

Islamic Banks' Financial Stability and Its Determinants: a Comparison Study With Conventional Banks in Indonesia

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Abstract

The research aimed to analyze the stability of Islamic banking industry and its determinants in Indonesia. The same analysis was also done to the conventional banking industry as Indonesia practices dual banking systems. Using monthly data on Indonesian Banking Statistics for 2008-2013, this research implemented the Banking Stability Index (BSI) model for predicting the bank's stability. The analysis began with measuring BSI then using VECM to examine the effect of variables on BSI. The result showed that the BSI of both banking system was exhibiting the moderate level of stability though Islamic banking is more stable and safe way of financing than conventional banking. The shocks of inflation, exchange rate, efficiency, income diversity, liquidity, and Industrial Production Index responded positively by Islamic Bank' stability, while interest rate and market share responded negatively. In another hand, conventional bank' stability responded positively the shock of the exchange rate, income diversity, interest rate, liquidity, and market share,

Keywords:

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while other variables responded negatively. The results of shocking variables strongly indicated that the conventional banking is more vulnerable than Islamic banking. Islamic banking looked tend to the shock resistance and less volatile. This conclusion, however, might be still questioned as the BSI was not designed specifically for Islamic banking. Therefore, constructing an Islamic BSI (under Islamic banking characters) was important to measure the banking stability more appropriate and to develop a proper early warning system for Islamic banking industry.

INTRODUCTION

The journey of Islamic bank in Indonesia for 24 years proved to give its color in the Indonesia financial sector, particularly for the banking industry. Nuryakin & Warjiyo (2006) stated that the development of Indonesia banking industry in the financial sector is more driven by the growth of the banks since the deregulation of the financial sector in October 1988. Since then, the banking industry became the dominant industry in the Indonesian financial sector.

The banking industry is one of the drivers of economic activity and monetary policy to stabilize the economy. Therefore, the success of banking performance is an important thing that must be considered. Indonesia has been implementing a dual banking systems since 1998 and now is heading full-fledged dual banking systems. Ascarya and Yumanita (2009) state that the success of banking system can be assessed by its performance on allocating financial resources and its stability in dealing with various shocks. The first assessment relates to the primary function of banking as an intermediary while the latter relates to risky nature of banking industry. As an infant industry, Islamic banking in Indonesia has enjoyed rapid growth since fifteen years later. The huge number of Muslim population might become one of the potentials of Islamic banking to have bright future in Indonesia.

The positive sight can be seen on the reports of Otoritas

Jasa Keuangan on December 2016 (yoy). Islamic banking assets have grown by 20.33%, the third party funds by 20.11%, and the financing by 20.54%. Interestingly, the growth of Islamic banks in Indonesia is better than conventional banks with the growth of its assets by 10.40%, the third party fund by 7.85%, and the financing by 9.60%. However, the market share of Islamic banks in the banking industry in December 2016 at 5.30% also better than previously at the point of 4.86%.

As an emerging country, however, Indonesia still facing various shocks which may disturb the stability of the financial system, including Islamic banking industry. The financial crisis is increasingly frequent, deeper and more widespread cause the financial system stability of a country becoming increasingly vulnerable. Banking stability is essential both for sustaining the growth of Islamic banking itself and the whole economy. This research is aim to analyze the stability of Islamic banking industry and its determinants in Indonesia. The same analysis is also done to the conventional banking industry as Indonesia practices dual banking systems.

LITERATURE REVIEW

Many researchers have been discussed about the banking stability. But generally, they are more focused on the conventional banks' stability and vote individually, as well as assessing the factors influencing the stability. Then, the research on Islamic banking stability has not been discussed by many researchers. In another hand, previous research has been presented about the stability of Islamic bank either partially or in combination with conventional. Maechler, Mitra, & Worrell (2005) stated that the z-score had become a traditional measure of bank soundness. So, the most researchers measured the banking stability by Z-Score excepting Ghost (2011) who offered the alternative measurement using the Banking Stability Index (BSI). Therefore, this research will extend the BSI for Indonesian Banking evidence. The using of Banking Stability Index (BSI) in this paper also attempts to fill the gap in the empirical literature of Indonesian banking. It should be the new vision to develop a proper early warning system for dual banking systems in Indonesia, Islamic and conventional bank as well as the to analyze the factor affecting them.

