Full Length Research Paper

Interdependency between monetary policy instruments and indonesian economic growth

Fitra Waty

Faculty of Economics, State Univesity of Medan, Indonesia.

The objective of this study is to analyze the interdependency between monetary policy instruments and Indonesian economic growth for the periods of 2000 to 2011. The monetary policy instruments are open market operation (OPT), reserve requirement (RR), and discount rate. For the analysis, this study employs Structural Vector Autoregression, and Impulse Response Function. The results of the analysis show that Open market Operation (OPT), Reserve Requirement (RR), and discount interest rate (rDiskonto) have some degrees of interdependency on economic growth (GROW) through other intermediary macroeconomic variables. These variables are exchange rate, exports, imports, investment, and balance of payment, unemployment and inflation. Impulse Response Function showing a shock in OPT by one standard deviation has a negative effect on economic growth (for short-, medium, and long-terms) through out. In other words, if OPT increases, economic growth decreases. An increase in Reserve Requirement (RR) has an immediate negative impact on growth. In a slightly longer period, the impact of RR on growth becomes positive. However, in other periods (medium- and long-terms) the impact of RR on growth was negative. The increased rDiskonto can increase growth in the medium term, contrary to other periods.

Key words: Interdependency, monetary policy, and economic growth.

INTRODUCTION

Monetary policy is planned and executed by a central bank to control money supply in order to achieve high employment growth and job vacancy, low inflation, balance of payments, and a desired economic development and growth (Pohan, 2008). The monetary policy instruments are open market operation, reserve requirement and discount rate. The target variable is aggregate demand or GDP. The transmission mechanism of monetary policy is through intermediate macroeconomic variables such as interest rate and investment, and imports, exports, and balance of payments, among others.

According to Keynes, fiscal policy is an important factor to determine aggregat demand, while monetary policy such as a change in money supply has relatively weak or even insignificant impact under certain condition on the economy. The mechanism of money supply to influence
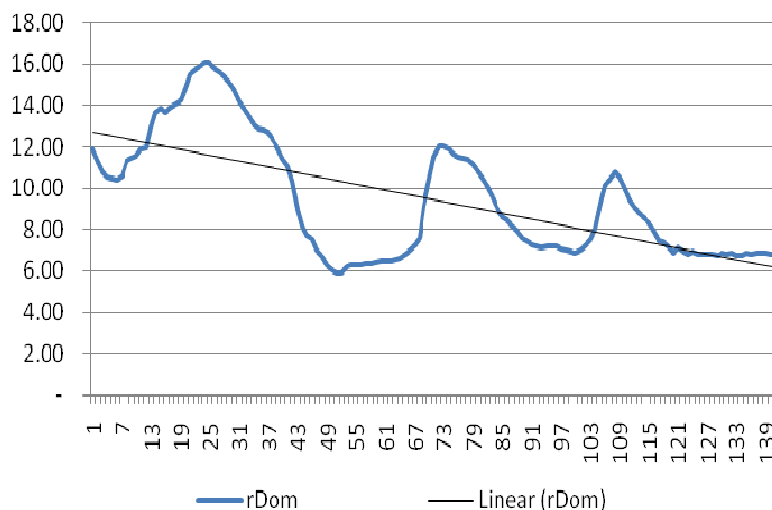
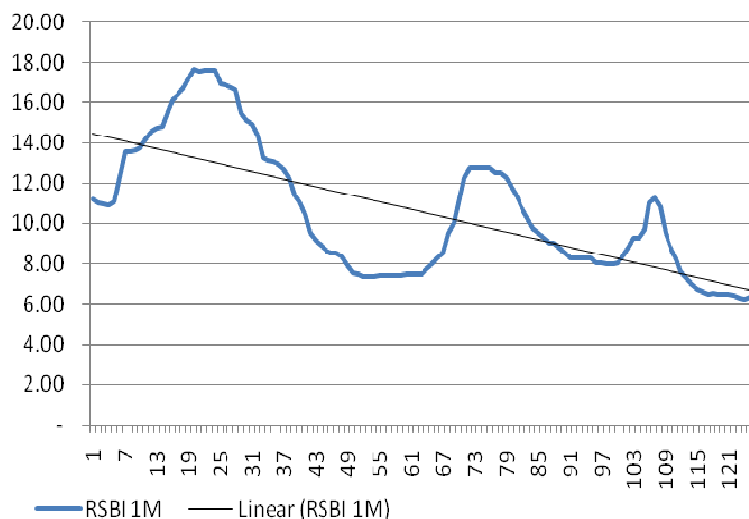**Figure 1.** Trend of domestic interest rate 2000-2011.

