Measuring the Stability of Islamic Banks in Indonesia
A Multidimensional Approach

Teguh Santoso, Ari Tjahjawandita, and Achmad Kemal Hidayat
Center for Economics and Development Studies, Department of Economics Universitas Padjadjaran
{teguh.santoso, ari.tjahjawandita, achmad.hidayat}@fe.unpad.ac.id

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Abstract: Islamic banks are characterized by the compliance to Islamic laws and practices, the main ones being the prohibition of interest, loan trading and derivative. Globally, during 2008-2009 financial crisis, when a large number of conventional have announced insolvency, no single Islamic bank has been reported. Therefore, a method of measurement the stability of Indonesian Islamic banks is required. This paper has three goals, the first is to measure Indonesian Islamic bank's stability. The second is to compare the stability between the large bank and the small one. The last, is to see the factors that influence the stability. In this study, Q-Index will be utilized to measure of Islamic banks stability. This index has a flexibility in determining the value of index itself which taking account for dimension of pressure, efficiency, and intermediation. The data sample in this study include 10 Indonesian Islamic banks. Based on the amount of bank asset, there are 5 large Islamic banks and 5 the small one. The result of Q-Index has shown that 8 banks out of 10 banks had experienced period of crisis (unstable). Using test equality of mean that the large Islamic banks are less stable than the small one. Some indicators econometrically can explain stability of Islamic banks, there are ratio financing to asset, cost to income ratio, non-performing financing, return on asset and capital adequacy ratio. However, the findings impact of capital adequacy ratio necessary further study due to no deal with economics and financial concept.

1 INTRODUCTION

Ever since Islamic banks has taken much higher market share in the world, governments, financial institutions agents, depositors, and debtors has started the importance of its role in financial system. Previous studies also have showed that Islamic banks has a relatively stable financial condition compare to their old brother, conventional bank. They have experience an 8% higher loan to deposit ratio, 2.2% lower of non-performing loan, and 2.9% higher of capital adequacy ratio. In periods of crisis, Islamic banks also tend to have a better stability condition (Demirgüç-Kunt and Detragiache, 2005; Cihák et al., 2012).

The most common characteristic that distinguish Islamic banks and conventional is the exist of interest. Islam banks which following Islam laws avoid all of transaction which contain interest, but replacing them by profit or loss sharing and goods services trading (Siddiqi, 2000). Sharia-compliant finance does not allow for the charging of interest payments (*riba*) as only goods and services are allowed to carry a price. On the other hand, Sharia-compliant finance relies on the idea of profit-, loss-, and risk-sharing, on both the liability and asset side. In practice, however, Islamic scholars have developed products that resemble conventional banking products, replacing interest rate payments and discounting with fees and contingent payment structures. In addition, leasing-like products are popular among Islamic banks, as they are directly linked to real-sector transaction (Thorsten, Beck; Asli, Demirguc-Kunt & Ourda, 2013)

In Indonesia, a dual banking system which incorporates conventional and Islamic banks services has been established since Act No. 7 Year 1992 about Banks and more specifically Act No. 21 Year 2008 about Islamic Banks have open-up possibility for public banks and private banks to expand their market to Indonesian people which in general holds Islam as their religion. Even though the system has reached 25 years old, yet the role and the market share of Islamic banks has not been increased significantly. This phenomenon also

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reflected by their financial stability. Previous research (Slamet and Mardani, 2015; Santoso et al., 2016) have shown that financial stability of Islamic banks in Indonesia is not as stable as conventional banks. These studies have compared the two-banking system using Z-score which is a common practice ever since Altman introduce it (Altman, 1968). The weakness

A relatively more flexible methodology is by using Q-index which also incorporates multidimensional magnitudes. This index has a flexibility in determining the value of index itself which taking account for dimension of pressure, efficiency, and intermediation. In each of these dimensions included some factors that determine the index value of each dimensions. Not only it has flexibility in including dimensions and their factors, but also flexible in determining the weights for its dimensions and factors, specifically unique because this index is considering a unique financial condition for each bank and the macroeconomic condition where they are belonging. By evaluating each dimension and their contributing factors, this index could be more useful for the bank itself, regulators (central banks, financial institutions supervision body, and deposit insurance institutions). This index would give a detail insight the source of instability for a bank, a group of banks (conventional or Islamic), and banking system as a whole. A better policy could be implemented to enhance banks stability.