Ghosh (2011) provided an analysis of the development an index of banking fragility and subsequently examine the factors affecting the index. The author introduces the Banking Stability Index (BSI) to measure the banking fragility as the alternative of z-score. He uses the indicators which take the three dimensions of banking operations, i.e. stability, soundness, and profitability. The higher values indicate an improvement of bank operations in that dimension. The regression analysis shows that the BSI significantly affect by the dummy of growth GDP, the growth of the branch, interest rate, foreign-owned, and bank concentration (Herfindahl index of bank credit).

Čihák & Hesse (2010) provided an analysis of the role of Islamic banks in financial stability. The results showed small Islamic banks incline to be financially stronger than small conventional banks; large conventional banks are stronger than large Islamic banks; and small Islamic banks are financially stronger than large Islamic banks, which for large Islamic banks may reflect challenges of credit risk management. The regression analysis also showed that banks with higher loan to asset ratios and higher cost to-income ratios tend to have lower z-scores. Z-scores tend to increase with greater income diversity and bank size for large banks and vice versa. Interestingly, the Islamic banks' z-scores tends to weaken when it's on the higher presence in a banking sector. For the macroeconomic variables, depreciation incline to lead to significantly higher banking risk, while real GDP growth and inflation do not have significant separate effects on stability. In addition, large Islamic banks are potentially more sensitive to liquidity risk than large conventional banks.

Mirzaei (2010) provided an analysis of the effect of market power on stability and performance of Islamic and Conventional Banks. By using the traditional SCP and RMP hypotheses, he assesses the relatively high bank returns in Islamic banking system. The results indicate that there is evidence that supports the traditional SCP paradigm in conventional banks, but Islamic banking systems are biased toward the RMP hypothesis. The interest rate also spreads appear to present conventional banks with a trade-off between risk and returns while off-balance-sheet activities increase bank profitability and stability for both

markets. Then, most of other bank-specific and macroeconomic variables such as capital adequacy, liquidity and cost efficiency are significant, although the impact and relation to profits and stability are not always the same for Islamic and conventional banks.

Al-Zaabi (2011) provided an analysis of bankruptcy prediction by implementing the emerging market (EM) Z-score model and measuring the financial performance of the major UAE Islamic banks. The results show that UAE Islamic banks should work on improving the ratios that are dragging their scores down to understand their past performance better and realize their current position in the industry. Based on it, the z-score model can be adopted by Islamic banks as an independent credit risk analysis approach and as effective evaluation approach. He also concludes that UAE Islamic banks are financially sound and healthy.

Masood, Niazi, & Ahmad (2011) provided an analysis of the determinants of the growth of smaller Islamic banks. Using Z-score analysis to test the stability and the pooled ordinary least square (OLS) regression technique is also employed to examine the factors. The results show higher z-scores for smaller Islamic banks indicating that the latter have tended to be more stable than larger Islamic banks. For large Islamic banks, Z-scores tend to increase with bank size but decrease for the small Islamic banks. The analysis also confirms that the larger banks have greater income diversity than do the smaller banks. Herfindahl index had a negative impact on both type of Islamic banks which is associated with lower stability. They also discover that both banks' loan to asset ratios is negatively related to z-scores.

Shahid & Abbas (2012) provided an analysis of the relative financial strength of Islamic banks based on evidence covering individual Islamic and conventional banks in Pakistani banking system with a substantial presence of Islamic banking. The results show the small Islamic banks tend to be financially stronger than small conventional banks; large conventional banks tend to be financially stronger than large Islamic banks. Then, the small Islamic banks tend to be financially stronger than large Islamic banks. The OLS analysis also shows that the

bank size, cost-income ratio, GDP growth rate, exchange rate depreciation, and Herfindahl Index have the positive effect on z-score while loan-asset ratio, inflation, and governance tend to the adverse effect on z-score.

Rahim & Zakaria (2013) provided an analysis of relative stability between Islamic and conventional banks in Malaysia by using Z-score and NPL as proxies for bank stability. Computation of Z-score and NPL suggest that on average Islamic banks are relatively more stable than their conventional counterparts. The results also show that the similar factors affect the stability of both Islamic and conventional banks, except for the income diversification's degree. Stability is a function of income diversification for conventional banks, but it is not in the case of Islamic banks. It clarified when various sources of bank income were adversely affected by the recent crisis, but Islamic banks are less volatile than the conventional banks.

