

Impact of Government Domestic Financing on Banking Deposits: Indonesia Case Study

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ABSTRACT

In order to finance its fiscal deficit, the Government of Indonesia increases domestic financing, especially by issuing Government Bond (GB). Domestic GB issuance potentially reduces banking deposits as it provides an alternative instrument for investors in optimizing their wealth. This paper delineates the impact of GB issuance on banking deposits in Indonesia by using Error Correction Model (ECM). Furthermore, this paper also investigates how funding of the fiscal deficit affecting investors' preference between holding GB and banking deposits by employing Vector Error Correction Model (VECM). The investor groups consists of foreign, insurance, pension fund, mutual fund and individual investors. The result shows that there is a significant negative correlations between banking deposits with GB volumes indicating a shifting from banking deposit to GB. Whereas spread between GB yield and banking deposits rate, both in long and short term, reveals a significant negative correlation. This finding also indicates that investors' portfolio decisions are affected by the spread between GB yield and banking deposits rate. Furthermore, the VECM result demonstrates varied responses among investors towards fiscal shock. Foreign, insurance and mutual funds investors responded by increasing their GB and decreasing their banking deposits. This finding confirms the first result, i.e. indication of shifting from banking deposits to GB. Conversely, pension funds and individual investors responded to the fiscal shock by decreasing their GB and increasing their banking deposits.

Key Words: Government Policy, Government Bonds, Banks, Deposit, Econometric

JEL Classifications: C51, E41, G21, G28

1. Introduction

1.1 Background

An expansive fiscal policy of the Indonesian Government which focusing on the infrastructure development results in an increase in the budget deficit since 2014. To cover the budget deficit, the Government's financing strategy is pursued through an increase in the issuance of Government Bonds (GB) while still referring to the manageable debt to GDP ratio. To increase a market deepening, Government issued debt instruments through more issuance frequencies such as a weekly basis as well as diversifying more diverse instruments. The Government issued diverse instruments of GB including conventional schemes consisting of State Bonds and Treasury Bills and Sharia scheme such as State Sukuk, Project Based Sukuk, Sukuk Ritel, Indonesian Pilgrim Funds Sukuk and Sharia State Treasury.

The Government's effort in increasing the issuance of GB come to fruition at the end of 2016, in which the amount of GB reached Rp2,733.83 trillion with share 78.90% of the total government debt. This amount of GB

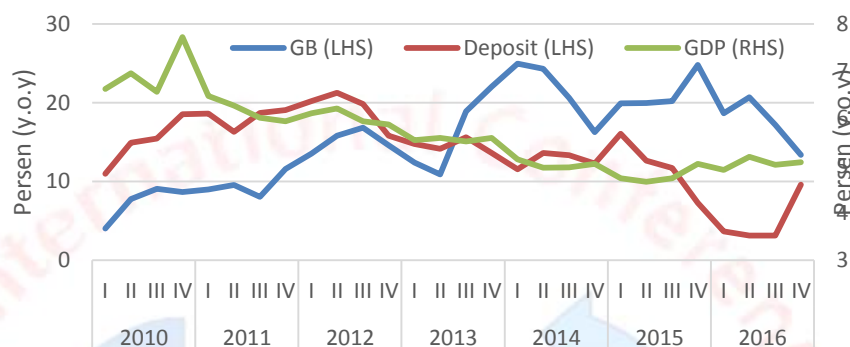
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was increased compared to the end of 2014 which was recorded at Rp1,931.22 trillion. Accordingly, it is also interesting to note that the increasing of GB SBN issuance is indicated to influence the declining trend in bank deposits. In addition to the slowing growth in GDP, the downward trend in bank deposits growth coincided with the rise in GB growth, especially since 2013 (Graph 1.1).

Graph 1.1. GDP, Bank Deposit and GB Growth



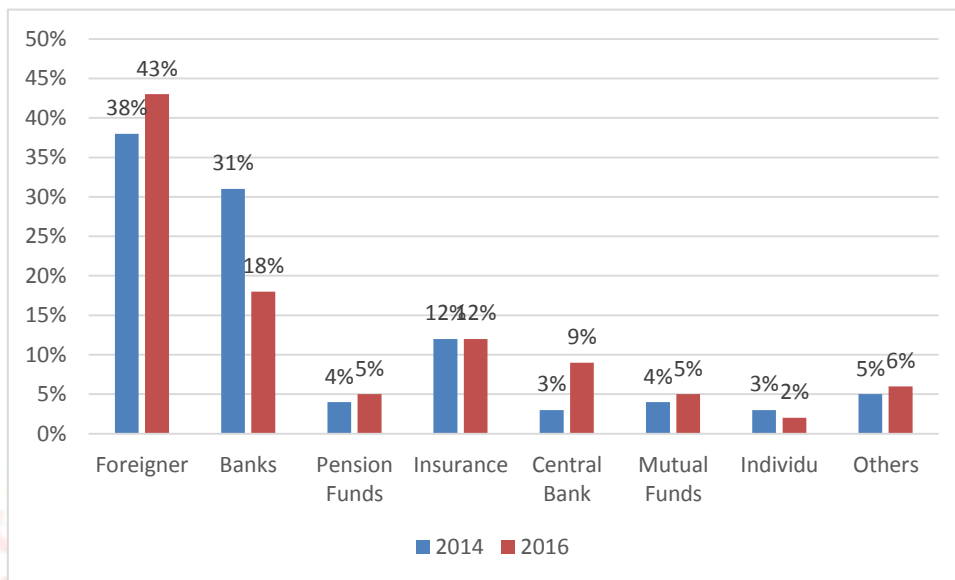
There are two factors that are expected to influence the relationship of Bank Deposit and GB. First, the 10-year SBN yield higher than the one-month deposit rate is perceived to be more attractive for investors to invest in GB than by placing funds in DPK. Second, the issuance of OJK Regulation No.1 / POJK 05/2016 regarding Securities Investment for Non-Bank Financial Services Institution dated January 11, 2016, which requires insurance and pension funds to place funds at minimum 30% of SBN, increase in government securities in these financial institutions.

