



INDONESIAN ISLAMIC BANKS AND FINANCIAL STABILITY: AN EMPIRICAL ANALYSIS

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ABSTRACT

Islamic banking in Indonesia is very vulnerable to volatility in their business processes due to its small market share. Compared to conventional banks, seen from their financial performance, Islamic banks have a worse performance because of lower profit (ROA). This study examines the stability of Islamic banking in Indonesia. Stability is measured using the Z Score. The data in this study are aggregate data for Islamic commercial banks. The data used are monthly data from January 2015 to December 2019. This study uses the ARDL (Autoregressive Distributed Lag) method. The results of this study are that all independent variables OER, NPF, inflation, IPI, exchange rates have an effect on the stability of Islamic banking, except FDR. Lower efficiency and problematic financing increases the stability of Islamic banking. Meanwhile, macroeconomic factors, inflation and exchange rates, have a negative effect on the stability of Islamic banking. The economic downturn due to inflation and rupiah depreciation will increase the instability of Islamic banks.

Keywords: *Autoregressive Distributed Lag (ARDL), Islamic Banking, Financial Stability, Z Score.*

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INTRODUCTION

The banking industry is an important pillar for the economy of a country, because it functions to support financial transactions and public business activities. Therefore, the government feels that it must take part in maintaining economic stability by maintaining the financial health level of the banking industry, both for conventional banks and Islamic banks. (Soekapdjo et al., 2019).

Islamic banks developed when the government passed Law No.21 of 2008 concerning Islamic banks. Sharia banking in Indonesia is currently experiencing growth in terms of institutions. According to a source from the OJK Islamic banking statistics, that as of December 2019 there were 14 Islamic Commercial Banks, 20 Sharia Business Units and 167 Sharia People's Financing Banks spread throughout Indonesia.

The stability of Islamic banks can be evaluated from their profitability along with a decrease in the value of financing known as non-performing financing (NPF). The Indonesian Financial Services Authority (OJK) classifies healthy Islamic banks based on their profitability with a return on assets (ROA) of more than 1.5% and a maximum NPF of 5%. The average ROA was 1.34% with a mean NPF of 4.02%. However, the financial performance of many Islamic banks is worse than conventional banks as their competitors. ROA and NPL of conventional banks were 2.61% and 2.56% respectively for the same period.

Based on their financial performance, the stability of Islamic banks is worse than conventional banks due to lower earnings (ROA) and higher NPF. Many types of empirical literature analyze the stability of Islamic banks. Specific factors of Islamic banks and macroeconomic conditions determine the stability of Islamic banks. Meanwhile, macroeconomic conditions that affect stability are inflation, domestic output and the exchange rate. (Ghenimi et al., 2017). Several previous studies also investigated the stability between Islamic banks and conventional banks. Some researchers show that the stability of Islamic banks is better than conventional banks. Several plausible reasons come from the limited investment of Islamic banks because they must comply with sharia principles (Hussein, 2010) have better risk management (Hassan et al., 2019) and have low credit risk because there are no speculative transactions in their financing. (Miah & Uddin, 2017) On the other hand, some empirical literature shows that the stability of Islamic banks is worse than conventional banks because of the moral hazard and asymmetric information that bore the profit and loss sharing system. (Kabir et al., 2015; Lassoued, 2018).

Bank stability or financial stability in financial institutions can be referred to as the opposite of financial vulnerability or instability. Referring to the implementation of institutional (banking stability) and market functions that shape the financial system. Furthermore, financial and monetary stability are the main prerequisites for the functioning of an economic system. Financial vulnerability

will create a dangerous situation of uncertainty that will lead to mislocation of resources and reluctance to invest (Dienillah & Anggraeni, 2016). In extreme conditions, disruptions to the financial sector will have a devastating impact on economic activity and even on political stability. Thus maintaining financial stability is the main objective of central banks and financial authorities. (Hardanto, 2006).

Based on the results of the research and the data above, the writer considers it important and motivated to conduct further research related to the stability of Islamic finance in Indonesia with the object of Islamic Commercial Banks and Sharia Business Units for the period 2015; 1 - 2019; 12. Some researchers apply NPF as a proxy for asset quality, which measures credit risk, to check the stability of Islamic banks. (Beck et al., 2019). To contribute to existing empirical studies in Indonesian Islamic banks, the authors apply the measure of the stability of Islamic banking is the Z-score. Other contributions relate to the estimation method. Most of the previous research on Islamic banks in Indonesia used the panel regression method with each Islamic bank. However, here the author examines the stability of Islamic banking by applying the dynamic Autoregressive Distributed Lag Model (ARDL).

