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Research Article

The Effect of Fiscal and Monetary Policy on Economic Growth in Indonesia

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Abstract: This study aims to see the effect of fiscal and monetary policy on output growth in Indonesia. This study uses secondary time series data from 1975-2017. The analytical tool used is VECM. With a significance level of 5 percent, it shows that fiscal policy in the form of taxes and government spending is proven to influence Indonesia's GDP while monetary policy influences economic growth through export variables. Therefore, the government is expected to control taxes, government expenditure and net exports so that economic growth is guaranteed to be stable.

Keywords: Fiscal Policy, Monetary Policy, Economic Growth.

INTRODUCTION

The aim of national development is to create a peaceful, democratic, fair, competitive, advanced and prosperous Indonesian society in a forum of the Republic of Indonesia that is certainly supported by Indonesian who are healthy, independent, faithful, pious, noble, human beings, aware of the country, aware of law and environment, mastering science and technology, having a high work ethic and discipline.

One of the dimension developments is economic development. It is a process that aims to increase the per capita income of the population or society in a country in long-term accompanied by fundamental changes in the economic structure and equal distribution of the income for the population of a country.

To run the wheels of government, the government always strives to achieve high economy. Therefore, the government always strives for the factors influencing economic growth to be controlled in order to make economic growth go as expected.

According to the theory of developing economic growth, a country's economic growth is influenced by the number of people as labor, the capital that can be used as investment, the controlled land area, the potential of natural wealth, the using of technology and human capital.

However, besides the above factors, the monetarist argues that the monetary dimension also plays an important role in the economic growth of a country. Expansive monetary policy will increase the economic growth. Conversely, contractive monetary policy will decrease the economic growth.

On the other hand, the fiscal people state that a country's economic growth is strongly influenced by the balance that occurs in the goods market. These people argue that fiscal policy applied expansively will be able to increase the economic growth. While a fiscal policy that is active will reduce economic growth.

Based on the above opinions, then the problem in this study is how does the influence of fiscal and monetary policy on the economic growth in Indonesia.

LITERATURE REVIEW

The research conducted by Putra and Nugraha (2007) concluded that government expenditure variables have impact on economic growth. In addition, Musa (2007) added that the addition of the money supply and government income variables affect the

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economic growth in Nigeria if it is proceed with good coordination.

Wulandari (2012) stated that interest rates and credit are very influential in determining inflation but they have less influence on economic growth in Indonesia. Furthermore, Anwar *et al*. (2018) mentioned that interest rates, exchange rates and foreign shocks have a significant effect on Vietnam's economic growth. On the other hand, Toledo and Venieris (2014) concluded that fiscal instruments, socio-political stability and income distribution affect economic growth.

Brueckner (2007) concluded that the fiscal decentralization policy is proved to be more effective in increasing economic growth. Moreover, Ono and Uchida (2018) examined the results that taxes will reduce economic growth. Besides that, in terms of the mix policy it turns out that interest rates, exchange rates and capital flows are proven to be able to maintain financial stability (Warjiyo, 2017). Expansive fiscal policy followed by contractive monetary policy will succeed if the finance mechanism, interest rate investment and exchange rates are market-based (Liu, 2014). The combined debt policy keeps the inflation stable. Taxes and labor wages are fiscal policy while monetary policy is in the form of political budget deficits (Reynolds, 2001). Mix policy in the form of interest rates, inflation and credit is concluded to affect output (Syurkani, 2010). Besides that, decentralization, credit and interest rates affect on output in Indonesia (Ridhwan & *et al*., 2009).

