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Can the Implementation of *Sharia* Banks' Roadmap Increase Their Performance? (Evidence from Indonesia 2012-2017)

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Abstract. *The purpose of this research is to compare the efficiency of 11 Sharia Banks in Indonesia and its impact on their performance. This study relies on the quarterly data from 2012-2017 and applied Data Envelopment Analysis to measure their performance. The result of the T-test shows that the P-value for two tail = 0.706. So based on this trend the P-value is greater than α = 0.05 (P-value> α). In the condition of P-value> α, H1 is rejected, meaning that there is no change in the value of efficiency between the period 2012-2014 and the period 2015-2017. This research shows that the efficiency of Islamic banking has not occurred during the implementation of the 2012-2017 Indonesian Sharia Banking Roadmap. Furthermore, the highest efficiency value during the period before implementation was 0.92 with an average efficiency value of 0.57. This means that during this period there was room to increase efficiency by 0.35. Meanwhile the period after implementing the highest efficiency value was 0.87 with an average efficiency value of 0.59. This means that during this period there was room to increase efficiency by 0.28. This means that during the 2012-2017 period, there was no significant difference in efficiency levels during the 2012-2014 period (before the implementation) and the 2015-2017 period (after the implementation of the Islamic banking road map).*

Keywords: *DEA, Efficiency, Sharia Bank*

Abstrak. *Tujuan dari penelitian ini adalah untuk membandingkan efisiensi dari 11 Bank Syariah di Indonesia dan dampaknya terhadap kinerja bank tersebut. Penelitian ini menggunakan data setiap kuartal selama tahun 2012 hingga tahun 2017 dan menggunakan Data Envelopment Analysis untuk mengukur kinerja. Hasil penelitian ini menunjukan bahwa selama implementasi Roadmap, perbankan syariah belum menunjukan kenaikan efisiensi. Sementara itu, sebelum implementasi tersebut, nilai efisiensi tertinggi perbankan syariah sebesar 0,92, sedangkan rata-rata nilai efisiensinya sebesar 0,57. Ini berarti bahwa ada ruang untuk meningkatkan level efisiensi sebesar 0,35. Sedangkan pada periode implementasi, nilai efisiensi tertingi perbankan syariah sebesar 0,87, dan rata-rata nilai efisiensinya sebesar 0,59. Ini berarti ada ruang untuk meningkatkan*

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level efisiensi sebesar 0,28. Hasil penelitian juga menunjukan bahwa, secara keseluruhan periode tahun 2012 hingga tahun 2017, hasil t-test menunjukan nilai P-value for two tail = 0.706. Ini berarti P-value> α, dan menolak H1, sehingga tidak terdapat perbedaan level efisiensi selama periode 2012-2014 (sebelum implementasi) dan periode 2015 – 2017 (setelah implementasi)

Kata kunci: *DEA, Efisiensi, Bank Syariah*

Introduction

The development of Islamic banking in Indonesia began with the issuance of Banking Law Number 7 of 1992 which was later revised through Law Number 10 of 1998. It began with the operation of Bank Muamalat Indonesia (BMI) as the first *Sharia* Commercial Bank in Indonesia on May 1, 1992. Until December 31, 2017 there have been 13 *Sharia* Commercial Banks. Despite the small market share, the growth rate of national Islamic banking in the last decade grew positively, with an average increase of 33.2%. However, amid this positive growth, there is a phenomenon of a slowdown in business volume growth from 2012 to 2014, which at the end of 2014 only recorded a growth of 12% and had an impact on the slowing down of the national economy in 2014 - the beginning of 2015.

Besides the slowing down in the business volume of the sharia banking industry, the financial sector integration of the ASEAN Economic Community (AEC), serves as a challenge to immediately increase the efficiency of Indonesia's *Sharia* Banks due to the fact that foreign sharia banks have much bigger capacity and competitiveness. In response to challenges faced by the sharia bank industry, Indonesia's Financial Services Authority (OJK) develop the *Sharia* Banking Roadmap 2015-2019. In reference to the 2015-2019 Indonesian *Sharia* Banking Roadmap, based on the evaluation of the implementation of the Islamic banking blueprint up to 2014, despite many achievements that have been produced, there are still many things that still need to be carried out. It is known that there are several strategic objectives to be achieved such as the fulfillment sharia in bank operations, applying prudence, increasing competitiveness and efficiency, building financial stability and benefits for the wider community. This study aims to measure national sharia banking current efficiency as in input to the industry and the government has the output target of an increased efficiency level been achieved.