LITERATURE REVIEW

Financial Stability

Regarding financial system stability or banking stability, there is actually no standard agreed definition for this term. But in simple terms, we can call financial system stability as a harmonious balance in the financial system. What is meant by harmonious balance is a condition in which the financial system in its function as an intermediary, payment system and risk spread can continue to run properly and stand resilient to face economic shocks. (Restiani, 2014). It is difficult to describe and even difficult to measure. Financial stability is a situation in which the ability to mobilize savings (savings) efficiently, provide liquidity, and allocate investment from financial institutions and other market players is well maintained. Financial stability is consistent with the failure of one or several financial institutions that occur periodically, meaning that failure is a common occurrence, and financial stability is maintained. Failure of financial institutions becomes a big problem, if it can shake and potentially destroy financial stability. (Hardanto, 2006)

Financial System Stability Measurement Index

The banking system stability measurement index is an important indicator for policy makers to observe, supervise and determine banking sector policies. Until now, many researchers have built the index method, even though with

different terms. However, until now the best index has not been found that is widely accepted by academics and practitioners in measuring the stability of the banking system. (Basurto & Goodhart, 2009).

To determine the level of banking stability, accounting-based bank health measurements have various kinds of measurement models according to each use, one of which is the so-called Z-Score. The general measure of stability at the individual institution level is the Z-Score. Among researchers, this measure is an option due to the fact that the Z-Score has a negative relationship with bankruptcy of financial institutions, namely the possibility of asset values being lower than debt values. The higher the Z-Score, the lower the probability of bankruptcy of a financial institution.

It is for this reason that previous research conducted by a number of researchers used the Z-Score model to see bank stability. The Z-Score can be calculated by the formula:

$$Zscore = \frac{ROA + CAR}{\sigma_{ROA}}$$

Where it is explained that the Z-score describes the stability of the bank, ROA is the return on assets of the bank during the observation period which describes the ability of the bank to generate profits. Meanwhile, the Capital Adequacy Ratio (CAR) is the bank's capital compared to RWA (Risk Weighted Assets) to see the level of bank leverage. σ_{ROA} is stability risk calculated by the standard ROA deviation. Thus, the Z score is obtained as a measuring tool for banking stability and the banking system, internal and external risks.

Previous Research

To analyze the stability of Islamic banking, it can be seen from the aspects of assets, CAR, efficiency and from external factors, namely inflation, IPI and the exchange rate. Assets and CAR affect stability, assets and high CAR supports the level of stability of Islamic banks, lower efficiency increases the instability of Islamic banks, inflation and exchange rates affect the instability of Islamic banks due to economic decline caused by inflation and exchange rates. (Widarjono, 2020). This is also supported by research from (Salami & Adeyemi, 2015) which states that to determine the level of efficiency and stability of Islamic commercial banks with Islamic business units in Malaysia in the 2003-2011 period, the results of their research show that before the crisis, Islamic commercial banks were more efficient. Islamic business units are more flexible than Islamic commercial banks. The longer it operates as a sharia business unit, the more efficient it will be.

To analyze the impact of income diversification on the profitability and risk of bank companies according to research (Paltrinieri et al., 2020) that there is no significant relationship between income diversification and stability for Islamic and conventional banks, diversification provides a lower profit impact for Islamic

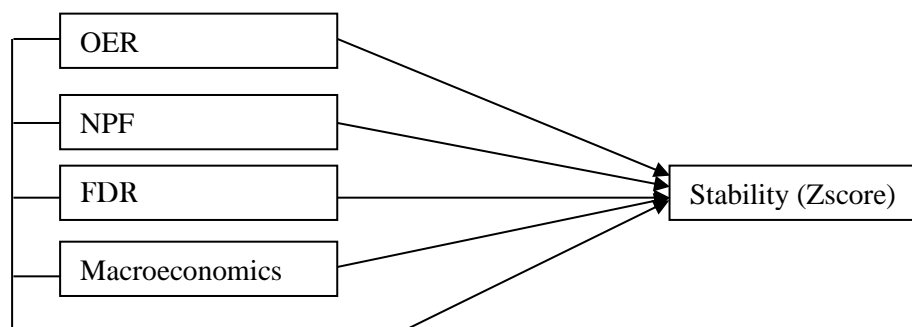
banks than for banks. conventional and there is no relationship between income diversification and stability for both Islamic and conventional banks. Islamic banks with conventional banks in the long term have different levels of stability, to test the stability of Islamic and conventional banks in the long term based on research from (Alqahtani & Mayes, 2018a) that based on the Z score it is concluded that in the long term conventional banks are more stable than Islamic banks. That Islamic banks are more risky than conventional banks. Higher levels of financial instability than conventional banks, confirm empirically the findings of (Alqahtani & Mayes, 2018b), who evaluated operating performance and found that Islamic banks survived the initial phase of the crisis but underperformed later on. Islamic banks are suffering more in the next phase of the financial crisis. Small Islamic banks show relatively better crisis handling than large Islamic banks. As financial shocks spread during the next phase of the global crisis, Islamic banks suffer from significantly higher levels of financial instability than conventional banks. This result applies to large banks but not to small Islamic banks. Islamic banks are more stable when they operate on a small scale but lose this stability as they scale up their operations. Islamic banks may have escaped the financial crisis which is very volatile, but they did not escape the major shocks in the real economy sector.

