The Impacts of Government Spending and Monetary Policy Rate in Indonesia

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ABSTRACT

This study reviews the impacts of government policies on the economy. The period of analysis starts from early banking sector reform until the current Covid-19 pandemic crisis. We apply Vector Error Correction Model based on the theory of money demand and inflation to analyze the relationships among income, inflation, money balance, government spending, and policy interest rate. The impacts of money balance and policy interest rate on income are as predicted by money demand. Financial sector growth and different expectation on inflation affect the efficacy of monetary policy. On the other hand, government spending might not be fully growth-enhancing. The need emerges to classify and distinguish the classes of government spending which increase growth.

Keywords: economic growth, fiscal policy, inflations, money demand, monetary policy, VECM.

I. INTRODUCTION

Indonesian financial system, especially the banking sector, underwent major change at the end of 1988. Since then, the financial system experienced several major crises in 1997-1998, 2009, and the current Covid-19 pandemic. Figure 1 shows the development of real GDP, inflation, money balance, government expenditure, and monetary policy rate from 1990 to 2021.

The crises impacted the financial system as well as the whole economy. Fig. 2 shows the economic growth from 1990 to 2021. During two crises of 1997-1998 and the current Covid-19 pandemic, economic growth turned negative.

The objective of this paper is to assess the efficacy of monetary policy and fiscal policy since the banking sector reforms. We take policy rate as a part of monetary policy and government spending as a part of fiscal policy.

We apply the VECM approach to see the short-run and long-run relationships among income, inflation, money balance, government spending, and policy interest rate. We also incorporate the effects of crises as exogenous variables to the relationships.

The paper is organized as follows. Section 2 reviews the theoretical framework. Section 3 elaborates the methodology and data. The result and discussion are presented in Section 4. Finally, section 5 concludes.

II. THEORETICAL FRAMEWORK

Monetary policy plays important role in shaping the financial condition in Indonesia [1]. The policy is transmitted through several channels: interest rate, credit, exchange rate, asset price, corporate balance sheet, and expectations.
channels [2]. For example, money affects inflation, while inflation does not affect money [3]. Fiscal policy also plays important role in economic development in Indonesia [4]. Combined with monetary policy, fiscal policy stimulates economic growth [5].

Bianchi and Ilut [6] mention the needs both of monetary and fiscal policy to affect inflation. The monetary and fiscal interactions are more apparent, as such as financial crises or the current COVID-19 crisis [7]. Discretionary fiscal policy may enhance economic growth in crisis [8]. On the other hand, fiscal policy and monetary policy response to the COVID-19 pandemic may increase the risk of inflation [9].

Dinh [10] relates inflation and economic growth and maintains that government needs to have a comprehensive monetary and fiscal policy to maintain inflation and stimulate growth. Countries may have different episodes of inflation and growth with different monetary and fiscal policies [11]. Ha [12] mentions the importance of the monetary policy’s credibility to control inflation. For example, if the Taylor principle is not satisfied, the monetary policy might even amplify shocks [13]. Moreover, Forbes [14] suggests that inflation dynamics should include global factors because economies have become more integrated.

Montes and Lima [15] based on Ciro and Mendonça [16] analyze fiscal policy or government spending (G) as functions of previous spending, real short-term interest rate (r), real GDP seasonally adjusted (Y), and inflation (INF).

\[ G_t = \alpha_0 + \beta_1 G_{t-1} + \beta_2 \varepsilon_{t-1} + \beta_3 Y_{t-1} + \beta_4 INF_{t-1} + \varepsilon_t \] (1)

There is much literature on the money demand. The parameters usually included in the studies are price level, real output, nominal interest rate with several methods employed as in Ball [17]. Following Mankiw and Summers [18], the demand for money (m) is a function of both, GDP deflator (Py) and consumer price (Pc), nominal interest rate (r), real income (Y), and real consumer expenditure (C):

\[ m_t = \alpha_0 + \beta_1 Py_t + \beta_2 Pc_t + \beta_3 r_t + \beta_4 Y_t + \beta_5 C_t + \varepsilon_t \] (2)

This study integrates money demand (m) and inflation (inf) to be functions of income (y), government expenditure (g), and monetary policy rate (r). A similar approach is used by Chen, Wohlfarth, and Smith [19] and Hoffman and Rasche [20].

\[ m_t = \alpha_1 + \beta_1 y_t + \beta_2 g_t + \beta_3 r_t + \varepsilon_t \] (3)

\[ \text{inf}_t = \alpha_2 + \beta_2 y_t + \beta_2 g_t + \beta_3 r_t + \varepsilon_t \] (4)

