Islamic and Conventional Banks Stability during Global Financial Crisis: Evidence from Indonesia

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Abstract: This study observes the stability of Islamic and conventional banks in Indonesia mainly during and post global financial crisis and their impact to the general financial stability. Bank stability measured by Z-scores, could be influenced by bank specifics, market concentration, and macroeconomic indicators. Pooled GLS regression analysis were employed to examine the Islamic and conventional banks stability. The sample size is 50 banks in Indonesia, consisting of 9 Islamic banks and 41 conventional banks between 2008 and 2017. The finding showed that the stability of the conventional banks is lower than the Islamic bank. However, large Islamic banks are significantly less stable than the large conventional banks. Meanwhile, the small Islamic banks are significantly more stable than the small conventional banks. The finding of the study is expected to enhance the understanding of banks stability during and post global financial crisis in general, and within the context of Indonesia in particular.

Keywords: Conventional Banks, Islamic Banks, Bank Specific, Bank Stability.

1. Introduction

The global financial market is developing dynamically and swiftly, including Islamic banks industry. Currently, the Islamic banks unfold in the course of the sector in each Muslim and non-Muslim nations (Deehani, Sadi, & Deehani, 2015). At the period of the 2008-2010, the global financial crisis caused a loss mostly of the conventional banks within the nations of the United States and Europe. The Asia-Pacific economy was also affected by the crisis, including Indonesia. The financial crisis influenced Islamic and conventional banks differently. This is due to Islamic banks have advanced interest free financing instruments which is primarily based on concepts, profit and loss sharing (PLS) and markup principle (Hasan & Dridi, 2010). However, Bourkhis and Nabiti (2013) suggest that the practice of Islamic banks is not different from conventional banks considering that nearly Islamic banks transactions depending extra on markup financing modes as opposed to PLS based financing instruments.

There is difference on intermediation ideas of Islamic and conventional banks. Islamic bank intermediation is asset-based and attention on risk sharing, while conventional banks intermediation is essentially debt-based and allows risk transfer. Hasan and Dridi (2010) argue the principal difference between Islamic and conventional banks are that the former does not permit investing in or financing the type of instruments that affected the global financial crisis. The units consisting of derivatives and conventional financial organization securities.

This study observes the stability of Islamic and conventional banks in Indonesia mainly during the global financial crisis 2008-2010 and post-global financial crisis 2011 – 2017 and their impact on general financial stability. In addition, this study compares the determinants of Islamic and conventional banks stability which consist of the impact of the global financial crisis on banks stability primarily based on a bank enterprise level, the large banks can be represented by way of full-fledged Islamic and conventional banks which have total assets 30 trillion Rupiah or more. Meanwhile, small banks could be represented by Islamic and conventional full-fledged banks which have total assets less than 30 trillion Rupiah.

2. Literature Review
Bank Stability

According to Beck, Jonghe, and Schepens (2013) and Korbi and Bougatet (2017), the model of measuring bank stability using the bank failure’s probability suggested the profitability of bank failure seems losing the exceeded total equity. The probability of bank failure is proxied by the bank stability indicator, known as Z-score. A higher Z-score value means a risk failure decrease, and proves that the bank is in stable condition. This study utilizing the same model with the study by Čihák and Hesse (2010), which uses the Z-score to measure bank stability. This indicator has the advantage of estimating the bank’s insolvency probability, through the following equation:

\[ Z = \frac{k + \mu}{\sigma} \]

Indicator \( k \) represents reserves and equity capital as asset percentage, while \( \mu \) represents an average return as asset percentage, and \( \sigma \) represents the ROA’s standard deviation as a proxy for return volatility. Bank stability is measured by bank-specific indicators, market concentration, and macroeconomic indicators.

Bank Specific

Bank specific is an indicator of bank performance that serves to measure bank stability. BourkhisandNabi (2013) and Hasan and Dridi (2016) mentioned the performance indicators of bank stability as accounting soundness. Following Čihák & Hesse (2010), Wahid and Dar (2016), and Rashid, Yousaf, and Khaleequzzaman (2017), this study measured bank specifics by capital adequacy ratio, size, efficiency ratio, profitability ratio, liquidity ratio, solvency ratio, and income diversity.