Figure 2. Trend of discount rate of central bank (RSBI) 2000-2010.

aggregate demand is through other intermediate varia-bles, that is, intereset rate and investment (Ahuja, 2002). However, the monetarist believes that money supply is really important to influence and enhance economy activity and price level (Sukirno, 2004). According to Mundell-Fleming proposi-tion, the effectiveness of fiscal and monetary policies in impacting aggregate income depends on the exchange rate regime of a particular country (Mankiw, 2000).

Looking at Indonesian data for the last one decade (2000 – 2010), there was an increase in money in circulation and a downward trend in discount rate (RSBI) followed by a decrease in domestic interest rate. At the same time Indonesian Central Bank tended to increase

the reserve requirement (RR). According to Pohan (2008), an increase in RR has a partial impact on money in circulation and total credit offered by the commercial bank. But, for the same time period, money supply showed an increasing trend. The same was true for credit disbursed for investment. But, according to Julaihah (2004), the increase in money in circulation (JUB) in the decade of the study was absorbed by an increase in the reserve requirement (RR) and thus this increase in money supply was not offered to the society (absorbed by increase in the RR). In other words, the increase in money in circulation has no impact on the growth of real sector (Figures 1 – 6).

Theoretically, a decrease in the domestic interest rate
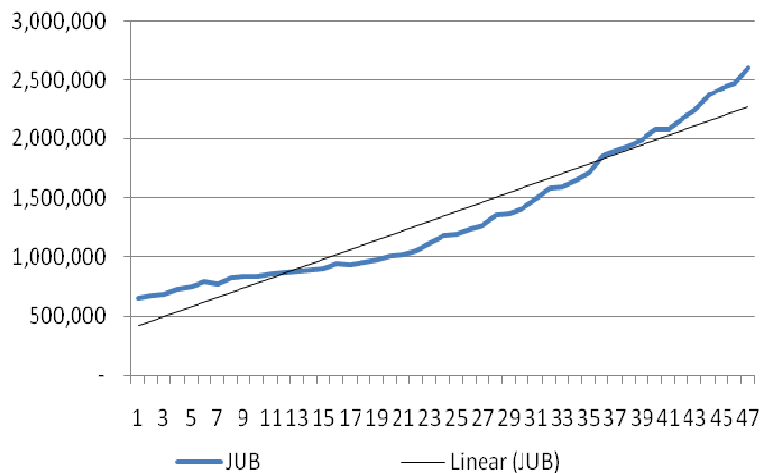
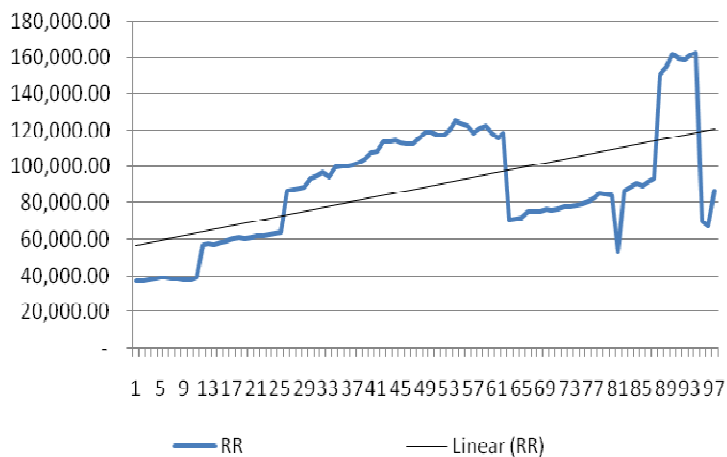**Figure 3.** Trend of money in circulation 2000-2011 (Billion Rp).