Tabash & Dhankar (2014) provided an analysis of the impact of the global financial crisis on the key performance ratios of all full-fledged-Islamic banks working in the Kingdom of Saudi Arabia (KSA). ANOVA is used to test hypotheses for time series data from 2005 to 2010 for all fledged-Islamic banks in KSA to analyze the relationship between the performance of Islamic banks and financial stability. The results show that Islamic banking sector is the more stable sector regarding capital adequacy and liquidity. The results are supporting the argument that Islamic finance is more stable and safe way of financing.

Odeduntan & Adewale (2015) provided a literature review of banking financial stability by surveying the extant literature. The study employs library method to gather information and further analyze it by way of comparative, inductive and deductive methods. The result establishes that while some Islamic banks are relatively stable concerning their financial activities, some banks are not. Islamic banking is an industry that follows the dictates of the divine guidance. Although it is a nascent industry about the conventional method, it has the potentials of not only bringing banking to the door steps of the individuals irrespective of their religious indoctrination but also making financial instability a thing of the past.

Chakroun & Gallali (2015) provide an investigation of the difference between the Islamic and the conventional model concerning stability and banking risk. By using Z-score as an indicator of banking stability, the analysis of 136 banks from the Gulf countries in which 50 banks are Islamic and 86 are conventional between 2003-2012 have obtained that conventional banks were most affected by the financial crisis. Then, analyzing the impact of Islamic banks on financial stability by testing the effect of market share regarding credit supply. The results show that the increase in market share regarding the offering of loans by Islamic banks negatively affects the financial stability, and thus leads to the growth of market share for conventional banks improving financial stability.

The investigation on the financial stability of banking industry as a system, both of Islamic banking and conventional bank neither individual banking is the origin of this study. It conducted to enrich the field of financial stability, especially Islamic banking while the financial crisis wouldn't only impact the specific bank, but the whole banking system of the country, indeed.

METHODOLOGY

This study implements the Banking Stability Index (BSI) model for predicting the banking stability. BSI design refers to Ghosh (2011) that is different from other authors who implement Z-score in predicting banking stability, such as Čihák & Hesse (2010); Masood et al. (2011); Shahid & Abbas (2012); Rahim & Zakaria (2013), etc. The use of BSI is to enrich and offer an alternative measurement of Islamic banking stability. BSI models constructed from three key variables, they are Non-Performing Loan (NPL) as the change of Loan-loss provisions (LLP) to total asset ratio, Capital Adequacy Ratio (CAR), and Return on Asset (ROA). These indicators take the three dimensions of banking operations, i.e., stability, soundness, and profitability. The use of ROA as a measure of bank profitability is quite commonplace in the literature. These use of the other two indicators as measures of bank stability and soundness are also much in vogue (Sundararajan et al., 2001; Martinez-Peria and Schmukler, 2001; Demirgüç Kunt and Huizinga, 2004 in Ghosh, 2011).

According to Ghosh (2011), the construct of BSI shall proceed as follows. For any indicator i , the index for the i (month) dimension, d_i is given by the expression:

$$d_i = \frac{A_i - m_i}{M_i - m_i}$$

Where A is the actual, M and m are the maximum and minimum value of dimension i . Higher values of d_i would suggest higher levels of achievement by the bank. In the n -dimensional space, the index is provided by the equation below:

$$BSI_j = 1 - \frac{\sqrt{\sum_{i=1}^n (1 - d_i)^2}}{\sqrt{n}}$$

The model is flexible and dynamic because it uses the minimum and maximum values which depend on the observation period. Hence, banks with a higher BSI have a lower probability of insolvency risk. Then, the samples of this study are aggregate Islamic banking and conventional banking in Indonesia. The data used were taken from the monthly report of Indonesian Banking Statistics, Indonesian Financial Statistics, Statistics Indonesia, and Pacific Exchange Rate Service for 2008-2013.

Several variables that influenced bank stability have been identified through literature reviews, such as bank-specific (efficiency, liquidity, income diversity) and macroeconomic condition (industrial production index, interest rate, exchange rate, inflation, market share). Efficiency measured by cost income ratio, liquidity by loan asset ratio, and income diversity by how much the bank income is diversified from traditional lending activities to other activities and market share by the bank's proportion of assets to national bank assets. The analysis begins with measuring BSI then using VECM with innovation accounting, such as Impulse Response Function (IRF) and Forecasting Error Variance Decomposition (FEVD) to examine the effect of variables on BSI. The definition of the variables are shown in Table 1 as well as below.