Based on critically review of previous research, it can be formulated the research framework as shown on figure 1 as follows:

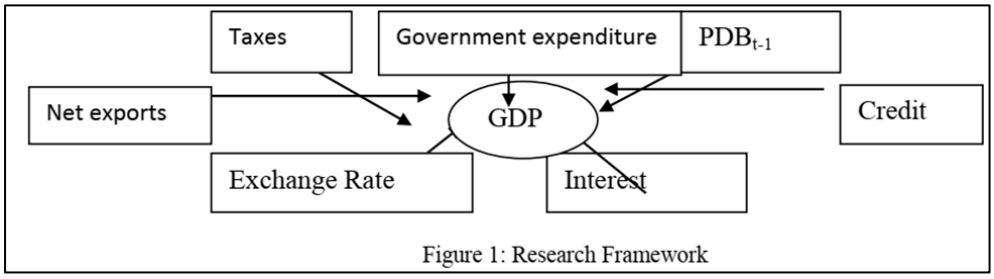

Figure 1: Research Framework

RESEARCH METHOD

Analytical Tool

The analytical tool used is VAR (Vector Auto-regression) model with the following equation:

$$Ln\ GDP_t = a_{1i} + \sum_{i=1}^{n} \beta_{1i}\ Ln\ GDP_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Ln\ Taxes_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Ln\ Government\ expenditure_{t-1} + \sum_{i=1}^{n} \beta_{1i} SB_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Ln\ Credit_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Exchange\ rate_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ export_{t-1} + \varepsilon_t$$

$$Ln\ Taxes_t = a_{1i} + \sum_{i=1}^{n} \beta_{1i}\ Ln\ Taxes_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Ln\ GDP_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Ln\ Government\ expenditure_{t-1} + \sum_{i=1}^{n} \beta_{1i} SB_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Ln\ Credit_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Exchange\ rate_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ export_{t-1} + \varepsilon_t$$

$$Ln\ Government_t = a_{1i} + \sum_{i=1}^{n} \beta_{1i} Ln\ Government\ expenditure_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ LnGDP_{t-1} + \sum_{i=1}^{n} \beta_{1i} Ln\ Taxes_{t-1} + \sum_{i=1}^{n} \beta_{1i} SB_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Ln\ Credit_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ Exchange\ rate_{t-1} + \sum_{i=1}^{n} \beta_{1i}\ export_{t-1} + \varepsilon_t$$

$$SB_t = a_{1i} + \sum_{i=1}^{n} \beta_{1i} SB_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, LnGDP_{t-1} + \sum_{i=1}^{n} \beta_{1i} Ln\, Taxes_{t-1} + \sum_{i=1}^{n} \beta_{1i} Ln\, Government_{t-1} + \sum_{i=1}^{n} \beta_{1i} Ln\, Credit_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Exchange\ rate_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, export_{t-1} + \varepsilon_t$$

$$Ln\ Credit_t = a_{1i} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ GDP_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ Taxes_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ Government\ expenditure_{t-1} + \sum_{i=1}^{n} \beta_{1i} SB_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ Credit_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Exchange\ rate_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, exsport_{t-1} + \varepsilon_t$$

$$Exchange\ rate_t = a_{1i} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ GDP_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ Taxes_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ Government\ expenditure_{t-1} + \sum_{i=1}^{n} \beta_{1i} SB_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ Credit_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Exchange\ rate_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, exsport_{t-1} + \varepsilon_t$$

$$Exsport_t = a_{1i} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ GDP_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ Taxes_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ Government\ expenditure_{t-1} + \sum_{i=1}^{n} \beta_{1i} SB_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Ln\ Credit_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, Exchange\ rate_{t-1} + \sum_{i=1}^{n} \beta_{1i}\, exsport_{t-1} + \varepsilon_t$$

Granger Causality Test

This test is useful to see the causality relationship among variables in the study, namely GDP, taxes, government expenditure, interest rates, credit, exchange rates and net exports. In this test, we can see the relationship of two variables in the form of reciprocity or only in the same direction.

Table 1 indicates that there is two-way causality relationship between the variables in this study. It is proved by the probability below 0.05 percent.

