EFFICIENCY AND STABILITY OF ISLAMIC BANKING IN ASIA

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EFFICIENCY AND STABILITY OF ISLAMIC BANKING IN ASEAN

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Abstract. *This study aims to analyze the efficiency and stability level of Islamic Banking in ASEAN. This study also examins differences in the level of efficiency and stability. Samples used in this study are seven Islamic Banks in five countries in the ASEAN region in 2013-2017. The method used to measure efficiency is Stochastic Frontier Analysis (SFA), while Z-Score is used to measure stability. Tests carried out in this study were hypothesis testing with Binomial Test and Kruskal-Wallis Test. The results indicate that the average efficiency value as a whole is equal to 0,986503. Binomial Test proving that Islamic Banking in ASEAN is efficient and stable. Meanwhile, the average stability value as a whole is 5.21. Furthermore, for the Kruskal-Wallis difference test, it proves that there is no significant difference between the levels of efficiency of Islamic Banking in ASEAN. In contrast, for stability, there is a considerable difference level.*

Keywords: Efficiency, *Stability, Stochastic Frontier Analysis (SFA), Z-Score, Islamic Banking*

Abstrak. *Studi ini menanalisis tingkat efisiensi dan stabilitas perbankan syariah di ASEAN. Selain itu, studi ini juga menganalisis perbedaan tingkat efisiensi dan tabilitas. Studi menggunakan sampel 7 bank syariah di 5 negara ASEAN pada periode 2013-2017. Metode yang digunakan untuk mengukur efisiensi adalah Stochastic Frontier Analysis (SFA), sementara untuk stabilitas menggunakan Z-Score. Pengujian yang dilakukan pada studi ini ialah pengujian hipotesis dengan Binomial Test dan Kruskal-Wallis Test. Hasil menunjukkan bahwa rata-rata nilai efisiensi keseluruhan sebesar 0,986503. Binomial Test membuktikan bahwa perbankan syariah di ASEAN efisien dan stabil, sementara itu, nilai rata-rata stabilitas keseluruhan sebesar 5.21. Selanjutnya, untuk uji difference Kruskal-Wallis, mebuktikan bahwa tidak ada*

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perbedaan yang signifikan antara tingkat efisiensi perbankan syariah di ASEAN, sedangkan untuk stabilitas terdapat perbedaan yang signifikan

Kata kunci: *Efisiensi, Stabilitas, Analisis Stochastic Frontier (SFA), Z-Score, Perbankan Syariah*

Introduction

The financial sector is a sector that has a vital role in the economy. At present, the Islamic finance sector is one of the world financial sector, especially Islamic banking. According to the Global Islamic Financial Report (2017), Islamic banking and finance in the world increased during 2013-2016, with the highest increase in 2014. The development of the Islamic finance industry, including Islamic banking, also experienced positive developments, even dominating among other Islamic finance sectors. According to the Global Islamic Financial Report 2017, the Islamic banking sector was the dominant sector in 2017. The banking sector controlled the share of global Islamic financial assets at 75%. The large percentage share of Islamic banking assets in the financial system globally makes Islamic banking an indicator that is considered to support the progress of the global Islamic financial sector.

Islamic banking needs to maintain its efficiency because it can provide a positive boost to Islamic finance globally, especially within the ASEAN region. Besides, with the existence of the ASEAN Economic Community (AEC) starting from 2015, competition in the financial industry will be increasingly stringent, especially for Islamic banking. To be able to face the intense competition in this AEC, Islamic banking in various countries in ASEAN needs to conduct performance evaluations, one of which can be done by measuring the level of efficiency of Islamic banking (Yulita & Rizal, 2016). That way, the results of efficiency measurements can be a performance evaluation material for parties related to Islamic banking in ASEAN to be able to improve their performance and be able to compete in the ASEAN region and globally.

In addition to the efficiency of Islamic banking, financial stability must also be a concern so that the financial system can continue to survive or face a crisis. The global crisis that occurred in 2007-2008 came from low-quality housing loans in the United States (Prasetyantoko, 2008). This is because of the problem spread to US banks, which caused the crisis to spread to Europe and Asia, including Indonesia. At the time of the crisis, Islamic banks were more stable than conventional banks because they did not contain interest, so they were not too affected by the turmoil crisis (Beck, Kunt, & Merouche, 2013; Miah & Uddin, 2018). At this time, the Islamic banking sector is also expected to be able to survive to advance finance in ASEAN.