Q-index is used previously to measure Indonesia's financial stability which consist banking sectors and financial sectors (Gunadi et al., 2013). It has not been used to compare conventional banks with Islamic banks, and individual banks one on another. In this study, we will do two steps of analysis. The first, we will calculate Q-index score to get the stability score of Islamic banks and the second, econometric model will be employed to analysis the factors affecting stability of Islamic banks.

2 LITERATURE REVIEW

Schinasi (2004) defined financial stability in terms of financial system ability to facilitate and enhance economic processes, manage risks, and absorb shocks. Moreover, financial stability is considered a continuum: changeable over time and consistent with multiple combinations of the constituent elements of finance. A financial system is in a range of stability whenever it is capable of facilitating (rather than impeding) the performance of an economy, and of dissipating financial imbalances that arise endogenously or as a result of significant adverse and unanticipated events.

In Indonesia, banking sector have larger portion in the financial system. Therefore, financial stability requires a soundness of banking sector. Indonesia implement dual banking sector, there are conventional banks and Islamic banks. Karim, et al (2016) studied the relation between macroeconomic indicators and bank stability. The bank stability measured with Z-Score. After getting z-score, regression model employed to measure the relation between bank stability and macroeconomic indicator, i.e. Gross Domestic Product (GDP) in US dollar, Interest rates (IR) in percentage and Consumer Price Index (CPI). The empirical findings suggest long run relationship between the stability of commercial banks and macroeconomic factors.

The findings also suggest the long run relationship between the stability of overall banking industry and macroeconomic factors. However, there is no evidence of long run relationship between the stability of Islamic banks and macroeconomics factors. Z-score used broadly to measure stability of banks, however z-score only capture the risk of banks in proxy with standard deviation of return on asset (ROA).

Gunadi, et al (2011, 2013), develop financial stability measurement called Q-Index. Q-index was composite model, which capture some variables from banking sector and financial market. Stability for banking sector constructing for 3 indexes, there are pressure index, intermediation index and efficiency index. For each index, have several variables weighted with Turning Point Analysis (TPA) Method.

3 METHODOLOGY

In this study we have three methods, the first we will calculate stability index of Islamic banks using Q-Index, the second we will be conducting test equality of mean to measure the difference of stability between the large Islamic banks and the small one, and in the last, we will employ the panel econometric model. Sources of data of this research are secondary data, that would be collected from Bank Indonesia, Indonesian Financial Service Authority, and bought from private research institution that has collected financial data of Indonesian banks. The data is in quarterly data and has a time frame from 2006 to 2016 that would

cover 10 Islamic banks which operates in Indonesia. The sample of banks are Mualamat Bank, Bank Syariah Mandiri, Bank BNI Syariah, Bank Mega Syariah, Bank BCA Syariah, Bank BRI Syariah, Bank, BTPN Syariah, Bank Panin Syariah, Bank Bukopin Syariah, Bank BTPN Syariah, Maybank Syariah

To measure stability index of Islamic Banks, we use Q-Index, developed by Gunadi et al (2013). Follow Gunadi et al (2013), the formula to calculate Q-index is:

$$Q\text{-}index_{it} = 0.6pressure_{it}\text{-}0.2efficiency_{it} + 0.2intermediation_{it} \quad (1)$$

where Q-index is a linear combination of the dimension of pressure, efficiency, and intermediation with each of their weights (0.6, 0.2, and 0.2 respectively). The higher the value of the index the worse the stability condition for a bank/group of banks.

