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WHAT DRIVES ECONOMIC GROWTH SUSTAINABILITY? EVIDENCE FROM INDONESIA*

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Abstract. This paper analyzes the determinants of economic growth sustainability in Indonesia. Based on annual data 1971-2017, this research applies the vector error correction model (VECM) to estimate the dynamic effects of the inflation rate, tax ratio, government spending, broad money, and exchange rate on economic growth. The findings present the existence of long-run equilibrium in a set of those variables. Specifically, the price level and fiscal policy have positive impact on economic growth sustainability. We also find that the effect of monetary policy on economic growth is neutral. The monetary authority should strengthen the impact of monetary variables on economic growth. The exchange rate is part of international factors that threatens the economic growth sustainability. It implies that economic growth sustainability is closely related to the international financial sector. Therefore, the central bank should control the exchange rate variable at the safety level to maintain economic growth sustainability.

Keywords: economic growth; exchange rate; fiscal; monetary; sustainability

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1. Introduction

In many developing countries, economic development mainly focuses on achieving economic growth and stabilizing the inflation rate at acceptable levels. Economic growth is one of the main macroeconomic variables, which indicates the quality of living standard and welfare level of the people in the country. It is important for all countries to preserve economic growth sustainability in the long period. For this reason, the government should pay more attention to the inflation rate to maintain sustainable economic growth. Specifically, low inflation is preferable to support stable economic growth (Akinsola & Odhiambo, 2017; Crafts, 2013; Kasidi & Mwakanemela, 2013; Sattarov, 2005). Since the inflation rate has a direct relationship with economic growth, a higher inflation rate will cause lower real economic growth. Finally, it will reduce the living standard and real income. Therefore, we can say that economic growth is potentially unsustainable. Many factors may affect

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economic growth sustainability, such as inflation rate, fiscal, and monetary policy as well as an international factor (Akinsola & Odhiambo, 2017; Barro, 2013; Bošnjak, 2018; Bukhari & Yusof, 2014; Butkiewicz & Yanikkaya, 2011; Gupta, 2011; Kasidi & Mwakanemela, 2013; Tsaurai & Odhiambo, 2013; Tvaronavičienė, 2019; Sasongko *et al.*, 2019; Zeibote *et al.*, 2019).

Similar to inflation that directly affects economic growth, fiscal and monetary policy may also influence economic growth sustainability. Some papers mention that expansive fiscal policy has positive effects on economic growth (Auerbach, Gale, & Harris, 2010; Nguyen, 2015; Raji, Juzhar, & Jantan, 2014). Likewise, the expansive monetary policy is also the main factor in supporting economic growth in various countries (Černohorská, 2018; Sirag, SidAhmed, & Ali, 2018; Tule, Ogundele, & Apinran, 2018). Therefore, we may infer that the expansive fiscal and monetary policies will encourage economic growth sustainability. International factor such as exchange rate may affect the economic growth sustainability through domestic currency depreciation mechanisms. Some previous papers highlight the relationship between exchange rate and economic growth (Karras, 2011; Mahmoodi & Mahmoodi, 2016).

As a member of developing countries, Indonesia has experienced some episodes of the economic development process as long the period of development plan. In 1971, the central government arranged the document of an economic development plan for the medium and long period. The long term development plans focus on three economic indicators, namely, sustainable economic growth, equity, and price stabilization. Sustainable economic growth was one of the main focuses of the development plan to improve the standard of living at the national level. The income inequality in Indonesia was one of the important issues as consequences of the large area of the country and the big numbers of the population. Meanwhile, the price stabilization policy was the priority of the development process as an impact hyperinflation phenomenon which emerged in 1965-1970. However, economic growth sustainability has become a challenge in Indonesia for a long period of development process until nowadays.

For about twenty years of the development process, Indonesia has successfully changed the economic structure from a purely agricultural economy into the semi industry country. Economic growth was stable at about 7 percent, and the inflation rate was less than 10 percent. Unfortunately, the deep financial crisis attacked most of the Asian countries, including Indonesia in 1997. As an impact of this crisis, economic growth dropped at about -13 percent, and inflation jumped to 58 percent in 1998 (Figure 1). In response to that situation, the central government made some policies to stabilize the price level and to recover economic growth. As a result, the national economy has successfully recovered in about three years, which was indicated by positive economic growth, and the inflation rate was less than 10 percent. Based on this brief phenomenon, it is important to study the issue of economic growth sustainability and to fill the recent literature regarding economic development policies.