Considering one of the mandates of Bank Indonesia is to maintain financial system stability, the DPK slowdown is important to note as it may put pressure on the banking intermediation level. Therefore, more in-depth research on the impact of the government deficit on the movement of banking DPK in Indonesia is needed.

1.2 The Development of Government Bonds and Bank Deposits

The Government increased the issuance of GB to fund infrastructure development programs with the result the amount of GB increased from Rp1,931.22 trillion at the end of 2014 to Rp2,732.16 trillion at the end of 2016. The proportion of GB ownership by banks and Non-Bank Financial Institutions has not changed much except the decreasing proportion of banking ownership and central bank as a result of changes in monetary policy instruments. In general, foreigners are the largest Indonesian GB owners with ownership proportions of more than 43 percent, followed by banks with a proportion of ownership of 18 percent and insurance of 12 percent.

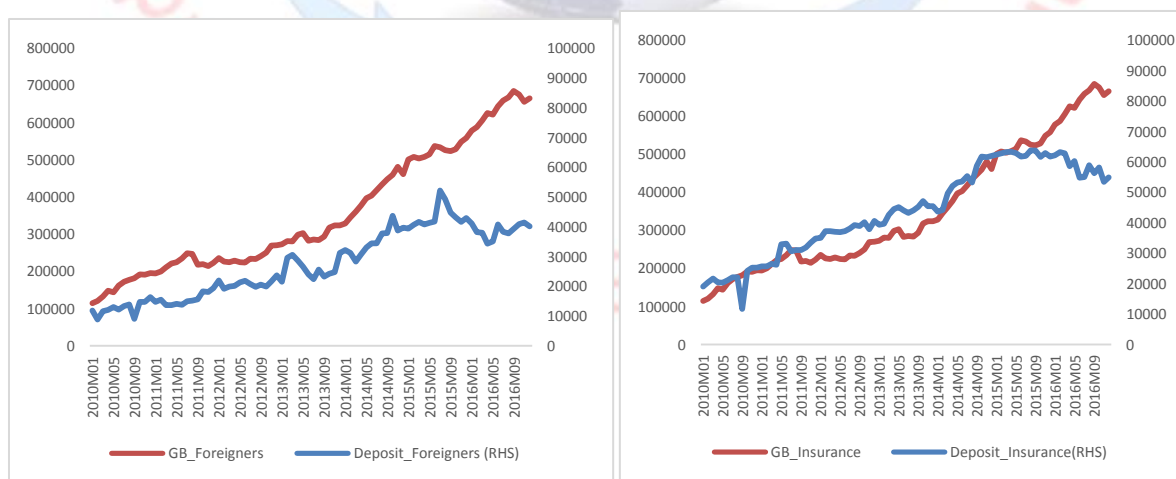
Graph 1.2 GB Ownership 2014 and 2016

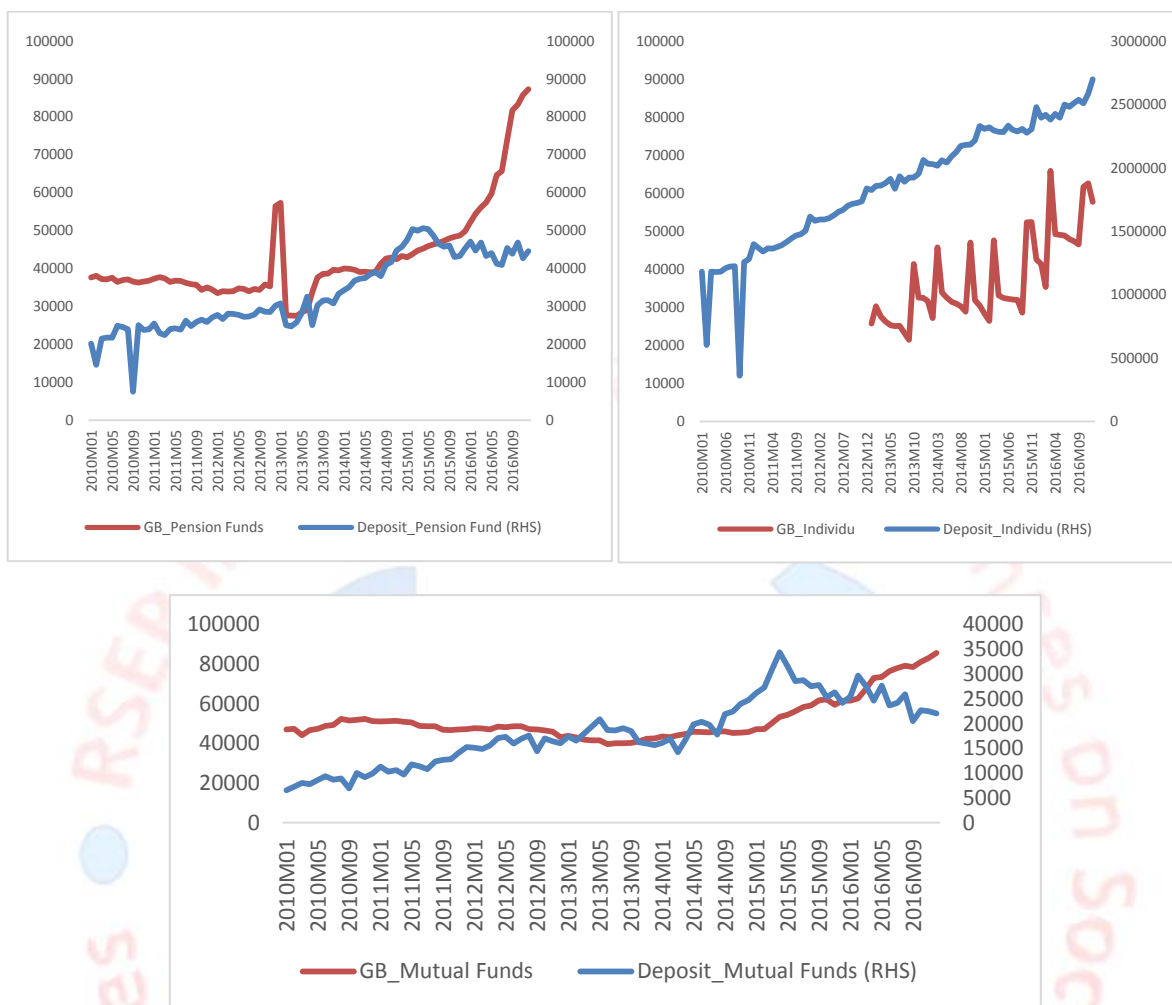


Source: Ministry of Finance Republic Indonesia

Meanwhile, the impact of the OJK regulation of 2016 as mentioned above is expected to have an impact on the decrease in deposits. In Graph 1.3 it is shown that there is a movement contrary to the value of ownership of deposits and GB from non-bank from mid-2015 until the end of 2016, particularly insurance and pension funds. By the end of 2016, GB ownership by insurers stood at Rp238.24 trillion, up 38.82% compared to the end of 2015 of Rp171.62 trillion. In the same period, there was a 10.97% decrease in bank deposits held by insurance by 61.73 trillion at the end of 2015 to Rp54.96 trillion at the end of 2016. In line with insurance, GB ownership in pension funds also increased by 75.10% from Rp49.83 trillion at the end of 2015 to 87.28 at the end of 2016.