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Turning to the current period, according to the Deposit Insurance Agency (LPS) (2018), entering to 2018, the Federal Reserve raised the benchmark interest rate (Fed rate) in March 2018. This Fed rate hike has been estimated, but the concern is if the increase is too aggressive. Another global pressure that emerged in 2018 was the presence of global financial market sentiment triggered by the US trade war with China that could potentially trigger global uncertainty and could increase volatility in financial markets. These external factors can put pressure on finance globally. For this reason, with a lot of external pressure, Islamic banking that is not interest-oriented is expected to have the resilience to the crisis, which can be measured by the level of banking stability. Efficiency is also an important matter for Islamic banking to improve the performance of Islamic banking. Thus, Islamic banks can be an alternative to sustainable finance in ASEAN or global.

During intense competition and global pressure, Islamic banking which dominates among other Islamic financial sectors is a concern, especially a gap in the development of Islamic banking in ASEAN countries. For this reason, the topic of efficiency and stability of Islamic banking in ASEAN is critical to be studied more deeply. This study aims to determine the level of efficiency and stability of Islamic banking in ASEAN and also its differences. This study has several advantages compared to previous studies. First, this study measures efficiency and stability, not just one of them. This study also uses a different sample, namely Islamic banking in ASEAN. In addition to the sample and variables, this study also used the Binomial Test and the Kruskal-Wallis Test on the results of measurements of efficiency and stability that are still rarely used in previous studies.

Literature Review

Research on the efficiency and stability of Islamic banking has been carried out before, but only a few studies have measured both of them simultaneously, such as (Beck et al, 2013), and (Miah & Uddin, 2017). Meanwhile, other studies generally only make one measurement, the efficiency or stability of Islamic banking. Beck (2013) found that the intermediary efficiency of Islamic banks was higher than conventional banks, while for cost efficiency Islamic banks were lower than conventional banks. Then for the level of stability, Islamic banks are more stable and crisis resistant compared to conventional banks. Miah & Uddin (2017) also found that Islamic banks are more stable than conventional banks, but have lower levels of efficiency.

There are several studies on efficiency that have been done before. (Rosman, Wahab & Zainol, 2013) researched the efficiency of Islamic banking during the crisis in the Middle East and Asia. The results indicate that Islamic banking in Asia more efficient than the Middle East. (Zuhroh, Ismail & Maskie, 2015) compared the cost efficiency of Islamic and conventional banking in Indonesia using the Stochastic Frontier Analysis method. The study found that the average efficiency value of conventional banks is more significant than Islamic

banks, even though the achievement of the highest efficiency value is in Islamic banks. Furthermore, (Kamaruddin et al, 2017) compared 29 domestic and foreign Islamic banks from Malaysia, Indonesia and Brunei Darussalam in 2016-2014. The study found that domestic Islamic banks were more efficient than foreign Islamic banks.

Research on the Stability of Islamic Banking and Conventional Banking in Indonesia has also been done before with varied results. Studies conducted by Karim et al. (2018), Miah & Uddin (2017), Shahid & Abbas (2012), and Cihak & Hesse (2008) reveal that Islamic banks are more stable than conventional banks. Studies conducted by Abrar, Ahmed & Kashif (2018) and Myirandasari (2015), on the other hand, argue that conventional banks are more stable than Islamic banks. Besides, several researchers also researched factors that influence stability, including research on the effect of total assets on banking stability by Ali & Puah (2018); Shahid &Abbas (2012) and Cihak &Hesse (2008). The results indicate that there is an influence between total assets and bank stability. Then for research that discusses the effect of diversification of income on bank stability, it has been done previously by Shahid & Abbas (2012) and Cihak & Hesse (2008).

The results showed that there was an influence between income diversification and bank stability. Then, Ali & Puah (2018); Shahid & Abbas (2012) researched the effect of inflation on stability. The results of the study indicate the influence of inflation on bank stability. However, this result is different from the research conducted by Cihak & Hesse (2008), which exhibits that there was no significant effect between inflation on bank stability. Meanwhile, for the exchange rate variable, a previous study was also conducted by Shahid & Abbas (2012) and Cihak & Hesse (2008) and the results prove that there is influence the exchange rate on the stability of the bank. There is the inconsistency of the results of previous studies. To re-explain the phenomena, this research also needs to see the level of stability and efficiency of Islamic banking, as well as the potential and role of Islamic banking in maintaining financial efficiency and stability to support Islamic finance in general and make a qualified global economy.