This paper elaborates the determinants of economic growth sustainability in the case of Indonesia. The organization of this paper continues as follows. The next section is the related literature, which presents a review of previous studies. Then, the empirical analysis contains the model specification and analysis procedure. The proceeding section presents empirical findings and discussion. The last section is the conclusion of the research.

2. Related Literature

The issue of sustainable economic growth has emerged in the last decade. Some papers have discussed the sustainable economic growth is part of the sustainable development program in many countries (Spangenberg, 2006; Armeanu, Vintilă, and Gherghina, 2018; Jovovic *et al.*, 2018; Kurniawan and Managi, 2018). Sustainable economic growth has become an important part of the global view of economic development since the declaration of Sustainable Development Goals (SDGs) in 2016. All countries should concern with the issue of sustainable

economic growth to ensure that the development in their countries has improved their living standard. Many factors may affect the sustainable economic growth such as inflation rate, the quality of government policies, infrastructure, and global environment.

The inflation rate is one of the macroeconomic variables, which has a closet relationship with economic growth. The increase in the inflation rate will cause lower real economic growth. Some previous studies found the negative effect of inflation on economic growth (Akinsola & Odhiambo, 2017; Barro, 2013; Bukhari & Yusof, 2014; Gupta, 2011). A high inflation rate has substantial effects on reducing the standards of living in many countries (Barro, 2013). In the long-run, the raises of ten percent inflation rate will cause a decrease in GDP at about 4 percent. Otherwise, Akinsola and Odhiambo (2017) found that the effects of inflation on economic growth is debatable. The effect of inflation on economic growth is negative in developed countries. Otherwise, its effect is positive on economic growth in other countries. The negative relationship means a higher price associated with lower economic growth. Therefore, a high target of economic growth requires a low inflation rate. In this case, the low inflation rate will support sustainable economic growth. This situation is economically reasonable because people will have a high real income. Therefore, controlling the inflation rate is important to keep the sustainable economic growth.

The quality of fiscal policy is also an important factor in sustainable economic growth. There are some instruments of fiscal policy, such as tax revenue and government spending. As part of the government budget, tax revenue will determine economic growth. An increase in tax ratio provides a higher budget for government activities, which potentially improve the economic activity in the public sector. An expansive fiscal policy through high government spending will become one of some key factors of economic growth. Some previous studies highlight the positive relationship between government spending and economic growth (Bošnjak, 2018; Butkiewicz & Yanikkaya, 2011; Tsauroi & Odhiambo, 2013). Regarding sustainable economic growth, a positive effect of government spending on economic growth supports the sustainability of economic growth.

The monetary sector plays an important role in the economy through the dynamic changes of the money supply. The expansive monetary policy through the increase in money supply leads to a higher investment opportunity. Previous studies confirm the important role of the monetary sector on economic growth in various countries (Černohorská, 2018; Sirag et al., 2018; Tule et al., 2018). The monetarist view states that money supply and economic activity has a positive relationship. Therefore, the increase in money supply associated with higher economic growth. An expansive monetary sector will support economic growth sustainability.

International factor such as the volatility in the international financial market generally has an impact on the domestic economic activity of the country through exchange rate changes. The depreciation of a currency will potentially affect economic activity in the country. The exchange rate volatility as an impact of depreciation or appreciation of the currency is an important factor of economic growth. Some papers mention that exchange rate volatility has a significant effect on economic growth (Karras, 2011; Mahmoodi & Mahmoodi, 2016). The depreciation of the currency potentially causes lower economic growth. Therefore, controlling the exchange rate is crucial for the country to maintain sustainable economic growth.

In line with the Sustainable Development Goals (SDGs) as the global view, sustainable economic growth will be an important part of the development process in all countries. A few papers consider the capital and human resources as determinants of sustainable economic growth in some countries. However, only limited papers focus on the role of the fiscal and monetary policy on sustainable economic growth. Therefore, identification of some factors that affect economic growth may provide new insight into the recent studies. Specifically, this study attempts to fill the gap of the literature by elaborating the determinants of economic growth sustainability for the Indonesian case. This research may be useful for other countries regarding the formulation of sustainable economic growth policies.