Each dimension is calculated using the following formulas:

$$pressure = 0.35NPF\text{-}0.2CAR\text{-}0.1ROA\text{-}0.3\Delta\left(LI\text{-}\frac{RR}{TA}\right) \quad (2)$$

$$efficiency = -0.30NII + 0.23BOPO + 0.23CIR + 0.23\frac{OHC}{PO} \quad (3)$$

$$intermediation = -0.2interest\_margin + 0.4Gap\ LDR + 0.4Gap\frac{Loan}{GDP} \quad (4)$$

Where NPF (Non-Performing Financing), CAR, ROA, and the change of the difference between liquid instrument and the ratio of required reserve to total asset are factors of pressure dimension. NII (Net Interest Income), BOPO (ratio of operating cost to income), CIR (cost of income ratio), and the ratio of overhead cost to operational income are factors of efficiency dimension. Interest margin, Gap of loan to deposit ratio (LDR) (disincentive rate for having an LDR less than 78% or higher than 90%), and the gap of loan to GDP relative to its long run equilibrium are factors for intermediation dimension. The signs of all factors reflect their influence on each dimension index.

Q-index for each group (conventional and Islamic) is calculated by grouping banks base on their asset. Banks with asset larger or equal to IDR13,348,000 are categorized as large banks. Banks with asset lower than that are categorized as small banks. The average of index of each dimension from banks in each group are used to calculate Q-index for each group (Cihák and Hesse, 2008).

After the Q-index for each bank for each group banks are calculated, they are being compared using descriptive statistics methods and using two-sample statistical test to test whether the average of the two indices of conventional and Islamic banks are significantly different. The value of the Q-index could be categorized into the following conditions:

Table 1: Stability Condition.

Index	Stability Condition
0 – 1.3	Good
1.3 – 1.7	Normal
1.7 – 2.0	Vigilant
2.0 – 4.0	Crisis

This research also would investigate the stability condition in periods of crisis that taking account for domestic crisis of oil price crisis in 2008, global financial crisis that happened in fourth quarter of 2007 until fourth quarter of 2009, and European crisis in early 2011. This method would expect a higher instability stability condition, followed by deeper investigation trough the dimensions and factors that show some spikes in those periods.

The econometric model we used in this study is fixed effect model to analysis the factors affecting Islamic banks stability, with the specification bellow

$$Q\text{-}Index_{it} = \beta_0 + \beta_1 G\_Asset_{it} + \beta_2 RFA_{it} + \beta_3 CIR_{it} + \beta_4 NPF_{it} + \beta_5 ROA_{it} + \beta_6 CAR_{it} + \varepsilon_{it} \quad (5)$$

Where the dependent variable is Q-Index (stability of Islamic banks. All of the independent variable reflects industry variable for all banks. There is growth of total asset for bank i at time t, credit to asset ratio (RCA) for bank i at time t, cost to income ratio (CIR) for bank i at time t, Non-Performing Financing (NPF) bank i at time t, ROA (Return on Asset) bank i at time t and Capital Adequacy Ratio (CAR). RFA is percentage of total financing to total asset of each bank. For Islamic banks, financing activity refers to lending with the *Murobahah* and *Mudharobah* scheme. CIR is percentage of total operational cost to total operational income. NPF is percentage of nonperforming financing total financing. ROA is percentage of net profit to total asset and CAR is ratio core capital to risk-weighted asset (market risk, operating risk and financing risk)

4 RESULTS AND ANALYSIS

Among Islamic banks, 8 banks out of 10 banks had experienced periods of crisis. Those banks are: Bank Mandiri Syariah, Bank BNI Syariah, Maybank Syariah, BRI Syariah, Panin Syariah, BCA Syariah, BTPN Syariah, Bukopin Interestingly, these banks experienced it long before periods of global financial crisis. Only Maybank Syariah and Bukopin Syariah experience periods of crisis 2008Q1-2008Q4. after that period, none of the sharia banks other than Bank BNI Syariah experienced a crisis. Bank BNI Syariah has experienced crisis after the period 2013Q4 until 2016Q4. It means the source of crisis probably not being triggered by global financial crisis, other factor(s) could be the cause of the crisis.