Grafik 1.3. Deposit and GB by ownership (in billion rupiah)

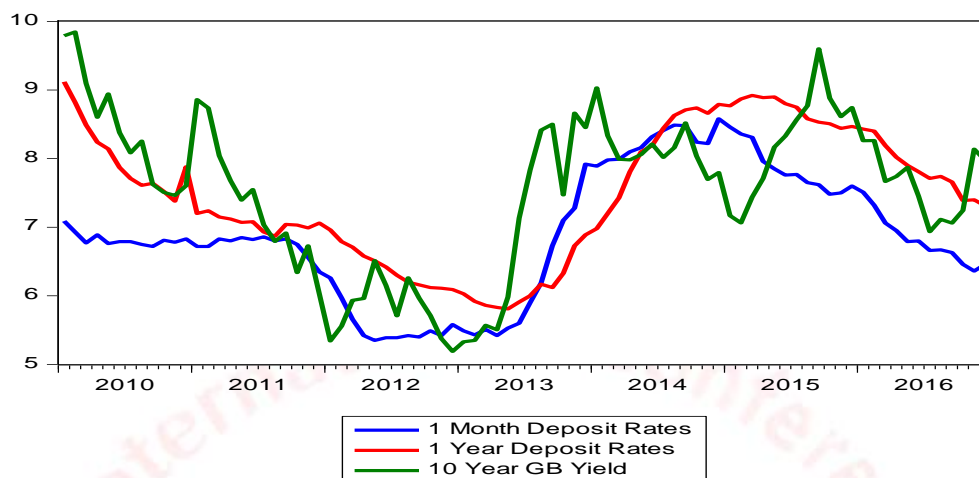




Source: Ministry of Finance Republic Indonesia and Central Bank of Republic Indonesia

One factor expected to play a role in the slowing growth in deposits is the more attractive yield of government bonds compared to deposit rates, prompting investors to shift their portfolios from deposits to GB. In Graph 1.4, it can be seen that the 10-year GB yield, as the most-traded GB tenor by investors, tends to be higher than the one-month deposit rate as the most widely held tenor of deposits by the public.

Graph 1.4. GB Yield and Deposit Rates (2010-2016)



Source: CEICData

1.3 Research Purposes

1. Investigate the impact of government domestic financing on the growth of bank deposits.
2. Investigate how the changes in investor behavior due to the increase of government domestic financing on the placement of deposits and the purchase of GB.

1.4 Structure of Writing

The writing structure of this research will be divided into 5 chapters beginning with Chapter 1 will introduce the background and the purpose of research, followed by a literature review in Chapter 2. Furthermore Chapter 3 will discuss the methodology and data used in this study. Chapter 4 will discuss the estimation and analysis results. Then Chapter 5 seeks to convey policy conclusions and implications.

2. LITERATURE REVIEW

In this chapter will be presented on the theory that explains the factors affecting DPK and literature studies that discuss about how the impact of the Government deficit on bond yields and banking indicators. The theory that specifically discusses the factors that influence the DPK is not stated in straightforward way, however, the approach is to use the theory of money demand.