3. Empirical Analysis

3.1. Data and variables

This study empirically estimates some equations of a set of variable which involve economic growth, inflation rate, tax ratio, government spending, and exchange rate. The data are annual time series for the period of 1971-2017. The variable economic growth and inflation are in annual percent. The variable tax ratio and government spending are in percent of real GDP. Meanwhile, the broad variable money is in Trillion rupiahs. Exchange rate of Indonesian currency is the ratio between US\$ and Indonesian Rupiah. The data inflation rate, broad money, and exchange rate are from several annual statistical reports of the Bank Indonesia (<http://www.bi.go.id/en/>). Meanwhile, the data of fiscal variables such as tax ratio and government spending are from annual reports of Indonesia Fiscal Policy Agency (<http://www.fiskal.kemenkeu.go.id/>).

3.2. Cointegration test

This research focuses on the dynamic analysis of economic growth sustainability using vector error correction model (VECM). The reason is that the method may encompasses the dynamic impact of selected independent variables on the economic growth. The empirical estimation using that approach requires the co-integration test and should involve the first difference variables. This approach is in line with some previous research, which also applied dynamic analysis (Khundrakpam, 2010; Bozkurt, 2014; Fakher, 2016). The co-integration analysis implies some prerequisite tests regarding the stationary properties of the data before running the empirical estimation. Most of the macroeconomic variables contain data that are not stationary in their level. Therefore, we should transform into the first difference to achieve their stationary form (Enders, 2010). The data is stationary if its mean and variance are zero and unchanged over time.

The co-integration analysis includes two steps, stationary testing of the variables and estimation process of the cointegration equation. This research applies the Augmented Dickey-Fuller (ADF) method for data stationary testing and Johansen's multivariate procedure for co-integration analysis (Johansen, 1991). As widely used in recent economic research, Johansen cointegration method applies vector autoregression (VAR) model to test the cointegration relationship in among time series variables. Cointegrating equation presents a long run relationship which is indicated by the significance of maximum eigenvalues (λ_{\max}) and trace test. We accept the hypothesis of at least one cointegrating vectors using likelihood ratio trace test. We reject or accept the hypothesis based on the probability value of MacKinnon, Haug, & Michelis, (1999). Cointegrating relationship occurs due to rejecting at least none cointegrating statement.

According to Johansen (1991), a VAR model fits the data with the appropriate lag structure. Specifically, a VAR model of order n of a set time series variables (A) is as follows.

$$\Delta y_t = A_0 + \sum_{i=1}^{n-1} \Gamma_i \Delta y_{t-i} + \alpha \beta' y_{t-n} + \varepsilon_t \quad (1)$$

Matrix Γ equals to $\alpha \beta'$ and captures the long-run relationship among the examined variables. Matrices α and β are $(n \times r)$ dimensions, r is the rank of the matrix Γ . The rank of the coefficient of matrix Γ gives the number of cointegrating vectors. The matrix β contains the long-run coefficients which represent the co-integrating relationship. The matrix α expresses the adjustment process from short-run disequilibrium toward long-run equilibrium. The estimation procedure assumes that the matrix Γ in an unrestricted form. The cointegration restrictions test imply accepting the rank of matrix Γ . The rank number of Γ equals the number of cointegrating vectors based on the maximum Eigenvalues (λ_{\max}) and Trace statistics. We accept the presence of cointegrating relationship if at least one cointegrating equation exists.

3.3. The Model Specification

We consider a dynamic analysis which involves some economic variables. As widely used in economic analysis, the cointegration and vector error correction model (VECM) can capture the causality relationship among some economic variables. Before formulating the econometric equations, we should develop an economic model which consists of a set of variables. In this study, we examine a set of economic variables as mentioned before, namely economic growth, inflation rate, tax ratio, government spending, broad money, and exchange rate. According to the standard VECM model, we may formulate the five equations as follows.

