

FUNDAMENTALS OF INTEGRATED COMMERCIAL BANK IN MACROECONOMIC AND SHARIA PERSPECTIVE IN INDONESIA

*Kumara Jati*¹
*Aziza Rahmaniar Salam*²

Abstract

This research analyses the fundamentals of integrated commercial bank in macroeconomic and sharia perspective in Indonesia. Based on the calculation of Vector Autoregression (VAR), the impact of macroeconomic variables (Jakarta Stock Islamic Index / JKSII, Indonesian Stock Price Composite Index / JKSE, Crude Oil Price, and Exchange Rate) on stock prices of commercial banks vary. These shocks indicate an indirect price transmission through exchange rate channels and economic growth. From the Structural Time Series Model (STSM), JKSII, JKSE, and commercial bank share price prediction will generally increase at the end of 2017 and 2018. This will generate hope and benefit for policy maker and business actors in the banking, finance and sharia sectors. In general, the ARMA-ARCH/GARCH model with dummy variables found negative impact of "Fasting Period and Eid Al-Fitr" on return of JKSII, JKSE, and commercial bank stock price. This indicates a cycle of stock price decline that occurs when consumers spend more money to purchase goods and services. However, this cycle of stock price declines is only temporary because the recovery of the world economy and the increase in demand for goods and services in the future can be a pull factor for stock prices (demand factor). Policy makers and stakeholders related to the financial system, banking and capital markets, especially the sharia sector need to see the movement of conventional bank stocks and "Fasting Period and Eid Al-Fitr" as they move in the opposite direction for a certain period.

Keywords: Stock Price of Commercial Bank, Macroeconomic and Sharia Perspective, Vector Autcregression (VAR), Structural Time-Series Models (STSM), ARMA-ARCH/GARCH

JEL Classification: F31, F47, G15, G21

Received: September 20, 2017; Revised: January 20, 2018 ;
Accepted: February 15, 2018

¹ Pusat Pengkajian Kerjasama Perdagangan Internasional Kementerian Perdagangan, kumara.jati@yahoo.com.

² Pusat Pengkajian Kerjasama Perdagangan Internasional, Kementerian Perdagangan.

I. INTRODUCTION

Macroeconomic variable that can be used in measuring the economic growth of a country is the capital market. Increased capital market activity in a country shows the amount of investment activity in the real sector in the country. The capital market is where investors meet (the party with funds) with the company (the party that needs the funds). The company can obtain cheap funding alternatives and can be used the finance its business activities in order to increase through the capital market. The company will encourage the economic growth of the country widely with the increasing activities of the stock market.

Indonesian capital market development can be seen from the stock capitalization value as reflected by the value of Indonesian Composite Stock Price Index (IHSG). IHSG is an index whose calculation is based on the value of all stock prices listed on the Indonesia Stock Exchange. Many factors can affect the value of the stock price index, among others, changes in the interest rates of the central bank, the condition of the global economy, the level of world energy prices, the political stability of a country, and others (Blanchard, 2006). The other research result suggests world oil prices, and the value of currency exchange rates affects the IHSG (Syarofi, 2014). The increasing phenomenon of globalization of world economic activity in the form of exports and imports makes the role of foreign exchange rate becomes important. The exchange rate will have an impact on the company's production costs due to the different currency values of countries in the world. If a company requires a lot of imported materials, the increase in foreign exchange rates will increase in production costs of the company. Increase in production costs resulted in reduced levels of corporate profits. The decline in corporate profits will dampen investor interest in buying shares of companies that impact on declining stock prices. World oil prices have an influence on the capital market of a country. The increase in world oil prices will increase the profits of companies engaged in the mining sector, and the decline in world oil prices makes investors tend to sell their shares.

Besides capital market, this paper also used Commercial Banks Stock market as an important variable. Although the Commercial Banks (CB) that we chose is the CB that has sharia Bank subsidiary company. Sharia principles are Islamic legal principles in banking activities based on fatwa (legal decision issued by an institution that has the authority in the determination of fatwa in the field of sharia (OJK, 2015). Sharia banking needs an innovation, product development, services and socialization by

the Islamic communities. Sharia bank is bank conducting business based on Sharia Principles and according to its types consists of Islamic Commercial Bank and Islamic Rural Bank (BI, 2012).

To the best of our knowledge, no systematic empirical research exists related to the fundamentals of integrated commercial bank in macroeconomic and sharia perspective, using Vector Autoregression (VAR), Structural Time Series Model (STSM), and ARMA-ARCH/GARCH in Indonesia. Therefore, there is still a room to contribute research in order to add a reference in the academic literature and beneficial to relevant stakeholders. According to the above description, the purpose of this research is to see how the relation between Jakarta Stock Islamic Index (JKSII), Indonesian Stock Price Composite Index (JKSE) and commercial bank share. It will also be seen how the prediction of those variables in the future.

II. LITERATURE REVIEW

The research about commercial bank in macroeconomic and sharia perspective in the world already happened since the year 1987 when the stock market fell down in the USA. Volatility spillover in financial market was called financial contagion (Beirne, Caporale, Schulze-Ghattas, & Spagnolo, 2008).

Bala & Premaratne (2003) studies about volatility spillover and co-movement of stock market return in Singapore, US, UK, Hong Kong and Japan. They used univariate GARCH, VAR, a multivariate and asymmetric multivariate GARCH. The result was the GJR model analysed better for the volatility dynamics in Singapore and Hong Kong, but EGARCH model is more suited to see the volatility dynamics in the UK, Japan and US. The Singapore stock market gives small but significant volatility spillover to Japan, US and Hong Kong stock markets.

Baruník, Kočenda, & Vácha (2009) wrote about asymmetric volatility spillovers in 30 US stocks. They combined the Diebold & Yilmaz (2009) model about spillover index with realized semi-variance and generalization in Klößner & Wagner (2012). Diebold & Yilmaz (2009) introduced the spillover index to measure spillovers from volatility from variance decomposition related to N-variable VAR (Vector Autoregression). Finally, the result of Baruník, Kočenda, & Vácha (2009) was they provided volatility spillover evidence, especially the importance of positive and negative volatility. Also, the pattern of volatility spillover (during periods of the economic situation is good or bad).

Moreover, the raising of crude oil price, limited supplies of fossil fuel and increase concerns about global economic crisis have created a growing demand for renewable energy sources (Srinivasan, 2009). Crude oil price is one of the macroeconomic indicators that can give effect to the economic condition including commercial bank. Serra & Zilberman (2009) study about food commodity, ethanol and crude oil price volatility using error correction model and multivariate GARCH. During 2002-2004, food commodity and ethanol predicted volatility shows high volatility because of tightening crude oil market period. This research also shows that crude oil influence price level and volatility of ethanol.

III. METHODOLOGY

3.1 Vector Autoregression (VAR) Model

The econometric model can be formed by the usual simultaneous equations is a structural model in which there is a relationship between variables based on a particular theory. However, sometimes basic economic theories often difficult to provide a form of specification of dynamic relationships between right variables. This problem led to the existence of alternative models that are non-structural to find relationships between variables. Associated with the above explanation, this research used a Vector Autoregression (VAR) model:

$$RJKII_t = \alpha_{A0} + \sum_{i=1}^n \alpha_{A1} RJKSE_{t-1} + \sum_{i=1}^n \alpha_{A2} ROIL_{t-1} + \sum_{i=1}^n \alpha_{A3} RERIU_{t-1} + \sum_{i=1}^n \alpha_{A4} RSTOCK_{t-1} + \varepsilon_{At} \quad (1)$$

$$RJKSE_t = \alpha_{B0} + \sum_{i=1}^n \alpha_{B1} RJKII_{t-1} + \sum_{i=1}^n \alpha_{B2} ROIL_{t-1} + \sum_{i=1}^n \alpha_{B3} RERIU_{t-1} + \sum_{i=1}^n \alpha_{B4} RSTOCK_{t-1} + \varepsilon_{Bt} \quad (2)$$

$$ROIL_t = \alpha_{B0} + \sum_{i=1}^n \alpha_{B1} RJKII_{t-1} + \sum_{i=1}^n \alpha_{B2} RJKSE_{t-1} + \sum_{i=1}^n \alpha_{B3} RERIU_{t-1} + \sum_{i=1}^n \alpha_{B4} RSTOCK_{t-1} + \varepsilon_{Bt} \quad (3)$$

$$RERIU_t = \alpha_{C0} + \sum_{i=1}^n \alpha_{C1} RJKII_{t-1} + \sum_{i=1}^n \alpha_{C2} RJKSE_{t-1} + \sum_{i=1}^n \alpha_{C3} ROIL_{t-1} + \sum_{i=1}^n \alpha_{C4} RSTOCK_{t-1} + \varepsilon_{Ct} \quad (4)$$

$$RSTOCK_t = \alpha_{D0} + \sum_{i=1}^n \alpha_{D1} RJKII_{t-1} + \sum_{i=1}^n \alpha_{D2} RJKSE_{t-1} + \sum_{i=1}^n \alpha_{D3} ROIL_{t-1} + \sum_{i=1}^n \alpha_{D4} RERIU_{t-1} + \varepsilon_{Dt} \quad (5)$$

where:

RJKII = The Return of Jakarta Islamic Index

RJKSE = The Return of Indonesian Stock Price Composite Index

ROIL	= The Return of Crude Oil Price
RERIU	= The Return of Exchange Rate between Indonesian Rupiah to USD
RSTOCK	= The Return of stock prices: Model 1 for Return Bank Mandiri Stock (RBMRI), Model 2 for Return of Bank BRI (RBBRI), Model 3 for Return of Bank BNI (RBBNI) stock price, Model 4 for Return of Bank BRI (RBBRI) stock price, Model 5 for Return of Bank BCA (RBBCA) stock price, Model 6 for Return of Bank Mega (RMEGA) stock price, Model 7 for Return of Bank Bukopin (RBBKP) stock price, Model 8 for Return of Bank Panin (RPNBN) stock price, and Model 9 for Return of Bank Victoria (RBVIC) stock price.
i	= time lag
n	= observation
t	= time at t
$\alpha_{A0}, \alpha_{B0}, \alpha_{C0}$ dan α_{D0}	= constanta
$\alpha_{A1}, \alpha_{A2}, \alpha_{A3}.. \alpha_{D4}$.	= regression coefficient
$\varepsilon_{At}, \varepsilon_{Bt}, \varepsilon_{Ct}$, dan ε_{Dt}	= error term

3.2. Structural Time Series Model (STSM) Decomposition

Jakarta Stock Islamic Index (JKSII), Indonesian Stock Price Composite Index (JKSE), International crude oil prices, rupiah/US\$ exchange rate, and commercial bank stock price are macroeconomic variables that are categorized as fluctuating or commodities that are difficult to model. Therefore, a simple model is needed that can explain the dynamics of the changes in those variables. One alternative solution to make more accurate and precise short-term assessments and predictions is to decompose and project in a comprehensive model of the Structural Time Series Model (STSM) Decomposition (Harvey & Peters, 1990).