2.2 Money Demand Theory

a. The Quantity of Money Theory

Demand theory of money shows the amount of wealth in the form of money that individuals want to have at any given time. Individuals are faced with several choices of placement of wealth, for example in the form of savings, deposits, securities, cash, or property. The selection process will be based on the opportunity cost of holding money because there is an opportunity to earn return on the placement in the lost securities if the individual holds the cash. In addition, the individual holding the money will be exposed to a decrease in purchasing power of money due inflation.

One important money demand theory is Liquidity Preference Theory, in which Keynes rejects the classical theory that the velocity of money is constant and the interest rate does not affect the demand for money. According to Keynes there are 3 motives that cause people to hold money, namely to transact, safety, and speculation. Keynes categorizes money requests into 2 types, that is demand on transaction (also safety) balances, L_T and demand on speculative balance, L_S .

$$L_T = L_t(Y) = kY, \text{ dengan } \partial L_T / \partial Y > 0 \text{ dan} \quad (1)$$

$$L_S = L_S(r) = R - dr, \text{ dengan } \partial L_S / \partial r < 0 \text{ dan } \partial^2 L_S / \partial r^2 < 0 \quad (2)$$

Where, $k = \text{income balance coefficient}$, $d = \text{interest rate elasticity}$,
 $Y = \text{Nominal output}$, $r = \text{representative interest rate}$
 $R = \text{Autonomous speculative balance}$,

The demand for money for transaction balances is positively affected by the nominal output (GDP), whereas the demand for money for speculative balances is negatively affected by interest rates. That is, an increase in interest rates will be followed by a decrease in money demand because economic actors prefer to place their wealth in a portfolio that provides interest rate benefits, such as savings or deposits.

In the balance condition, money supply (M) has the same value as real money demand namely $M/P = L$.

$$L = L_T + L_S = kY + L_S(r) \quad (3)$$

In line with the quantity theory of money, transaction balances emphasize the importance of money as a means of payment so that demand depends on the level of income society at that time. While the function of store of value shows the existence of motive speculation of money demand. In Keynes's theory (1973), decisions in the selection of portfolios by agents are based on expectations of future bond prices (e.g bond yields). Bonds will still be held by the public if the expectation of total return is positive.

Functions in the bond market are as follows,

$$BP = \frac{n}{r} \cdot NV \quad (4)$$

Where, $BP = \text{Bond market price}$, $r = \text{effective yield}$.
 $n = \text{nominal coupon}$, $NV = \text{nominal value}$.

There is also a critical market yield, r , which makes investors become indifferent in determining the funding options. When the market rate is above the critical market yields, investors will choose to put their wealth on the bonds because interest income is greater than the capital loss expansion. Conversely, if the market rate is below the critical market yields, then the investor will choose to sell his bonds and hold the money.

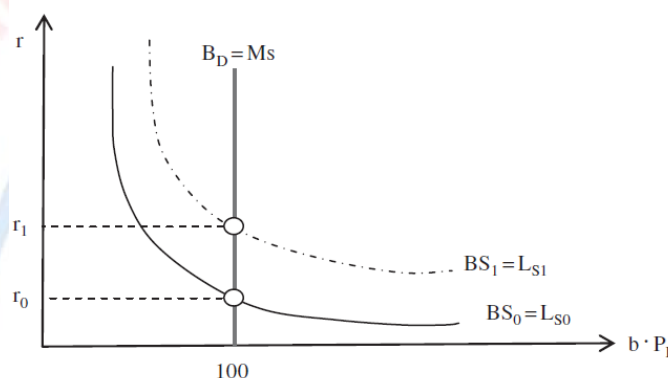
Therefore, the demand for a speculative balance is the process of determining whether the economic actor will hold a bond or money. Assuming that everyone has a difference in estimating the normal yield (also the critical yield), then all the requests can be incorporated into aggregate demand of the speculative balance. The aggregate demand has a negative slope because the decline in market interest rates will lead to more and more investors choosing to hold bonds.

In the liquidity preference theory, the demand for bonds is equal to the money supply, so $B_D = M_S$ which indicates the demand for a speculative balance.

$$L_s = L_s(r, W), \frac{\partial L_s}{\partial W} > 0 \quad (5)$$

An increase in the number of bonds offered will cause the liquidity preference curve to shift upward, so that with the same level of money supply will lead to an increase in interest rate (change from position r_0 to r_1 as in graph 3). Thus, if the central bank conducts monetary operations that change the money supply, then it will also affect the balance of liquidity function preferences.

Graph 2.1 Keynesian Liquidity Preference



2.3 Impact of Government Deficit on Bond Yield and Banking Indicators

The theory of the relationship between the yield of government bonds and the fiscal deficit is still debated. In Gale and Orszag (2002) summarized that from 60 studies on the impact of fiscal deficit on interest rates was found to be very diverse results. Half of these studies stated positive impact, while the remaining half said there was no impact or mixed impact. The paper itself concludes that a decrease in government surplus will reduce national savings and impact on declining national income, regardless of whether or not interest rate hikes are rising. Specifically the study states that as long as the increase in budget deficit is not offset by an increase in domestic savings, the increase in budget deficit will lead to a decrease in domestic investment and increase current account deficit.