Table 1- Granger Causality Test

Null Hypothesis:	F-Statistic	Prob.	Conclusion
Ln Exchange rate does not Granger Cause Net export	4,48154	0,0183	Reject Ho
Net export does not Granger Cause Ln exchange rate	10,0336	0,0003	Reject Ho
Net export does not Granger Cause Ln Government	12,4098	8,E-05	Reject Ho
Ln PDB does not Granger Cause Net export	5,06371	0,0115	Reject Ho
Net export does not Granger Cause Ln PDB	8,94580	0,0007	Reject Ho
Net export does not Granger Cause Interest rates	3,78859	0,0321	Reject Ho
Ln credit does not Granger Cause Ln exchange rate	3,34439	0,0465	Reject Ho
Ln Government does not Granger Cause Ln PDB	3,34731	0,0464	Reject Ho
Ln Government does not Granger Cause Ln Taxes	6,40646	0,0042	Reject Ho
Ln PDB does not Granger Cause Ln Taxes	5,03907	0,0118	Reject Ho
Ln Taxes does not Granger Cause Interest rates	4,83491	0,0138	Reject Ho

Source: Processed Eviews

From the table above, there is a reciprocal relationship that the exchange rate will affect net exports. The lower the exchange rate, the more it can increase net exports. Conversely, net exports are also proven to have a reciprocal relationship affecting the rupiah exchange rate. The more net exports, the stronger the exchange rate will be because the rupiah is increasingly needed.

Furthermore, net exports are also proved to have a reciprocal relationship affecting government expenditure. The higher net exports, the higher GDP

will be, so that government expenditure will also increase.

Economic growth is also proved to have a reciprocal relationship affecting net exports. The higher the economic growth, the more production of goods and services in the country and the greater the opportunity for exports occur. Conversely, net exports are also proven to have a reciprocal relationship affecting GDP. The higher net exports, the greater the GDP is formed.

Net exports are proven to have a reciprocal relationship affecting domestic nominal interest rates. The high net exports will increase the exchange rate and affect the domestic nominal interest rate. The high net exports will also increase economic growth and inflation so that nominal interest rates will also be affected.

The amount of credit distribution is proven to have a reciprocal relationship affecting the rupiah exchange rate. The higher the amount of credit distribution, the greater the economic growth occurs so that interest rates increase and affect the exchange rate.

Government expenditure is proven to have a reciprocal relationship affecting Indonesia's GDP. The higher the government expenditure, the more the wheels of the country's economy will move.

Government expenditure is proven to have a reciprocal relationship affecting domestic taxes revenue. Government expenditure in the form of employee expenditure will increase the income of a country from the tax side.

GDP is proven to have a reciprocal relationship affecting taxes revenue. The higher the economic growth that occurs, the more the production of goods and services are produced so that taxes revenue including business taxes and sales tax increases more.

Taxes revenue is proven to have a reciprocal relationship affecting domestic nominal interest rates. The amount of taxes revenue will reduce domestic output, so that it affects the inflation and influences interest rates.

Regression Model

The model of the influence of fiscal and monetary policy on Indonesia's GDP growth is as follows:

$$LnGDP_t = 0{,}736729 LnGDP_{t-1} - 0{,}082614 LnExchange\ rate_{t-2} - 0{,}283764 LnGovernment_{t-1} - 0{,}207088 \mathrm{Ln} Government_{t-2}$$

$$LnCredit_t = 3{,}748176 LnGDP_{t-2} + 0{,}514974 LnExchange\ rate_{t-2} - 1{,}213126 \mathrm{Ln} Government\ expenditure_{t-2}$$

$$\begin{aligned} 〖LnExchange\ rate〗\_(t &=) \ 〖2{,}082187 LnGovernment\ expenditure〗\_(t-1) + \ 〖1{,}41333 LnGovernment\ expenditure〗\_(t-2) \\ &+ 0{,}00001 \mathrm{Ln} \ 〖export〗\_(t-1) \end{aligned}$$

$$LnGovernment_{t=} - 0{,}931577 \mathrm{Ln} Government\ expenditure_{t-1} - 0{,}563635 \mathrm{Ln} Government\ expenditure_{t-2}$$