Capital Adequacy Ratio is measured by Capital to Risk-Weighted Assets Ratio is interpreted to mean that the higher the level of Capital Adequacy Ratio, the higher financial stability, this means that the Capital Adequacy Ratio has a positive influence on financial stability. Capital Adequacy Ratio is used to examine the bank stability of the financial systems around the world (Tabash & Dhankar, 2014). Finding of previous studies have different results. Some claimed that the positive influence on bank size stability. Large size can reduce the costs of economies of scale so that financial stability is increased. The other finding stated that small banks are more likely to achieve good performance, whereas large banks are less likely to achieve good performance (Zarrouk, Jedidia, and Moualhi, 2016).

Efficiency ratio is measured by Cost to Income Ratio interpreted that the lower the Cost Income Ratio Increasingly efficiency. Čihák & Hesse (2010), Chakroun and Gallali (2013), and Wahid and Dar (2016) using the Cost to Income Ratio in controlling financial stability. According to Delis, Iosifidi, and Tsonias (2016) under the impulse of the prospect and the behavioral theories, banks with relatively low-efficiency levels are likely to take very high risk. Cost to Income Ratio interpreted that the lower the cost of income ratio means the higher efficiency, the higher the bank's financial stability. The efficiency ratio negatively influences on financial stability.

Profitability ratio is measured by Return On Asset interpreted that the higher profitability contributes to higher financial stability. This means that the profitability ratio has a positive influence on financial stability. Čihák and Hesse (2010), Rokhim and Gamaginta (2011), Shahid and Abbas (2012) use profitability ratio is measured by Return On Asset to examining financial stability. Liquidity Ratio is measured by Total Deposits to Total Financing, which is expressed by the Islamic Bank Financing to Deposit Ratio (FDR). Chakroun and Gallali (2013), Tabash and Dhankar (2014) use this ratio to examine financial stability. The higher the risk, the lower the liquidity held by banks. Liquidity Ratio negatively influences financial stability, interpreted that the higher the liquidity ratio, the lower the bank's financial stability. In this regard, Islamic bank needs to control the liquidity ratio in accordance with Bank Indonesia’s rule (Rokhim & Gamaginta, 2011). Efforts for Islamic banking in the liquidity squeeze one of them is to increase savings (Hamid & Azmi, 2011). Liquidity Ratio is expected not to trigger a banking instability. It is not encouraged to let Islamic banking taps open as wide as possible in case of insufficient liquidity.

Credit risk ratio as measured by non performing financing to total financing ratio is interpreted that the credit risk the higher the ratio, the greater the amount of debt that is guaranteed by the bank, it means the risk of failure should be imposed and credit risk increase. Shahid and Abbas (2012), Chakroun and Gallali (2013) use this ratio to measure the stability of the bank. Credit risk ratio negatively affects the financial stability. Accordingly, it could be interpreted that the higher the credit risk ratio, the lower the bank's financial stability. According to Čihák and Hesse (2010) the income diversity follows define as the income diversity capture the degree to which
banks diversity from traditional lending activities. For Islamic banks, the net interest income is generally defined as the sum of the positive and negative income flows associated with the Profit and Loss Sharing (PLS) arrangements.

### Market Concentration

Čihák and Hesse (2010), Chakroun and Gallali (2013), Wahid and Dar (2016) measured market concentration in Hirschman-Herfindahl Index (HHI) as indicator of financial stability. It is defined as the sum of squared market shares (regarding total assets) of all banks. This ratio is used to detect the influence of market share financing offered by Islamic banks. The higher the market concentration, the market is getting stronger and enhancing financial stability. Market concentration has a positive influence on financial stability.

### Macroeconomic Indicators

Čihák and Hesse (2010), Chakroun and Gallali (2013), Wahid and Dar (2016), Rashid et al (2017) use Gross Domestic Product (GDP) Growth Rate to measure financial stability. According to Hachicha and Amar (2014) GDP is the indicator to examine economic growth. Macroeconomic indicators are measured by Gross Domestic Product (GDP) Growth Rate has a positive influence on financial stability where the higher GDP Growth Rate, the higher financial stability. The other macroeconomic indicators was inflation in measuring financial stability. Macroeconomic indicators as measured by inflation have a negative influence on financial stability where the higher the inflation the lower financial stability and vice versa.

### 3. Methodology

#### Sample and Data

The samples used in this study are 50 banks in Indonesia, which consists of 9 full-fledged Islamic banksthat published reports to the Financial Services Authority, and 41 full-fledged conventional banksthat were listed on the Indonesia Stock Exchange (IDX). The bank industry level is divided into larger banks represented by full-fledged banks that have a total equity of 30 trillion Rupiahs or greater, and smaller banks represented by full-fledged banks that have total equity of less than 30 trillion Rupiahs, for both Islamic and conventional banks. Data was taken from bank annual reports from 2008 to 2017. The financial statements for conventional full-fledged banks were selected from the data directory of the Indonesia Stock Exchange (IDX), while the financial statements of full-fledged Islamic banks were collected from each bank’s web site, the Financial Authority Services web site, and the web site of the central bank, because not all Islamic full-fledged banks are listed on the Indonesia Stock Exchange (IDX). Only Bank Muamalat Indonesia (BMI) had been listed.