Yudistira (2004) stated that during the period 1997 - 2000 in 12 countries, including Indonesia, although they felt the impact of the global crisis in 1998-1999, all Islamic banks showed excellent performance after going through these difficult times. Alfarisi and Hendrawan (2010) found that 3 Islamic Banks were among the 20% most efficient bank in Indonesia in doing intermediation function. Although its resilience in facing the crisis as well as, several studies of Islamic banking in recent years show that the level of efficiency is not optimal, as concluded by Firdaus and Hosen (2013)

This research purpose is to analyzes sharia banking efficiency for the period 2012-2017, before the implementation of sharia banking road map (2012-2014) and after implementation of sharia banking road map (2015-2017) using the Data Envelopment Analysis (DEA) method.

Literature review

DEA method was Developed by Farrel (1957) which measures the efficiency of one input and one output technique into multi-input and multi-output, using a relatively efficient value framework as input ratio (single virtual input) with output (single virtual output). The DEA method calculates the technical efficiency of the entire DMU. The efficiency value of each DMU in the sample is between 0 (zero) and 1 (one), where the value of 1 (one) shows perfect efficiency. The efficient DMUs will form a frontier line, the DMUs are said to be relatively efficient compared to other DMUs in the group and are a reference for inefficient DMUs. The general equation of the DEA method:

$$hs = \frac{\sum_{i=1}^{m} u_{is} y_{is}}{\sum_{j=1}^{n} v_{js} x_{js}} \quad \text{.....(1)}$$

The efficiency ratio (hs) is then maximized with the following constraints:

$$\frac{\sum_{i=1}^{m} u_i y_{ir}}{\sum_{j=1}^{n} v_j x_{jr}} \leq 1 \text{ for } r = 1,\ldots,N \text{ ; } u_i \text{ and } v_j \geq 0 \text{.....(2)}$$

where N indicates the number of banks in the sample.

Previous Research

Hendrawan and Azhar (2018), investigated the level of efficiency 21 banks on the IDX during 2008-2017 using SFA Method., They found Overall, the banking sector in the Indonesian capital market between 2008 - 2017 recorded an efficiency score of 0.43. With this score, the banking system in the Indonesian capital market is still considered to be inefficient (0.43 <0.5).

Rusydiana (2018) measured the level of the national sharia banking efficiency from 2007 to 2014 with DEA method, which concluded that the level of is at 66% with a standard of deviation 0,14 using DEA-CRS, and a level of 81% with a standard of deviation 0,11 using DEA-VRS. Havidz et al. (2017), conducted research on ten sharia commercial banks in Indonesia during the period of January 2011 - March 2015 using the DEA method. The results of the study show that Bank Syariah Bukopin is the most efficient for technical efficiency, Bank Muamalat Indonesia is the most efficient for technical efficiency, while the most efficient in terms of scale efficiency is Bank Mega Syariah and Bank Syariah Bukopin. Overall the technical efficiency is 72.9% during the study period for all banks, which means that there is an input wasted on average worth 27.1%.

Sari and Saraswati, (2017), use the DEA method to measure efficiency in 26 BUMN / BUMD, 6 Foreign banks, 11 mixed banks, 19 Foreign Exchange BUSNs and 27 Non-Foreign Exchange BUSNs in the 2012-2014 period. The results of the study concluded that the group of foreign banks had the highest efficiency followed by the BUMN / BUMD group, non-foreign exchange BUSN group, foreign exchange BUSN group and mixed bank group. Miranti and Sari (2016) conducted a study to 11 national sharia banks for the period of quarter 1 of 2013 to quarter 1 of 2015 indicates that efficiency level of the industry is inefficient and not yet optimum. In contrast, Maybank Syariah and Panin Syariah Bank are most efficient.