$$LnTaxes_{t=} - 0{,}788027 LnGovernment\ expenditure_{t-1} - 0{,}743763 \mathrm{Ln} Government\ expenditure_{t-2} - 0{,}012779\ SB_{t-2}$$

$$LnEkspor_{t=} 370.854{,}3 \mathrm{Ln} Government\ expenditure_{t-2}$$

In the above economic growth equation, it can be seen that each 1 percent increase in GDP in the previous year will increase GDP this year by 0.736729 percent. However, each 1 percent increase in government expenditure in the previous year and two years earlier, it will reduce GDP this year by 0.283764 and 0.207088 percent. In addition, each 1 percent rate increase in the previous two years will increase GDP this year by 0.082614 percent. One year's economic growth will have chain effect on the following year. Likewise one year’s government expenditure will affect on the following year. Government expenditure in this study is only in the form of employee expenditure and subsidies, so that it weakens economic growth. On the other hand, if government expenditure is in the form of capital goods, it will certainly increase economic growth. In addition, the rupiah currency decrease in the previous two years will increase economic growth this year. The determination rate model is formed by 0.669587. That is the model that can explain economic growth by 66.96 percent, while 33.14 percent is explained by other variables out of the model.

Table 2: Short Term VECM Regression Model

Error Correction:	**D(LNPDB)**	**D(LNCREDIT)**	**D(LNER)**	**D(LNGOV)**	**D(LNTAX)**	**D(SB)**	**D(EXPOR)**
	t-statistic coefficient	t-statistic coefficient	t-statistic coefficient	t-statistic coefficient	t-statistic coefficient	t-statistic coefficient	t-statistic coefficient
D(LNPDB(-1))	0,736729 [2,38777]*	-0,038709 [-0,02159]	-0,204083 [-0,12036]	1,342388 [1,61441]	1,754444 [1,84097]	4,528114 [0,12673]	-992451,3 [-1,68746]
D(LNPDB(-2))	0,231021 [0,82970]	3,748176 [2,31688]*	-2,085662 [-1,36301]	0,651735 [0,86854]	1,415038 [1,64535]	13,55594 [0,42040]	138251,8 [0,26048]
D(LNCREDIT(-1))	-0,011620 [-0,38098]	0,308982 [1,74352]	0,206732 [1,23332]	-0,150190 [-1,82714]	-0,092023 [-0,97678]	-1,426550 [-0,40386]	-16935,16 [-0,29128]
D(LNCREDIT(-2))	-0,041431 [-1,20999]	-0,265323 [-1,33365]	0,334239 [1,77623]	-0,111204 [-1,20511]	-0,188382 [-1,78121]	-3,200156 [-0,80704]	49583,32 [0,75968]
D(LNER(-1))	0,030509 [0,66396]	-0,254497 [-0,95326]	-0,073733 [-0,29199]	0,023789 [0,19211]	0,168098 [1,18441]	4,904793 [0,92173]	-21251,29 [-0,24263]
D(LNER(-2))	0,082614 [2,25248]*	0,514974 [2,41659]*	-0,352967 [-1,75116]	0,092708 [0,93793]	0,053528 [0,47251]	4,280422 [1,00776]	56535,93 [0,80866]
D(LNGOV(-1))	-0,283764 [-2,99144]*	-1,048975 [-1,90328]	2,082187 [3,99420]*	-0,931577 [-3,64411]*	-0,788027 [-2,68958]*	-16,71875 [-1,52193]	303224,9 [1,67698]
D(LNGOV(-2))	-0,207088 [-2,35465]*	-1,213126 [-2,37405]*	1,413330 [2,92416]*	-0,563635 [-2,37803]*	-0,743763 [-2,73795]*	-5,921085 [-0,58135]	370854,3 [2,21214]*
D(LNTAX(-1))	0,066110 [1,12144]	0,022083 [0,06447]	-0,304655 [-0,94038]	0,060716 [0,38217]	-0,114186 [-0,62711]	-5,119723 [-0,74994]	-132326,6 [-1,17760]
D(LNTAX(-2))	0,096121 [1,80576]	0,392536 [1,26921]	-0,287748 [-0,98365]	0,244121 [1,70175]	0,036286 [0,22070]	1,016298 [0,16487]	-92381,60 [-0,91047]
D(SB(-1))	-0,001333 [-0,69978]	-0,007034 [-0,63547]	-0,002435 [-0,23257]	-0,001892 [-0,36850]	-0,005629 [-0,95665]	0,188636 [0,85499]	-1228,432 [-0,33826]
D(SB(-2))	0,001909 [1,12486]	0,015375 [1,55967]	-0,002283 [-0,24481]	0,002685 [0,58719]	-0,012779 [-2,43836]*	-0,182359 [-0,92808]	-3321,127 [-1,02687]
D(EXPOR(-1))	-1,76E-07 [-1,23709]	-5,12E-07 [-0,62056]	1,59E-06 [2,03410]*	-2,38E-07 [-0,62070]	-5,00E-07 [-1,13879]	-5,30E-06 [-0,32222]	-0,075443 [-0,27859]