Research Methodology

The population in this study is the Islamic Commercial Bank (BUS) in ASEAN countries. The sample in this study is BUS financial data with Top 2 range of Islamic bank in Indonesia based on total asset (Bank Syariah Mandiri and Bank Muamalat Indonesia), Malaysia (Maybank Islamic Berhad and CIMB Islamic Berhad), Brunai Darussalam (Islamic Bank of Brunei Darussalam), Philippines (Al Amanah Islamic Bank of the Philippines), and Thailand (Islamic Bank of Thailand). For Brunei Darussalam, only one Islamic bank publishes its annual financial report, while in the Philippines and Thailand, there is also only one Islamic bank in the country. All of them consist of 7 Islamic banks with 35 reports. Measurement of efficiency carried out using the Stochastic Frontier Analysis (SFA) method

is one method of measuring efficiency with parametric statistical tests. In this study, the researcher used an intermediation approach with input variables, including Labor Costs, TPF, and Fixed Assets and Output Variables, namely Total Financing. While for stability measurement using Z-Score. In term of measuring banking stability, this research adopted a formula used by Karim et al. (2018) and Zahra et al. (2018) as follow:

$$Z\ Score = \frac{ROA + \frac{Equity}{Total\ Asset}}{\partial ROA}$$

Notes:

Z-Score : Banking Stability
ROA : Return on Asset
∂ROA : Standar Deviasi ROA

Research Findings

1. Results of Efficiency Analysis with SFA

Efficiency analysis in this study uses the Stochastic Frontier Analysis method. This calculation is done using STATA 14. Software results of the efficiency of SFA in Islamic banking in ASEAN are as follows.

Tabel 1. The efficency of Islamic Banking in ASEAN with SFA

	2013	2014	2015	2016	2017	Average
BSM	1	1	1	0,992274	1	0,998455
BMI	0,999478	0,999999	0,999388	0,999999	0,993436	0,998460
MIB	0,999999	0,999999	0,975286	0,999999	0,990376	0,993132
CIMBIB	0,999999	0,964951	0,999999	0,999999	0,993278	0,991645
BIBD	0,910792	0,999994	0,999994	0,978520	0,958108	0,969482
Amanah Philippines	0,996472	0,999968	0,968281	0,986345	0,999967	0,990207
IBT	0,999997	0,999997	0,850337	0,999997	0,970382	0,964142
Average	0,986677	0,994987	0,970469	0,993876	0,986507	0,986503

Source: Data processed by the researcher with STATA 14 and Ms Excel

The Table 1 shows that the average highest value of Islamic banking efficiency in ASEAN is at Bank Muamalat Indonesia of 0.998460. Nonetheless, Islamic banking that achieves optimum efficiency is only Bank Syariah Mandiri, except in 2016. And the lowest average value of Islamic banking efficiency in ASEAN is at Islamic Bank of Thailand of 0.964142. Furthermore, based on the year, the highest value of Islamic banking efficiency in ASEAN is in 2014, while the lowest is in 2015. Meanwhile, for the average efficiency value of Islamic banking in ASEAN as a whole is equal to 0.986503. The efficiency of Islamic

banking in ASEAN is also considered to be quite good because the value of efficiency is close to one, which is optimal efficiency looks quite a lot. In the graph, it can be seen that only a few banks in a certain period have a slightly different efficiency rate compared to others and below 0.95, such as Brunei Darussalam Islamic Bank in 2013 and Islamic Bank of Thailand in 2015. Meanwhile, for the rest, it looks there is almost no significant difference.

2. Results of Stability Analysis with Z-Score

Stability analysis in this study used the Z-Score method. This calculation is done using Ms Excel. The results of the Stability of the Z-Score of Islamic banking in ASEAN are as follows.