The advantages of this STSM approach compared to historical averages are more structured, can model seasonal patterns and irregularity of commodity prices and make their models more robust. STSM

decomposition (Harvey & Peters, 1990) and (Durbin & Koopman, 2001) consists of 3 components:

(1.) Trend Components that follow the random walk process.

$$\tau_t = \mu_t + \tau_{t-1} + n_t, n_t \sim N(0, \sigma_n^2) \quad (6)$$

$$\mu_t = \mu_{t-1} + v_t \sim N(0, \sigma_v^2) \quad (7)$$

Where τ_t is the trend component, μ_t is the slope that can be stochastic, and n_t is the error of τ_t , and v_t is the error of μ_t .

(2.) The seasonal component of the specification (γ_t) follows the trigonometric model

$$\begin{bmatrix} \gamma_{j,t} \\ \gamma_{j,t}^* \end{bmatrix} = \begin{bmatrix} \cos \lambda_j & \sin \lambda_j \\ -\sin \lambda_j & \cos \lambda_j \end{bmatrix} \begin{bmatrix} \gamma_{j,t-1} \\ \gamma_{j,t-1}^* \end{bmatrix} + \begin{bmatrix} \omega_t \\ \omega_t^* \end{bmatrix} \quad (8)$$

for $j = 1, \dots, [s/2]$; $t = 1, \dots, T$. Where γ_t is a seasonal component, ω_t is an error of γ_t .

(3.) Cycle Component whose models resembles Seasonal Components

$$\begin{bmatrix} \psi_{j,t} \\ \psi_{j,t}^* \end{bmatrix} = \rho_\psi \begin{bmatrix} \cos \lambda_c & \sin \lambda_c \\ -\sin \lambda_c & \cos \lambda_c \end{bmatrix} \begin{bmatrix} \psi_{j,t-1} \\ \psi_{j,t-1}^* \end{bmatrix} + \begin{bmatrix} K_t \\ K_t^* \end{bmatrix} \quad (9)$$

for $t = 1, \dots, T$. Where ρ_ψ is the cycle component, ρ_ψ and λ_c are damping and frequency factors with values $0 < \rho_\psi \leq 1$ and $0 \leq \lambda_c \leq \pi$ while K_t and K_t^* are not mutually correlated $N(0, \sigma_k^2)$. If all three components are summed then it becomes:

$$y_t = \tau_t + \gamma_t + \psi_t + \varepsilon_t \quad (10)$$

So, y_t is the price of the commodity predicted by the trend component (τ_t), seasonal (γ_t) and cycle (ψ_t). This model is estimated using the MLE (*Maximum Likelihood Estimation*) method and difficult to estimate components generated from Kalman filter (Harvey & Peters, 1993). The software used in this model uses OxMetrics Stamp 7.

3.2 Model Autoregressive Moving Average (ARMA)-ARCH/GARCH

3.3.1 Model Autoregressive Moving Average (ARMA)

A simple Autoregression and Moving Average model is ARMA (1,1), which can be presented as follows:

$$\begin{aligned} Y_t - \varphi &= \beta_1(Y_{t-1} - \varphi) + e_t + \delta_1 e_{t-1} \\ d_t &= \beta_1 d_{t-1} + e_t + \delta_1 e_{t-1} \\ E(d_t) &= E(Y_t - \varphi) = 0 \\ Var(d_t) &= E(d_t^2) \end{aligned} \quad (11)$$

Where: $\beta_0, \beta_1, \delta_1$ are parameters, e_t is residual random.

ARMA univariate modelling is done by Box-Jenkins procedure with stages: (1) identification by looking and comparing correlogram from some combination of existing models, (2) estimation by Ordinary Least Square (OLS) or Maximum Likelihood, (3) evaluation to check the estimated model if it is sufficient.

3.3.2 Model Autoregressive Conditional Heteroskedasticity/Generalized Autoregressive Conditional Heteroskedasticity (ARCH/GARCH)

ARCH model estimates a conditional variance. The OLS assumption uses Best Linear Unbiased Estimator (BLUE) assumptions, whereas ARCH sees that the residual variance at a point of time (t) is a function of residual variance at other points. The ARCH model was introduced by (Engle, 1982) and the model was generalized to GARCH by (Taylor, 1986) and (Bollerslev, 1986). Here is the basic model of GARCH (1,1):

$$Y_t = X_t \theta + e_t \quad (12)$$

$$\sigma_t^2 = c + \alpha e_{t-1}^2 + \beta \sigma_{t-1}^2 \quad (13)$$

Where : c = constant; e_{t-1}^2 = ARCH parameter; σ_{t-1}^2 = GARCH parameter.

Equation (12) is a function of an exogenous variable with an error term (e). Equation (13) is a conditional variance by predicting a future period a variance based on information in the past.

3.3.3 The Effect of “Fasting Period and Eid Al-Fitr” to Return of Stock Price using ARCH/GARCH Dummy Variable

One of the important moments in Indonesia is during Fasting Period and Eid Al-Fitr. Government functions during this special period is to make sure that macroeconomic condition, especially banking and finance still run effectively. If the price of basic food commodity fluctuates at certain times and increase of demand, then the government should know what is the impact to the economy in the broader view.

The “Fasting Period and Eid Al-Fitr” can represent the real sector and the stock price can represent the financial sector. There is the big attention between these two sectors. There are five possible relationships between the financial and real sector, which are: (1) no causal relation, (2) demand-following, (3) supply-leading, (4) negative causal link from finance to growth, and (5) interdependence (David, Blum; Klaus, Federmaier; Gerhard, Fink; Peter, 2002). Furthermore, these two sectors have specific linkage where higher growth in financial sector reduces real growth in certain condition (Cecchetti & Kharroubi, 2015). This indicates that financial sector competes with real sector for resources. Although the better development of banking sector stimulates growth (Samsi, Yusof, & Cheong, 2012).

The calculation of “Fasting Period and Eid Al-Fitr” effect to return of stock price hopefully can get the statistical evidence to prove about the relation of these two sectors. Therefore, this part of research using dummy variable of “Fasting Period and Eid Al-Fitr” in ARCH-GARCH Model. The function of this dummy variable is to analyse the behaviour of the conditional variance at the time “Fasting Period and Eid Al-Fitr” to return of stock price.

$$y_t = c_1 + \beta_1 y_{t-1} + e_t + \delta_1 e_{t-1} \quad (14)$$

$$\sigma_t^2 = c_2 + \alpha_1 e_{t-1}^2 + \beta_3 \sigma_{t-1}^2 + \beta_4 (D_1 e_{t-1}^2) \quad (15)$$

D_1 = dummy “Fasting Period and Eid Al-Fitr”. Where β_4 is the effect of the Muslim people in Indonesia fasting and celebrate the “Hari Raya Lebaran”, the value becomes 1 when it is entering the period of “Fasting Period and Eid Al-Fitr” in the year 2013-2017. This model has been used and evaluated in (Mensah, 2011) and (Miniaoui, Sayani, & Chaibi, 2014) on the effects of structural changes from the global financial crisis.

Table 1 and 2 shows the descriptive statistics of macroeconomic variables and stock price year 2013-2017. Some of the skewness values are greater than zero indicates that the distribution is more to the right. The kurtosis values are greater than three for all variables showed that the distribution square of the macroeconomic variables and stock price have a fat tail compared to normal distribution. This kurtosis value is higher than 3 also indicates of heteroscedasticity.

4.1 Result of Stationarity Test

Data were analysed using Eviews economics software version 7 and 8. The stationarity data test should be performed before estimating ARCH/GARCH model. According to (Gujarati, 2003), time coherent data can be said to be stationary if the values of averages, variance and autocovariance for each lag are constant over time. The way to detect the stationarity of an existing variable is by using Augmented Dicky-Fuller (ADF) test. This ADF test is done at the level (see table 3). The result is all stationary variables at the level for all returns of the variable data.

Table 3
Result of Stationerity Test using Augmented Dicky-Fuller (ADF)

No.	Variable	Test ADF	MacKinnon Critical Value	Order Integration
1	Return of Jakarta Islamic Index (RJKI)	-19.07621	-3.458594***	Level
2	Return of Jakarta Stock Exchange (RJKSE)	-17.07135	-3.458594***	Level
3	Return of Crude Oil Price (ROIL)	-11.34590	-3.458594***	Level
4	Return of Exchange Rate IDR / US\$ (RERIU)	-14.25944	-3.458594***	Level
5	Return of Bank Mandiri Stock (RBMRI)	-18.12307	-3.458594***	Level
6	Return of Bank BRI Stock (RBBRI)	-16.65098	-3.458594***	Level
7	Return of Bank BNI Stock (RBBNI)	-17.14712	-3.458594***	Level
8	Return of Bank BCA Stock (RBBCA)	-19.14222	-3.458594***	Level
9	Return of Bank Mega Stock (RMEGA)	-14.91059	-3.458594***	Level
10	Return of Bank Bukopin Stock (RBBKP)	-16.44889	-3.458594***	Level
11	Return of Bank Panin Stock (RPNBN)	-14.93700	-3.458594***	Level

No.	Variable	Test ADF	MacKinnon Critical Value	Order Integration
12	Return of Bank Victoria Stock (RBVIC)	-11.74789	-3.458594***	

Note: ***, **, * represent the levels of significance of 1%, 5%, and 10% respectively, Source: writer's calculation

4.2 VAR Estimation with Innovation Accounting (Impulse Response Function)

In innovation accounting will be described how and how the influence of shock or disturbance on the variables formed in the equation. Innovation accounting consists impulse response function (IRF). IRF is used to see the impact of shock on the stock price of commercial banks. IRF tracks the effects of one of the shock to another in the present and future shock of the endogenous variable.