$$\begin{aligned} \Delta eg_t &= \alpha_{1i} + \beta_{1i} \sum_{i=1}^n \Delta eg_{t-i} + \lambda_{1i} \sum_{i=1}^n \Delta p_{t-i} + \delta_{1i} \sum_{i=1}^n \Delta tr_{t-i} + \phi_{1i} \sum_{i=1}^n \Delta gs_{t-i} + \eta_{1i} \sum_{i=1}^n \Delta bm_{t-i} \\ &+ \varphi_{1i} \sum_{i=1}^n \Delta er_{t-i} + \gamma_{1i} ECT_{1t} + \varepsilon_{1t} \end{aligned} \quad (2)$$

$$\begin{aligned} \Delta p_t &= \alpha_{2i} + \beta_{2i} \sum_{i=1}^n \Delta eg_{t-i} + \lambda_{2i} \sum_{i=1}^n \Delta p_{t-i} + \delta_{2i} \sum_{i=1}^n \Delta tr_{t-i} + \phi_{2i} \sum_{i=1}^n \Delta gs_{t-i} + \eta_{2i} \sum_{i=1}^n \Delta bm_{t-i} \\ &+ \varphi_{2i} \sum_{i=1}^n \Delta er_{t-i} + \gamma_{2i} ECT_{2t} + \varepsilon_{2t} \end{aligned} \quad (3)$$

$$\begin{aligned} \Delta tr_t &= \alpha_{3i} + \beta_{3i} \sum_{i=1}^n \Delta eg_{t-i} + \lambda_{3i} \sum_{i=1}^n \Delta p_{t-i} + \delta_{3i} \sum_{i=1}^n \Delta tr_{t-i} + \phi_{3i} \sum_{i=1}^n \Delta gs_{t-i} + \eta_{3i} \sum_{i=1}^n \Delta bm_{t-i} \\ &+ \varphi_{3i} \sum_{i=1}^n \Delta er_{t-i} + \gamma_{3i} ECT_{3t} + \varepsilon_{3t} \end{aligned} \quad (4)$$

$$\begin{aligned} \Delta gs_t &= \alpha_{4i} + \beta_{4i} \sum_{i=1}^n \Delta eg_{t-i} + \lambda_{4i} \sum_{i=1}^n \Delta p_{t-i} + \delta_{4i} \sum_{i=1}^n \Delta tr_{t-i} + \phi_{4i} \sum_{i=1}^n \Delta gs_{t-i} + \eta_{4i} \sum_{i=1}^n \Delta bm_{t-i} \\ &+ \varphi_{4i} \sum_{i=1}^n \Delta er_{t-i} + \gamma_{4i} ECT_{4t} + \varepsilon_{4t} \end{aligned} \quad (5)$$

$$\begin{aligned} \Delta er_t &= \alpha_{5i} + \beta_{5i} \sum_{i=1}^n \Delta eg_{t-i} + \lambda_{5i} \sum_{i=1}^n \Delta p_{t-i} + \delta_{5i} \sum_{i=1}^n \Delta tr_{t-i} + \phi_{5i} \sum_{i=1}^n \Delta gs_{t-i} + \eta_{5i} \sum_{i=1}^n \Delta bm_{t-i} \\ &+ \varphi_{5i} \sum_{i=1}^n \Delta er_{t-i} + \gamma_{5i} ECT_{5t} + \varepsilon_{5t} \end{aligned} \quad (6)$$

Equations (2)-(6) are also known as part of the vector error correction model (VECM) which explains the existence of the short-run relationship in among a set of variables. For addition, each equation describes the relationship between dependent variables and its explanatory variables, including error correction term (ECT). A negative and significant error correction term (γ_i) indicates the existence of a long-run relationship between the dependent and its independent variables (Bozkurt, 2014; Fakher, 2016; Feridun & Adebisi, 2005). The optimum lag length of this autoregressive model (ADL) model is determined using information criteria such as Schwarz Criterion (SC) and Akaike Information Criterion (AIC). The error correction term also measures the speed of adjustment from short-run deviations to long-run equilibrium. Regarding this issue, we use the cointegration approach to test the existence of long-run equilibrium in among underlying variables.

4. Empirical Results and Discussion

4.1. Data description

Before conducting the empirical analysis of cointegration and VECM model, it is important to describe the behavior of the data of the examined variables. We present the descriptive statistic indicators of the variables in Table 1. Meanwhile, Figure 1 and Figure 2 depict the selected variables. Focusing on the descriptive statistic indicators, the mean of economic growth is 5.94%, with a maximum value of 9.77% and minimum at -13.12% in 1998. The lowest economic growth was as an impact of monetary crisis, which occurred in 1997. The inflation rate has its maximum value at 58.40% in 1998, also a consequence of the monetary crisis in 1997. The mean value of the inflation rate is about 11.2% indicating the high-level price instability economy.