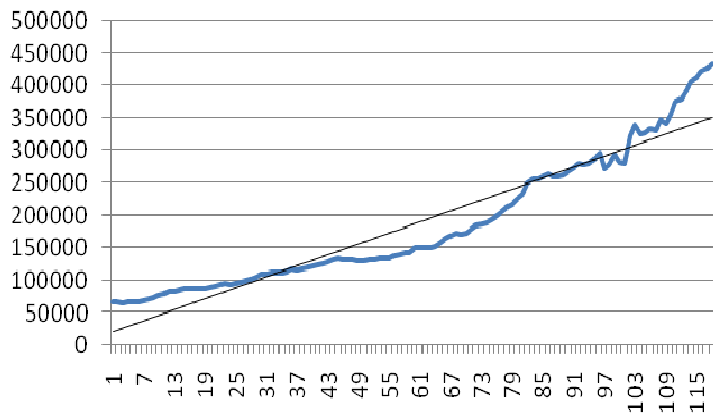**Figure 4.** Trend of Reserve Requirement (RR) 2003-2011.

Figure 5. Trend of loans for investment approved   by commercial banks 2002-2011.
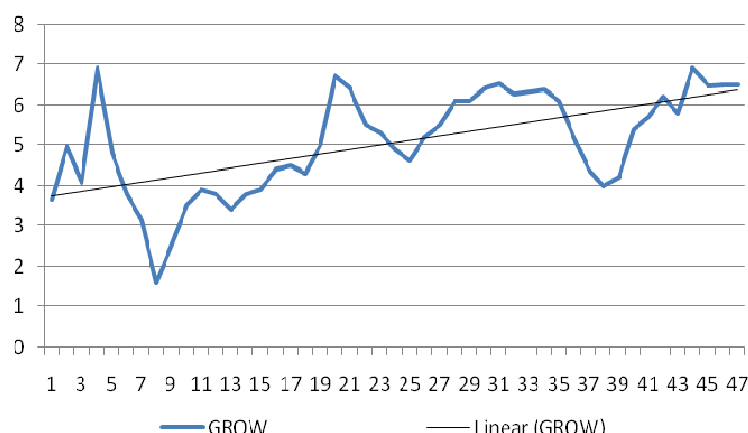
Figure 6. Trend of Economic growth 2000-2011

has a positive impact on investment and this can be translated into an increase in investment and economic growth. Interest, inflation and exchange rates have an impact on export and economic growth. These impacts are parallel to what is predicted by Mundell-Fleming theory (Mankiw, 2000). In a small open economy that has no restriction on capital mobility, a decrease in domestic interest rate triggers capital outflow.

Generally, the objective of this study is to analyze the interdependency of monetary policy instruments comprising open market operation (OPT), reserve requirement (RR) and discount interest rate (rDiskonto) on economic growth in Indonesia. The transmission mechanism of these instruments is via the impact on intermediate variables such as money in circulation (JUB), domestic interest rate (JUB), exchange rate (EXC), exports (EXPORT), imports (IMPORT), investment (INVEST), balance of payment (BOP) and inflation (INF). The organization of this paper is as follows; the next section discusses the methodology of the study and this is followed by results and discussions. The last section concludes.

METHODOLOGY

This section discusses methodology and data. The time series data for the period of 2000 - 2011 were retrieved from the Bank of Indonesia and the Statistics Department of Indonesian. These data were tested for stationerity of the variables or unit root test known as stationary stochastic process (Bapepam, 2008) by employing Augmented Dickey Fuller (ADF) test. The next step was to determine the length of the lag using Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC), and Likelihood Ratio (LR) (Thomas, 1997; Greene, 2000; Alfirman and Sutriono, 2006) methods. The objective of these tests is to determine whether the variables used in this study were cointegrated or not as suggested by Bafadal (2005), Bapepam (2008), Engle and Granger (1987) and Ward (2000). The cointegration test was conducted by employing Johansen Criterion. The estimation models used for this study were Vector Autoregression (VAR), Structural Vector Autoregression