If shock occurs in the i -th variable directly it will affect the variable itself and also propagate to other endogenous variables through dynamic structure of VAR. IRF can also provide the direction of relationships the magnitude of influence between endogenous variables. Thus the shock that occurs in a variable when the new information can affect the variable itself and other variables in the system of VAR equations. Here are presented impulse response results of variables.

4.2.1. Response of RJKII Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RJKII variable in the next ten (10) period shows that the shock in Indonesian Stock Exchange Composite Index (JKSE), Oil Price and Exchange Rate Return can be explained as follows:

- (1) The response of RJKII return variable to the shock return of Indonesian Stock Exchange Composite Index (JKSE). The shock on the RJKSE positively responded by JKII return in the first and second week then convergent. So, if it is assumed that the shock of JKSE increased from 5,200 in December 2016 to 5,300 in January 2017, then the return of JKSE is expected to be affected initially increase in one week after shock but convergent in the next week. This indicates that there is indirect price transmission through a stock channel.

- (2) Response variable return of JKII return to shock return of crude oil price. The shock on the crude oil price return responded negatively by the return of RJKII in the second and third week then convergent. So, if it is assumed that there is a shock of crude oil price return in December 2016, then the JKII return is expected to be affected by the decrease in the second and third week after the shock. This indicates that there is an indirect price transmission from energy market to sharia stock market.
- (3) Response variable return of JKII return to shock return of exchange rate. The shock on the exchange rate return responded negatively by the return of RJKII in the second week and responded positively in the third week, then convergent. So, if it is assumed that there is a shock of exchange rate return in December 2016, then the JKII return is expected to be affected by the decrease in the second week, then increased in the third week after the shock. This indicates that there is an indirect price transmission from money market to sharia stock market.

4.2.2. Response of RJKSE Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RJKSE variable in the next ten (10) periods in case of shock on Jakarta Islamic Index (JKII), Oil Price and Exchange Rate Return can be explained as follows:

- (1) RJKSE variable response to the shock return of JKII. The shock on the JKII return positively responded by the JKSE return variable in the first week, but responded negatively by the return of JKSE in the second week then convergent.
- (2) RJKSE variable response to the shock return of Oil Price (ROIL). The shock on Oil Price return responded neutral by RJKSE then convergent.
- (3) RJKSE variable response to the shock return of Exchange Rate (RERIU). The shock on the exchange rate return responded negatively by the JKSE return variable in the first week then convergent.

4.2.3. Response of RBMRI Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RBMRI variable in the next ten (10) periods in case if there is a shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return, can be explained as follows:

- (1) The response of RBMRI variable to the shock of return of JKII. The shock on the BMRI return positively responded by the RJKII variable in the first week, but responded negatively in the second week then convergent.
- (2) The response of RBMRI variable to the shock of return of JKSE. The shock on the RBMRI positively responded by the RJKSE in the first and second week then convergent.
- (3) The response of RBMRI variable to the shock return of Oil Price (ROIL). The shock on the BMRI return positively responded by the Oil Price (ROIL) return variable in the first week, but responded negatively in the second week then convergent.
- (4) The response of RBMRI variable to the shock return of exchange rate (RERIU). The shock on the BMRI return responded negatively by RERIU in the first and second week then convergent.

4.2.4. Response of RBBRI Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RBBRI variable in the next ten (10) periods in case if there is a shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return, can be explained as follows:

- (1) The response of RBBRI variable to the shock of return of JKII. The shock on the BMRI return positively responded by the RJKII variable in the first week, but responded negatively in the second week then convergent. This response is similar with RBMRI variable.
- (2) The response of RBBRI variable to the shock of return of JKSE. The shock on the RBMRI positively responded by the RJKSE in the first week then convergent.
- (3) The response of RBBRI variable to the shock return of Oil Price (ROIL). The shock on the BMRI return negatively responded by the Oil Price

(ROIL) return variable in the first week, but responded positively in the second week then convergent. This response is the opposite with RBMRI variable.

- (4) The response of RBBRI variable to the shock return of exchange rate (RERIU). The shock on the BBRI return responded negatively by RERIU in the first and second week then convergent. This response is similar with RBMRI variable.

4.2.5. Response of RBBNI Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RBBNI variable in the next ten (10) periods in case if there is a shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return, can be explained as follows:

- (1) The response of RBBNI variable to the shock of return of JKII. The shock on the BBNI return positively responded by the RJKII variable in the first week, but responded negatively in the second week then convergent. This response is similar with RBMRI and RBBRI variables.
- (2) The response of RBBNI variable to the shock of return of JKSE. The shock on the RBMRI positively responded by the RJKSE in the first and second week then convergent. This response is similar with RBMRI variable.
- (3) The response of RBBNI variable to the shock return of Oil Price (ROIL). The shock on the BBNI return negatively responded by the Oil Price (ROIL) return variable in the first week, but responded positively in the second week then convergent. This response is the opposite with RBMRI variable, but similar with RBBRI variable.
- (4) The response of RBBNI variable to the shock return of exchange rate (RERIU). The shock on the BBNI return responded negatively by RERIU in the first and second week then convergent. This response is similar with RBMRI and RBBRI variables.

4.2.6. Response of RBBCA Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RBBCA variable in the next ten (10) periods in case if there is a shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return, can be explained as follows:

- (1) The response of RBBCA variable to the shock of return of JKII. The shock on the BBBCA return positively responded by the RJKII variable in the first week, but responded negatively in the second week then convergent. This response is similar with RBMRI, RBBRI and RBBNI variables.
- (2) The response of RBBCA variable to the shock of return of JKSE. The shock on the RBBCA positively responded by the RJKSE in the first and second week then convergent. This response is similar with RBMRI variable.
- (3) The response of RBBNI variable to the shock return of Oil Price (ROIL). The shock on the BBNI return negatively responded by the Oil Price (ROIL) return variable in the first week, but responded positively in the second week then convergent. This response is the opposite with RBMRI variable, but similar with RBBRI variable.
- (4) The response of RBBNI variable to the shock return of exchange rate (RERIU). The shock on the BBNI return responded negatively by RERIU in the first and second week then convergent. This response is similar with RBMRI and RBBRI variables.

4.2.7. Response of RMEGA Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RMEGA variable in the next ten (10) periods in case if there is a shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return, can be explained as follows:

- (1) The response of RMEGA variable to the shock of return of JKII. The shock on the RMEGA return positively responded by the RJKII variable

in the first and second week, but responded negatively in the third week then convergent.

- (2) The response of RMEGA variable to the shock of return of JKSE. The shock on the RMEGA positively responded by the RJKSE in the first and second week then convergent. This response is similar with RBMRI variable.
- (3) The response of RMEGA variable to the shock return of Oil Price (ROIL). The shock on the RMEGA return negatively responded by the Oil Price (ROIL) return variable in the first and second week then convergent.
- (4) The response of RMEGA variable to the shock return of exchange rate (RERIU). The shock on the RMEGA return responded positively by RERIU in the first, second and third week then convergent. This response is relatively different with previous variables.

4.2.8. Response of RBBKP Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RBBKP variable in the next ten (10) periods in case if there is a shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return, can be explained as follows:

- (1) The response of RBBKP variable to the shock of return of JKII. The shock on the RBBKP return positively responded by the RJKII variable in the first week, but responded negatively in the second week then convergent.
- (2) The response of RBBKP variable to the shock of return of JKSE. The shock on the RBBKP positively responded by the RJKSE in the first and second week then convergent. This response is similar with RBMRI variable.
- (3) The response of RBBKP variable to the shock return of Oil Price (ROIL). The shock on the RBBKP return positively responded by the Oil Price (ROIL) return variable in the second week then convergent.
- (4) The response of RBBKP variable to the shock return of exchange rate (RERIU). The shock on the RBBKP return responded positively by RERIU

in the second week then convergent. This response is relatively different with previous variables.

4.2.9. Response of RPNBN Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RPNBN variable in the next ten (10) periods in case if there is a shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return, can be explained as follows:

- (1) The response of RPNBN variable to the shock of return of JKII. The shock on the RPNBN return positively responded by the RJKII variable in the first and second week, but responded negatively in the third week then convergent.
- (2) The response of RPNBN variable to the shock of return of JKSE. The shock on the RPNBN positively responded by the RJKSE in the first and second week then convergent. This response is similar with RBMRI variable.
- (3) The response of RPNBN variable to the shock return of Oil Price (ROIL). The shock on the RPNBN return negatively responded by the Oil Price (ROIL) return variable in the first week then convergent.
- (4) The response of RPNBN variable to the shock return of exchange rate (RERIU). The shock on the RPNBN return responded negatively by RERIU in the first week then convergent. This response is relatively the same with response from the ROIL return shock.

4.2.10. Response of RBVIC Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return

The response of RBVIC variable in the next ten (10) periods in case if there is a shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return, can be explained as follows:

- (1) The response of RBVIC variable to the shock of return of JKII. The shock on the RBVIC return positively responded by the RJKII variable in the

first week, but responded negatively in the second week then convergent.