#### Regression Analysis with Dummy Variable

Multiple Regression analysis is used to examine the influence of bank specific indicators, market concentration, and macroeconomic indicators (Wahid and Dar, 2016; Rashid, et al, 2017)as follow:

\[
Z\text{-Score}_t = \alpha + \beta_1\text{IB}_t + \beta_2\text{Period}_t + \beta_3\text{CAR}_t + \beta_4\text{SIZE}_t + \beta_5\text{ROA}_t + \beta_6\text{LDR}_t + \beta_7\text{NPL}_t + \beta_8\text{ID}_t + \beta_9\text{MC}_t + \beta_{10}\text{GDP}_t + \beta_{11}\text{INF}_t + \varepsilon \tag{2}
\]

\(t\) denotes the bank’s cross section dimension and \(t\) denotes time series dimension. The dependent variable is the Z-score, while examining of bank specific, market concentration, and macroeconomic variables. IB is dummy variable represent bank type which takes value 1 for an Islamic bank and 0 for conventional banks and Period is dummy variable represent crisis period which takes value 1 for during crisis (2008-2010), and 0 for post crisis (2011-2017). According to Grotenhuis and Thijs (2015), Oke and Oyeka (2015) Value 1 stands for ‘this unit belongs to category \(x\)’ and 0 stands for ‘this unit does not belong to category \(x\)’. One can include \(k - 1\) dummy variables, where \(k\) stands for the total number of categories in the ordinal/nominal variable. The category that is left out of the equation is called ‘the reference category’. All the parameters of the dummy variables included denote the difference/deviation from this reference category.

Following Brown (1968) and Yip and Tsang (2007) the dummy variables were introduced to detect any systematic differences which are attributable, in this study, the dummy variable are follow, bank type (Islamic and conventional) and crisis period (during crisis and post crisis). According to Gujarati and Porter (2015), the coefficient on the dummy variable is often called the differential intercept coefficients, because this coefficient explains how much the intercept variable that gets a value of 1 (included dummy) is different from the intercept
excluded dummy coefficient (value 0). The interpretation of the positive sign on the differential intercept coefficients is "higher", while the interpretation of the negative sign is "lower".

4. Results and Discussion

Result of Normality Test

Result of Data Stationary Normality Test using data mean, median, standard deviation, skewness, and kurtosis in table 1.

| ZS  | CAR  | SIZE  | ROA   | LDR   | NPL   | CIR   | ID   | MC   | GDP  | INF  |
|-----|------|-------|-------|-------|-------|-------|------|------|------|------|------|
| Mean| 4.764| 0.226 | 30.235| 0.013 | 0.856 | 0.022 | 0.911| 0.482| 0.040| 0.056| 0.056|
| Median| 4.099| 0.177 | 29.977| 0.014 | 0.847 | 0.015 | 0.881| 0.376| 0.006| 0.055| 0.040|
| Maximum| 20.022| 3.043 | 34.612| 0.106 | 3.099 | 0.740 | 12.263| 4.441| 0.858| 0.074| 0.111|
| Minimum| 7.616| -0.223 | 25.209| -0.521 | 0.001 | 0.001 | 0.001|-1.772| 4.230| 0.047| 0.028|
| Std. Dev.| 2.770| 0.196 | 1.971 | 0.034 | 0.262 | 0.041 | 0.575| 0.429| 0.088| 0.008| 0.028|
| Skewness| 2.504| 7.412 | 0.132 | -8.792| 2.911 | 11.97 | 15.542| 2.559| 4.836| 0.748| 0.720|
| Kurtosis| 13.032| 91.614| 2.352 | 129.71 | 23.589| 192.05 | 304.65| 20.280| 35.291| 2.603| 2.091|
| Jarque-Bera| 2619.4| 168169| 10.196| 340953| 9537.73| 756540| 191593| 6766.90| 23672.2| 50.132| 60.404|
| Probability| 0.000| 0.000 | 0.006| 0.000 | 0.000 | 0.000 | 0.000| 0.000| 0.000| 0.000| 0.000|
| Observation| 500| 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 | 500 |