Tabel 2 Stability of Islamic banking in ASEAN with Z-Score

	2013	2014	2015	2016	2017	Average
BSM	3,24	0,52	1,36	1,41	1,41	1,59
BMI	3,83	1,54	1,73	1,88	1,32	2,06
MIB	19,95	20,50	18,94	18,02	20,03	19,49
CIMBIB	7,73	10,07	9,45	10,31	8,82	9,28
BIBD	6,06	7,93	7,34	6,54	8,37	7,25
Amanah Philippines	-2,64	-1,17	-1,01	-3,05	-3,04	-2,18
IB Thailand	0,59	-2,23	-1,21	-1,09	-1,04	-0,99
Average	5,54	5,31	5,23	4,86	5,13	5,21

Source: Data processed by the researcher

Based on Table 2 above, it can be seen that the average highest stability value of Islamic banking in ASEAN is on Maybank Islamic Berhad with an average stability value of 19.49. Meanwhile, the lowest average value of Islamic banking stability in ASEAN is at the Amanah Islamic Bank Philippines is -2.18. Then, based on the year, the highest value of Islamic banking efficiency in ASEAN is in 2013 of 5.54 while the lowest value of Islamic banking in ASEAN efficiency is in 2016 of 4.86. Meanwhile, the average stability value of Islamic banking in ASEAN as a whole is 5.21. The highest stability was achieved by Maybank Islamic Berhad followed by CIMB Islamic Berhad, BIBD, BSM, BMI, Thailand IB and finally Amanah Philippines Islamic Bank with the smallest stability. One of these variations is because the net income generated by Islamic banks is different, for the Philippines and Thailand to get negative stability figures due to the past five years, the two banks in both countries suffered losses.

3. The Result of Binomial Test

Previous research conducted normality tests based on the Kolmogorov Smirnov or Shapiro-Wilk normality tests. The result showed that data efficiency and stability are not normally distributed. For this reason, the hypothesis test used in this research is the Binomial non-parametric test. This hypothesis test is maintained to see whether Islamic banking in ASEAN is efficient/stable or not.

a. Binomial Test for Efficiency

The binomial test for efficiency data uses the proportion of 50% or 0.5 to see which probability is higher. In addition, to be considered efficient, the number 0.99 is used because 0.99 is very close to 1, which is considered as the optimum efficiency. The following are the Binomial test results for efficiency data on Islamic banking in ASEAN.

Tabel 3. The Result of Binomial Test for Efficiency

		Category	N	Observed Prop.	Test Prop.	Exact Sig. (2-tailed)
Efisiensi	Group 1	<= ,99	9	,26	,50	,006
	Group 2	> ,99	26	,74		
	Total		35	1,00		

Source: Data processed by the researcher with SPSS 23

Notes:

Group 1: The probability of Islamic banking in ASEAN is inefficient, with the criteria of efficiency value is less than or equal to 0.99.

Group 2: The probability of Islamic banking in ASEAN is efficient, with the criteria value of efficiency is more than 0.99.

Table 3 shows that the p-value = 0.006 <significance value (α = 0.05). Then H0 is rejected, and the probability of Islamic banking in ASEAN is more efficient than the probability being inefficient. This can also be seen from observed prob. values Group 2 = 0.74> 0.26 (observed prob. Group 1). This proves that Islamic banking in ASEAN is efficient.

b. Binomial Test for Stability

In the binomial test for this stability, data uses a proportion of 50% or 0.5 to see which probability is higher. In addition, the criteria to be considered stable is to reach the

number 0, in the sense that a positive number indicates the stability of Islamic banking and vice versa. If the number is negative, then it can be considered less stable. This is used as a reference or criterion because no reference can be found to measure the value of banking stability. The followings are the Binomial Test results for the stability data of Islamic banking in ASEAN.

Tabel 4. The Result of Binomial Test for Stability

		Category	N	Observed Prop.	Test Prop.	Exact Sig. (2-tailed)
Stabilitas	Group 1	<= 0	9	,26	,50	,006
	Group 2	> 0	26	,74		
	Total		35	1,00		

Source: Data processed by the researcher with SPSS 23

Notes:

Group 1: The probability of Islamic banking in ASEAN is unstable, that is, with the criteria value of stability is less than or equal to 0.

Group 2: The probability of Islamic banking in ASEAN is stable, with the criteria value of stability is more than 0.

Table 4 indicates that the p-value = 0.006 <significance value (α = 0.05). Then H0 is rejected, and the probability of Islamic banking in ASEAN is stable greater than the probability of being unstable. Observed prop. Values showed by Group 2 = 0.74> 0.26 (observed prob. Group 1). This proves that Islamic banking in ASEAN is considered stable.