- (2) The response of RBVIC variable to the shock of return of JKSE. The shock on the RBVIC positively responded by the RJKSE in the first, second and third week then convergent.
- (3) The response of RBVIC variable to the shock return of Oil Price (ROIL). The shock on the RBVIC return negatively responded by the Oil Price (ROIL) return variable in the first, second and third week then convergent.
- (4) The response of RBVIC variable to the shock return of exchange rate (RERIU). The shock on the RBVIC return responded negatively by RERIU in the first and second week then convergent.

4.3 Analysis Result from Estimation of Structural Time-Series Model (STSM) Decomposition

4.3.1 Prediction JKII with STSM Decomposition

STSM Decomposition Approach to JKII shows that (see Figure 11): (1) Dynamics of JKII is derived from high seasonal and irregularity components associated with buying and selling from domestic and foreign for sharia stock traders as well as fundamentally changing corporate factors over time. (2) Seasonally stable seasonal Jakarta Islamic Index (JKII) arose in the beginning of the year up to March and then declined from October until December. The decline in the IHSG index is predicted because usually the maturity / payment of corporate debt in the form of rupiah or US \$ occurs the most in December, thus affecting the financial and performance of companies that go public. In addition, the tendency of stock traders to do profit taking before the end of the year. (3) The existence of irregularity component in May-June 2014, March-April 2015, and December 2017. JKII prediction in December 2018 and in the middle of 2019 will be relatively increased.

4.3.2. Indonesia Stock Exchange Prediction (JSX) with STSM Decomposition

STSM Decomposition Approach to JKSE shows that (see Figure 12): (1) Dynamics of JKSE is derived from high seasonal and irregularity components associated with buying and selling from domestic and foreign for regular

stock traders as well as fundamentally changing corporate factors over time. (2) Seasonally stable seasonal Indonesian Stock Price Composite Index (JKSE) arose in the beginning of the year up to March and then declined from September until December. The decline in the JKSE is predicted because usually the maturity / payment of corporate debt in the form of rupiah or US \$ occurs the most in the end of the year, similar reason with JKII. In addition, the tendency of stock traders to do profit taking before the end of the year. (3) The existence of irregularity component in the middle of 2014, and in the middle of 2017. The irregularity in the middle of 2014 indicates that there is non-economic factor that influence the JKSE such as a political factor (similar case in (Al-Khazani, Bouri, & Zoubi, 2015)). JKSE prediction in December 2017, December 2018 and in the middle of 2019 will be relatively increased.

4.3.3 Bank Mandiri Stock Price Prediction (BMRI) with STSM Decomposition

STSM Decomposition Approach to BMRI shows that (see Figure 13): (1) Dynamics of BMRI is derived from high seasonal and irregularity components associated with buying and selling for regular Bank Mandiri stock traders as well as fundamentally changing corporate factors of Bank Mandiri over time. (2) Seasonally stable seasonal Bank Mandiri Stock Price (BMRI) arose in the beginning of the year up to March and then declined from July until December. The decline in the BMRI is predicted because usually the maturity / payment of corporate debt in the form of rupiah or US \$ occurs the most in the end of the year, similar reason with JKII and JKSE. (3) The existence of irregularity component in the August 2014, and in the April-May 2017. BMRI prediction in December 2017 is relatively constant, but in December 2018 and in the middle of 2019 will be relatively increased.

4.3.4 Bank BRI Stock Price Prediction (BBRI) with STSM Decomposition

STSM Decomposition Approach to BBRI shows that (see Figure 14): (1) Dynamics of BBRI is derived from high seasonal and irregularity components associated with buying and selling for regular Bank BRI stock traders as well as fundamentally changing corporate factors of Bank BRI over time. (2) Seasonally stable seasonal Bank BRI Stock Price (BBRI) arose in the beginning of the year up to March and then declined from July until December. The decline in the BBRI is predicted because usually the maturity

/ payment of corporate debt in the form of rupiah or US \$ occurs the most in the end of the year, similar reason with JKII, JKSE and BMRI. (3) The existence of irregularity component in the middle of 2015, 2016 and 2017. BBRI prediction in December 2017, December 2018 and in the middle of 2019 will be relatively increased.

4.3.5 Bank BBNI Stock Price Prediction (BBNI) with STSM Decomposition

STSM Decomposition Approach to BBNI shows that (see Figure 15): (1) Dynamics of BBNI is derived from high seasonal and irregularity components associated with buying and selling for regular Bank BBNI stock traders as well as fundamentally changing corporate factors of Bank BBNI over time. (2) Seasonally stable seasonal Bank BNI Stock Price (BBNI) arose in the beginning of the year up to March and then fluctuate from July until December, but the difference with other variables is the lowest point of the seasonal in BBNI is in month of September – October but not in the end of the year. (3) The existence of irregularity component in the middle of 2015, 2016 and 2017 (similar with BBRI). BBNI prediction in December 2017, December 2018 and in the middle of 2019 will be relatively increased (the amount of increasing number is higher compared to BMRI, BBRI, BBNI, MEGA, BBKP and BVIC).

4.3.6 Bank BBKA Stock Price Prediction (BBKA) with STSM Decomposition

STSM Decomposition Approach to BBKA shows that (see Figure 16): (1) Dynamics of BBKA is derived from high seasonal and irregularity components associated with buying and selling for regular Bank BBKA stock traders as well as fundamentally changing corporate factors of Bank BBKA over time. (2) Seasonally stable seasonal Bank Central Asia Stock Price (BBKA) arose in the beginning of the year up to April and then fluctuate from May until December. (3) The existence of irregularity component in the middle of 2014, 2015, 2016 and 2017. BBKA prediction on December 2017, December 2018 and in the middle of 2019 will be relatively increased (the amount of increasing number in 2018 and 2019 is for BBKA will be higher compared to BMRI, BBRI, BBNI, MEGA, BBKP and BVIC; this due to the fact that profit of Bank BCA is relatively high compared to other commercial banks).

4.3.7 Bank MEGA Stock Price Prediction (MEGA) with STSM Decomposition

STSM Decomposition Approach to MEGA shows that (see Figure 17): (1) Dynamics of MEGA is derived from only seasonal component associated with buying and selling for regular Bank MEGA stock traders as well as fundamentally changing corporate factors of Bank MEGA over time. (2) Seasonally stable seasonal Bank MEGA declined in the beginning of the year up to April and then increased from May until September, then decreased again in the end of the year. (3) There are no irregularity and cycle in Mega Stock Price Component.

4.3.8 Bank Bukopin Stock Price Prediction (BBKP) with STSM Decomposition

STSM Decomposition Approach to BBKP shows that (see Figure 18): (1) Dynamics of BBKP is derived from high seasonal and irregularity components associated with buying and selling for regular Bank BBKP stock traders as well as fundamentally changing corporate factors of Bank BBKP over time. (2) Seasonally stable seasonal Bank BBKP decreased in the beginning of the year (same with MEGA) up to April and then fluctuate from May until December. (3) The existence of irregularity component in the middle of 2014, 2015, 2016 and 2017. BBKP prediction of December 2017 will be increased, but the prediction of December 2018 and in the middle of 2019 will be relatively stagnant.

4.3.9 Bank Panin Stock Price Prediction (PNBN) with STSM Decomposition

STSM Decomposition Approach to PNBN shows that (see Figure 19): (1) Dynamics of PNBN is derived from high seasonal and irregularity components associated with buying and selling for regular Bank PNBN stock traders as well as fundamentally changing corporate factors of Bank PNBN over time. (2) Seasonally stable seasonal Bank PNBN increased in the beginning of the year in up to April/May and then fluctuate from June until December. (3) The existence of irregularity component in the middle of 2014, 2016, and 2017. PNBN prediction on December 2017 will be increased (the amount of increasing number will be higher compared to BMRI, BBNI, BBCA MEGA, BBKP but lower compared to BBRI), then the

prediction in December 2018 and in the middle of 2019 will be the highest compared to other commercial banks.

4.3.10 Bank Victoria Stock Price Prediction (BVIC) with STSM Decomposition

STSM Decomposition Approach to BVIC shows that (see Figure 20): (1) Dynamics of BVIC is derived only from high seasonal components associated with buying and selling for regular Bank BVIC stock traders as well as fundamentally changing corporate factors of Bank BVIC over time. (2) Seasonally stable seasonal Bank BVIC decreased in the beginning of the year, up to April/May and then increased from June until September/October, finally decreased again in the end of the year. (3) The existence of irregularity component in the middle of 2014, 2016, and 2017. BVIC prediction on December 2017, December 2018 and in the middle of 2019 will be relatively stagnant.

4.3 ARMA Analysis Result

Table 4.
The Best ARMA for All Variables

No.	Variables	The Best Model for ARMA
1	Return of Jakarta Islamic Index (RJKII)	MA(1)
2	Return of Jakarta Stock Exchange (RJKSE)	MA(1)
3	Return of Crude Oil Price (ROIL)	AR(1)
No.	Variables	The Best Model for ARMA
4	Return of Exchange Rate IDR / US\$ (RERIU)	MA(1)
5	Return of Bank Mandiri Stock (RBMRI)	AR(1)
6	Return of Bank BRI Stock (RBBRI)	AR(1)
7	Return of Bank BNI Stock (RBBNI)	MA(1)
8	Return of Bank BCA Stock (RBBCA)	AR(1)
9	Return Bank Mega Stock (RMEGA)	AR(1)
10	Return Bank Bukopin Stock (RBBKP)	AR(1)
11	Return Bank Panin Stock (RPNBN)	AR(1)
12	Return Bank Victoria Stock (RBVIC)	AR(1)

Source: writer's calculation (2017)

Table 4 shows the best ARMA model for the variables varies. All macroeconomics and stock price variables are known to have either autoregressive or moving average in the first order. The election of the first order is common in the ARMA model because if the order is taken higher (second or third order) then the effect will be smaller in the ARMA model.

4.4 Test Result of ARCH/GARCH

This research uses ARCH/GARCH model based on ARMA model. The ARMA result indicates that the clustering volatility indicates an ARCH effect. Furthermore, data is tested whether no ARCH effect or not on model then used ARCH-LM test.