(SVAR), and test of Impulse Response Function (IRF). The VAR model was widely used to investigate the impact of monetary policy such as the studies of the dynamic effect of monetary policy and the effectiveness of monetary policy (Gordon dan Leeper, 1994; Rudebusch, 1998; Hakim, 2003). The VAR model assumes all variables are endogenous. Also, VAR model is able to estimate identity equation such as in the Engel-Granger causality equation (Thomas, 1997; Gujarati, 1995, Hakim, 2003). The model specification of the VAR can be expressed as follows:

$$VAR(k), Z_t = A_1 Z_{t-1} + A_2 Z_{t-2} + ... + A_k Z_{t-k} + \varepsilon_t$$

where Z_t is a specified time series variable, A_k is the parameter of an nx matrix, and K is the order or lag. The order of the VAR (k) is determined by *Akaike Information Criterion* (AIC) test, *Likelihood-Ratio* (LR) test, and *Scwarz Information Criterion* (SIC). If k=2 then the model specification of VAR in this research can be formulated as follows:

$$rGROW_t = a_{11}OPT_{t-1} + a_{12}GWM_{t-1} + a_{13}RDiskontq_{-1} + a_{14}rJUB_{t-1} + a_{15}rDOM_{t-1}$$
$$+ a_{16}EXC_{t-1} + a_{17}EXPORT_{-1} + a_{18}IMPORT_{-1} + a_{19}INVEST_{-1} + a_{1.10}BOP_{-1}$$
$$+ a_{11}OPT_{t-2} + a_{12}GWM_{t-2} + a_{13}RDiskonto_{t-2} + a_{14}rJUB_{t-2} + a_{15}rDOM_{t-2}$$
$$+ a_{1.12}INF_{-1} + a_{1.13}GROW + a_{16}EXC_{-2} + a_{17}EXPORT_2 + a_{18}IMPORT_2 + a_{19}INVEST_2$$
$$+ a_{1.10}BOP_{t-2} + a_{1.11}INF_{t-2} + a_{1.12}GROW_{t-2}$$

The SVAR equations for this study are as follow:

$$LOG[OPT] = u_1; \ LOG[GWM] = u_2; \ LOG[rDiskonto] = u_3; \ LOG[JUB] = u_4$$
$$LOG[EXC] = u_5; \ LOG[EXPORT] = u_6; \ LOG[IMP] = u_7; \ LOG[INV] = u_8$$
$$LOG[GROW] - C_1 LOG[OPT] - C_2 LOG[RR] - C_3 LOG([Rdiskonto] - C_4 LOG[JUB] - C_5 LOG[RDOM]$$
$$- C_6 LOG[EXC] - C_7 LOG[EXPORT] - C_8 LOG[IMPORT] - C_9 LOG[INVEST] - C_{10} LOG[BOP]$$
$$- C_{11} LOG[INF] = u_{12}$$

RESULTS AND DISCUSSION

Of the stationary test, all variables have been stationary at the second difference. Table 1 shows the results of the SVAR of the shock in monetary policy variables on economic growth. All of the monetary variables – open market operation (OPT), reserve requirement (RR) and

Table 1. SVAR estimation results on economic growth.

Variable	Coeficient	Probability	Variable	Coeficient	Probability
OPT	-1.367774	0.0041	EXPORT	5.636611	0.0000
RR	-1.698417	0.0000	IMPORT	-7.356434	0.0000
rDiskonto	-0.845875	0.0030	INVEST	-0.063818	0.9031
rDOM	1.636008	0.0000	BOP	0.126896	0.4110
EXC	-5.090151	0.0074	INF	-0.148985	0.3123

Source: the result of the research: JUB variable is not cointegrated to the level of second difference so it was excluded from the model.

Table 2. The summary of the results of the growth of IRF.