In line with previous research that from research (Beck et al., 2013) examining the stability, efficiency and business models of countries implementing dual banking systems, there is evidence that Islamic banks are less cost-effective, but have higher intermediation ratios, higher asset quality, and better capitalization. (Berger et al., 2019) comparing Islamic banks and commercial banks related to liquidity during the global financial crisis in 24 countries for the period 2000-2014, the result is that Islamic banks create more liquidity per unit of assets than conventional banks, especially on the asset side of the balance sheet. The results are economically significant, econometrically robust, resilient in high and low income countries, and during global financial crises and other times. Conventional bank liquidity results in a decline in national financial stability, particularly in high-income countries, while the creation of Islamic bank liquidity does not.

Caporale et al. (2019) analyzing bank loan disbursement from monetary policy in Malaysia, the result is that Islamic finance is less responsive than conventional credit to interest rate shocks in high and low growth regimes. Further analysis shows that the sensitivity of Islamic credit and conventional credit to interest rate shocks converged after 2002. In addition, this study reveals that Islamic financing increases output growth in periods of low growth and the effect is positive. These findings can be interpreted in terms of the characteristics of Islamic banking.

Chaffai (2019) said that conventional banks are more vulnerable to a decline in their lending business activities. The sensitivity of Islamic banks to a substantial decline in business does not vary across lending and non-lending activities, large banks are much more resilient than small banks regardless of bank flow. Bank vulnerability occurs more when banks are unable to adjust their fees in the short term, then costs increase with exposure to larger shocks.

Research Framework



Source: Data processed, (2019)

METHODOLOGY

This study uses a quantitative approach in the form of ratios and is based on time series data. This type of research is explanatory research. This research explains the causality relationship between variables through hypothesis testing and the explanation is more focused on the nature of the analysis (Tanjung, H & Devi, 2013). The data used in this study is secondary data using time series data from January 2015 - December 2019. The type of data used in this study is in the form of ratios obtained from statistical data on Islamic banking in Indonesia during the observation period obtained from the Financial Services Authority. ARDL model can be used to solve models with different stationarity levels. If the ECM model can only be applied if the data is not stationary at the level but stationary at the same level of data differentiation and there is cointegration between the variables studied. If the variables under study have different stationarity levels, the ECM model cannot be applied (Widarjono, 2018). The long-run Islamic bank stability model can be written in the regression equation as follows :

$$Stability_t = \beta_0 + \beta_1 BOPO + \beta_2 FDR + \beta_3 NPF + \beta_4 INF + \beta_5 IPI + \beta_6 EXCRATE + e_t$$

According to Dendawijaya (2009) Operational Costs Operational Income is used to measure the level of efficiency and the ability of a bank to carry out its operations. This can be interpreted as the increasing ratio of Operational Expenses

to Operating Income reflects a bank's lack of ability to reduce operating costs and increase its operating income.

Financing to Deposit Ratio is a comparison between loans extended by banks to third party funds. Non Performing Finance is an activity in which the customer is no longer able to pay part or all of his obligations to the bank as promised. NPF data used in this study are monthly NPF data from each dependent variable. The NPF value is presented in the form of a percent (%).

The Industrial Production Index is an economic indicator that calculates the level of output produced by all industries in a country. The Industrial Production Index is calculated by considering several components both in terms of output capacity and efficiency to form an index.

Inflation is a condition in which there is an increase in the money supply or an increase in liquidity in an economy. This definition refers to the general symptoms caused by an increase in the money supply which is thought to have caused an increase in prices. In a further development, inflation can briefly be interpreted as a tendency to increase the prices of goods and services in general and continuously.

Exchange Rate is an exchange rate or exchange rate known as the currency exchange rate against current or future payments between two currencies of each country or region. The exchange rate describes the economic stability of a country. The strengthening of the exchange rate is a sign that the country's economic condition is in good condition. Therefore, changes in exchange rates will affect the smooth running of customers' businesses, especially those who run their business with imported raw materials, and can even reduce customer profits, resulting in an increase in the ratio of problem financing at banks and can reduce the stability of the bank itself (Soekapdjo et al., 2019).