These finding fit with the data, that during the 2008-2009 financial crisis, when a large number of conventional banks around the world have announced bankruptcy (about 140 in the USA only according to the Federal Deposit Insurance Corporation), no single Islamic bank failure has been reported, so that the adoption of the PLS system by a number of Saudi banks contributed positively to the international financial stability (Ghassan, Fachin and Guendoz, 2013). According to Hassan (2006), possible explanation of this difference may be the only partial integration of Islamic banks in the global financial system, as Islamic banks do not deal with derivatives and loans sale Overall, Bank Maybank Syariah is the most instable Islamic bank with Q-Index at 3.7, while the most stable bank is Muamalat with lowest Q-Index at 1.49. These results also indicate that bank muamalat which is a pure sharia bank without associated with the parent company (conventional bank) tends to be more stable than the sharia bank which is a subsidiary of conventional bank.

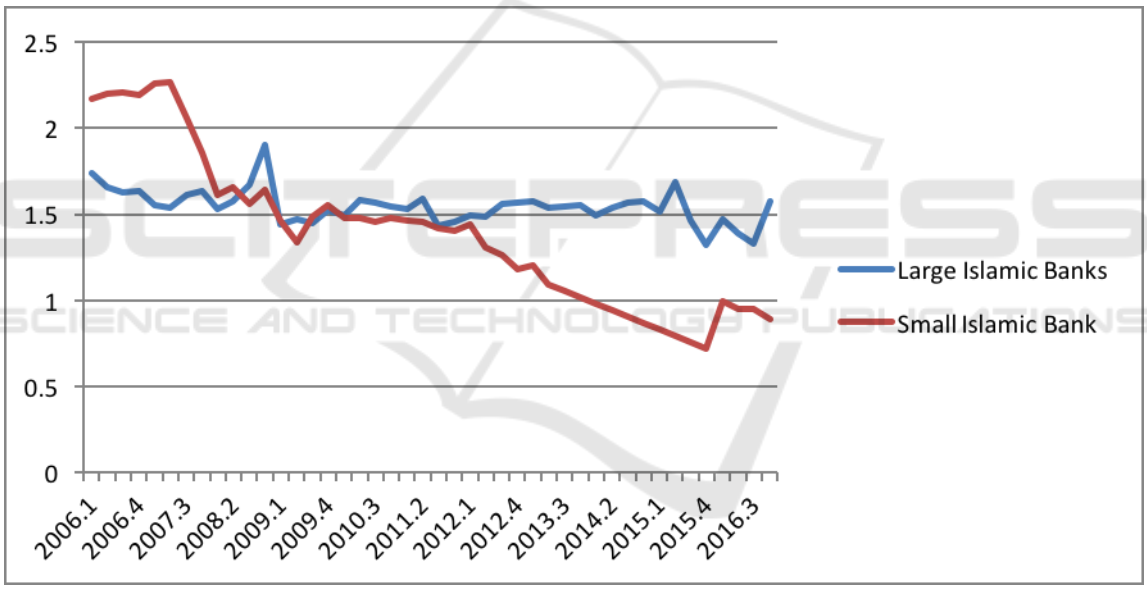

Figure 1: Average Q-Index Indonesia's Islamic Banks.

Figure 1 shows that (on average) small Islamic banks experienced crisis before global financial crisis and even more stable after global financial crisis. at the beginning of the global financial crisis period, it was the large Islamic bank that experienced crisis. Picture 1 also shows that small Islamic banks relatively more stable than the large bank. Q-Index tend to decrease after global financial crisis in 2008-2010. However, the large Islamic bank keep experienced instable either in the before crisis period or after crisis period. This result confirmed by test for quality of means, showing that Q-index between large and small banks are different in the series of Q-Index. Even the large Islamic banks looks more stable than the small one, however, the Q-Index of small Islamic banks relatively more volatile than the large one. Standard deviation of small Islamic banks is highest than the large one.