We employ VECM which is built to test the cointegration in the series which is integrated in the first difference [21]. The reduced-form of the model of VAR and first-differenced error correction form are as follows:

\[ Y_t = A_0 + \sum_{i=1}^{k} A_i Y_{t-i} + \delta X_t + \varepsilon_t \] (5)

\[ \Delta Y_t = A_0 + \sum_{i=1}^{k} A_i \Delta Y_{t-i} + \delta X_t + \varepsilon_t \] (6)

The groups of endogenous variables (Y) are income (y), inflation (inf), money balance (m), government spending (g), and interest rate (r). The group of exogenous variables (X) consists of dummy variables representing the financial crisis in 98 and the current COVID-19 pandemic.

\[ Y = [y, \text{inf}, m, g, r] \] (7)

\[ X = [d_{98}, d_{covid}] \] (8)

### III. METHODOLOGY AND DATA

The data are mainly taken from OECD, Statistics Indonesia, and the Ministry of Finance. We use data from OECD because it is a reliable source of comparable statistics and economic and social data. Money (M1, INDMANNM101STQ), inflation (CPI inflation, IDNCIPALT01GPQ), interest rate (Central Bank policy rate, IDNIRSTCB01STQ) is from OECD.

We could not have complete data for income and government expenditure from OECD, therefore income is taken from Statistics Indonesia, while government expenditure is from the Ministry of Finance. We use X-12-ARIMA to create seasonally adjusted series for money, income, and government expenditure.

First, we apply the Augmented Dickey-Fuller test (ADF) tests, the Phillips–Perron tests, and the Kwiatkowski–Phillips–Schmidt–Shin (KPSS) tests to check the presence of unit root. The lag length selections for ADF tests use the Schwarz information criterion. PP tests and KPSS tests use Newey-West bandwidth selection with Bartlett kernel. The null hypothesis of ADF tests and PP tests is the existence of a unit root, while the null hypothesis of KPSS tests is the non-existence of a unit root.

Table I shows the results of the unit root tests. We can see that income, money, and government expenditure are non-stationary in level but stationary in first difference. Inflation is stationary in level. ADF tests and PP tests suggest that interest rate is stationary in level, but KPSS tests results indicate that it is stationary in first difference. The results imply the need for a cointegration approach to analyze the data.

| Variables | ADF | PP | KPSS |
|-----------|-----|----|------|
| y         | -0.5119 (1) | -0.6326 (5) | 1.3429 *** |
| inf       | -5.8507 (2) | *** -5.5739 (2) | 0.4399 * |
| m         | 0.5116 (0) | 0.7652 (9) | 1.2686 *** |
| g         | -0.4640 (3) | -1.9838 (3) | 1.3577 *** |
| r         | -3.5618 (1) | *** -3.1374 (1) | 0.7940 * |
| d(y)      | -9.0028 (0) | *** -9.0736 (5) | 0.0767 *** |
| d(inf)    | -8.5446 (2) | *** -20.9067 (17) | 0.0718 *** |
| d(m)      | -11.5209 (0) | *** -11.5260 (6) | 0.1835 |
| d(g)      | -11.2759 (2) | *** -75.2823 (31) | 0.3895 * |
| d(r)      | -9.4835 (0) | *** -9.4406 (7) | 0.0319 |

Notes: * , ** and *** represent 10%, 5% and 1% levels of significance, respectively.
We apply Johansen multivariate cointegration test to determine the number of cointegration vectors. The test includes both the trace statistics and the maximum eigenvalue. The lag length of 4 is selected based on HQ Information Criteria with a maximum of 8 lags specified.

Table II reports the results of the Johansen test. Both trace statistics and maximum eigenvalue statistics indicate the existence of two cointegrating relationships among variables.

We test the stationarity of the process using the inverse roots of the AR characteristic polynomial indicators. All inverse roots as shown in Fig. 3 lie within the unit circle. We may conclude that the process is stationary.

| TABLE II: Cointegration Tests |
|-----------------------------|
| Rank Test (Trace)           |
| Number of CE(s) | Eigenvalue | Trace Statistics | 0.05 Critical Value |
| None                          | 0.6414    | 185.0791          | 69.8189             |
| At most 1                    | 0.2647    | 59.9467           | 47.8561             |
| At most 2                    | 0.0968    | 22.4425           | 29.7971             |
| At most 3                    | 0.0787    | 10.0240           | 15.4947             |
| At most 4                    | 0.0002    | 0.0255            | 3.8415              |

| Rank Test (Maximum Eigen Value) |
|-------------------------------|
| Number of CE(s) | Eigenvalue | Max-Eigen Statistics | 0.05 Critical Value |
| None                          | 0.6414    | 123.6323             | 33.8769             |
| At most 1                    | 0.2647    | 37.5043              | 27.5843             |
| At most 2                    | 0.0968    | 12.4185              | 21.1316             |
| At most 3                    | 0.0787    | 9.9985               | 14.2646             |
| At most 4                    | 0.0002    | 0.0255               | 3.8415              |

Notes: *, ** and *** represent 10%, 5% and 1% levels of significance, respectively. Variables included are y, inf, m, g, r as endogenous variables and dummy for Asian Crisis and Covid-19 Pandemic as exogenous variables.