Table 5
Test ARCH-LM

No.	Variables	Obs*R-squared (LM statistic)	F-statistics (Probability)
1	Return of Jakarta Islamic Index (RJKII)	4.784360	4.843248 (0.0288)**
2	Return of Jakarta Stock Exchange (RJKSE)	4.122000	4.160553 (0.0425)**
3	Return of Crude Oil Price (ROIL)	6.304038	3.198784 (0.0427)**
4	Return of Exchange Rate IDR / US\$ (RERIU)	0.101690	0.050204 (0.95)
5	Return of Bank Mandiri Stock (RBMRI)	7.065973	3.597713 (0.029)** (Lag 2)
6	Return of Bank BRI Stock (RBBRI)	7.700708	3.932141 (0.021) ** (Lag 2)
7	Return of Bank BNI Stock (RBBNI)	2.510232	2.515837 (0,11)
8	Return of Bank BCA Stock (RBBCA)	6.625254	6.762438 (0.0099)***
9	Return of Bank Mega Stock (RMEGA)	6.470440	6.599844 (0.0108)**
10	Return of Bank Bukopin Stock (RBBKP)	0.001290	0.001279 (0.9715)
11	Return of Bank Panin Stock (RPNBN)	0.030837	0.030573 (0.8614)
12	Return of Bank Victoria Stock (RBVIC)	2.329981	2.333358 (0.1280)

Note: ***, **, * represent the levels of significance of 1%, 5%, and 10% respectively, Source: writer's calculation

Table 5 shows that 9 variables have probability below 5% and 3 variables have probability above 10%. This indicates that ARMA-ARCH/GARCH will be more effective for 9 variables and the ARMA model will be more effective to 3 variables that have probability above 10%. Then, further estimate is to simulate the ARCH/GARCH test by estimating the parameters using Quasi Maximum Likelihood (QML). This estimation is to get the ARCH/GARCH model from the lowest value presented in Akaike Info Criterion (AIC) and Schwarz Criterion (SC) values.

Table 6.
Test ARMA- GARCH(1,1) for Macroeconomic Variables

Coefficient	RJKII MA(1)-GARCH (1,1)	RJKSE GARCH(1,1)	MA(1)- ROIL GARCH(1,1)	AR(1)-
Constant (C)	0.000001**	0.000006**		0.000002
ARCH (α_1)	0.126491***	0.139860**		0.097948***
GARCH (β)	0.779004***	0.778587***		0.898817***
AIC	-6.249962	-6.633589		-5.559084
SC	-6.175679	-6.559306		-5.484573

Note: ***, **, * represent the levels of significance of 1%, 5%, and 10% respectively, Source: writer's calculation

Table 7.
Test ARMA- GARCH(1,1) for Commercial Bank Stock Prices

Coefficient	RBMRI AR(1)- GARCH(1,1)	RBBRI AR(1)- GARCH(1,1)	RBBCA AR(1)- GARCH(1,1)	RMEGA AR(1)- GARCH(1,1)
Constant (C)	0.000008	0.000001*	0.000003***	0.000007**
ARCH (α_1)	0.184632**	0.088161***	0.225972***	0.148479**
GARCH (β)	0.551136**	0.858143***	0.606796***	0.678857***
AIC	-5.210502	-5.167627	-5.890889	-4.941832
SC	-5.135991	-5.093115	-5.816378	-4.867321

Note: ***, **, * represent the levels of significance of 1%, 5%, and 10% respectively, Source: writer's calculation

Table 6 and 7 show that α_1 and α_2 are ARCH coefficients and β is the GARCH coefficient. This calculation takes the lowest values of AIC and SC. It also selected significant values of constants, α and β . Therefore, based on the simulation comparison of some models, it is seen that the best model chosen is AR(1)-GARCH (1,1) for commercial bank stock price and return of oil price, but the best model for RJKII and RJKSE is MA(1)-GARCH(1,1).

Table 8.
Test ARMA-GARCH(1,1) with Dummy Variable
"Fasting Period and Eid Al-Fitr" to Return of Macroeconomic Variables

Coefficient	RJKII MA(1)-GARCH (1,1)	RJKSE MA(1)- GARCH(1,1)	ROIL AR(1)-GARCH(1,1)
Mean Equation			
Constant (c1)	0.001074*	0.000569	-0.000364
AR (1) (β_1)	-	-	0.303312***
MA (1) (δ_1)	-0.140375**	-0.105505	-
Variance Equation			
Constant (c2)	0.000001***	0.000003***	0.00002
ARCH (α_1)	0.165323***	0.447844***	0.097826***
GARCH (β_3)	0.742273***	0.279504***	0.899737***
Dummy 1 (β_4)	-0.41019***	-0.726673	-0.008237

AIC	-6.250283	-6.640808	-5.550456
SC	-6.160869	-6.551394	-5.461043
HQ	-6.214219	-6.604744	-5.514393

Note: ***, **, * represent the levels of significance of 1%, 5%, and 10% respectively, Source: writer's calculation

Table 9
Test AR(1)-GARCH(1,1) with Dummy Variable
"Fasting Period and Eid Al-Fitr" to Return of Stock Price

Coefficient	RBMRI AR(1)- GARCH(1,1)	RBBRI AR(1)- GARCH(1,1)	RBBCA AR(1)- GARCH(1,1)	RMEGA AR(1)- GARCH(1,1)
Mean Equation				
Constant (c_1)	0.001441	0.001947*	0.001711***	0.000367
AR (1) (β_1)	-0.250962***	-0.021750	-0.150527***	0.041249
Variance Equation				
Constant (c_2)	0.00009**	0.00005**	0.00005***	0.000122***
ARCH (α_1)	0.21322**	0.156893**	0.342266***	0.185971**
GARCH (β_2)	0.529635***	0.615688***	0.334767***	0.558341***
Dummy 1 (β_4)	-0.295762***	-0.24654***	-0.734653***	-0.433400**
AIC	-5.217377	-5.168060	-5.916312	-4.955853
SC	-5.127964	-5.078646	-5.826898	-4.866439
HQ	-5.181314	-5.131996	-5.880248	-4.919789

Note: ***, **, * represent the levels of significance of 1%, 5%, and 10% respectively, Source: writer's calculation

Table 8 and 9 are the result of conditional variance estimation to see the effect of "Fasting Period and Eid Al-Fitr" to Return of Macroeconomic Variables and Return of Stock Price. The effect of the "Fasting Period and Eid Al-Fitr" are negative. This indicates that exist negative "Fasting Period and Eid Al-Fitr" effect to stock price (Al-Khazani et al., 2015). The religious experiences are associated with a statistically significant change in mean returns of stock (Al-Ississ, 2010).

The effect of "Fasting Period and Eid Al-Fitr" to RJKI and RJKSE is bigger compared to oil price return. This indicates that the linkages between financial sector to Muslim Holy days is closer compared to energy sector. This condition happened due to the fact that the data of oil price is world oil price and the other macroeconomic variables and stock price is related to Indonesian data. Future research of the study can be done with a model that has more macroeconomic variables such as domestic oil and electricity prices.

The effect of "Fasting Period and Eid Al-Fitr" to the return of commercial bank stock price significant for all four banks. This indicates that exist the anomalies during Ramadhan and Muslim holy days (Ali, 2016).

RBBCA get the biggest effect of "Fasting Period and Eid Al-Fitr" with negative 0.73 compared to other commercial bank stocks. This condition happened due to the fact that Bank BCA is more focus on profit oriented, maximized profit and increase the welfare of the stakeholder. So, Bank BCA will have to adapt quickly when there is a certain period of time that need to be adjusted like "Fasting Period and Eid Al-Fitr". Different policy applied to state-owned enterprise commercial bank, they responsible to the government as the biggest stakeholder and the function of the bank is agent of development to get not only profit but also public service (Sahulata, 2015). Furthermore, special case for Bank Mega that the stock that sell at the market (owned by the society) only small portion compared to the total shareholders by the main stakeholder.

IV. CONCLUSION

The analysis of fundamentals of integrated commercial bank in macroeconomic and sharia perspective can be concluded as follows: (1) There is indication of indirect price transmission through exchange rate channels and economic growth when calculating the impact of macroeconomic variables on stock prices of commercial banks, (2) Jakarta Stock Islamic Index, Indonesian Stock Price Composite Index, and commercial bank share prediction will generally increase at the end of 2017, 2018 and in the middle of 2019, (3) During "Fasting Period and Eid Al-Fitr", consumers spend more money to purchase goods and services that makes a negative impact to the financial sector, especially stock price of commercial bank, but this condition happened only temporary because the pull factor and world economy recovery will increase the stock price again in the long run.

Policy makers and stakeholders related to the financial system and banking and capital markets need to see the movement of JKII, JKSE, Rupiah / US\$ exchange rate and crude oil prices because there are indications that these three commodity prices can give effect to the commercial bank stock. In practices, investors should buy stocks at the beginning or before fasting period and sell them after Eid Al-Fitr to get short term profit. Moreover, the relevant authorities of finance should consider establishing new regulation that might reduce the negative excess of "Fasting Period and Eid Al-Fitr" to the financial sector (Al-Khazani et al., 2015) especially macroeconomic variables and commercial banks that have sharia bank as a subsidiary.

