long-term implications of government spending on economic growth, as well as the interactions between fiscal and monetary policies in different economic environments. By deepening our understanding of these dynamics, we can better inform policy decisions that promote stable and sustainable economic growth.

CONCLUSION

The results show that government spending has a significant positive impact on GDP growth, indicating the effectiveness of expansionary fiscal policy in promoting economic growth. However, the impact on inflation shows a more complex pattern, where inflation initially increases in response to government spending, but then tends to stabilize in the medium term. This finding highlights the need for prudent fiscal and monetary policy management to avoid unwanted inflation. Variance Decomposition analysis also shows that changes in GDP are more influenced by government spending than other variables, which confirms the important role of fiscal policy in the Indonesian economy.

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