Autoregressive Distributed Lag (ARDL)

Autogressive Distributed Lag (ARDL) is a regression model that includes a variable value that explains either the present or past value (lag) of the independent variable in addition to the model that includes the lag value of the dependent variable as one of the explanatory variables. The ARDL model is very useful in empirical econometrics, because it makes economic theory that is static to be dynamic by taking into account the role of time explicitly. This model can distinguish short-term and long-term responses from explanatory variables.

Unit Root Test

According to Thomas (1997) stationary data is time series data that does not contain unit roots. On the other hand, data that is not stationary is time series data containing unit roots. Time series data is said to be stationary if the mean, variance and covariance of the data are constant over time. (Gujarati, 2004) state

that this test is done to determine early and more definitely, spurious regression. This spurious regression will make the estimation results have a confusing statistical test. The usual data stationarity test procedure is to use the Dickey Fuller (DF) test Augmented Dickey Fuller (ADF) test, as well as the Phillips-Perron (PP) test.

Cointegration Test Bound Test

The cointegration test is to see whether exogenous variables have a relationship with endogenous variables (Gujarati, 2006). The long-term relationship between variables in one model can be seen through a linear combination so that in the long run it can become stationary, a linear combination that is stationary or also known as a long-term equilibrium relationship between variables called cointegration.

Table 1
Variables Description, Hypothesis and Source of Data

| VARIABLES | DESCRIPTION | HYPOTHESIS |
|------------------------|--|------------|
| Dependen Variables | | |
| Z Score | (ROA+CAR)/SD(ROA) (%) | |
| Independent Variables | | |
| Islamic Bank Specific | | |
| OER | Ratio ofOperational expense to operational revenue (%) | - |
| FDR | Financial Deposit Ratio | + |
| NPF | Non Perfoming Financing (%) | - |
| Macroeconomic Variabel | | |
| Inflation | Inflation Rate (%) | - |
| IPI | Industrial Production Index (%) | + |
| Exc Rate | IDR againts US Dollar | - |

Source: Data processed (2020)

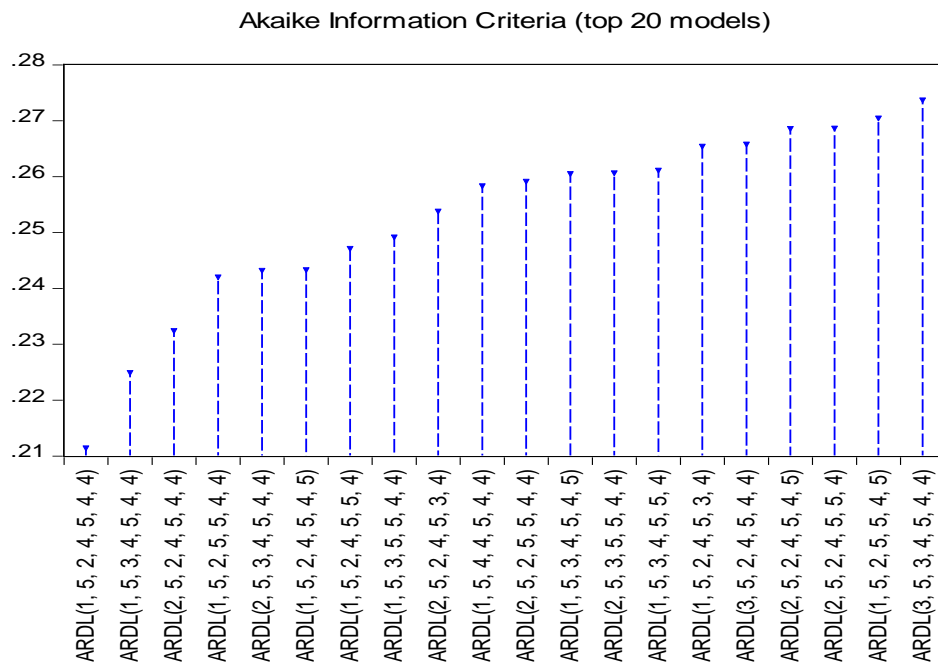
RESULT

Unit Root Test

Stationarity testing is carried out to determine which data is integrated in the same or different orders. The stationarity test used was Augmented Dickey Fuller (ADF) and Philip Perron (PP). The results clearly show that the Z-score, BOPO, FDR, NPF, IPI, Exchange Rate are integrated in the first difference or I (1) data. The integrated inflation variable is at level I (0), none of which is stationary at the second difference. Therefore, the ARDL model is a suitable model to estimate the stability of Islamic banking. The maximum lag length chosen is 4 for the dependent variable and 5 for the regressor or dependent variable, using the Akaike info criterion (AIC) to estimate the ARDL model. The results of the stationarity

test showed that none was stationary in the second difference. so that the selection of the ARDL method is the right method.