Table 1. The variables definition

| Variables | Description | Source |
|-----------------------------------|--|---------------------------------|
| BSI (Banking Stability Index) | Index of Banking Stability | Indonesian Banking Statistics |
| Efficiency (EF) | Ratio of cost to income (percent) | Indonesian Banking Statistics |
| Liquidity (LIQ) | Ratio of loans to assets (percent) | Indonesian Banking Statistics |
| income diversity (ID) | $1 - \frac{\text{net interest income} - \text{other operating income}}{\text{total operating income}}$ | Indonesian Banking Statistics |
| IPI (Industrial Production Index) | country economic indicators that measure the real monthly production output | Statistics Indonesia |
| interest rate (IR) | Interest rate policies that reflect the stance of monetary policy which set by Bank Indonesia and announced to the public. | Indonesian Financial Statistics |
| exchange rate (ER) | Nominal exchange rate, local currency per U.S. dollars | Pacific Exchange Rate Service |
| Inflation (INF) | Customer Price Index (CPI) per month (percent) | Indonesian Financial Statistics |
| market share (MS) | Market share of Islamic banks in a country per month (percent) | Indonesian Banking Statistics |

EMPIRICAL FINDINGS

Indonesian Banking Stability Profile

According to Ghosh (2011) , the bank level of stability is exhibiting high stability if the BSI exceeds the value at 90 percentile. Likewise, banks are classified as exhibiting moderate and low stability if the BSI lies between the median and 90 percentile, or are below the median, respectively. The result shows that the BSI of both banking system is exhibiting the moderate level of stability though Islamic banking is higher

than conventional banking which explained by percentile 0.544 > 0.458. The result of banking stability index measurements are shown in Table 2 as well as below.

Table 2. Islamic and conventional banking stability index

| Statistics | Islamic_BSI | Conventional_BSI |
|------------|-------------|------------------|
| Mean | 0.416 | 0.364 |
| Median | 0.409 | 0.348 |
| Percentile | 0.544 | 0.458 |

This result supports the finding of Rahim & Zakaria (2013) and Tabash & Dhankar (2014) that declared the Islamic finance is more stable and safe way of financing. The result also supported by BSI of Islamic Bank is less volatile than BSI of Conventional Bank. It can be seen from the data along the observation period on Figure 1. The concluding remarks that the BSI of Islamic bank is more stable than the Conventional bank because the more volatile, it will be increasingly unstable, and vice versa.



Figure 1. The volatility of BSI for both banking system

Unit Root Test

The unit root test in this study using the Augmented Dickey-Fuller test in 5% significance level. If the ADF t-value is smaller than the MacKinnon critical value, it can be concluded that the data is stationary. Testing unit roots are done at the level up to the first difference. The variables are not all stationary at the level, so it needs to be done at first difference. After all variables

formed at the first difference, the data is stationary at the 5% significance level. Hence, the results imply that every data series are integrated of order one, i.e., I(1). Unit root test results can be seen in the table 3 as well as below.

Table 3. ADF unit root test

| Variable | ADF | | Variable | ADF | |
|----------|------------|----------------------------|----------|------------|----------------------------|
| | Level | 1 st difference | | Level | 1 st difference |
| BSI_Conv | -3.796409* | -10.62499* | CPI | -2.071830 | -5.174543* |
| BSI_Islm | -4.077250* | -12.49527* | IPI | -1.332795 | -13.20248* |
| EF_Conv | -4.313447* | -9.224980* | IR | -2.102672 | -3.630226* |
| EF_Islm | -5.585049* | -10.28591* | LIQ_Conv | -1.630398 | -6.617638* |
| ER | -1.678175 | -6.564010* | LIQ_Islm | -3.267886* | -5.017917* |
| ID_Conv | -5.644944* | -11.10041* | MS_Islm | 0.810997 | -9.076424* |
| ID_Islm | -3.217368* | -10.96097* | | | |

*= significance at 5%

Cointegration Test

Given that all the data series are I(1), the next stage of the study is to test for the optimum lag, VAR stability, and the presence of cointegration. Optimal lag is very useful to eliminate the problem of autocorrelation in the VAR system. The determination of the optimal lag is based on the shortest lag using the Schwarz Information Criterion (SC). The result shows that the both banking systems have the shortest lag in lag 1. Then for VAR stability, the BSI of Islamic bank in the stability condition with the modulus between 0,128050 - 0,996411 and the BSI of the Conventional bank also in the stability condition with the modulus between 0,053297 - 0,995079.