Table 1. Descriptive Statistic of Variables

Variables	Descriptive Statistic Indicators				Standard Deviation
	Mean	Median	Maximum	Minimum	
Economic Growth (%)	5.94	6.17	9.77	-13.12	3.42
Inflation Rate (%)	11.18	8.30	58.40	3.53	9.80
Tax Ratio (% of GDP)	4.44	1.36	13.83	0.08	5.02
Government Spending (% of GDP)	14.69	11.38	22.89	7.16	5.85
Broad Money (Trillion IDR)	984.45	159.95	5,321.43	14.07	1,475.67
Exchange Rate (US\$/Rp)	4964.85	2,155.00	16,800.00	415.00	4,764.81

Source: <http://www.bi.go.id/en/> and <http://www.fiskal.kemenkeu.go.id/>

The volatility of economic growth along the period of 1971-2017 was not extreme unless in 1998 when the deep monetary crisis attacked the country (Figure 1). Compared to fiscal variables such as tax ratio and government spending, economic growth appears similar behavior. It may note that the tax ratio was higher than economic growth since 2000. This phenomenon is a positive indicator for the economic growth sustainability in the long-run. Government spending, which is in the percentage of real GDP, has grown faster than economic growth since the 1990s. It indicates that the government sector has played a more important role in the economy since that period comparing before. Comparing to the inflation rate as described in Figure 2, the economic growth is mostly lower along the period of 1971-2017, indicating potential inflationary effects on real income.