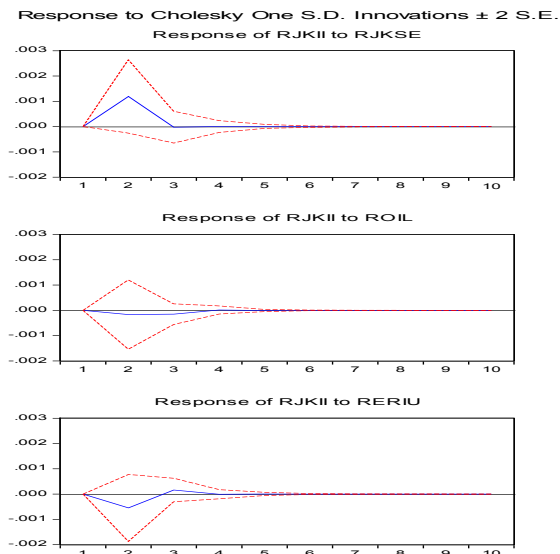
REFERENCES

- Al-Ississ, M. (2010). *The Impact of Religious Experience of Financial Markets*. Duke University's 2010 Islam and Economic Development Conference.
- Al-Khazani, O., Bouri, E., & Zoubi, T. (2015). The Impact of Religious Practice on Stock Returns and Volatility. *International Review of Financial Analysis*, 52, 172–189.
- Ali, I. (2016). *The Holy Day Effect and Stock Performance: Evidence from Asian and African Markets*. COMSATS Institute of Information Technology.
- Bala, L., & Premaratne, G. (2003). *Volatility Spillover and Cc-movement: Some New Evidence from Singapore*. Singapore.
- Baruník, J., Kočenda, E., & Vácha, K. (2009). *Asymmetric Volatility Spillovers: Revisiting the Diebold-Yilmaz (2009) Spillover Index with Realized Semivariance*. Social Science Electronic Publishing.
- BEI. (2016). *Indeks Harga Saham*. Jakarta. Retrieved from <http://www.idx.co.id/id-id/beranda/informasi/bagiinvestor/indeks.aspx>
- Beirne, J., Caporale, G. M., Schulze-Ghattas, M., & Spagnolo, N. (2008). *Volatility Spillovers and Contagion from Mature to Emerging Stock Markets*. IMF Working Paper.
- BI. (2012). *Indonesian Banking Booklet 2012*. Bank Indonesia. Jakarta.
- BI. (2016). *Kurs Transaksi Bank Indonesia*. Jakarta. Retrieved from <http://www.bi.go.id/id/moneter/informasi-kurs/transaksi-bi/Default.aspx>.
- Blanchard, O. (2006). European unemployment: The evolution of facts and ideas. *Economic Policy*, 21(45), 5–59. <https://doi.org/10.1111/j.1468-0327.2006.00153.x>
- Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics*, 31(3), 307–327. [https://doi.org/10.1016/0304-4076\(86\)90063-1](https://doi.org/10.1016/0304-4076(86)90063-1)
- Cecchetti, S. G., & Kharroubi, E. (2015). Why does financial sector growth crowd out real economic growth? *Working Paper*, (September), 1–24. <https://doi.org/10.3386/w16827>

- David, Blum; Klaus, Federmair; Gerhard, Fink; Peter, H. (2002). The Financial-Real Sector Nexus: Theory and Empirical Evidence, (100), 1–72. <https://doi.org/10.1111/j.1475-4932.1987.tb00650.x>
- Diebold, F. X., & Yilmaz, K. (2009). Measuring Financial Asset Return and Volatility Spillovers, with Application to Global Equity Markets. *The Economic Journal*, 119(534), 158–171.
- Durbin, J., & Koopman, S. J. (2001). *Time Series Analysis by State Space Methods*.
<https://doi.org/10.1093/acprof:oso/9780199641178.001.0001>
- EIA. (2016). *Petroleum and Other Liquids Spot Prices*. Energy Information Administration (EIA), USA. Retrieved from https://www.eia.gov/dnav/pet/pet_pri_spt_s1_d.htm
- Engle, R. F. (1982). Autoregressive conditional heteroskedasticity with estimates of the variance of United Kingdom Inflation. *Econometrica*, 50(4), 987–1008.
- Gujarati, D. N. (2003). *Basic Econometric: Fourth Edition International Edition*. Singapore: McGraw-Hill Higher Education.
- Harvey, A., & Peters, S. (1990). Estimation procedures for structural time series models. *Journal of Forecasting*, 9(2), 89–108. <https://doi.org/10.1002/for.3980090203>
- Harvey, A., & Peters, S. (1993). Structural Time Series Models. *Handbook of Statistics*, 11(2), 1–6.
- Klößner, S., & Wagner, S. (2012). *Robustness and Computation of Spillover Measures for Financial Asset Returns and Volatilities*. Saarland University, Germany.
- Mensah, J. O. (2011). *Examining the Behaviour of African Financial Markets using Volatility Models*. Universiti Brunei Darussalam.
- Miniaoui, H., Sayani, H., & Chaibi, A. (2014). *The Impact of Financial Crisis on Islamic and Conventional Indices of the GCC Countries*.
- OJK. (2015). *Indonesia Banking booklet 2015*. Otoritas Jasa Keuangan, Jakarta.
- Sahulata, Y. (2015). Analisis Komparatif Kinerja Keuangan Empat Bank Terbesar di Indonesia. *Jurnal Riset Bisnis Dan Manajemen*, 3(1), 85–96.

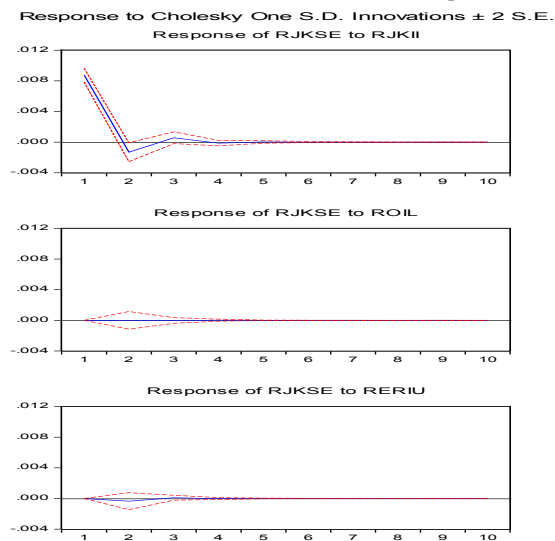
- Samsi, A. M., Yusof, Z., & Cheong, K. C. (2012). Linkages between the real sector and the financial sector: The case of Malaysia. *Asian Academy of Management Journal of Accounting and Finance*, 8(Suppl.), 93–113.
- Serra, T., & Zilberman, D. (2009). *Price Volatility in Ethanol Markets*. the Agricultural & Applied Economics Association's 2009 AAEA&ACCI Joint Annual Meeting, Milwaukee,.
- Srinivasan, S. (2009). The Food vs Fuel Debate: A Nuanced View of Incentives Structures. *Renewable Energy*, 34, 950–954.
- Syarofi, F. H. (2014). *Analisis Pengaruh Suku Bunga SBI, Kurs Rupiah/US\$, Harga Minyak Dunia, Harga Emas Dunia, DJIA, Nikkei 225 Dan Hang Seng Index Terhadap IHSG Dengan Metode GARCH-M*. Universitas Diponegoro.
- Taylor, S. J. (1986). *Modelling Financial Time Series*. Chichester, United Kingdom.

APPENDIX



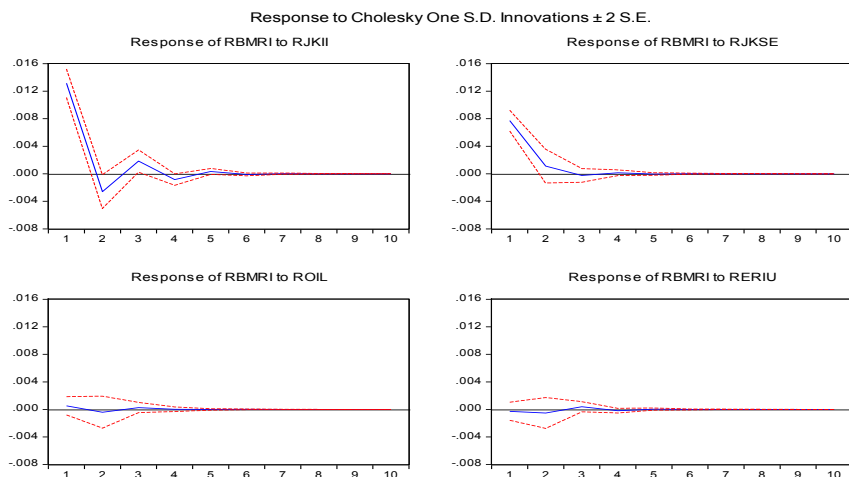
Source: Eviews 8 software calculation results

Figure 1. Response of RJKII Variable to Shock of Indonesian Stock Exchange Composite Index (JKSE), Oil Price (ROIL) and Exchange Rate (RERIU) Return



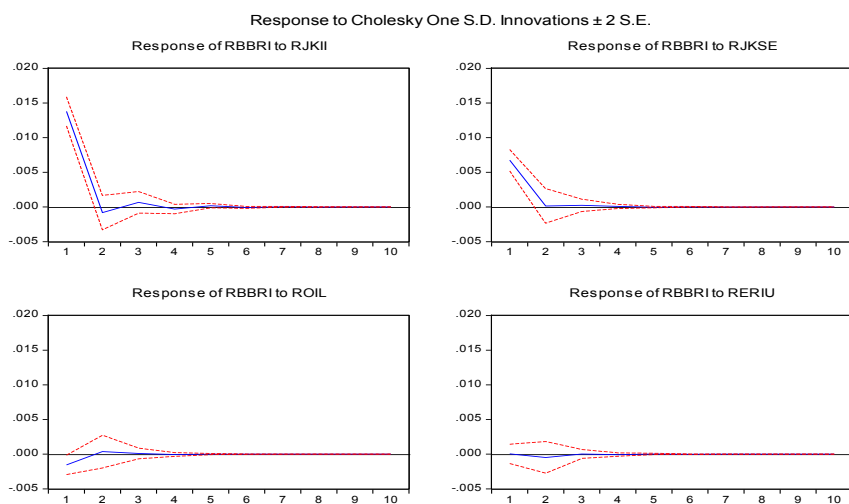
Source: Eviews 8 software calculation results

Figure 2 Response of RJKSE Variable to Shock of Jakarta Islamic Index (JKI), Oil Price (ROIL) and Exchange Rate (RERIU) Return



Source: Eviews 8 software calculation results

Figure 3. Response of RBMRI Variable to Shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return