4. The Result of the Kruskal-Wallis Test

Based on the Kolmogorov Smirnov or Shapiro-Wilk normality tests, efficiency data is not normally distributed. For this reason, the different test used is the Kruskal-Wallis Test

Tabel 5: The Result Kruskal-Wallis Test for Efficiency and Stability

Test Statistics[a,b]
Efficiency

Chi-Square	11,134
Df	6
Asymp. Sig.	,084

Test Statistics[a,b]
Stability

Chi-Square	32,107
Df	6
Asymp. Sig.	,000

a. Kruskal Wallis Test	**a**. Kruskal Wallis Test
b. Grouping Variable: BS	**b.** Grouping Variable: BS

Source: Data processed by the researcher with SPSS23

a. Efficiency

Table 5 shows that the p-value = 0.084> significance value (α = 0.05). H0 is accepted; it means that there is no significant difference level of efficiency of Islamic banking in ASEAN. This is because the efficiency level of Islamic banking in ASEAN tends to be at an excellent level, and is very close to number 1, which is considered as the maximum efficiency. This makes the efficiency difference between Islamic banks not significant. The author has not found the results of a study that analyzes the differences in the efficiency of Islamic banking in ASEAN through the Stochastic Frontier Analysis method. Therefore, the authors were unable to compare the results of the Kruskal-Wallis test in the discussion section. However, the researcher found several studies that are still related to different tests on this efficiency.

Several studies comparing the efficiency of Indonesian and Malaysia Islamic banking have been done before, considering that these two countries are leaders in the Islamic banking industry in ASEAN. Yulita & Rizal (2017) stated that there was no significant difference in efficiency Islamic banking with Data Envelopment Analysis (DEA) methods between Indonesia and Malaysia in 2006-2014. Likewise, with the research conducted by Maulidiyah & Laila (2016), the Mann Whitney test proved that there was no significant difference efficiency with the DEA method in Islamic banking in Indonesia and Malaysia for the period 2010-2014. This is in line with the results of this study which states that there is no significant difference level of efficiency of Islamic banking in ASEAN.

b. Stability

Based on table 5, it can be seen that the p-value = 0.00 <significance value (α = 0.05). H0 is rejected; it means that there is a significant difference stability level of Islamic banking in ASEAN. This is following the statement of Ali & Rama (2015) which says that the growth of Islamic banking in ASEAN is still not evenly distributed, in this case especially at the level of stability which is influenced by profits or profits obtained by Islamic banks. Because there are significant differences, a Post Hoc test will be carried out, which is a further test rather than a different test.

5. Post Hoc Test with Mann Whitney Test

Post Hoc test is a follow-up test after a different test if the different test concludes that there are significant differences between the independent variables. In this study, only the stability that concluded there were significant differences, while not for efficiency. The different test done previously was the Kruskal-Willis non-parametric test, for which the Post Hoc test carried out was also a non-parametric test, which was using the Mann Whitney U-Test.

Tabl: 6 Post Hoc Test for Stability with Mann Whitney Test

Islamic Bank			Sig.	Result
BSM	X	BMI	0,067	Not Different
BSM	X	MIB	0,105	Not Different
BSM	X	CIMBIB	0,063	Not Different
BSM	X	BIBD	0,040	Different
BSM	X	AIBP	0,067	Not Different
BSM	X	IBT	0,040	Different
BMI	X	MIB	0,009	Different
BMI	X	CIMBIB	0,009	Different
BMI	X	BIBD	0,009	Different
BMI	X	AIBP	0,009	Different
BMI	X	IBT	0,009	Different
MIB	X	CIMBIB	0,009	Different
MIB	X	BIBD	0,009	Different
MIB	X	AIBP	0,009	Different
MIB	X	IBT	0,009	Different
CIMBIB	X	BIBD	0,028	Different
CIMBIB	X	AIBP	0,009	Different
CIMBIB	X	IBT	0,009	Different
BIBD	X	AIBP	0,009	Different
BIBD	X	IBT	0,009	Different
AIB	X	IBT	0,175	Not Different

Source: Data processed by the researcher using SPSS 23 and Ms Excel

Notes:

BSM: Bank Syariah Mandiri **BIBD**: Bank Islam Brunei Darussalam
BMI: Bank Muamalat Indonesia **AIBP**: Amanah Islamic Bank Philippines

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MIB: Maybank Islamic Berha **IBT**: Islamic Bank of Thailand
CIMBIB: CIMB Islamic Berhad