No	Variables	Periods		
		Short	Mmedium	Long
1	ε OPT	-	-	-
2	ε RR	+	-	+
3	ε rDiskonto	-	+	-
4	ε rDOM	-	+	-
5	ε EXC	-	-	-
6	ε EXPORT	+	+	+
7	ε IMPORT	-	+	+
8	ε INVEST	+	+	+
9	ε BOP	+	-	-
10	ε INF	-	+	+

Source: the result of the research.

discount rate (rDiskonto) – have a negative impact on economic growth. An increase in OPT by Rp 1 billion will make the Indonesian economic growth to decrease by 1.378 percent.

A shock in RR has a coefficient of -1.698. This co-efficient implies that an increase in reserve requirement by Rp 1 billion, the economic growth will shrink by 1.698 percent. With a shock in discount rate (rDiskonto) by one percent, the economic growth will decrease by 0.846 percent.

The above SVAR results show that monetary policy instruments have interdependency with economic growth. The effect of monetary policy instruments on growth can be explained as follows. When the financial paper (such as T-bill and bond) is recalled through open market ope-ration (OPT) there will be an increase in money supply. An increase in money supply is usually followed by a decrease in reserve requirement (RR) and a decrease in discount rate (rDiskonto). Thus domestic interest rate (rDOM) will increase (?). An increase in domestic interest rate (rDOM) has an impact on exchange rate (EXC). A decrease in exchange rate encourages exports (EXPORT), discourages imports (IMPORT) as well as a decrease in investment (INV). As a result of that, balance of payments (BOP) becomes a deficit and a decrease in inflation

(INF), thus there will be an impact on economic growth.

Intermediate variables – domestic interest rate (rDOM), exchange rate (EXC), exports (EXPORT), and imports (IMPORT) – partially have a significant effect on economic growth with an α = 0.05. Other intermediate variables – investment (INV), balance of payment (BOP) and inflation (INF) – have no effect on growth. Exports (EXPORT) have the biggest positive coefficient which was 5.6366. The demand for exports was very high during the period of the study, thus the economic growth.

In this study, it was found that investment has no impact or to a certain degree investment was detrimental to growth. However, this finding was parallel to the study done by Erwan (2005). Sollow-Swan's economic growth theory explains that if a country has adopted an efficient and advanced technology, saving and investment that has increased has a positive effect on economic growth, with the assumption that the population and technology are constant. But, let us say population is not constant, then, a high saving and investment as well as high consumption are required to increase economic growth. The finding of this study was at odd to the literature. An expansion to Sollow-Swan's theory highlighted the fact that when the relationship between investment and unemployment is negative then investment is the only source of capital accumulation. Then it is revealed that the growth happens due to the decline of inflation and unemployment which increases purchasing power of the people and obviously the growth itself; this growth does not happen through the growth of investment.

The results of SVAR model estimation can be used to analyse the respond function towards equilibrium path and the response of accumulation function towards equilibrium path and variant proportions. This analysis is known as *impulse response function analysis* (IRF) that can be used to see the effect of a change in one standard deviation of a variable towards the said variable or other variable. For the purpose of this study, the analysis of IRF was divided into 3 terms: short-term (period 1-5), medium-term (period 6-10) and long-term (period 10-20). One period was equal to 2.5 months. The summary of IRF analysis for Indonesian economic growth is presented in Table 2. The shock by one standard deviation of the

Table 3. The respond of economic growth variables toward monetary policy variable (OPT, RR, dan rDiskonto).

Period	OPT	RR	rDiskonto	Period	OPT	RR	rDiskonto
1	-0.085983	-0.234694	-0.255708	11	0.029208	-0.113843	-0.062043
2	-0.012841	-0.058139	-0.026794	12	-0.010598	-0.071451	-0.037922
3	-0.178600	0.060360	-0.079235	13	-0.015514	0.007927	-0.013561
4	-0.265863	0.169872	0.011423	14	0.015711	0.040006	-0.052062
5	-0.208985	0.037125	-0.085779	15	0.030243	0.036198	-0.078298
6	-0.116975	0.074845	-0.036691	16	-0.001586	0.021083	-0.053772
7	-0.131852	0.006579	0.013164	17	-0.031534	0.024556	-0.019567
8	-0.095377	-0.037698	0.048646	18	-0.017839	0.038212	-0.011565
9	0.004082	-0.046421	0.045328	19	0.007398	0.023439	-0.028659
10	0.043066	-0.086001	-0.020727	20	-0.000734	-0.011839	-0.035917

Source: the result of the research.