Source: Eviews 8 software calculation results

Figure 4. Response of RBBRI Variable to Shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return

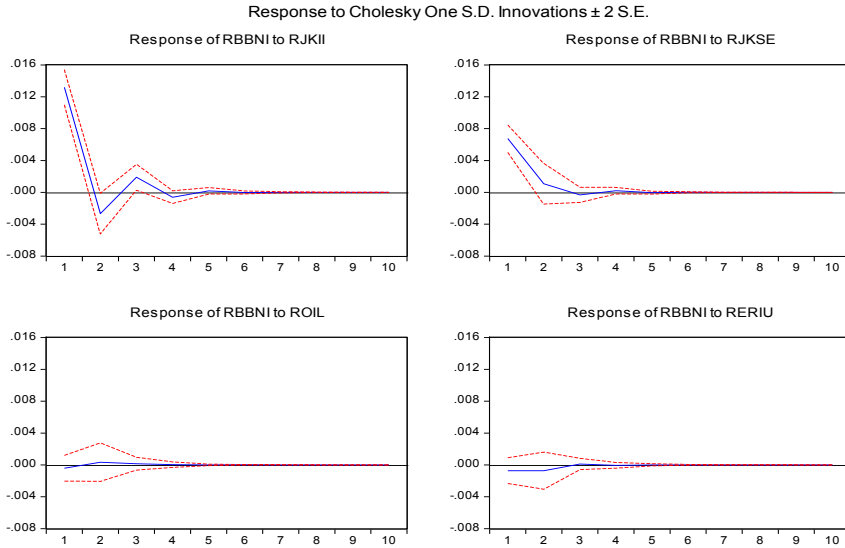


Figure 5. Response of RBBNI Variable to Shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return

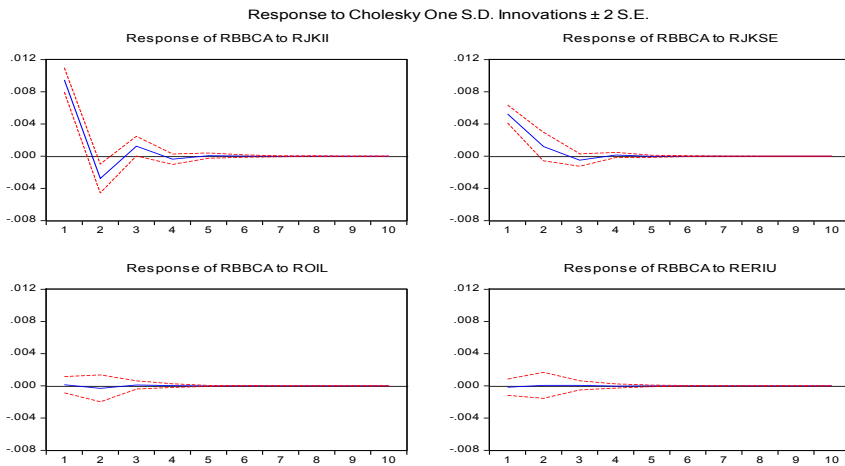


Figure 6. Response of RBBCA Variable to Shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return

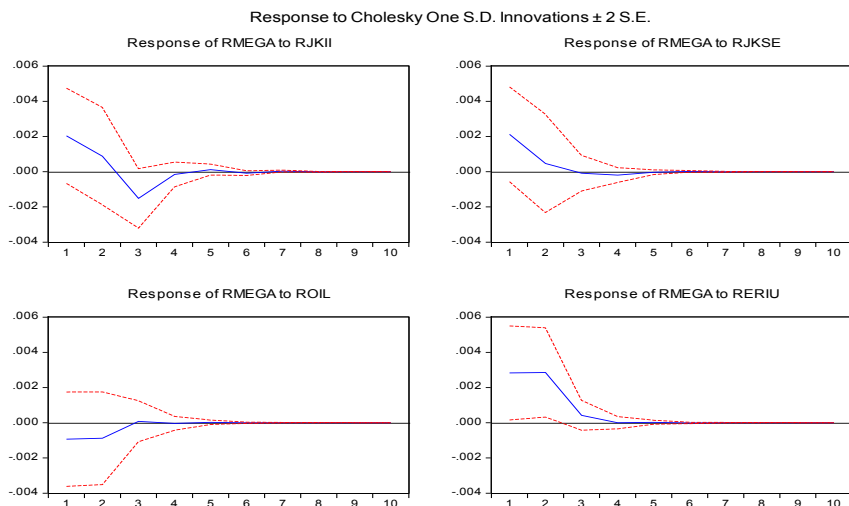


Figure 7. Response of RMEGA Variable to Shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return

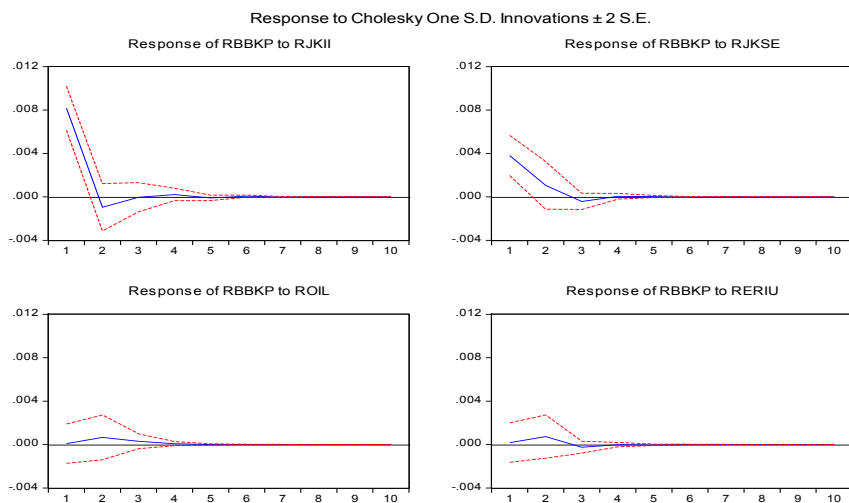
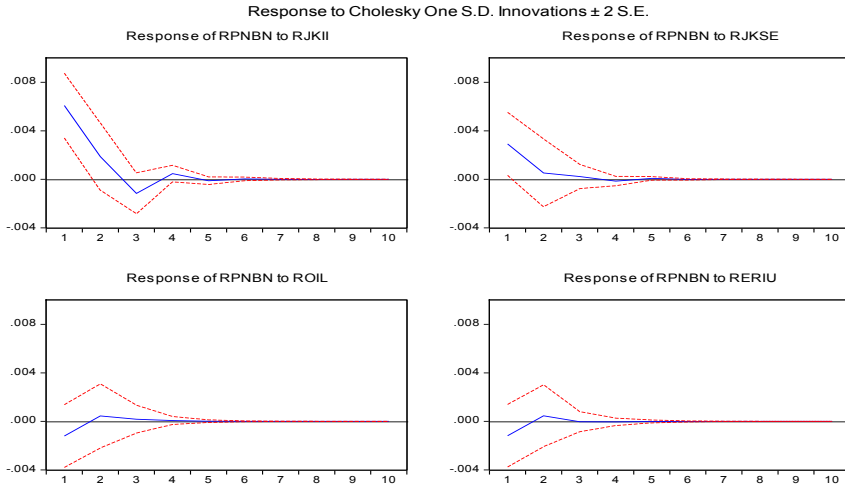
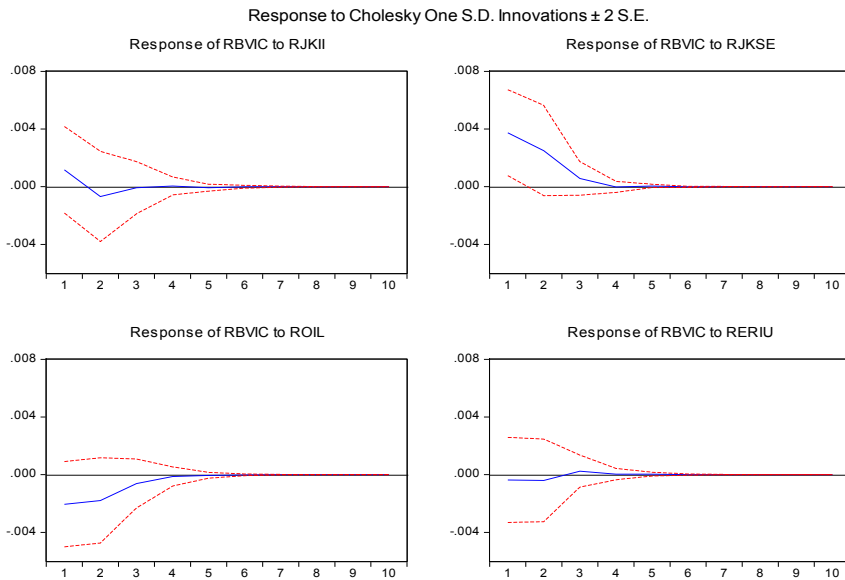


Figure 8. Response of RBBKP Variable to Shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return



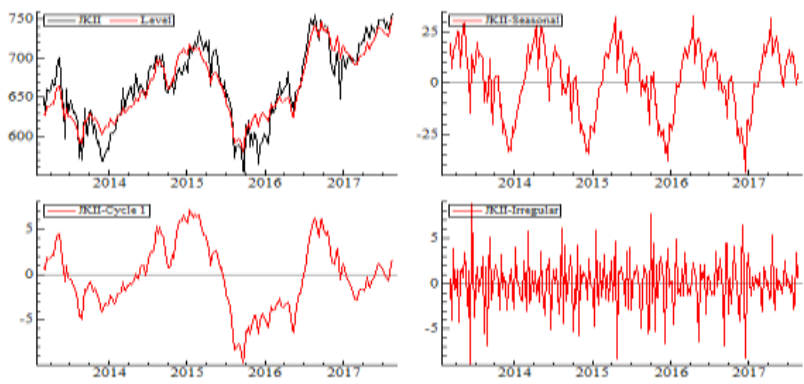
Source: Eviews 8 software calculation results

Figure 9. Response of RPNBN Variable to Shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return.