Based on Table 6, it can be seen that the significance value of 16 of the 21 tests carried out obtained a significance value/p-value <0.05 (α). H0 is rejected, and there are significant differences between the two samples. Furthermore, for the remaining five tests, it has a significant value / p value> 0.05 (α). There is no significant difference between the stability levels of the two samples, found in the tests conducted on BSM and BMI, BSM and MIB, BSM and CIMB IB, BSM and AIBP and tests conducted on AIBP and IBT. Overall, it can be seen that there is indeed a significant difference level of stability of Islamic banking in ASEAN. The author has not found the results of a study that analyzes the differences in the stability of Islamic banking in ASEAN through the Z-Score method in any countries. Therefore, the authors were unable to contrast the Kruskal-Wallis test and Post Hoc Test results with the Mann Whitney test result in the discussion section. The author hopes that this research can be a reference for further research related to the differences in the stability of Islamic banking in ASEAN.

Conclusion and Implication

1. Conclusion

In measuring the efficiency level of Islamic banking in ASEAN using the Stochastic Frontier Analysis method, the highest average value of efficiency of Islamic banking in ASEAN is at Bank Muamalat Indonesia with an average efficiency value of 0.998460. Optimum efficiency achieved only by Bank Syariah Mandiri, except in 2016. The lowest average value of efficiency was at the Islamic Bank of Thailand of 0.964142. Meanwhile, for the average value of efficiency as a whole is equal to 0.986503. Based on the Binomial Test, the probability of efficiency of Islamic banking in ASEAN is higher than the probability of inefficient. This proves that Islamic banking in ASEAN is efficient. In measuring the stability level of Islamic banking in ASEAN using the Z-Score formula, the highest average stability value of Islamic banking in ASEAN is at Maybank Islamic Berhad with an average stability value of 19.49, and the lowest is at the Amanah Philippines Islamic Bank of -2.18. Meanwhile, for the average stability value as a whole is 5.21.

Based on the Binomial Test, the probability of Islamic banking in ASEAN is stable higher than the probability of being unstable. This proves that Islamic banking in ASEAN is stable. In the Kruskal-Wallis Test, efficiency values were found that there were significant differences in the level of efficiency of Islamic banking in ASEAN, proving that there was no significant difference between the levels of efficiency. Furthermore, in the Kruskal-Wallis stability test, it was found that there were significant differences between the levels of efficiency. The Post Hoc test with the Mann Whitney test concluded that 16 of the 21 tests conducted proved that there were significant differences between the stability levels of the

two samples of Islamic banks. Overall, it can be seen that there is indeed a significant difference between the levels of stability of Islamic banking in ASEAN.

2. Implication

Islamic banking efficiency and stability levels in ASEAN is quite good, making customers and investors of Islamic banking in ASEAN can make wise decisions related to the decision to save or to invest in Islamic banking, especially in ASEAN. This good level of efficiency and stability can also maintain customer loyalty to Islamic banking in ASEAN. However, the efficiency of Islamic banking has not achieved optimum efficiency as a whole; only Bank Syariah Mandiri has been able to achieve it in 4 of the five years of the study period. Improved efficiency can be done by improving resource management by implementing several strategies such as HR management, cash management and better asset management. Besides, there are still several banks in ASEAN whose value for stability is negative. This increase in stability can be done with marketing strategies and product innovation. It is necessary to pay more attention, so that Islamic banks can offer competitive products, both in terms of fund collection and fund distribution.

Thus, the opportunity to generate profits can be even more significant to maintain and maintain the stability of Islamic banking in ASEAN. Meanwhile, there is no difference between the efficiency level of Islamic banking in ASEAN, proving that Islamic banking efficiency in ASEAN is still in a safe position and not much different from one to another. However, for the level of stability, there are significant differences. Customers and investors must be careful in choosing Islamic banking in ASEAN. The level of efficiency and stability of Islamic banking can be a benchmark for them to be careful in making economic decisions.

3. Recommendation

Recommendations for the future researcher are expected to be able to use different methods to analyze bank efficiency and stability. For example, it can add and compare with other methods such as the non-parametric Data Envelopment Analysis (DEA) method for efficiency and can add or compare with the Altman Z-Score formula for the stability of Islamic banking. For efficiency, the approach used can also be made with other approaches, such as an asset or production approach. Then for the sample used, it would be better if it could be added to the number of Islamic banks in Indonesia and Malaysia to be more comprehensive. Also, further research can add factors that influence stability and efficiency.

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