Another study was conducted by Ardagna (2009) which analyzed the behavior of government bond yields during fiscal stance changes in some OECD countries during 1960-2002. Ardagna found that 10-year government bonds rose by more than 180 basis points during the year when the fiscal deficit increase was higher than 1.5 percent of GDP in one year or 1 percent of GDP per year from two consecutive years. Therefore, this study recommends the use of 10-year GB yield as a reference in response to the increase in fiscal deficit.

Further research Baldacci and Kumar (2010) states that there is a nonlinear relationship between the government deficit and bond yields. The study looked at the fiscal impact of deficit and government debt on interest rates in the 1980-2008 period using panel data from 31 developed and developing countries. The results suggest that the increase in deficit and government debt significantly affects long-term interest rates. The magnitude of this influence depends on several factors, namely the initial fiscal conditions, institutional and other structural conditions, as well as global financial conditions. If the initial fiscal condition is at a high deficit, then the

increase in yield bonds in the long run will be higher. A large fiscal deficit and government debt will put pressure on yield bonds to increase in the medium term.

Research in Indonesia related to the impact of GB issuance has also been investigated by Utari, et al. (2010) that examined the impact of GB on the crowding out phenomenon using Error Correction Model method using monthly data from 2003 to 2009. From the research, it can be concluded that the existence of domestic GB does not give a significant impact to the increase of total credit. While changes in the stock of domestic GB relative to GDP also have no significant impact on long-term interest rate changes. This is different from Detragiache et al. (2005), which analyzed 89 low-income countries and found that government bonds have a negative relationship with the Loan to GDP ratio and Deposit to GDP ratio.

Excessive government bond issuance can push the lazy bank phenomenon, a condition where banking intermediation is disrupted, causing a decline in bank credit. This phenomenon is found in Hauner's (2006) research which shows that fixed-rate and high-value fixed coupon bonds, as well as the type of risk free asset, cause the bank to receive constant flow of earnings from domestic government bond holdings. This reduces the incentive for banks to extend credit to the private sector that is seen as more risky than government bonds.

3. METHODOLOGY AND DATA

3.1 Methodology

This research will look for a link between the impact of the government's fiscal deficit policy and banking deposits using the Error Correction Model (ECM) and the Vector Error Correction Model (VECM). The equations to be tested in this study are as follows:

a) Impact of GB on Banking Deposit

Long Term

$$\text{Model 1: } DPK_t = \beta_0 + \beta_1 PDB Riil_t + \beta_2 RDep1_t + \beta_3 SBN_t + Z_t$$

$$\text{Model 2: } DPK_t = \beta_0 + \beta_1 PDB Riil_t + \beta_2 Spread_t + Z_t$$

Short Term

$$\text{Model 1: } \Delta DPK = \beta_0 + \beta_1 ECMDPK_{t-1} + \beta_2 \Delta PDB Riil + \beta_3 PDB Riil_{t-1} + \beta_4 \Delta RDEP1MT_t + \beta_5 RDEP1MT_{t-1} + \beta_4 \Delta SBN_t + \beta_5 SBN_{t-1}$$

$$\text{Model 2: } \Delta DPK = \beta_0 + \beta_1 ECMDPK_{t-1} + \beta_2 \Delta PDB Riil + \beta_3 PDB Riil_{t-1} + \beta_4 \Delta Spread_t + \beta_5 Spread_{t-1}$$

Note: Spread is 10 year GB Yield minus Deposit interest rate 1 month.

b) Impact of Investment Behavior of Non-Bank Investor Portfolio

$$\Delta Y_t = \alpha_t + \sum_{i=0}^n \beta_i \Delta Y_{t-i} + \sum_{i=0}^n \delta_i \Delta X_{t-i} + \sum_{i=0}^n \gamma_i \Delta Z_{t-i} + p_1 e_i$$

$$\Delta X_t = \alpha_t + \sum_{i=0}^n \beta_i \Delta Y_{t-i} + \sum_{i=0}^n \delta_i \Delta X_{t-i} + \sum_{i=0}^n \gamma_i \Delta Z_{t-i} + p_2 e_{i-1}$$

$$Y_t = SBN, DPK$$

$$X_t = \text{Yield SBN, RDep1Yr, Gov_Deficit}$$

As for the method of VECM will be analyzed at each non-bank financial institution consisting of: (i) Foreign; (ii) Insurance; (iii) the Pension Fund; (iv) Individuals; (v) Mutual funds.

3.2 Data

Data to be used as samples in the study are quarterly banking and macroeconomic data from 2008q1 through 2016q4 for ECM methods and monthly data from 2013M1 through 2016M12 for the VECM method.

Tabel 3.1. Data Summary

ECM

Variable	Data	Source
DPK	Banking Deposit	Bank Indonesia
PDBRL	Real GDP	CEICData
RDEPI	1 month deposit rate	Bank Indonesia
SBN	Government Bonds	Ministry of Finance
YSBN_10YR	10 years GB yield	Bloomberg

VECM

Variabel	Data	Sumber
Gov_Deficit	Government Deficit	Bank Indonesia
YSBN_10YR	10 years GB yield	Bloomberg
SBN*	Government Bonds	Ministry of Finance
DPK*	Banking Deposit	Bank Indonesia

*) individual data

4. ESTIMATION RESULT AND ANALYSIS

4.1. Stasionerity Test

Based on unit root testing, it is concluded that almost all variables are not stationary at the level. By using Augmented Dicky Fuller (ADF) Test with trend and intercept, it is found that the data used are mostly stationary at the level, but stationary at first difference. The results of the stasionerity test of these variables indicate the use of Error Correction Model (ECM) and Vector Error Correction Model (VECM) methods are in accordance with econometric literature.