D(EXPOR(-2))	-6,21E-08	4,85E-07	8,95E-07	3,07E-07	1,21E-07	-1,20E-05	0,095513
	[-0,52591]	[0,70651]	[1,37876]	[0,96517]	[0,33275]	[-0,87948]	[0,42426]
C	0,016551	-0,036980	0,028734	0,024950	-0,044048	-0,061862	15878,33
	[0,90060]	[-0,34632]	[0,28450]	[0,50376]	[-0,77597]	[-0,02907]	[0,45326]
R-squared	0,669587	0,432719	0,737586	0,549889	0,624989	0,494204	0,491882

Description: * significant; Source: Processed Eviews

In the long-term, table 2 shows that the GDP forming model of Indonesia is as follows:

$$Ln\ GDP_{t=} - 8.772957 - 0.642116\text{Ln}Taxes_{t-1} + 0.927609LnGovernment\ expenditure_{t-1} + 0.137457LnCredit_{t-1} + 0.135872LnExchange\ rate_{t-1} + 0{,}00001exsport_{t-1}$$

Taxes are negatively related to economic growth. Each tax increase in the previous year by 1 percent, it will reduce economic growth in year t by 0.642116 percent. This is because taxes will reduce consumption so that it will decrease economic growth.

In the long-term, each increase in government expenditure by 1 percent in the previous year will increase economic growth by 0.927609 percent in year t. The increase in government expenditure in the form of employee expenditure and subsidies will increase public consumption and reduce the cost of business production so that economic growth can increase.

Credit is positively related to economic growth. Each 1 percent increase in credit distribution in the previous year will increase economic growth in the year by 0.137457 percent. This is because the more amount of credit distributed, the more it will increase investment so that economic growth becomes more passionate.

The exchange rate is positively related to economic growth. The more rupiah value must be spent in each 1 US dollar in the previous year; it will more increase economic growth in year t by 0.135872 percent. The lower the exchange rate, the higher net exports will be, so that economic growth becomes expansive.

In the long-term, net exports is positively related to economic growth. Each net exports increase in the previous year by 1 percent, it will increase economic growth in year t by 0.000001 percent.

If the variable of credit, exchange rate, government expenditure, taxes, interest rates and net exports remain, Indonesia's economic growth will increase by 8.77 percent.

Table 3-M Long-Term VECM Regression Models

Cointegrating Eq:	**Coefficient**	**Distribution t**	**T tabel**	**Significant**	**Remark**
Ln Credit(-1)	0,137457	4,77196	2,01669	Reject Ho	Significant
Ln Exchange rate(-1)	0,135872	4,00990	2,01669	Reject Ho	Significant
Ln Government(-1)	0,927609	7,37355	2,01669	Reject Ho	Significant
Ln Taxes(-1)	-0,642116	-3,05160	-2,01669	Reject Ho	Significant
Interest rate(-1)	-0,007557	-1,76447	-2,01669	Accept Ho	Non-Significant
Export(-1)	1,47E-06	4,34538	2,01669	Reject Ho	Significant
C	8,772957				

Source: Processed Eviews

IRF GDP test on tax shocks, government expenditure, interest rates, exchange rates, credit and net exports.