Lutfiana and Yulianto (2015) conducted a study of factors that affect the Efficiency Level of *Sharia* Commercial banks in Indonesia for the first quarter of 2011 - the third quarter of 2014 against 7 Islamic banks. The results of the study show that Bank Panin Syariah and BCA Syariah have an optimal level of efficiency. In contrast, the banks with low and very volatile efficiency are BRI Syariah. In general, the results of his research indicate that BUS is inefficient in optimizing the resources owned and has not been able to carry out its role as an intermediation institution optimally.

Rahmawati (2015) measured the level of cost efficiency for national sharia banks from 2010 to 2013 using the DEA and SFA method and concluded the overall level was at 85.38% and 93.25% respectively. Novandra (2014) analyzes the comparison of the efficiency of Islamic and conventional banking in Indonesia with the object of research of all conventional banks and Islamic banks for the period 2008-2013 using the DEA method. The inputs used are demand deposits, savings and deposits, while the output is financing/credit provided by the bank (mudharabah, musharakah and murabahah). The results of the study show empirical evidence that Islamic banking can reduce the effects of the global financial crisis.

Firdaus and Hosen (2013) measured efficiency with the DEA method on 10 BUS in the second quarter period of 2010 until the fourth quarter of 2012. Inputs used were third party funds, total assets and labor costs with financing and operational opinion. His research concluded that no BUS has a stable efficiency score. Banks that have the highest level of efficiency are the highest during the study period, namely Bank Muamalat.

A study by Pratikno and Sugiarto (2011) comparing the efficiency of national sharia banks before and after the global crisis, from2006 to 2010 has indicated that the industry in general is categorized as efficient measured using the DEA-CRS method and shows no significant difference between before and after the global crisis. Yudistira (2004) examined the efficiency of 18 Islamic banks in the world during the period 1997-2000, using the DEA method. The input variables used are staff costs, fixed assets and total deposits while the output variable is total loans and liquid assets. The results of the study concluded that the inefficiency of the 18 banks of research objects was small, slightly above 10%, which is relatively low compared to conventional banks.

Method, Data, and Analysis

As explained in equation 1 and 2 above, where the DEA general equation derivatives for the DEA CCR model are as follows:

$$\text{Max. } h_s = \sum_{i=1}^{m} u_i y_{is}$$

$$\text{st. } \sum_{i=1}^{m} u_i y_{ir} - \sum_{j=1}^{m} v_j x_{jr} \leq 0 \; ; \; r = 1,\ldots,N \quad \ldots\ldots\ldots\ldots\ldots\ldots(3)$$

$$\sum_{j=1}^{m} v_j x_{js} = 1, \; u_i, \; v_j \geq 0$$

The above equation explains that the objective function of the equation is to maximize output with a constraint function that the input value is equal to one, so the output value minus the input value is less than or equal to 0. For the DEA model the BCC is still guided by the general DEA mathematical model and modification of DEA CCR model by adding connectivity constraints to the equation so that the mathematical formula becomes:

$$\text{Max. } h_s = \sum_{i=1}^{m} u_i y_{is} + U_0$$

$$\text{st.} \sum_{i=1}^{m} u_i y_{ir} - \sum_{j=1}^{m} v_j x_{jr} \leq 0 \quad ; \; r = 1,\ldots,N \quad \ldots\ldots\ldots\ldots\ldots\ldots(4)$$

$$\sum_{j=1}^{m} v_j x_{js} = 1$$

$$u_i, \; v_j \geq 0$$

where U_0 is a piece that can be positive or negative.

The data we used in this study is quarterly data from the financial statements from 2012 to 2017. As for the input variables, it applied labor cost, fixed asset and deposit. As for the output variables, it utilized *Sharia* lending and Operating income. There were 11 *Sharia* Bank selected for the sampling.