OPT variable has a negative effect on economic growth in all short-, medium- and long-terms. The shock of RR by one standard deviation has a negative impact on growth for medium-term only. While the shock in discount rate (rDiskonto) by one standard deviation affected economic growth for short- and long-terms only.

In other words, the shock in OPT will be responded by economic growth negatively. That means, if OPT increases then economic growth will decrease. The increase in RR in the short- and long-periods has an impact on economic growth in a positive manner, while an increase in rDiskonto has an effect on growth for middle-period only.

For the intermediate variables, the shocks of export and investment by one standard deviation, respectively, have positively affected economic growth in short-, medium- and long-terms. But, a shock on exchange rate variable (EXC) has a negative effect on growth for all three periods. A shock by one standard deviation on imports (IMPORT) and investment (INVEST) has a negative effect on growth in a short-period, but has a positive effect on economic growth in the medium- and long-terms.

The results of the shock by one standard deviation on monetary policy variables on economic growth are shown in Table 3, while the results of the shock on intermediate variables on growth are revealed in Table 4.

Table 3 (Columns 2 and 6) explains the effect of a shock by one standard deviation on open market operation (OPT) toward economic growth (GROW). On the first period, the shock of OPT caused the growth to decrease by 0.09 percent. The decline in economic growth was continuous until the 8th period, that is, medium-term. But, at the end of medium-term, that is, the 9th and 10th periods, the effect became positive (0.0431 percent). This positive effect can be seen in the long-term (11th to 20th periods).

The shock of reserve requirement (RR) by one standard deviation has a negative effect on growth initially. For period 1, the effect was -0.2347 percent and for period 2 it was -0.05814 percent. But for the 3rd to 7th periods the effect of the shock in reserve requirement (RR) by one standard deviation on economic growth was positive. For the $7^{th} - 12^{th}$, the response was negative again and followed by a positive impact for the periods $13^{th} - 19^{th}$.

The impact of a shock by one standard deviation on discount rate (rDiskonto) on economic growth shows mostly in a negative fashion as predicted by the literature (see Columns 4 and 8, Table 3). The results revealed that this negative impact occurred in the periods of $1 - 3$ and the periods of $10 - 20$.

Tabel 4 explains the effect of the shock of an intermediate variable by one standard deviation on economic growth. On the second column of Table 4 the effect of the shock of domestic interest rate (rDOM) on growth is seen.

It is expected that an increase in domestic interest rate (rDOM) to have a negative impact on growth. This study found that for the first period, a shock in rDOM by one standard deviation caused the economic growth to increase by 0.1515 percent. However, in the second period the growth decreased by -0.3141 percent. This negative relationship lasted until the 6th period. For the $7^{th} - 10^{th}$ period domestic interest rate and growth interacted in a positive manner. However, this interaction became negative for periods 7 to 20.

The response of economic growth as a result of a change by one standard deviation of the exchange rate (EXC) during the observation periods always showed a negative relationship (see Colum 3, Table 4). In other words, if the value of the Rupiah was stronger compared to those of the USD, it has a negative impact on growth.

The literature predicts that exports promote growth. So does the export led theory on growth. The results of this study revealed that an increase in exports (EXPORT) by one standard deviation has a positive effect on growth as

Table 4. The response of economic growth variable toward intermediate variable.