The exogeneity test results in Table III indicate that money and government expenditure are at least weakly exogenous. Therefore, we normalized the cointegrating relationship on income and inflation equations.

| TABLE III: Exogeneity Test |
|----------------------------|
| var | t-value | p-value |
| y   | 18.693  | 0.0000  |
| inf | 105.471 | 0.0000  |
| m   | 1.965   | 0.1610  |
| g   | 1.765   | 0.1840  |
| r   | 47.952  | 0.0000  |

We also employ a robustness check by conducting analysis using different lag lengths. The results remain the same. Even when we add additional variables such as government revenue, the impulse responses remain similar.

IV. RESULT AND DISCUSSION

Table IV reports the cointegration vector and error correction term of the equations, while Figure 4 reports the impulse response graphs for all variables. In the cointegrating vector, income is affected positively by money and negatively by interest rate as expected. However, government spending has negative impacts on income. This happens also in some countries [22]. This may indicate the existence of the crowding-out effect of government spending.

If we classify the spending into several classes, probably the results will differ among classes. Some spending is growth-enhancing, while others might not have the same quality or even reduce growth [23]. Spending on infrastructure may have positive impacts in the long run but spending on other sectors may have less impact or even negative impacts. Moreover, because it tends to be procyclical [24], fiscal policy should be directed toward the supply side of the economy.

In the long run, inflation is affected positively by government spending and interest rate and negatively by money balance. Government spending increases demand for goods and services as predicted. It increases the inflation risk premium as mentioned by Montes and Lima [15].

The positive effects of interest rate and negative effect of money balance on inflation are not as expected. Financial deepening and growth might contribute to the negative relationship between inflation and money balance [25].

Financial development affects economic growth. The more developed the financial sector, the more money is available in the economy. The economy may grow more rapidly, supply increases more than demand. Therefore, inflation risk might decrease.

The positive relationship between interest rate and inflation might be caused by the disagreement about inflation expectation as mentioned by Mankiw, Reis, and Wolters [26]. Interaction with fiscal policy can cause an increase in interest rates to raise inflation as proposed by Linnemann [27]. The relationship between money, inflation, and inflation might not be reliable [28]. This evidence suggests that monetary policy should not be decided mechanically based on algebraic formulations only [29].

V. CONCLUDING REMARKS

The impacts of monetary policy and fiscal policy depend on economic conditions and the interaction between them. The evidence suggests that expansionary monetary policy does not always cause higher inflation. On the fiscal side, the needs emerge to find the types or sectors of government expenditure that are growth-enhancing. Fiscal policy should be directed to expand the supply side of the economy. In this sense, there might be room for expansionary monetary policy and fiscal policy. By targeting specific sectors, scrutinizing the impacts of each policy, and paying attention to the interaction between policies, higher growth may be achieved without increasing inflation risk.
TABLE IV: COINTEGRATING EQUATION AND ERROR CORRECTION

| Cointegrating Equation: |
|------------------------|
| y | inf | m | g | r |
| Cont. Eq. 1 | -1 | 0 | 0.8000 | *** | -0.7742 | *** | -0.0910 | *** |
| Cont. Eq. 2 | 0 | -1 | -2.9713 | *** | 5.0839 | *** | 0.2713 | *** |

| Error Correction: |
|-------------------|
| d(y) | d(inf) | d(m) | d(g) | d(r) |
| Cont. Eq. 1 | -0.0141 | *** | -5.1182 | *** | -0.0119 | *** | -0.0409 | *** | -6.5142 | *** |
| Cont. Eq. 2 | 0.0031 | ** | -1.3878 | *** | 0.0038 | *** | 0.0107 | -0.5911 | ** |

Adj. R-squared: 0.6763, S.E.: 0.0109, F-statistic: 14.3032, Loglikelihood: 389.2764, Akaike AIC: -6.0537, Schwarz SC: -5.9540, S.D. dependent: 0.0191, Cointegrating Equation: 2.7149

Standard errors are in the parenthesis. 122 observations are included. AIC is -2.8128; BIC is -0.2846.

Fig. 4. Impulse Response.

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