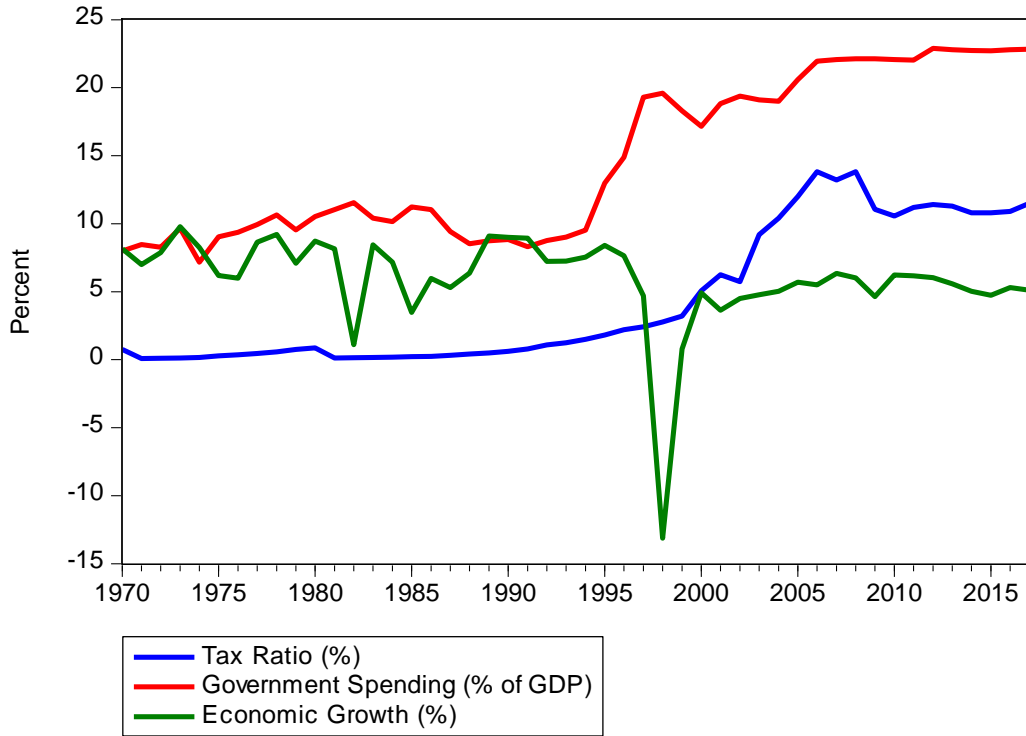


Figure 1. The behavior of Economic Growth, Tax Ratio, and Government Spending

Source: <http://www.fiskal.kemenkeu.go.id/>

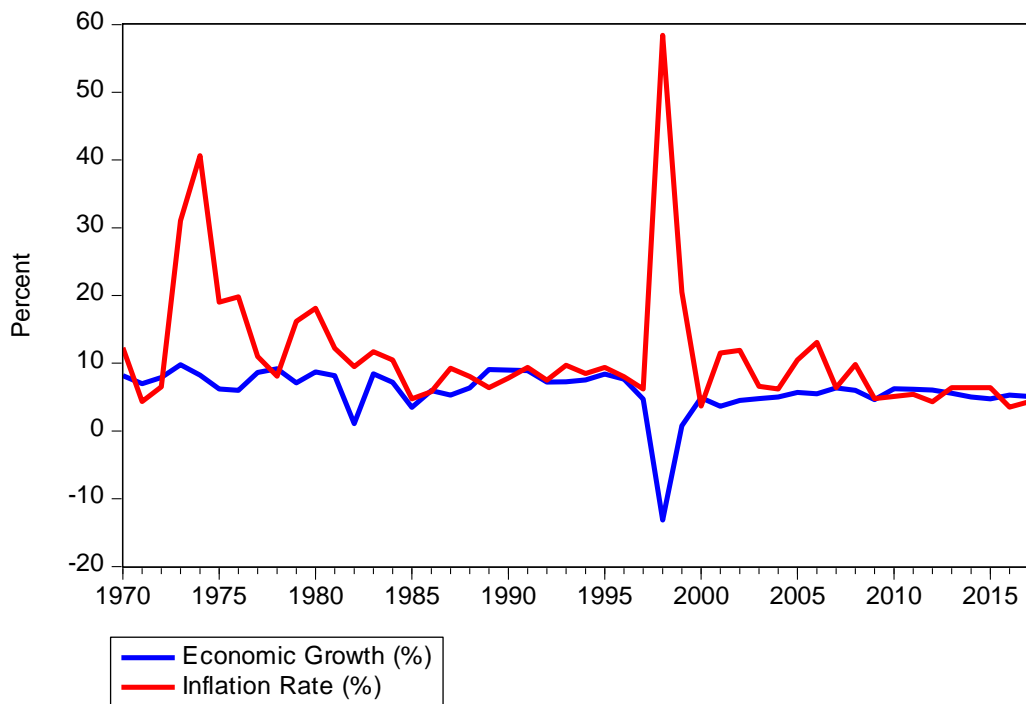


Figure 2. The behavior of Economic Growth and Inflation Rate

Source: <http://www.bi.go.id/en>

4.2. Cointegration analysis

The presence of cointegrating relationship represents the long-run relationship among examined variables. Before estimating cointegration analysis, we should conduct stationary testing for all variables. The standard procedure of such testing is unit root test using Augmented Dickey-Fuller (Dickey & Fuller, 1981). The results of the unit root test of all variables are in Table 2. We estimate the testing based on individual data series with intercept and time trend component. The results show that the data contains unit root in the level. It implies that we accept the hypothesis of non-stationary data. Otherwise, we reject this hypothesis in the first difference, at least at 5 % level for all variables (Table 2). These indicate that all the data series are stationary in first difference or integrated into the first difference. Therefore, we may write that all the data are in I(1). Cointegration test is valid if all data series are stationary at the first difference.

Table 2. Results of Unit Root Test using Augmented Dickey-Fuller

Variables	The equation contains an intercept only		The equation contains intercept and trend	
	Level	First Difference	Level	First Difference
Economic growth	-1.23	[-7.47]***	-1.96	[-19.9]***
Inflation Rate	-1.48	[-7.91]***	-2.14	[-21.3]***
Tax Ratio	-2.35	[-3.58]**	-1.96	[-5.73]***
Government Spending	-2.06	[-5.81]***	-1.78	[-5.80]***
Broad Money	-2.613	[-6.92]***	-1.97	[-10.9]***
Exchange Rate	-0.59	[-6.69]***	-1.22	[-10.3]***

Note: Values in the [] are t-statistic. *** and ** indicate significant at 1% and 5% level

Source: Author’s analysis.

Table 3. Results of Cointegration test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigenvalue Statistic	Critical Value at 0.05	Probability**
None *	0.509	84.156	83.937	0.048
At most 1	0.357	51.402	60.061	0.216
At most 2	0.273	31.052	40.174	0.301
At most 3	0.233	16.332	24.275	0.356
At most 4	0.071	4.071	12.320	0.700
At most 5	0.013	0.646	4.129	0.481

Cointegrating equation:

$$eg: 13.83 + 0.029p_t + 1.03tr_t^{***} + 0.67gst^{***} + 0.0004bm_t - 0.0006er_t^{***}$$

Note: * denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values.