The ARDL method requires determining the lag length needed to estimate the general ARDL equation. The determination of the lag length is done automatically with Eviews 10. Selection of the best ARDL model with the optimal lag combination is selected based on the Akaike Info Criterion (AIC) criteria. The criteria with the best AIC score are selected from the best 20 models presented by the AIC criteria. Based on the AIC selection, the best ARDL model for this research model is ARDL (1,5,2,4,5,4,4).



Source: Data processed (2020)

Figure 1
Results of Optimal Lag Selection for Islamic Commercial Banks

Autocorrelation Test

Literally autocorrelation means that there is a correlation between the members of one observation and another observation at different times. In relation to the assumptions of the ARDL method and the time series data, autocorrelation is a correlation between one disturbance variable and another disturbance variable. To be able to detect autocorrelation, the authors apply the serial correlation LM test model. If Prob.Chi Square exceeds 0.05, the model does not contain autocorrelation, but if Prob.Chi Square is less than 0.05, it can be concluded that the model contains autocorrelation.

Table 2
Autocorrelation Test Results for Islamic Commercial Banks

| Breusch-Godfrey Serial Correlation LM Test: | | | |
|---|---------|---------------------|--------|
| F-statistic | 0.06957 | Prob. F(2,21) | 0.933 |
| Obs*R-squared | 0.362 | Prob. Chi-Square(2) | 0.8344 |

Source: Data processed (2020)

From the autocorrelation table above, it can be said that the model does not contain autocorrelation because Prob. Chi Square is 0.8344 more than 0.05.

ARDL Estimation Result

The results of the estimation of the stability of Islamic banks are shown in Table 3. The model shows ARDL (1,5,2,4,5,4,4). In the model, of the 31 independent variables, 17 independent variables are significant at a significance of 10% or less.

Bound Testing Approach

Based on the results of the bound test test for Islamic Commercial Banks, the f-statistical value is greater than the f-critical value of 1 percent in the first difference, namely $5.40 > 3.99$, which means the research variables have long-term cointegration with a significance level of 1 percent. The results of the bound test are as follows :

Table 3
Cointegration Test Results for Islamic Commercial Banks

| F-Bounds Test | | Null Hypothesis: No levels relationship | | |
|----------------|----------|---|------|------|
| Test Statistic | Value | Signif. | I(0) | I(1) |
| F-statistic | 5.404543 | 10% | 1.99 | 2.94 |
| k | 6 | 5% | 2.27 | 3.28 |
| | | 2.5% | 2.55 | 3.61 |
| | | 1% | 2.88 | 3.99 |

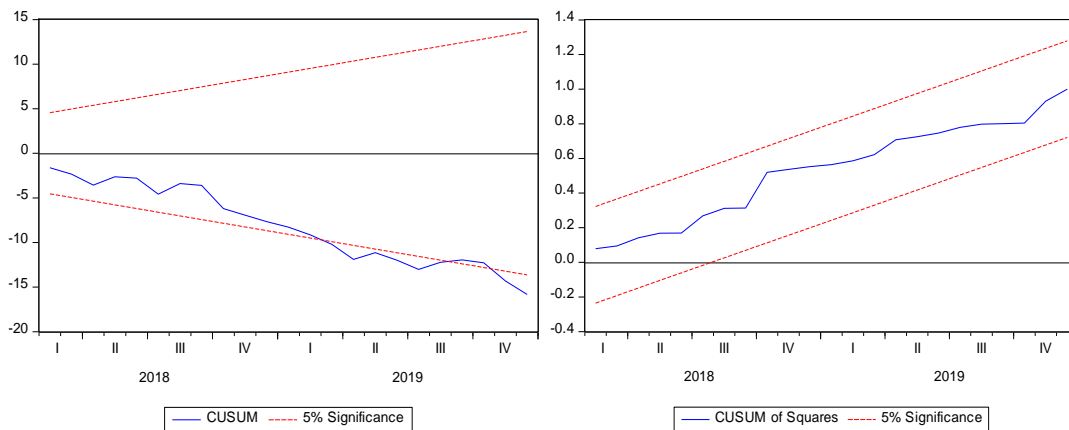
Source: Data processed (2020)

ECM ARDL

Data that is not stationary often shows an imbalance relationship in the short term, but there is a tendency for an equilibrium relationship to occur in the long run. For this reason, it is related to the cointegration test to determine whether or not there is a long-term relationship in the variables studied. After fulfilling the

requirements of the ECM model, the next step is to estimate the ECM model by entering the error correction variable to correct the imbalance..