In another hand, the cointegration test was conducted to obtain a long-term relationship among the variables in the observation period in which all variables have been stationary to the same degree I (1). Long-term information is obtained by first determining the cointegration rank to determine how the system of equations that can describe the entire existing system. Cointegration testing criteria are based on trace-statistics and show at least there is three rank cointegration equation was able to explain the overall model of BSI of the Islamic and Conventional bank at 5% significance level. The optimum lag

and johansen cointegration test results can be seen in Table 4 and Table 5 as well as below.

Table 4. Optimum lag

| Lag | 0 | 1 | 2 | 3 | 4 | 5 |
|----------|----------|-----------|----------|----------|----------|----------|
| BSI_Islm | 14.48833 | 3.156261* | 5.903757 | 8.319059 | 9.605543 | 8.988036 |
| BSI_Conv | 13.01509 | 2.965855* | 5.955945 | 8.478301 | 10.70249 | 9.736551 |

Table 5. Johansen cointegration test

| Model | Trace Statistics | | | | | | | | | |
|-------------------|------------------|----------------|----------------|----------------|---------|---------|---------|---------|---------|---------|
| | H0 | r=0 | r<=1 | r<=2 | r<=3 | r<=4 | r<=5 | r<=6 | r<=7 | r<=8 |
| | H1 | r>=1 | r>=2 | r>=3 | r>=4 | r>=5 | r>=6 | r>=7 | r>=8 | r>=9 |
| BSI_Conventional | | 224.950 | 172.062 | 125.963 | 88.9725 | 59.1186 | 38.457 | 22.2078 | 9.6274 | 0.0408 |
| 5% critical value | | 197.371 | 159.53 | 125.615 | 95.7537 | 69.8189 | 47.8561 | 29.7971 | 15.4947 | 3.84147 |
| BSI_Islamic | | 270.514 | 202.897 | 142.811 | 96.0593 | 65.0449 | 40.4941 | 20.6381 | 10.5058 | 3.77436 |
| 5% critical value | | 208.437 | 169.599 | 134.678 | 103.847 | 76.9728 | 54.079 | 35.1928 | 20.2618 | 9.16455 |

Impulse Response Function (IRF)

Impulse Response Function is used to identify a shock to one endogenous variable that can determine how an unexpected change in a variable affects other variables. It is also used to see the influence of contemporary a dependent variable if getting shocks or innovations from the independent variable by one standard deviation. The IRF results of BSI for both banking system are shown in Figure 2 and 3 as well as below.