Tabel 4.1 Unit Root Test using Augmented Dicky Fuller (ADF)

Variabel	Level	First Difference
Deposits		
- Deposit - Foreign	0.1132	0.0000
- Deposit - Insurance	0.6406	0.0000
- Deposit - Pension Funds	0.2973	0.0000
- Deposit - Individual	0.0000	0.0000
- Deposit - Mutual Funds	0.3305	0.0000
GB		
- GB - Foreign	0.9184	0.0000
- GB - Insurance	0.9739	0.0000
- GB - Pension Funds	0.997	0.0000
- GB - Individual	0.0001	0.0004
- GB - Mutual Funds	1.0000	0.0000
Inflation	0.3078	0.0000
Real GDP	0.9961	0.8730
1 month deposit rate	0.7328	0.0506
1 year deposit rate	0.2985	0.0000

4.2 Impact of GB on Banking Deposit Analysis

Furthermore, to examine the effect of declining deposits due to the increase in domestic government financing, ECM methods are conducted with both long-term and short-term. Impacts on deposits due to an increase in GB issuance and yield of GB are shown in Table 4.2 and Table 4.3.

Tabel 4.2 Long Term Estimation

Variable	(1)	(2)
C	-29.679***	-20.345***
Real GDP	3.408***	2.436***
Deposit Rate	0.016***	-
GB	-0.344***	-
Spread	-	-0.016**
<i>Adjusted R-Squared</i>	0.996	0.988

*) Significance level 90% , **) Significance level 95% , ***) Significance level 99%

In the long run, the rise in bank deposit is influenced by changes in real GDP, 1-month deposit rate, nominal of GB and spread yield between 10-year GB and 1-month deposit rate. An increase in economic performance will boost growth in depositor funds, as indicated by a 1% increase in Real GDP positively raising 3.4% of deposits. Furthermore, a 1% rise in deposit rates will also increase bank deposits by 0.016%.

Based on the first equation, besides influenced by economic growth and deposit rates, the movement of bank deposits is also influenced by long-term GB volume. The increase in GB issuance will reduce the number of deposits indicating the shifting allocation of public funds from the banking deposits to GB. Furthermore, in the second equation, it can be seen that there is a negative and significant relationship between the bank deposits and spread of the 10-year GB yield with the 1-month deposit rate. This indicates that depositors also consider GB yields as well as spreads in the placement of funds. The higher the yield of GB and spread, the lower the number of deposits placed.

Table 4.3 Short Term Estimation

Variabel	(1)	(2)
C	-0.976	-0.0796
ECM	-0.2369***	-0.293**
D(Real GDP)	0.272	1.864
Real GDP (-1)	0.1596**	0.0067
D(Deposit Rate)	0.0024	-
Deposit Rate (-1)	0.0003	-
D(GB(-1))	-0.186*	-
GB (-2)	-0.092***	-
D(Spread(-3))	-	-0.0072**
Spread(-4)	-	-0.0059
T>2014 Q1	0.015	-
T>2015 Q1	-	-0.0211***
T=2015 Q3	-0.033***	-0.0337***
<i>Adjusted R-Squared</i>	<i>0.653</i>	<i>0.799</i>

*) Significance level 90% , **) Significance level 95% , ***) Significance level 99%

Estimates of short-term equations show results in the same direction as long-term equations. In the first equation, the movement of bank deposit is influenced negatively by GB significantly indicating the shifting of public fund allocation from deposit to GB. Furthermore, the second equation shows a negative relationship between deposits with a spread between 10-year GB yield and 1-month deposit rate indicating the same thing as what happened in the long run.

4.3 Investor Behavior due to Government's Domestic Financing

To investigate changes in investor behavior due to the increase of Government's domestic financing on deposit placement and GB purchase, this research uses Vector Error Correction Model (VECM) method for each investor, i.e foreign, insurance, pension fund, mutual fund and individual, with monthly data from 2013 through 2016. The VECM method is used in this study considering that the variables used in this study are not stationary at the level, but stationary at first difference. The variables used in the VECM equation are government deficit, GB, deposits and spread between 10-year GB yield and one-month deposit rate.

From the five VECM equations for each investor, it is found that the optimum lag for the five investors is lag 1. Meanwhile, all VECM equations indicate one cointegration relationship except for mutual funds, which have 2 cointegration relationships. This indicates that mutual fund investment decisions are more complex than those of other four investors.