*** denote significant at the 0.01 level.

Source: Author’s analysis.

Next, we conduct a cointegration analysis to elaborate on the presence of the long-run relationship among examined variables using the Johansen procedure. The results of the cointegration test are in Table 3. The long-run equilibrium, which is indicated by a cointegrating relationship, exists if we find at least one cointegrating equation. The results reject the null hypotheses of none co-integrating relationship at 5 percent level. It implies the existence of one cointegrating equation in a set of the variables, including economic growth, inflation rate, tax ratio, government spending, broad money, and exchange rate. The presence of the co-integrating relationship indicates the long-run equilibrium among the variables. Such a relationship implies that the changes of the dependent variable are a function of the residual from the cointegration model. Overall, we may infer that price level, fiscal, and monetary variables support the economic growth sustainability in the long-run. Meanwhile, the

broad money variable is neutral. The only exchange rate does not support economic growth sustainability in the long period.

4.3. Empirical VECM estimates and economic growth sustainability

We present the empirical model based on vector error correction model (VECM), which covers five equations. The model captures the dynamic response of the dependent variable toward explanatory variables which indicate the short-run behavior. This study concerns the sustainability of economic growth by estimating a set of variables including economic growth, inflation rate, tax ratio, government spending, and exchange rate. Even though estimation results using VECM provides five equations, our discussion only focuses on the economic growth model. According to the Akaike information criterion, we find the empirical VECM estimation with one lag. The coefficient of error correction term (ECT), which indicates the validity of VECM is statistically significant at the 0.05 level except for broad money model. This coefficient also indicates the presence of a long-run equilibrium relationship between each dependent variable and its explanatory variables. The coefficient of the error-correction term for economic growth model is -0.477 indicating the moderate response of economic growth to the deviations from its long-run equilibrium.

Table 4. Results of VECM Estimation

Independent Variables	Dependent Variables					
	ΔEconomic Growth	ΔInflation Rate	ΔTax Ratio	ΔGovernment Spending	ΔBroad Money	ΔExchange Rate
Constant	0.104 [0.20]	-0.594 [-0.33]	0.247 [1.49]	0.291 [1.33]	18.389 [1.22]	119.50 [0.73]
ΔEconomic Growth(-1)	0.465 [1.93]*	0.438 [1.32]	-0.221 [-2.75]***	-0.152 [-1.44]	-0.091 [-0.012]	-256.32 [-2.28]***
ΔInflation Rate(-1)	-0.135 [-1.96]**	-0.141 [-0.82]	-0.005 [-0.32]	-0.029 [-1.37]	-1.123 [-0.77]	89.376 [5.70]***
ΔTax Ratio(-1)	-0.079 [-0.16]	-1.404 [-0.79]	0.157 [0.95]	0.272 [1.24]	-14.927 [-1.00]	-186.73 [-1.16]
ΔGovernment Spending(-1)	-0.440 [-1.03]	4.681 [3.09]***	0.039 [0.28]	-0.069 [-0.36]	7.788 [0.60]	446.85 [3.23]***
ΔBroad Money(-1)	0.0003 [0.13]	-0.0007 [-0.08]	-0.0004 [-0.52]	-0.0001 [-0.10]	0.902 [11.92]***	1.735 [2.12]**
ΔExchange Rate(-1)	0.0004 [2.11]***	-0.001 [-2.35]**	0.00013 [0.18]	-0.0005 [-0.72]	-0.001 [-0.23]	-0.398 [-5.64]***
Error Correction term	-0.477 [-4.70]***	0.603 [1.83]*	-0.328 [-3.37]***	0.231 [1.67]*	5.753 [0.60]	-358.16 [-3.51]***
R-squared	0.629	0.452	0.106	0.204	0.792	0.873
F-statistic	9.239	4.494	0.648	1.397	20.776	37.585
Akaike IC	4.929	7.469	2.732	3.290	11.737	16.496

Note: Values in the [] are t-statistic. ***, **, and * and indicate significant at 1%, 5%, and 10% level. The optimum lag length based on the Akaike Information Criterion (AIC).