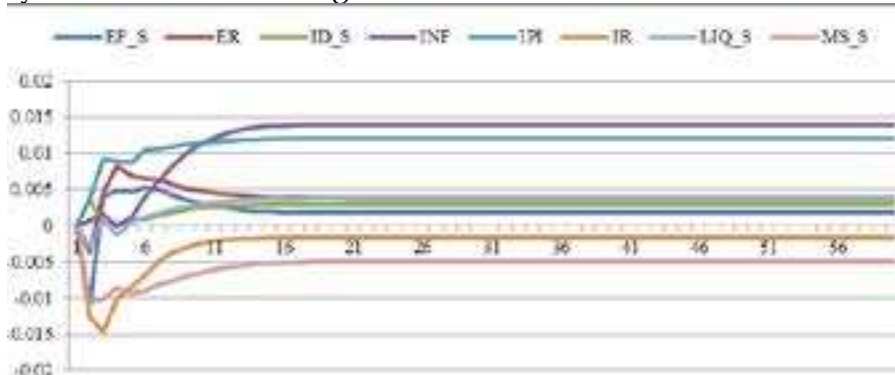


Figure 2. Impulse response function of Islamic bank

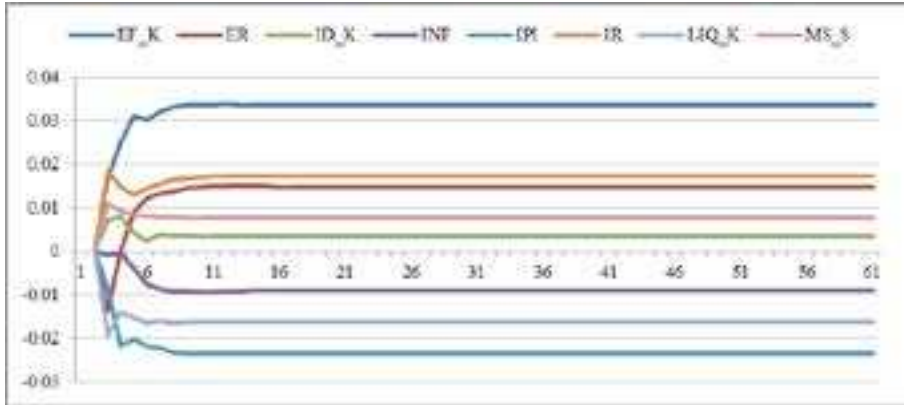


Figure 3. Impulse response function of conventional bank

According to the figure 2 and 3 above, the response of BSI for both banking system after the shock from the macroeconomics condition and bank-specific conclude as shown in table 6. In another hand, the response of BSI for both banking system in the shock of several variables is same, such as the shock of the exchange rate, income diversity, and liquidity.

Table 6. Impulse response function results

| Variables | Shock | Response | |
|------------------|-------|----------|--------------|
| | | Islamic | Conventional |
| Efficiency | ↑ | + | - |
| Exchange rate | ↑ | + | + |
| Income diversity | ↑ | + | + |
| Inflation | ↑ | + | - |
| IPI | ↓ | + | - |
| Interest Rate | ↑ | - | + |
| Liquidity | ↑ | + | + |
| Market Share | ↓ | - | + |

The Shock of Bank’s Efficiency. The efficiency of both banking system measured by cost-income ratio. Therefore, the higher of cost-income ratio tends to inefficiency. For conventional bank, the response of BSI is negative and it supported by Čihák & Hesse (2010); Masood et al. (2011); and Mirzaei (2010) whose stated that the increase of efficiency means the reduced levels of efficiency, so that the banks

with higher costs to income ratios are further estimated to be less stable. It is assumed due to the decreased levels of efficiency would lead to disrupting the operational activities of conventional banks, so it will affect the banking stability is declined. In another hand, the different result shows by BSI of Islamic bank which explained the positive responses of the level of efficiency or the Islamic bank would more stable when the bank is less efficient. The finding is following the previous literature, such as Shahid & Abbas (2012) and Rahim & Zakaria (2013). It's assumed that Islamic bank's operation in Indonesia is more focused on the profitability and ignored the efficiency level to attract the intention of the surplus unit to deposit their funds in Islamic Bank.

The Shock of Exchange Rate. The Exchange rate shocks or depreciation tend the both banking system stability is higher or better. It can be seen from the positive response of each. It means the depreciation of exchange rate will make the domestic products are competitive and increase competition in the export. In the case of the conventional bank, it will be more aggressive to offer the services for exports transaction, while the Islamic bank will be intensively in serving on business sectors which have the export business scale, such as crafts or furniture. Therefore, it will increase the profits and then will boost the banking stability, both conventional and Islamic bank. The findings are following Shahid & Abbas (2012).

The Shock of Bank's Income Diversity. Increasing income diversity ratio marks income diversity, both conventional and Islamic bank experiencing shocks. In this study, it responded positively by banking stability, which means that the both banking stability increase with increasing the income diversity ratio. Masood et al. (2011) and Shahid & Abbas (2012) explained that income diversity is used to measure how much a bank revenue diversification from traditional lending activities compared to the activities fund distribution in other sectors. Thus increasing the income diversity ratio means the decrease of the credit/financing ratio. The more stable of both banking system assumed supported by the higher distribution of noninterest income which increases the banking profitability and decreases its non-performing loans

risk.