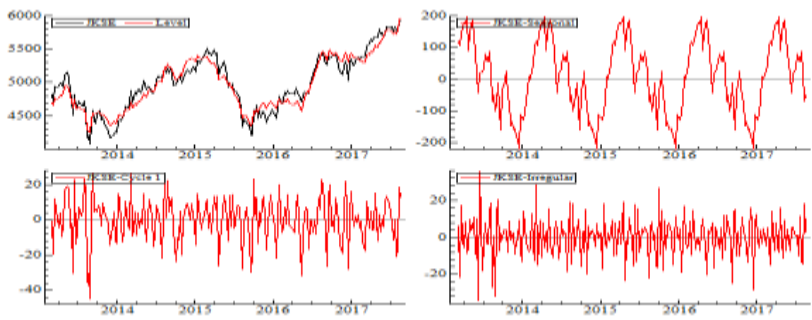
Source: Eviews 8 software calculation results

Figure 10. Response of RBVIC Variable to Shock of Jakarta Islamic Index (JKII), Indonesian Stock Exchange Composite Index (JKSE), Crude Oil (ROIL) and Exchange Rate (RERIU) Return



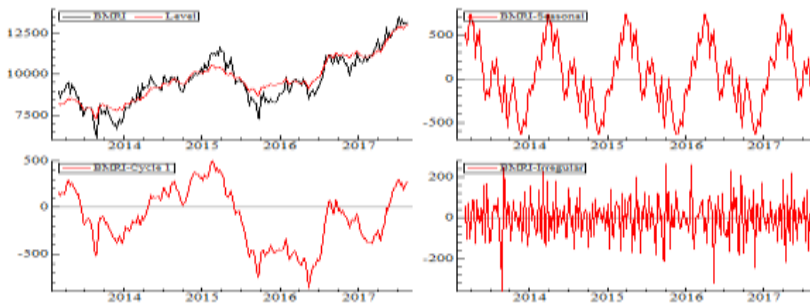
Source: Oxmetrices software calculation results (2017)

Figure 11. Development of Jakarta Islamic Index (JKII) and the Influence of Trend, Cycle, Seasonal and Irregularities Components



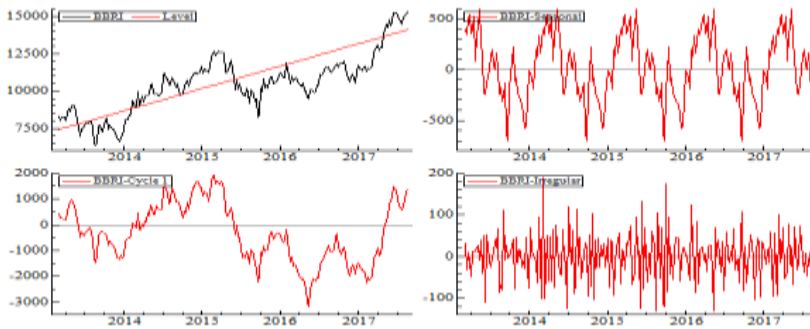
Source: Oxmetrices software calculation results (2017)

Figure 12. Development of Indonesia Stock Price Composite Index (JKSE) and Influence of Trend, Cycle, Seasonal and Irregularities Components



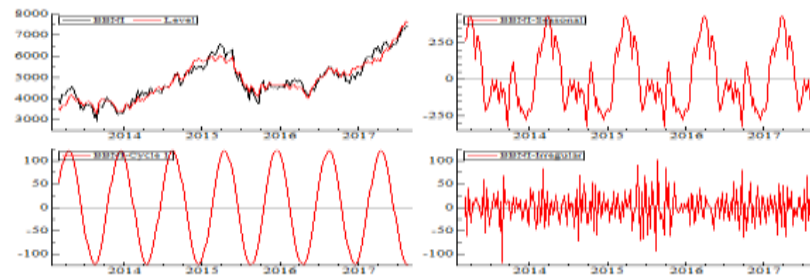
Source: Oxmetrices software calculation results (2017)

Figure 13. Development of Bank Mandiri Stock Price (BMRI) and Influence of Trend, Cycle, Seasonal and Irregularities Components



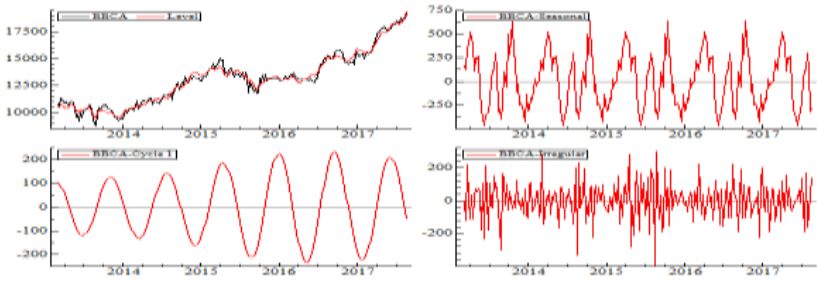
Source: Oxmetrices software calculation results (2017)

Figure 14. Development of Bank BRI Stock Price (BBRI) and Influence of Trend, Cycle, Seasonal and Irregularities Components



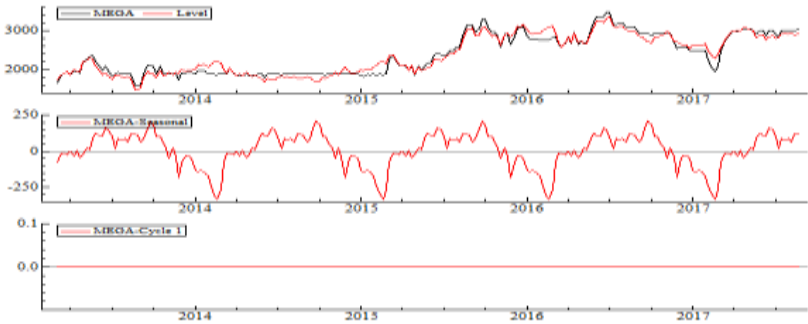
Source: Oxmetrices software calculation results (2017)

Figure 15. Development of Bank BNI Stock Price (BBNI) and Influence of Trend, Cycle, Seasonal and Irregularities Components



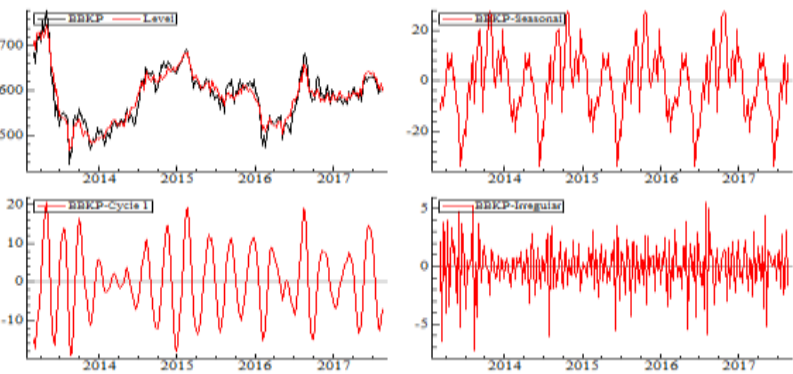
Source: Oxmetrices software calculation results (2017)

Figure 16. Development of Bank Central Asia Stock Price (BBCA) and Influence of Trend, Cycle, Seasonal and Irregularities Components



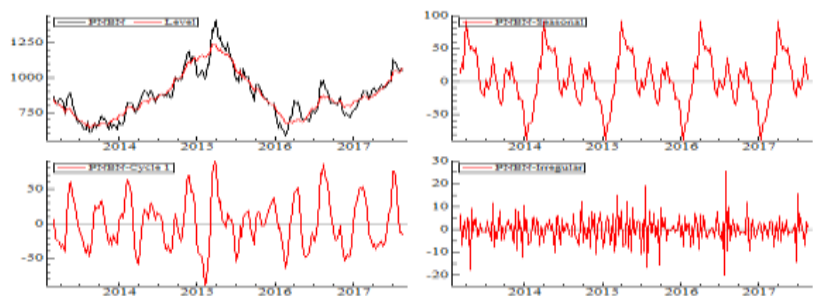
Source: Oxmetrices software calculation results (2017)

Figure 17. Development of Bank MEGA Stock Price (MEGA) and Influence of Trend, Cycle, and Seasonal Components



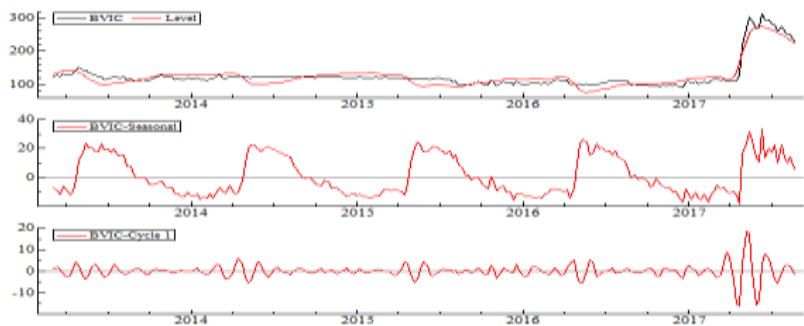
Source: Oxmetrices software calculation results (2017)

Figure 18. Development of Bank Bukopin (BBKP) Stock Price and Influence of Trend, Cycle, Seasonal and Irregularities Components



Source: Oxmetrices software calculation results (2017)

Figure 19. Development of Bank Panin (PNBN) Stock Price and Influence of Trend, Cycle, Seasonal and Irregularities Components



Source: Oxmetrices software calculation results (2017)

Figure 20. Development of Bank Victoria (BVIC) Stock Price and Influence of Trend, Cycle, Seasonal and Irregularities Components

This page is intentionally left blank