From Figure 1, it can be seen that the GDP response to credit shocks and government expenditure is positive from the first year to the tenth year. Theoretically, credit distribution will affect the economy through the circulation of flowing money and increase investment so that GDP increases. The amount of government expenditure also greatly affects GDP. Employees' expenditure can increase consumption of the real sector and accelerate economic growth.

The response of GDP to exchange rates, interest rates and taxes is negative in the first year to the tenth year. This negative response indicates that the exchange rate is inversely related to GDP. The lower the exchange rate means that there has been an appreciation of the currency so that GDP increases. Interest rates are also very influential on economic

growth. High interest rates will reduce GDP because of the reluctance of people to borrow money so that investment decreases. Taxes itself are proved to be inversely proportional to economic growth. The greater the withdrawal of taxes is done, the lower the GDP is.

Whereas the GDP response to net export shocks is negative in the first to second year but it changes into positive in the third to tenth year. Increasing exports in the first to second years will lead to increase taxes so that it weakens economic growth. However, for the next eight years, increasing exports will always increase economic growth.

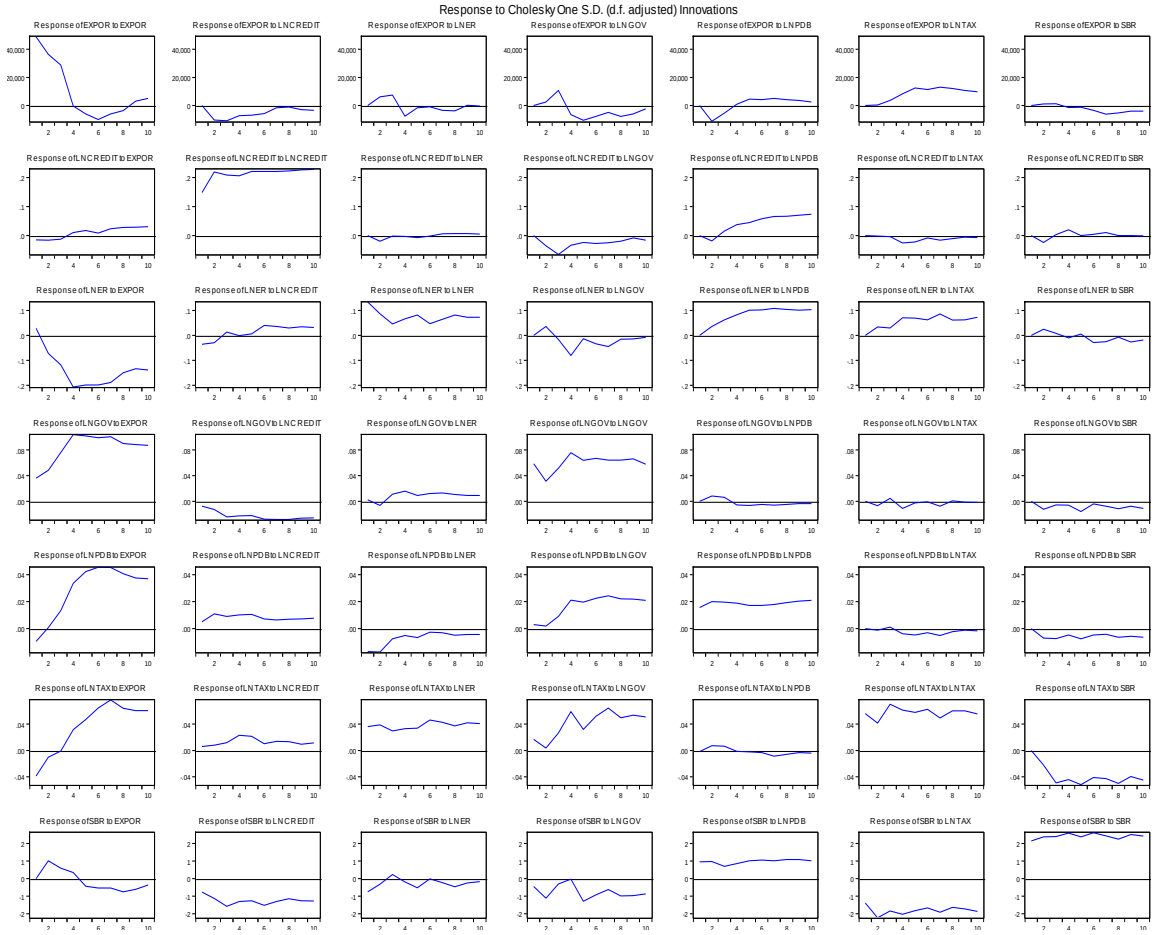

Figure 1. IRF Test; Source: Processed Eviews

Variance Decomposition

This test is conducted to analyze how much the shock of a variable affects the other variables.

The table shows that in the first period, GDP shocks are influenced by themselves by 36.88 percent. It increased in the second and third years and then decreased by 23.27 percent in the fifth year.

Table 4- GDP Variance Decomposition

Variance Decomposition of LNPDB:								
Period	S.E.	EXPORT	LNCREDIT	LNEXCHANGERATE	LNGOVERNMENT	LNGDP	LNTAXES	SB
1	0,025678	13,97132	3,869341	43,96804	1,303007	36,88830	0,000000	0,000000
2	0,039249	6,009257	9,401133	38,86085	0,781772	41,52922	0,088003	3,329768
3	0,048806	11,42195	9,490559	27,57769	3,914802	43,03645	0,099012	4,459539
4	0,066901	31,23007	7,339678	15,29056	12,03694	30,80150	0,402711	2,898543
5	0,084707	44,41415	6,119664	10,16008	12,86513	23,26905	0,568269	2,603662

Source: Processed Eviews