Table 2: Test Equality of Mean.

Method	df	Value	Probability
t-test	86	2.17948	0.032
Satterthwaite-Welch t-test*	47.3955	2.17948	0.0343
Anova F-test	(1, 86)	4.75013	0.032
Welch F-test*	(1, 48)	4.75013	0.0343

Source: Authors calculation.

Table 3: Standard Deviation.

Variable	Count	Mean	Std. Dev.	Of Mean
LARGE_ISLAMIC_BANKS	44	1.54476	0.10162	0.01532
SMALL_ISLAMIC_BANK	44	1.39354	0.4489	0.067674
All	88	1.46915	0.33239	0.035433

Source: Authors calculation.

After getting Q-Index score, the last step is modelling stability index in the regression model. Fixed effect model will have employed to find out what the variable has a significant impact to stability index of Islamic banks. The result of regression model is presented below:

Equation 1: Result of Fixed Effect Panel Data Regression.

$$Q_{INDEX_{i,t}} = 1.16728 - \underset{(13.95466)}{0.000139G\_ASSET} \underset{(1.185003)}{-0.003856RFA} + \underset{(3.234532)**}{0.001969CIR} + \underset{(6.126688)***}{0.01934NPF} - \underset{(2.921228)**}{0.000143ROA} + \underset{(4.627605)}{0.022093CAR} \quad (6)$$
$$(23.44787)$$

$R^2 = 0.783$

Fixed Effects (Cross - Intercept):

_MUAMALAT--C	0.169746	_BRISYARIAH--C	0.060031
_BNISYARIAH--C	0.762114	_PANINSYARIAH--C	-0.199141
_MANDIRISYARIAH--C	-0.029147	_BUKOPINSYARIAH--C	-0.282430
_MEGASYARIAH--C	-0.097985	_BCASYARIAH--C	-0.231957
_MAYBANKSYARIAH--C	-0.212985	_BTPNSYARIAH--C	0.061754

Source: Authors Calculation

Based on the result of fixed effect model, known that the factor significantly affecting stability of Islamic banks are financing to asset ratio, cost to income ratio, non-performing financing, return on asset and capital adequacy ratio. Except capital adequacy ratio, the sign of all variable is fit according to concept of financial stability of banks. Growth of asset have a negative sign to stability, however it variable has no significant impact. Conceptually, the greater the asset of banks, bank banks can conduct business activities that encourage increased profitability.

Variable return on asset shows negative relation and have a significant impact to stability. It means, the more profitable of banks, will lower the index or increasing in stability. Variable cost to income ratio have a positive sign and significant impact to stability. These result in line with study of Santoso, et al (2016), increasing in cost to income will higher instability. Their study using z-score to measure stability, which have a different direction, the higher z-score banks will more stable. Even different in direction, however, these found are same in meaning. Cost to income ratio as a proxy of efficiency. The greater cost to income ratio, banks will increasingly inefficient. Inefficiency will lead to increased operating costs, thereby decreasing profitability and will result in higher stability score (unstable). Non-Performing Financing (NPF) have a positive and significant impact to stability. For banks, NPF are ugly cost which can substract profitability. The

higher of NPF, profitability of banks will decrease, so increase instability.

5 CONCLUSION

During global financial crisis, most of Islamic banks didn't experience crisis. Only two banks experienced crisis, there are Maybank Syariah and Bukopin Syariah. It means the source of crisis probably not being triggered by global financial crisis, other factor(s) could be the cause of the crisis. These findings correspond with the data indicated that during the 2008-2009 financial crisis, when a large number of conventional banks around the world have announced bankruptcy no single Islamic bank failure has been reported. Small Islamic banks relatively more stable than the larger one. Large Islamic banks looks always experience crisis in the period before, during and after crisis. The financial indicators that have significant impact to Islamic banks stability are ration financing to asset, cost to income ratio, non-performing financing, return on asset and capital adequacy ratio. The interesting findings and necessary to do further study is the impact of capital adequacy ratio to Islamic banks stability

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