Period	rDOM	EXC	EXPORT	IMPORT	INVEST	BOP	INF
1	0.151493	-0.114832	-0.054465	-0.285395	-0.048689	0.079341	-0.171645
2	-0.314126	-0.227317	0.197824	-0.032649	0.109396	0.203092	-0.140860
3	-0.412368	-0.145038	0.039868	-0.066381	0.176372	0.051081	-0.057399
4	-0.309570	-0.073998	0.153662	0.080863	0.145589	0.092824	-0.078183
5	-0.282505	-0.051077	0.088866	0.082047	0.157562	0.167643	0.042675
6	-0.052148	-0.071419	0.087270	0.026280	0.108187	0.081135	0.115466
7	0.026505	-0.106393	0.126742	0.065270	0.025943	0.019718	0.138278
8	0.074328	-0.036861	0.100386	0.169154	-0.066764	-0.058296	0.122291
9	0.054010	-0.010022	0.090966	0.199816	-0.111204	-0.074695	0.125967
10	0.018522	-0.036748	0.065948	0.120708	-0.104762	-0.027640	0.136385
11	-0.022889	-0.064488	0.085143	0.044524	-0.042252	-0.001256	0.120444
12	-0.065772	-0.055194	0.058171	-0.007573	-0.004656	-0.029431	0.075568
13	-0.077387	-0.017850	0.037805	0.005118	0.007000	-0.023749	0.027426
14	-0.087707	-0.006044	0.030537	0.015723	0.044414	0.031886	0.022369
15	-0.079787	-0.032787	0.035595	-0.032564	0.077278	0.056366	0.034334
16	-0.071017	-0.057459	0.054302	-0.059345	0.076095	0.038714	0.031677
17	-0.056283	-0.038735	0.061166	-0.008305	0.050785	0.014074	0.014690
18	-0.039024	-0.009532	0.059974	0.061402	0.026790	0.016858	0.008942
19	-0.032167	-0.013417	0.062494	0.073456	0.019292	0.038236	0.029139
20	-0.033237	-0.039039	0.074251	0.043432	0.022429	0.039630	0.052728

Source: the result of the research.

shown in Colum 4 of Table 4, except for the 1st period. Column 5 of Table 4 reveals the reaction of growth on imports (IMPORT). It is found that a change in IMPORT by one standard deviation has a mixed effect on growth, although the literature suggests a negative relationship between IMPORT and growth. Imports components of a growing economy, such as in the case of Indonesia, consist of consumer goods and capital goods. The importation of consumer goods increases the production capacity of a country. Thus, the results showed a mixed relationship between imports and growth.

A shock in investment (INVEST) by one standard deviation has a positive impact on growth for the periods of 2 to 7 and for the periods of 13 – 20, as predicted in the literature. However, other time periods the response of growth on investment was negative.

The response of economic growth on a shock by one standard deviation of balance of payment (BOP) and inflation (INF), respectively, is shown as mixed results. Balance of payment has a positive effect on growth for the beginning of the periods (period 1 to 7) and at the end of the periods (periods 14 to 20). However, in the middle range (periods 8 to 13), there was a negative relationship between BOP and growth. Inflation has a negative relationship with growth for the beginning of the periods (periods 1 to 4), but has a positive correlation after period 5.

It can be summarized that in a short period of time, the response of growth as a result of a shock by one standard deviation of a certain intermediate variable has an impact as predicted by the theory. An increase in the balance of payment (BOP) caused economic growth. This study adds little to the literature in the case of domestic interest rate (rDOM), in which the correlation between rDOM and growth was mixed. The results of the simulation that is, an increase in one standard deviation of the variable OPT, RR, rDiskonto, EXC, IMPORT, INVEST and INF showed a decrease in growth in a short-term. In short-term, an increase in EXPORT did not show an expected outcome as predicted by the theory. During the period of 2004 – 2010 the highest contributor to Indonesian gross domestic product (PDB) was oil and gas industry (24 – 28 percent), while agriculture, animal husbandry, forestry and fishery sectors contributed 13 – 15 percent of the gross domestic product.

In the medium-term, an increase in OPT, EXPORT, IMPORT, INVEST, BOP, INF has shown an increase in GROWTH. These results were in tandem to what was predicted by the theory. The low level of inflation (below 10 percent) was able to speed up economic growth. An increase in price as a result of low inflation encouraged producers to produce more because they think they made more profit. But, if there was a high level of inflation, many economic activities will be disrupted. The

same situation was true for IMPORT. A high demand for IMPORT has a negative consequence on balance of payment (BOP). An increase in imports sped up economic growth if it was accompanied by an increase in exports. Thus, net export was expected to become a source of foreign exchange to increase the output.