Notes:
ZS = Z-score, CAR = Capital Adequacy Ratio, SIZE = total assets, ROA = Return on Assets, LDR = Loan to Deposit Ratio, NPL = Net Performing Loan, CIR = Cost to Income Ratio, ID = Income Diversification, MC = Market Concentration, GDP = Gross Domestic Product, INF = Inflation

According to Cain, Zhang and Yuan (2016), skewness and kurtosis are two components in determining normality. The population or sample is assumed to be normally distributed when the mean of variables is similar to the value of median, skewness value is zero, and the kurtosis value is 3. The normality test presents there are no variables have skewness value zero and kurtosis value 3. Therefore, it indicates that the results failed to fulfill the assumption of normal distribution. The skewness and kurtosis tests are denoted by the Jarque-Bera coefficient to evaluate the normality for all variables also showed its significantly less than 5 percent ($\rho < 0.05$), this means all of the variables failed to fulfill the normality test. According to Gujarati and Porter (2015), the variance analysis is not heavily dependent on the assumption of normality was not seriously offended since this study covered a large sample size (more than 100 data observation). Following Jusoh, et al (2014) for the reason that data isn’t normally distributed, the estimation model of ordinary least square (OLS) to analyze the sample data could produce bias and inefficient estimators. therefore, the generalized least square (GLS) model of estimation is greater suitable and it’s miles predicted to yield a much better result (Gujarati& Porter, 2015).

Results of Multicollinearity Test

This test was based on the Pair-wise Pearson correlation matrix for the variables, and the results are provided in table 2. It indicated that multicollinearity was not a problem, as the correlations between all variables were relatively low. Multicollinearity could be a problem when the correlation exceeded 0.80. The diagnostic test presents that correlation among the variables revealed that the highest correlation was 0.79 (between CIR and ROA). The low intercorrelation among the explanatory variables used in the regression indicated no reason to suspect serious multicollinearity.
Table 2. Pearson Correlation Matrix

<table>
<thead>
<tr>
<th></th>
<th>CAR</th>
<th>CIR</th>
<th>SIZE</th>
<th>ROA</th>
<th>LDR</th>
<th>NPL</th>
<th>ID</th>
<th>MC</th>
<th>GDP</th>
<th>INF</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CIR</td>
<td>-0.058</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>-0.086</td>
<td>-0.079</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td>0.063</td>
<td>-0.795</td>
<td>-0.001</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDR</td>
<td>-0.075</td>
<td>0.080</td>
<td>0.240</td>
<td>0.078</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPL</td>
<td>0.098</td>
<td>0.330</td>
<td>0.269</td>
<td>-0.288</td>
<td>0.085</td>
<td>0.038</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>-0.041</td>
<td>-0.127</td>
<td>0.541</td>
<td>0.083</td>
<td>-0.004</td>
<td>-0.019</td>
<td>0.027</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC</td>
<td>0.041</td>
<td>0.107</td>
<td>-0.057</td>
<td>0.041</td>
<td>0.169</td>
<td>0.011</td>
<td>0.062</td>
<td>0.0008</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>0.032</td>
<td>0.117</td>
<td>-0.033</td>
<td>0.008</td>
<td>0.186</td>
<td>0.034</td>
<td>-0.009</td>
<td>0.0004</td>
<td>0.636</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Notes:
1. The sample of panel data runs for 10 years between 2008 and 2017. Number of panel data observation = 500
2. CAR = Capital Adequacy Ratio, CIR = Cost to Income Ratio, SIZE = Total assets, ROA = Return on Assets, LDR = Loan to Deposit Ratio, NPL = Net Performing Loan, ID = Income
3. Diversification, MC = Market Concentration, GDP = Gross Domestic Product, INF = Inflation

Results of Heteroscedasticity Test

The heteroscedasticity problem refers to the situation where the conditional variance is not constant between variables x and y. The classical linear regression model assumes that the variance of each disturbance is constant. The result of heteroskedasticity test using Breusch-Pagan-Godfrey, the probability of Chi-square is insignificant (0.5239). This suggests that the error variance is constant, which means there is no heteroscedasticity problem (Gujarati & Porter, 2015).