Results

Based on the results of the research in table 1 below, it shows that the highest efficiency value during the period before implementation in 2012-2014 was 0.92 (*Sharia* Maybank) with an average efficiency value of 0.57. This means that during this period there was room to increase efficiency by 0.35. While the period after implementing in 2015-2017 the highest efficiency value was 0.87 (*Sharia* Maybank) with an average efficiency value of 0.59. This means that during this period there was room to increase efficiency by 0.28. This means that overall during the 2012-2017 period there were no significant wears from the implementation of the Islamic banking road map. While the average Islamic banking efficiency is 0.58, with the highest efficiency value is 0.9. this means there is room to increase efficiency by 0.32.

Table 1. Efficiency Score of *Sharia* Bank in Periode 2012-2017

No	Bank	Eff-Score 2012-2014	Bank	Eff-Score 2015-2017	Bank	Eff-Score 2012-2017
1	Maybank Syariah	0,92	Maybank Syariah	0,87	Maybank Syariah	0,90
2	Panin Syariah	0,74	Panin Syariah	0,80	Panin Syariah	0,77
3	BNI Syariah	0,60	Victoria Syariah	0,66	BNI Syariah	0,61
4	BJB Syariah	0,55	BNI Syariah	0,61	BCA Syariah	0,58
5	BCA Syariah	0,55	BCA Syariah	0,61	Victoria Syariah	0,53
6	Muammalat	0,54	Bukopin Syariah	0,53	BJB Syariah	0,53
7	Bukopin Syariah	0,51	BJB Syariah	0,51	Bukopin Syariah	0,52
8	Mandiri Syariah	0,51	BRI Syariah	0,50	Muammalat	0,51
9	BRI Syariah	0,50	Muammalat	0,49	BRI Syariah	0,50
10	Mega Syariah	0,48	Mega Syariah	0,45	Mega Syariah	0,47
11	Victoria Syariah	0,41	Mandiri Syariah	0,42	Mandiri Syariah	0,46
	Mean	**0,57**	**Mean**	**0,59**	**Mean**	**0,58**
	Highest	0,92	Highest	0,87	Highest	0,90
	Improvement Score	0,35	Improvement Score	0,28	Improvement Score	0,32

t-Test Analysis value of efficiency Between 2012-2014 and 2015-2017

To test the hypothesis in the study used t-Test: Paired Two Sample for Means with the help of excel. The t-Test results can be seen in table 4-4 below. Based on the results of the t-test shows that the P-value for two tail = 0.706. So based on this trend the P-value is greater than α = 0.05 (P-value> α). In the condition of P-value> α, H1 is rejected, meaning that there is no change in the value of efficiency between the period 2012-2014 and the period 2015-2018. With this conclusion, it can be said that the implementation of the 2015-2018 Indonesian *Sharia* Banking Roadmap has not been able to improve the efficiency of sharia in general banking.

t-Test: Paired Two Sample for Means

	2012-2014	2015-2017
Mean	0.574286258	0.585153326
Variance	0.020046715	0.020837241
Observations	11	11
Pearson Correlation	0.790066026	
Hypothesized Mean Difference	0	
df	10	
t Stat	-0.38890022	
P(T<=t) one-tail	0.352751091	
t Critical one-tail	1.812461123	
P(T<=t) two-tail	**0.705502181**	
t Critical two-tail	**2.228138852**	

Discussion

For the detailed, three banks that have perfect efficiency discussed below :

Maybank *Sharia*

During the observation period, the efficiency value of *Sharia* Maybank was almost consistently the highest among the ten other Islamic banks, In general it was quite volatile with an average value of 0.90. From 2012 to 2017 the output variable was an increasing trend in Operating Income but there was a downward trend in Financing. Whereas in the input variable, the increasing trend occurs in Fixed Assets and Employee Costs but there is a downward trend in the Savings Fund. This shows that although the amount of funds collected from the community in the form of savings funds has decreased, it also affects the decrease in the amount of financing that can be channelled to the community, but the operating income earned has increased.