Exports contributed 13.97 percent on changes of GDP in the first year. This contribution decreased by 6.01 percent in the second year, but continued to increase by 44.41 percent in the fifth last year.

The number of credit distributed by banks contributed 3.87 percent on changes of GDP in the first year, but this contribution continued to increase by 9.49 percent in the third year. However, this contribution decreased in the fourth year so that it only reached 6.12 percent in the fifth year.

The exchange rate contributed 43.97 percent on changes of GDP in the first year, but its value continued to decrease by 10.16 percent in the fifth year.

Tax revenues in Indonesia do not contribute on changes of GDP in the first year and continued to increase by 0.57 percent in the fifth year. Likewise, Indonesia's interest rates do not contribute on changes of GDP in the first year and the rate continues to increase by 4.46 percent in the third year. In the following years, this contribution continued to decrease by only 2.60 percent in the fifth year.

CONCLUSIONS

1. The causal granger test results concluded that the tax, government expenditure and export variables have a causal relationship affecting Indonesia's GDP.
2. In the long-term, from the VECM model it is proved that taxes are negatively related to economic growth while government expenditure, credit, exchange rates and net exports are positively related to economic growth.
3. The IRF test results concluded that the GDP response on credit shocks and government expenditure is positive from the first year to the tenth year. The response of GDP to exchange rates, interest rates and taxes is negative in the first year to the tenth year. Whereas the GDP response on net export shocks is negative in the first year to the second year but it changes into positive in the third year to the tenth year.

Recommendations

1. From the fiscal side, the government must prepare policies to reduce taxes, increase government expenditure and prepare policies to boost net exports.
2. From the monetary side, the government must prepare policies for rupiah exchange rate stability to boost exports.
3. In addition, the government must prepare long-term policies to maintain credit stability, interest rates, government expenditure, exchange rates and net exports.

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