The results of short-term dynamics estimation can be seen in table 5, namely the estimation of the Error Corection Mechanism (ECM) in the ARDL model. In the short-term estimation results, the ECT or CointEq (-1) value is - 0.788875 with a probability of 0.0000 which means that there is cointegration in the model. The negative coefficient value shows the model towards equilibrium if there is a disturbance or shock with a speed of 78.88 percent per month which supports the long-term relationship between the variables in the model. About 78.88 percent of the imbalance that occurred in the previous period will return to the equilibrium point in the current period. The error correction coefficient is statistically significant at the 1 percent level.



Source: Data processed (2020)

Figure 2
Results of (CUSUM) and (CUSUMQ) of Recursive Residuals

Table 4
ARDL Long-Run Coefficient Estimation Results

| Variabel | Z Score | |
|----------|--------------|-----------|
| | Coefficient | t-Value |
| BOPO | -0.207094*** | -2.854194 |
| FDR | -0.011444 | -0.404773 |
| NPF | -1.244595*** | -4.648185 |
| INF | -3.620073*** | -3.578937 |
| IPI | -0.095871*** | -2.946408 |
| EXC_RATE | -0.000457*** | -3.017079 |
| C | 49.94122*** | 4.172082 |

Note ***, **, * are stationer at $\alpha=1\%$, 5% , 10% respectively.

Source: Data processed (2020)

Discussion

From the long-term estimation results above, it can be said that in the long term all independent variables of Islamic commercial banks have an effect on the stability of Islamic banking except FDR. The internal variable of Islamic banking, namely BOPO of Islamic commercial banks, is negative and significant. This is in accordance with the initial hypothesis that BOPO has a negative effect on the stability of Islamic banking, because the higher the costs incurred by Islamic commercial banks, the more inefficient and can reduce the stability of Islamic banking. From this ratio, it can be measured how the management of a bank uses all of its production factors efficiently and effectively. From the results of the study states that Operation Efficiency (BOPO) has a negative effect on the stability of Islamic banking, this means that the initial hypothesis can be accepted.

The FDR variable in Islamic commercial banks is negative and insignificant, this is different from the initial hypothesis that FDR in the long run has a positive effect on the stability of Islamic banking. From the regression results, the negative FDR sign indicates that the expansion of financing is proportional to the increase in problem financing. The FDR of Islamic Commercial Banks during the 2015-2019 period had an average of 83.54%. This figure shows a high enough FDR ratio in order to provide high profit sharing for customers. Islamic Commercial Banks still maintain a high FDR because the liquidity ratio determines the profit sharing rate for depositors' customers. The more customer deposits that are channeled into financing, the higher the profit sharing rate received by the savings customers. However, from 2015 to 2017, based on the Sharia Banking Statistics, it was seen that the increase in non-performing financing (NPF) almost touched 5%, thereby reducing bank current profits. Even though the FDR continues to be raised, if the NPF is left high, it will affect the equivalent deposit rate. The greater the distribution of funds in the form of financing compared to bank deposits, the greater the risk that must be borne by Islamic Commercial Banks. Supporting research (Nugroho et al., 2019) on Islamic Commercial Banks, the variable FDR in the long term has a negative effect on the stability of Islamic banking.

Non-performing financing (NPF) is negative and significant in the long term. This is in accordance with the initial hypothesis that in the long term the more problematic financing (NPF) will decrease the stability of Islamic banking. If more and more financing is issued by Islamic banks, the costs that must be incurred will also increase, both the cost of reserves for productive assets and other activities, so that it has the potential to cause losses to the bank and in the long term banking stability will decrease. This is according to research (Hassan et al., 2019). Therefore, the initial hypothesis that NPF has a negative effect on the stability of Islamic banking in the long term is acceptable.

The inflation variable is negative and significant. This is in accordance with the hypothesis that inflation in the long run will reduce the stability of Islamic

banking. Inflation is a condition in which there is an increase in the money supply or an increase in liquidity in an economy. Based on The Loanable Fund Theory, Dornbus and Fischer (Nandadipa, 2010) have explained that inflation can have an impact on usage and functions such as weakening the spirit to save, increasing the desire to shop, withdrawing savings funds, accumulating money and wealth, playing price games, non-productive investment, and the distribution of goods is relatively unstable and concentrated. This can result in difficulties for banks in channeling funds due to the large number of people who withdraw their funds.

In Islamic Commercial Banks, the IPI variable is negative and significant. This is different from the initial hypothesis that IPI in the long term has a positive effect on the stability of Islamic banking. This negative relationship supports research (Mutamimah & Chasanah, 2012) that high GDP can increase problematic financing because it is indicated that the behavior of Indonesian people with high levels of consumption prioritizes consumption rather than paying for financing, this is what also has a negative impact on the stability of Islamic banking.