Source: Author’s analysis

Focusing on the economic growth model, two explanatory variables, namely the inflation rate and exchange rate, are statistically significant. It implies that the inflation rate hurts economic growth. The negative effect of inflation rate on economic growth implies that higher inflation reduces economic growth. This finding is in line with some recent studies (Akinsola & Odhiambo, 2017; Barro, 2013; Bukhari & Yusof, 2014). We may infer that the price level is not neutral to the economy in the short-run. The price level significantly eliminates real income. Therefore, a high inflation rate did not support economic growth sustainability.

Moreover, the exchange rate has a positive impact on economic growth, implying that the depreciation of the Indonesian currency causes lower economic growth. This finding is similar to previous studies (Karras, 2011; Mahmoodi & Mahmoodi, 2016). These results reflect that the international financial market assault economic growth sustainability. The globalization and trade liberalization, which has an impact on Indonesian currency depreciation, potentially reduce the real income. The central government should avoid capital outflow to minimize the depreciation of the domestic currency against international currencies.

We may further discuss the sustainability of economic growth based on the VECM empirical model by elaborating the role of other variables such as tax ratio, government spending, and broad money. Table 5 summarizes the effects of examined variables on economic growth sustainability. The effect of the tax ratio on economic growth is not significant, indicating that higher tax ratio does not increase the economic growth. Meanwhile, the increase of economic growth significantly causes lower tax ratio. These results show that the tax ratio is not an important factor for economic growth. Therefore tax ratio is neutral to the economic growth sustainability. In other words, we may state that the tax ratio is neutral to economic growth sustainability.

The other fiscal variable, which is indicated by government spending, does not significantly affect economic growth. Otherwise, higher economic growth also did not increase government spending. This phenomenon exhibits a weak relationship between fiscal policy and economic growth. This result is not in line with some previous studies (Bošnjak, 2018; Butkiewicz & Yanikkaya, 2011; Tsaurai & Odhiambo, 2013). We may infer that the government spending is neutral to the sustainability to the economic growth in the short-run. The Indonesian fiscal authority should reform government spending to maintain economic growth sustainability in the future.

Table 5. The effect of independent variables on economic growth sustainability

Independent Variables	Implication on Economic Growth Sustainability	
	Long-run effect	Short-run effect
Inflation rate	Positively affect sustainability	Negatively affect sustainability
Tax ratio	Positively affect sustainability	Neutral
Government spending	Positively affect sustainability	Neutral
Broad money	Neutral	Neutral
Exchange rate	Negatively affect sustainability	Negatively affect sustainability

Source: The summary is based on the results of Table 3 and Table 4.

The relationship between broad money and economic growth is not significant. Therefore, this paper confirms that money is neutral in the economy. This point of view is in line with the Keynesian theory, which states that the monetary policy is powerless in the economy. The broad money variable as the main instrument of monetary policy is also neutral to economic growth sustainability. Based on the empirical estimation, the broad money is not significant. Meanwhile, higher economic growth did not increase the broad money variable. We may conclude that the relationship between the monetary sector and economic growth should be strengthened to encourage economic growth sustainability.

5. Conclusion

This research elaborates economic growth sustainability based on the dynamic econometric models. We utilize cointegration and vector error correction model to estimate the dynamic relationship between economic growth and other selected variables such as inflation rate, tax ratio, government spending, broad money, and exchange rate in Indonesia. We find the presence of a long-run relationship between economic growth and all the mentioned variables. In other words, the dynamic changes of those selected variables will affect the economic growth in the future. The empirical model based on VECM estimation shows that only inflation rate and exchange rate significantly affect the economic growth. Therefore, those two variables determine economic growth in the short-run. We may infer that economic growth depends on price stability and external factors such as the international money market.

This paper presents that the price stabilization, fiscal and monetary policies, and exchange rate have a long-run impact on economic growth sustainability. In the short-run only price level and exchange rate associated with economic growth sustainability. However, those both variables do not support the economic growth sustainability in the short-run. Unlike those variables, inflation rate, tax ratio, and government spending have a positive impact on economic sustainability in the long-run. Specifically, we may conclude that economic growth sustainability in Indonesia positively associates with fiscal policies. The exchange rate variable does not support economic growth sustainability both in long and short-run. The inflation rate has a positive relationship with economic growth sustainability in the long run. Otherwise, it does not support economic growth sustainability in the short-run. We also highlight that the effect of monetary policy on economic growth sustainability is neutral both in the long and short-run.

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