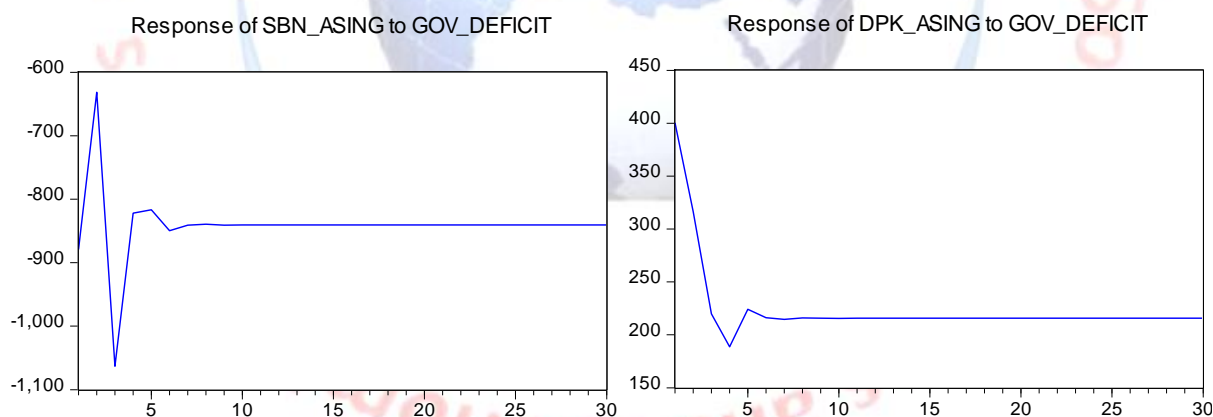
Table 4.4 Optimum Lag dan Cointegration

	Lag Length	Cointegration
VECM FOREIGN	1	1
VECM INSURANCE	1	1
VECM PENSION FUND	1	1
VECM INDIVIDUAL	1	1
VECM MUTUAL FUND	1	2

4.3.1 Foreign Investor

Based on the impulse response function of foreign investors VECM, it can be seen that the shock of increasing the Government's deficit will be responded by foreign investors with the increase of GB ownership. This foreign investor's response will return to the balance point at month 10. Considering that foreign investor is the biggest owner of GB with 43% share, the result of impulse response function of VECM of foreign investor has been able to describe most of the aggregate movement of GB due to the shock of increasing Government deficit. Meanwhile, the increase in government deficit was responded by foreign investors with decreasing bank deposits.

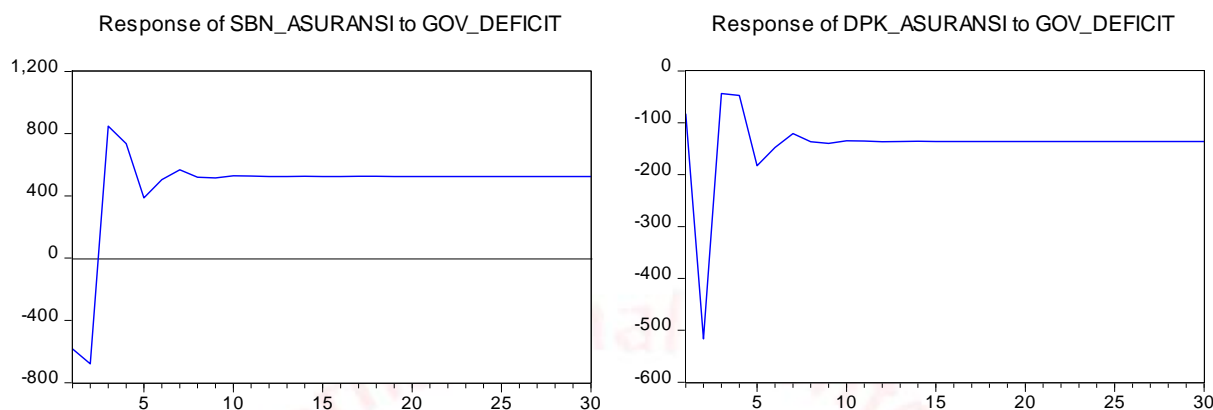
Response to Cholesky One S.D. Innovations



4.3.2 Insurance Investor

The impulse response function of VECM insurance investors indicates that the shock of increasing the Government's deficit will be responded by the increase of GB ownership and the decrease of bank deposit. This result is in line with ECM estimation result indicating shifting from bank deposits placement to GB. The increase of GB ownership by insurance is also influenced by the Regulation of OJK No.1 / POJK 05/2016 concerning Investment of Securities for Non Bank Financial Institution on January 11, 2016. This regulation requires insurance to place at least 30% of their fund placement in GB.

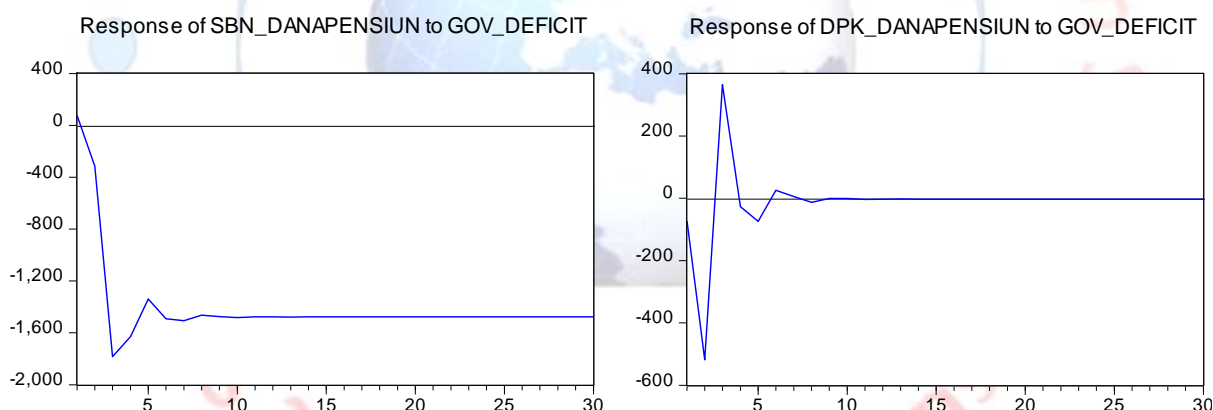
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4.3.3 Pension Fund Investor

Impulse response function of VECM pension fund investors show different results compared with foreign investors and insurance. The increase in the Government's deficit will be responded by pension fund investors with declining GB ownership and increased bank deposit. Given that the share of GB's ownership of pension funds is not too large, at 5%, the movement of pension fund GB does not significantly affect the movement of GB in aggregate.