Exchange Rate is negative and significant. This means that according to the initial hypothesis that the exchange rate in the long run has a negative effect on the stability of Islamic banking. This is because the exchange rate describes the economic stability of a country. The strengthening of the exchange rate is a sign that the economic condition of a country is in good condition. Therefore, changes in exchange rates will affect the smooth running of customers' businesses, especially those who run their business with imported raw materials, and can even reduce customer profits, resulting in an increase in the ratio of problem financing at banks and can reduce the stability of the bank itself. (Soekapdjo et al., 2019).

CONCLUSION

The stability of Islamic banking in Indonesia is represented by the Z Score, in which the Z Score has a negative relationship with the bankruptcy of financial institutions, namely the possibility of the asset value being lower than the debt value. The higher the Z-Score, the lower the probability of bankruptcy of a financial institution. The Z score is a measure of banking stability and of the banking system, internal and external risks of the bank. It is for this reason that the measurement of banking stability uses the Z Score model. The stability of Islamic banking can be seen from the internal and external factors of Islamic banking. The internal factor of Islamic banking is seen from the component of the Islamic Commercial Bank object. The result is that all independent variables OER, NPF, Inflation, IPI, Exchange Rate affect the stability of Islamic banking except FDR. OER variable has a negative long-term effect on the Z Score or the stability of Islamic banking, this is in accordance with the initial hypothesis. Because the higher the costs incurred by the bank, the more inefficient and can reduce the stability of Islamic banking.

The FDR variable has a negative and insignificant effect in the long run on Islamic commercial banks. This is possible because the increase in financing expansion is proportional to financing problems so that the effect is negative but not significant on the Z Score. Non-performing financing or NPF has a negative and significant effect, this is in accordance with the hypothesis that in the long run, the increase in problem financing will reduce banking stability.

Macroeconomic factors also greatly influence the stability of Islamic banking, namely inflation, IPI and the exchange rate. When macroeconomic conditions deteriorate due to high domestic prices and depreciation, non-performing Islamic bank financing also increases. Therefore, Islamic banks must be able to provide sufficient reserves of funds to anticipate an economic downturn for non-performing financing which is experiencing more decline in value.

In Islamic commercial banks, inflation has a negative and significant effect on the stability of Islamic banking. This is in accordance with the initial hypothesis that the increase in prices of goods in general and continuously will cause a decline in the stability of Islamic banking. The IPI variable in Islamic commercial banks has a negative and significant effect on the stability of Islamic banking in the long term. This shows that high GDP can increase problematic financing because it is indicated that the behavior of Indonesian people with high levels of consumption prioritizes consumption rather than paying for financing, this is what also has a negative impact on the stability of Islamic banking.

Exchange rates at Islamic commercial banks have a negative and significant effect on banking stability in the long term. This is because the exchange rate describes the economic stability of a country. The strengthening of the exchange rate is a sign that a country's economic conditions are in good condition. Therefore, changes in exchange rates will affect the smooth running of customers' businesses, especially those who run their business with imported raw materials, and can even reduce customer profits, resulting in an increase in the ratio of problem financing at banks and can reduce the stability of the bank itself.

REFERENCES

- Alqahtani, F., & Mayes, D. G. (2018a). Financial stability of Islamic banking and the global financial crisis: Evidence from the Gulf Cooperation Council. *Economic Systems*, 42(2), 346–360.
- Alqahtani, F., & Mayes, D. G. (2018b). Financial stability of Islamic banking and the global financial crisis: Evidence from the Gulf Cooperation Council. *Economic Systems*, 42(2), 346–360.
- Basurto, M. S., & Goodhart, C. (2009). Banking stability measures. *IMF Working Papers*, 1–54.