Panin *Sharia*

During the observation period, Panin *Sharia* efficiency values were almost consistently the second highest among nine other Islamic commercial banks with efficiency scores of 0.77. From Panin Syariah's financial data, the trend of Panin Syariah deposit and financing funds since the first quarter of 2012 until the second quarter of 2017 shows a tendency to increase which is relatively consistent, but since the second quarter of 2017 until the fourth quarter 2017 shows a

negative trend. Operating income, despite the tendency to increase positive deposit funds from the first quarter of 2012, looks stable despite fluctuations. But in the first quarter of 2015 there was an increase even though it tended to be stable afterwards, in other words there was no increase even though it did not decline. What needs to be considered in the Panin Syariah case is, although there is a tendency for an increase in deposit funds to have a similar trend effect on financing but does not have the same effect on operating income.

BNI *Sharia*

BNI *Sharia* efficiency value shows that the value of efficiency is quite volatile with an average of 0.61. The trend of BNI *Sharia* deposit and financing funds since the first quarter of 2012 until the fourth quarter of 2017 has consistently shown an increasing trend. While operating income even though it had shown an increase starting from the second quarter of 2015 to the fourth quarter of 2015. However, it was quite volatile but tended to no growth after that, similar to the conditions before the second quarter of 2015. BNI *Sharia's* labor costs are very volatile but have a stable tendency during the observation period. While the fixed assets of BNI Syariah tend to increase with high growth

Furthermore, Finding from this research shows that the average labor cost incurred by Islamic banking is IDR 229 billion. Labor costs fluctuate significantly every quarter following a nearly identical pattern for Islamic Banking. Mandiri Syariah has the highest average cost of IDR 943 billion, and Victoria *Sharia* of IDR 17 billion owns the lowest average cost. The results showed that labor costs have a solid correlation to efficiency so that the strategy in managing labor costs is critical in increasing the efficiency and performance of Islamic commercial banks.

During the period 2012-2017, the amount of savings collected by Islamic banking was an average of IDR 14.3 trillion. The collection of deposit funds was achieved by Mandiri Syariah amounting to IDR 77.9 trillion in the 4th quarter of 2017, and the lowest collection was by Victoria Syariah of IDR 400 billion. The results showed that savings funds showed a negative correlation, this shows that in islamic banking, savings funds have not been optimazed for use, especially in terms of distribution to third parties. Therefore it is necessary to make a special strategy to balance between savings and distribution of funds to third parties.

The average value of Islamic banking assets in the periode 2012-2017 is IDR 454 billion. Asset value shows a negative correlation, this indicates that the use of assets in Islamic banking is less than optimal, so the merger of Islamic banking is something that needs to be done to improve the efficiency and performance of Islamic banking in Indonesia.

The financing of Islamic banking is dominated by four banks, Mandiri Syariah, Muamalat, BNI Syariah and BRI Syariah. In the period 2012-2017, shows that public trust in Islamic banking has increased. Still on the other hand, Islamic banking is experiencing difficulties in channelling financing, so a special strategy is needed to increase financing in Islamic banking.

Conclusion

In this study, using 11 *Sharia* Banks in Indonesia shows that using quarterly data during 2012-2017 can be summarized as follows the average of efficiency sharia Bank in Indonesia during the highest efficiency value during the period before implementation in 2012-2014 was 0.92 (*Sharia* Maybank) with an average efficiency value of 0.57. This means that during this period there was room to increase efficiency by 0.35. While the period after implementing in 2015-2017 the highest efficiency value was 0.87 (*Sharia* Maybank) with an average efficiency value of 0.59.

This means that during this period there was room to increase efficiency by 0.28. This means that overall during the 2012-2017 period there were no significant wears from the implementation of the Islamic banking road map. While the average Islamic banking efficiency is 0.58, with the highest efficiency value is 0.9. this means there is room to increase efficiency by 0.32. From the t-Test also found that the implementation of the 2012-2017 Indonesian *Sharia* Banking Roadmap has not been able to improve the efficiency of sharia bank. Future research of sharia bank efficiency should focus on what financial input elements has a direct impact on efficiency and align with the *Sharia* Banking Roadmap 2015-2019 efficiency strategies directions.

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