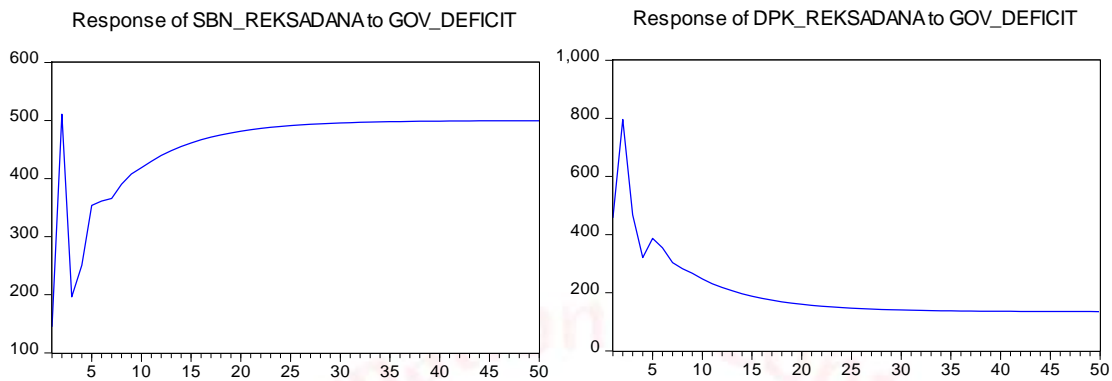
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4.3.4 Mutual Fund Investor

The impulse response function of VECM equation of mutual fund investors shows that the government deficit increase will be responded by increasing GB ownership and decreasing bank deposit. This result is in accordance with the equation using ECM indicating the shifting of fund placement from bank deposit to GB.

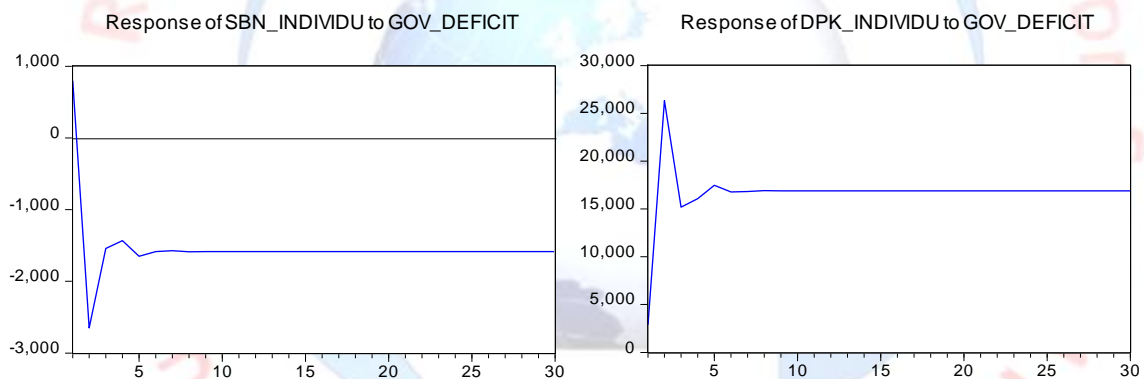
Response to Cholesky One S.D. Innovations



4.3.5 Individual Investor

Impulse response function equation VECM individual investor shows the same direction with investor pension fund that is increase of deficit Government will be responded with decreasing GB ownership and increasing bank deposit. As the investor with the smallest shareholding share of GB, which is 2%, the movement of individual investor GB does not significantly affect the movement of GB in aggregate. In addition, investment alternatives owned by individual investors are relatively broader compared to other groups of investors, which can invest in the capital market and real sector.

Response to Cholesky One S.D. Innovations



5. CONCLUSION AND POLICY IMPLICATION

5.1. Conclusion

1. From the result of two estimations using Error Correction Model (ECM), it is found that besides caused by economic growth, bank deposit is also affected negatively and significantly by the volume of issuance GB and spread of 10-year GB yield with 1-month deposit rate. This indicates that the customer decision to place in the bank deposits consider the return on investment obtained from the yield of GB and the deposit interest rate. In addition, estimates using the ECM also confirm the shifting of public funds from bank deposits to GB.
2. Based on estimates using the Vector Error Correction Model (VECM) method, the Government's increased domestic financing is responded by investors in various way.
 - a) Foreign investors, insurance investors, and mutual fund investors as GB owners with a proportion of 43%, 12%, 5% respectively, responded to increased domestic government financing by increasing GB purchases and decreasing bank deposit.
 - b) On the other hand, the increase in domestic government financing is responded by pension fund investors (5% GB ownership share), and individuals (proportion of GB 2% ownership) through decreases in purchases of GB and increased bank deposits.
 - c) Although not aligned with foreign investors, insurance and mutual funds, pension and individual response does not significantly affect aggregate demand given the relatively small proportion of the two types of investors. In addition, pension fund investors and individuals have an alternative placement of funds in the real sector.

5.2 Policy Implication

Considering the future direction of government fiscal policy focusing on domestic financing, BI needs to be cautious about its impact on financial stability system as the increase in volume and spread between yield on GB and deposit rates will lower deposits which will ultimately impact the decline in the banking intermediation function.

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