Results of Regression Analysis

Pooled GLS regression analysis is used to test the robustness of the results. Bank Type (Islamic bank dummy) and Crisis period as dummy variables to examine bank specific factors, market competition, and macroeconomic indicators in (1) all banks, (2) Large banks, (3) Small banks. The results of Pooled GLS regression analysis are presented in table 3. From the result of regression analysis in table 3 it can be observed that the coefficient of Islamic bank dummy variable indicates a positive sign and significant at 0.000 (ρ < 0.01). This reveals that Islamic banks in Indonesia are more stable than conventional banks. In addition, the coefficient of Period, which is the proxy of the dummy variable during crisis and post-crisis, examines the influence of the recent global financial crisis on the stability of banks. From the result of regression analysis in table 3 the sign of the coefficient of the Period is positive and significant at 5 percent level (ρ < 0.05). This result can be interpreted that Islamic banks are more stable than conventional banks during crisis.

A similar regression model is estimated based on different bank sizes (industry). For this purpose, banks in the sample are categorized into small and large banks based on the total assets. Table 3(2) presents the pooled GLS regression results for large banks, while Table 3(3) presents the pooled GLS regression results for small banks. The coefficient result of Islamic banks dummy variables in table 3(2) indicates a negative sign and highly significant at a 1 percent level. This reveals that the large Islamic banks are significantly less stable than the large conventional banks. On the other hand, the coefficient result of small Islamic banks dummy variable in table 3(3) indicates a positive sign and highly significant at 1 percent level. This reveals that the small Islamic banks are significantly more stable than the small conventional banks.

Table 3. Regression Analysis Results

<table>
<thead>
<tr>
<th>Estimator</th>
<th>All Banks(1)</th>
<th>Large Banks(2)</th>
<th>Small Banks(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>13.790</td>
<td>-11.609</td>
<td>30.964</td>
</tr>
<tr>
<td></td>
<td>(0.000*)</td>
<td>(0.000*)</td>
<td>(0.000*)</td>
</tr>
<tr>
<td>IB</td>
<td>15.735</td>
<td>-7.495</td>
<td>34.226</td>
</tr>
</tbody>
</table>
Indicators of stability for Islamic and conventional banks, the first indicator of bank-specific is CAR. The coefficient signs of CAR are positive and significant at 1 percent, suggest that an increase in the CAR tends to increase the level of stability. Next, the coefficient signs of Size, indicate a negative and significant at 1 percent level. Size has a negative relationship so that the greater the size of the bank, the lower the stability and vice versa. Except for large banks, the relationship of size and bank stability is positive, which means that the greater the size of the bank, the higher the stability of the bank. The coefficient sign of profitability ratio, which is proxy by ROA, indicate a negative and insignificant, while large banks the relationship is positive, but
insignificant. The coefficient sign of efficiency ratio, which is proxy by Cost to Income Ratio (CIR), indicate a negative and significant at the 10 percent level. This means that the lower the efficiency ratio, the higher the bank's stability.

In addition, the coefficient sign of liquidity ratio, which is proxy by Loan to Deposit Ratio (LDR), indicate a positive and significant at 1 percent level. This means that the higher the liquidity ratio in a certain limit, the higher the stability of the bank. The coefficient sign of credit risk ratio, which is proxy by Non-Performing Loan (NPL), indicate a negative and significant at 1 percent level. This means that the higher the NPL, the lower the stability of the bank and vice versa. The last bank-specific indicator is Income Diversification (ID), the coefficient sign indicates a positive but insignificant. Next, the coefficient of market concentration, indicate a negative and significant at 1 percent level. This means that the higher the market concentration, the lower the stability of the bank and vice versa. The last is macroeconomic indicators, the first indicator is GDP, the coefficient sign indicate a positive but insignificant. The last indicator is inflation, the coefficient sign indicates a negative but insignificant.

5. Conclusion

The study revealed that the overall the stability of the conventional bank is lower than the Islamic bank's stability. A similar regression model is estimated based on different bank sizes (industry). For this purpose, banks in the sample are categorized into small and large banks based on the total assets. The large Islamic banks are significantly less stable than the large conventional banks. On the other hand, the small Islamic banks are significantly more stable than the small conventional banks. Bank managers need to pay attention to indicators that influence the stability of banks such as Capital Adequacy Ratio, size, Cost-to-Income Ratio, Loan-to-Deposit Ratio, Non-Performing Loans, Market Concentration. Meanwhile, return on Assets, Income Diversification, GDP, Inflation, do not indicate significant influence on bank stability.

The findings of the study contributes towards the enhancement of the understanding of Islamic and conventional bank stability during and post global financial crisis. With such understanding, it is expected that bank industry players could provide greater emphasis on the stability indicators in shaping their precautionary strategies in the event similar crisis or situation might take place in future.

References