The Shock of Inflation. The BSI of both banking system has the inverse responses from the inflation shock. The BSI of conventional bank responses negatively, while the BSI of Islamic bank responses positively. The negative response of conventional bank following Shahid & Abbas (2012) and it assumed that the inflation shock tends to the weak level of consumption and the industry sector, and have the impact on the higher level of non-performing loan. However, the condition will make the conventional bank is unstable. In another hand, the positive responses of the Islamic bank on the inflation shock assumed that the Indonesian Inflation during the observation period is restrained. So, increasing of profit sharing or profit margin is higher than the increase of the cost and eventually will boost the level of profitability and stability of Islamic bank. The finding also following Rahim & Zakaria (2013).

The Shock of Industrial Production Index (IPI). The BSI of both banking system also have the inverse responses from the IPI shock. The BSI of conventional bank responses negatively, while the BSI of Islamic bank responses positively. The positive responses of Islamic bank following the literature that mentioned a stronger economy condition will strengthen the financial sector, in this case is the banking sector. The result of Islamic bank stability also following previous studies, such as Rahim & Zakaria (2013); Shahid & Abbas (2012); and Mirzaei (2010). In another hand, the conventional bank stability which responses negatively on the shock of IPI assumed by the response of conventional bank in their operation, in particular on the lending activities to minimize the rise of the non-performing loan during the recession and it will boost their stability.

The Shock of Interest Rate. The BSI of both banking system also have the inverse responses from the interest rate shock. The BSI of conventional bank responses positively, while the BSI of Islamic bank responses negatively. The negative response of Islamic bank stability is following the literature that the higher of interest rate tend the higher of non-

performing loans and finally will decreasing the Islamic bank stability. This condition in the long-term will tend the Islamic bank runs into fragility. In another hand, the positive response of conventional bank stability assumed that the conventional bank will gain the more fund from the third parties and can diverse the fund from traditional activities to other activities as the customer will avoid the credit with the higher rate.

The Shock of Liquidity. The liquidity for both banking system measured by the loan-asset ratio which explained the higher value to the bank's liquidity is less liquid. The IRF shows that the higher value of liquidity responses positively by both banking stability. It means when the bank is less liquid will increase the both banking stability. The result assumed that in the case of the both bank liquidity is less, they will increase the prudence level of their credit/financing to take care the operation well and tend to higher banking stability, *ceteris paribus*. The findings are following the previous literature of Mirzaei (2010).

The Shock of Market Share. The shock of Islamic bank market also responded differently by both banking system. The BSI of Islamic bank responses negatively, while the BSI of conventional bank responses positively. It means that the higher of Islamic bank market share tend to unstable of Islamic bank stability and boost the conventional bank stability. In other words, the decreasing of market share level for each banking system will expand both stabilities. It assumed that the banks would optimize its source and improve the performance and risk management to get the higher profitability and finally will boost its stability.

Forecast Error Variance Decomposition (FEVD)

After analyzing the shocks behavior through impulse response, the next step is to predict the contribution of each variable to the shocks or changes of particular variables in the study to see by the Forecast Error Variance Decomposition (FEVD). The figures of FEVD analysis for both models can be seen in Figure 4 and 5 as well as below