In the long-run, an increase in OPT, EXPORT, IMPORT and INF has a parallel relationship with economic growth. A high consumption of imported good in the long period enabled the economy to expand. The high consumption of the public was considered as a source of national income, even though this condition can possibly cause inflation.

Conclusion

The results of this study show that the monetary policy instruments in the form of open market operation (OPT), Reserve Requirement (RR), and discount rate (rDisk) have interdependency with economic growth (GROW) through some macroeconomic variables such as inter-mediate variables. A shock in monetary policy variables (OPT, RR, and rDiskonto) has a negatively significant effect on Indonesia economic growth.

The result of Impulse Response Function shows that an OPT affected negatively growth variable, either in the short-, medium- or long-terms. While RR variable had positive effect on growth in the long-run and rDiskonto variable impacted growth positively in the medium-run. In other words, in general, an increase in OPT impacted economic growth negatively, while an increase in RR impacted growth positively in the short- and long-terms. The increase in rDiskonto has an increased effect on economic growth in medium-term.

A shock in reserve requrement (RR) by one standard deviation has a negative impact on growth at an early stage (the first two periods). But, after the 3rd period, the economic growth showed a positive effect as a result of an increase in RR. However in the long-run the impact of an increase in RR on growth became negative again. A shock in discount rate (rDiskonto) variable by one standard deviation, in general, has a negative effect on growth.

To increase the rate of economic growth in the short term, the government must be aware of the swift flow of goods imported into Indonesia, because it can lower domestic production. Expansionary monetary policy needs to be done, because the decline in interest rates can stimulate investors to invest in the country to cause economic growth.

Conflict of Interests

The author have not declared any conflict of interests.

REFERENCES

Ahuja HL (2002). Macroeconomic Theory and Policy, ninth edition, S Chad & Company Ltd, Ram Nagar, New Delhi.

Alfirman L, dan Sutriono E (2006). Analisis Hubungan Pengeluaran Pemerintah dan Produk Domestik Bruto dengan Menggunaran Pendekatan Granger Causality dan Vector Autoregression. Jurnal Keuangan Publik. 4(1):25-66.

Bafadal A (2005). Dampak Defisit dan Utang Pemerintah Terhadap Stabilitas Makroekonomi. Disertasi. Sekolah Pascasarjana Institut Pertanian Bogor.

Bapepam LK (2008). Badan Pengawas Pasar Modal dan Lembaga Keuangan. Analisis Hubungan Kointegrasi dan Kausalitas serta Hubungan Dinamis Antara Aliran Modal Asing, Perubahan Nilai Tukar dan Pergerakan IHSG di Pasar Modal Indonesia. Departemen Keuangan Republik Indonesia.

Engle RF, Granger, CWJ (1987). Co-Integration and Error Corection: Representation, Estimation, and Testing. Econometrica 55:251-276.

Gordon DB, Eric ML (1994). The Dynamic Impact of Monetary Poicy: An Excercises in Tentative Identification. J. Polit. Econ. 102(6):1228-1247.

Greene WH (2000). Econometric Analysis. 4th. New Jersey: Prentice Hall.

Gujarati D (1995). Basic Econometrics. McGraw-Hill: Singapore.

Hakim L (2003). Kebijakan Moneter Ekspansif dan Volatilitas Harga-Harga Aset 1990-2001. Media Ekonomi Universitas Trisakti 9(3): 2003.

Mankiw NG (2000). Makro Ekonomi. Penerbit Erlangga. Jakarta.

Pohan A (2008). Potret Kebijakan Moneter Indonesia. PT. Raja Grafindo Persada. Jakarta.

Rudebusch G (1998). Do Measures of Monetary Policy in a VAR Make Sense? Int. Econ. Rev. 39:907-931.

Sukirno S (2004). Makroekonomi Teori Pengantar. Rajawali Pers. Jakarta.

Thomas LB (1997). Money, Banking and Financial Market. International Edition. Mc Graw-Hill. New-York. USA.

Ward BD, Siregar H (2000). The Role of Aggregate Demand Shocks in Explaining Indonesian Macro-Economic Fluctuations. Commerce Division Discussion Paper No. 86. Lincoln University. Canterbury.