- Beck, T., Demirgüç-Kunt, A., & Merrouche, O. (2013). Islamic vs. conventional banking: Business model, efficiency and stability. *Journal of Banking and Finance*, 37(2), 433–447.
- Beck, T., Demirgüç-Kunt, A., Merrouche, O., Berger, A. N., Boubakri, N., Guedhami, O., Li, X., Bitar, M., Pukthuanthong, K., Walker, T., Caporale, G. M., Çatık, A. N., Helmi, M. H., Menla Ali, F., Tajik, M., Chaffai, M., Čihák, M., Hesse, H., Parashar, S. P., Abedifar, P. (2019). How did Islamic banks do during global financial crisis? *Global Finance Journal*, 38(2), 100487.
- Berger, A. N., Boubakri, N., Guedhami, O., & Li, X. (2019). Liquidity creation performance and financial stability consequences of Islamic banking: Evidence from a multinational study. *Journal of Financial Stability*, 44, 100692.
- Caporale, G. M., Çatık, A. N., Helmi, M. H., Menla Ali, F., & Tajik, M. (2019). The bank lending channel in the Malaysian Islamic and conventional banking system. *Global Finance Journal, July 2018*, 100478.
- Chaffai, M. (2019). Hyperbolic distance function, technical efficiency and stability to shocks: A comparison between Islamic banks and conventional banks in MENA region. *Global Finance Journal, June 2018*, 100485.
- Dendawijaya, L. (2009). Manajemen Perbankan Edisi Revisi. In *Ghalia Indonesia*. Ghalia Indonesia.
- Dienillah, A. A., & Anggraeni, L. (2016). Dampak Inklusi Keuangan Terhadap Stabilitas Sistem Keuangan Di Asia. *Buletin Ekonomi Moneter Dan Perbankan*, 18(4), 409–430.
- Ghenimi, A., Chaibi, H., & Omri, M. A. B. (2017). The effects of liquidity risk and credit risk on bank stability: Evidence from the MENA region. *Borsa Istanbul Review*, 17(4), 238–248.
- Gujarati, D. N. (2004). Basic Econometrics. In *New York*. McGraw-Hill.
- Hardanto, S. S. (2006). *Manajemen Risiko bagi Bank Umum kisi kisi ujian sertifikasi manajemen risiko Perbankan Tingkat I*. PT Elex Media Komputindo.
- Hassan, M. K., Khan, A., & Paltrinieri, A. (2019). Liquidity risk, credit risk and stability in Islamic and conventional banks. *Research in International Business and Finance*, 48, 17–31.
- Hussein, K. (2010). Bank-level stability factors and consumer confidence-A comparative study of Islamic and conventional banks product mix. *Journal*

of Financial Services Marketing, 15(3), 259–270.

- Kabir, M. N., Worthington, A., & Gupta, R. (2015). Comparative credit risk in Islamic and conventional bank. *Pacific Basin Finance Journal*, 34, 327–353.
- Lassoued, M. (2018). Comparative study on credit risk in Islamic banking institutions: The case of Malaysia. *Quarterly Review of Economics and Finance*, 70, 267–278.
- Miah, M. D., & Uddin, H. (2017). Efficiency and stability: A comparative study between islamic and conventional banks in GCC countries. *Future Business Journal*, 3(2), 172–185.
- Mutamimah, & Chasanah, siti nur zaidah. (2012). Analisis eksternal dan internal dalam menentukan. *Jurnal Bisnis Dan Ekonomi (JBE)*, 19(1), 49–64. <https://media.neliti.com/media/publications/24170-ID-analisis-eksternal-dan-internal-dalam-menentukan-non-performing-financing-bank-u.pdf>
- Nandadipa, S. (2010). Analisis Pengaruh Pengaruh CAR, NPL, Inflasi, Pertumbuhan DPK, Dan Exchange Rate Terhadap LDR (Studi Kasus Pada Bank Umum Di Indonesia Periode 2004 - 2008). *Universitas Diponegoro*.
- Nugroho, L., Kuncoro, F. W., & Mastur, A. A. (2019). Analis Perbandingan Bank Umum Syariah Dengan Unit Usaha Syariah Dari Aspek Efisiensi; Kualitas Asset Dan Stabilitas Keuangan (Periode Tahun 2014-2017). *IQTISHADIA: Jurnal Ekonomi & Perbankan Syariah*, 6(2), 100.
- Paltrinieri, A., Dreassi, A., Rossi, S., & Khan, A. (2020). Risk-adjusted profitability and stability of Islamic and conventional banks: Does revenue diversification matter? *Global Finance Journal*, 100517.
- Restiani, D. (2014). *Mengenal Stabilitas Sistem Keuangan dan Berperan Serta di Dalamnya*. Kompasiana.
- Salami, O. L., & Adeyemi, A. A. (2015). Malaysian islamic banks' efficiency: An intra-bank comparative analysis of islamic windows and full-fledged subsidiaries. *International Journal of Business and Society*, 16(1), 19–38.
- Soekapdjo, S., Tribudhi, D. A., & Nugroho, L. (2019). Pengaruh Fundamental Ekonomi dan Kinerja Keuangan Terhadap Kredit Bermasalah Pada Bank Syariah Di Indonesia. *Ekonika : Jurnal Ekonomi Universitas Kadiri*, 4(2), 126.
- Tanjung, H & Devi, A. (2013). *Metodologi Penelitian Ekonomi Islam*. Gramata Publishing.
- Thomas, R. . (1997). *Modem Econometrics: An Introduction*. Addison-Wisley Longman.

Widarjono, A. (2018). *EKONOMETRIKA Pengantar dan Aplikasinya Disertai Panduan Eviews* (5th ed.). UPP STIM YKPN.

Widarjono, A. (2020). Stability of Islamic banks in Indonesia: Autoregressive Distributed Lag Approach. *Jurnal Keuangan Dan Perbankan*, 24(1), 40–52.