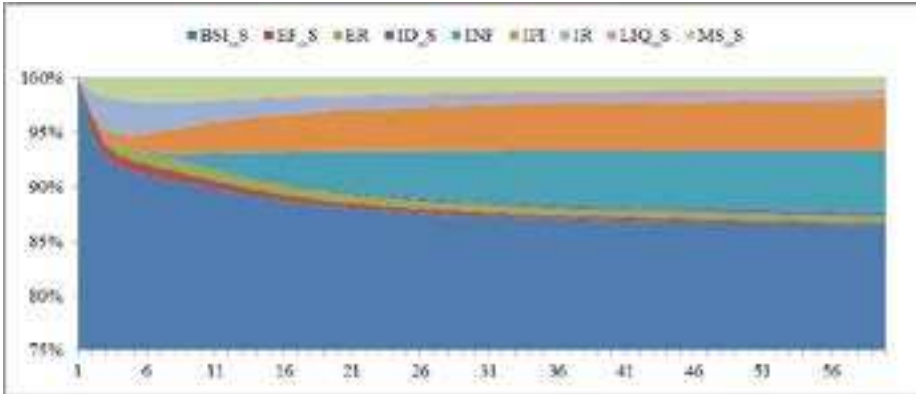


Figure 4. Forecast error variance decomposition of Islamic bank

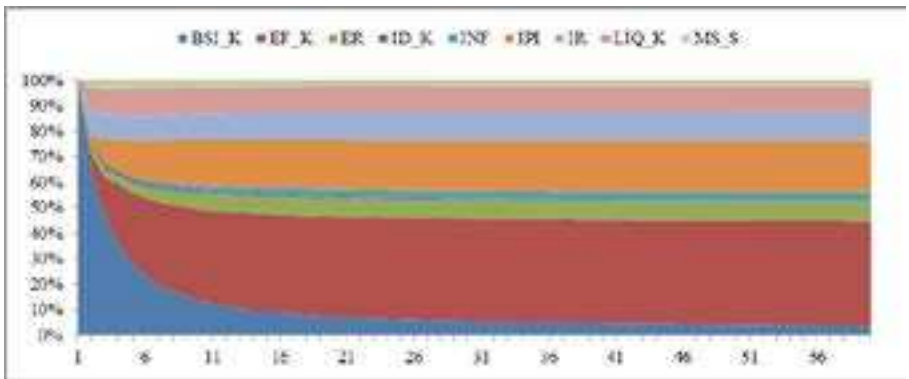


Figure 5. Forecast error variance decomposition of conventional bank

The figures above show that the behavior of conventional bank and Islamic bank stability. The Islamic banks' stability is predominantly influenced by inflation shocks in the first order, secondly by IPI, and thirdly by market share. Contributions of these three variables are 5,72% (INF), 4,67% (IPI), and 1,11% (MS_S). Meanwhile, in addition to these three variables don't contribute significantly because only contribute less than one percent, they are the efficiency (0,26%), exchange rate (0,60%), income diversity (0,26%), interest rates (0,46%), and liquidity (0,43%).

Then, the conventional banks' stability is predominantly

influenced by the efficiency's shock in the first order, secondly by IPI, thirdly by interest rates, and liquidity for the last order. The fourth contributions of these variables are 41,19% (EF_K), 20,58% (IPI), 10,98% (IR), and 10,16% (LIQ_K). While there is only one variable that does not have a significant contribution because only contribute less than one percent, its' the income diversity (ID_K) of 0.48 percent. The summary of analytical results for the both banking system can be seen in the table below:

Table 7. Forecast error variance decomposition results

| Variable | Contributions Shocks to BSI_Conventional (%) | Contributions Shocks to BSI_Islamic (%) |
|------------------|---|--|
| Efficiency | 41.19 | 0.26 |
| Exchange rate | 7.78 | 0.60 |
| Income diversity | 0.48 | 0.26 |
| Inflation | 2.92 | 5.72 |
| IPI | 20.58 | 4.67 |
| Interest Rate | 10.98 | 0.46 |
| Liquidity | 10.16 | 0.43 |
| Market Share | 2.25 | 1.11 |

CONCLUSION

The results show the BSI mean higher than the median and suggesting that both banking systems are exhibiting the moderate level of stability while Islamic banking is higher but more stable than conventional banking ($0,416 > 0,364$) and a save way of financing. The VECM analysis suggests that the shocks of inflation, exchange rate, efficiency, income diversity, liquidity, and Industrial Production Index responded positively by Islamic Banking' stability, while interest rate and market share responded negatively. Interestingly, the main contributors of Islamic banking stability are inflation (5,72%) and stable for the next 24 months. In another hand, conventional banking' stability responses positively the shock of the exchange rate, income diversity, interest rate, liquidity, and market share, while other variables responded negatively. The main contributor to conventional banking stability is efficiency (41,19%) and stable for the next 17 months. Hence, when the bank is more efficient tend the higher stability of conventional banking. Further, the negative response of conventional banking stability on several

macro-economic conditions indicates that the crisis pushed the conventional banking run into fragility. The results of shocking variables also strongly indicate the conventional banking is more volatile than Islamic banking.

Commonly, the research of banking stability conducted on individual banking as the measurement of their resistance from the shocks by Z-Score, but the research on the banking system, both the conventional and Islamic bank are rarely. This research is a preliminary study on Islamic banking stability using BSI model and the research on the banking system stability of a country by denying the banks' ability individually. This conclusion, however, may be still questioned as the BSI is not designed specifically for Islamic banking. Therefore, constructing an Islamic BSI (under Islamic banking characters) is important to measure the banking stability more appropriate and to develop a proper early warning system for Islamic banking industry.

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