

Determinants of Islamic Banking Social Fund Management Efficiency in Indonesia: Two Stages Data Envelopment Window Analysis

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Abstract

The presence of Law No. 21 of 2008 concerning Islamic Banking mandates Islamic banking in Indonesia; apart from carrying out fund collection and distribution activities, it also must manage social funds. This is one of the things that differentiates it from practices in conventional banks. This research aims to analyze the level of Efficiency of management of Islamic banking social funds in Indonesia and the factors that influence it using Two-Step Data Envelopment Window Analysis (DEWA) analysis based on the Scale Efficiency assumption in the first stage and the second stage using pooled Tobit regression applied to 9 Islamic banks throughout the 2018 – 2022 period. The result shows that the level of efficiency in managing social funds of Islamic banks in Indonesia shows an improving trend every year. Return on Assets (ROA) has a positive and significant effect on the social efficiency of Islamic banking. Financing to Deposit Ratio (FDR) has no significant effect or does not have a natural effect on the social efficiency of Islamic banking. Capital Adequacy Ratio (CAR) has a negative effect and is significant.

Keywords: Islamic Banks, Social Funds, Efficiency, Data Envelopment Window Analysis

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1. INTRODUCTION

The presence of Islamic banking in the 1970s has provided unique color and development in the last 50 years, starting with the establishment of Mit Gamr Bank in Egypt in 1963, followed by the opening of commercial banking services for the first time by Dubai Islamic Bank in 1975 (Prasetyo et al., 2020). Efforts to re-emerge Islamic economics in the world community with a scientific conceptual offer and an economic system that seems to have only begun to be pursued on a massive scale since the modernist century, as has been the case in Indonesia, Islamic economics has felt massive since the emergence of Islamic banking activities in Indonesia which were pioneered by Bank Muamalat Indonesia in 1992 (Pantas et al., 2021).

The existence of Islamic banking for the last 31 years has provided its color and variation to the development of the banking industry. Sharia banking in Indonesia has experienced accelerated growth momentum since the enactment of Law No. 21 of

2008 concerning Sharia Banking. Even though it seems slow, the development of the Islamic banking industry in Indonesia shows relatively good progress. Data for January 2023, based on Islamic banking statistics, the number of Islamic banks has reached 13 Islamic Commercial Banks, 21 Islamic Business Units, and 168 Sharia People's Financing Banks with a total office network of 2,460 offices throughout Indonesia. Based on the 2019 Islamic Finance Country Index Report, the Islamic finance industry in Indonesia was in first place above other Islamic countries. Indonesia is ranked number one with a score of 81.93, overtaking Malaysia, which has dominated the index since 2011 (IFCI, 2019).

Referring to data from the Financial Services Authority or OJK (2023), Table 1 below explains the development of the number of Islamic Commercial Banks (BUS) and Islamic Business Units (UUS) along with the number of offices.

Table 1. Islamic Banking Office Network in Indonesia

	2018	2019	2020	2021	2022
Islamic Commercial Bank	14	14	14	12	13
▪ Banks	1.875	1.919	2.034	2.035	2.007
▪ Office					
Islamic Business Unit					
▪ Banks	20	20	20	21	20
▪ Office	354	381	392	444	438
Totat Office	2.229	2.300	2.426	2.479	2.445

Source: OJK (2023)

Based on the number of offices, there has been a downward trend in the last year, possibly due to operational efficiency strategies. Technology is very advanced and simplifies the Islamic banking business process without requiring too many physical buildings and a workforce. On the other hand, this growth was not accompanied by developments in the Islamic banking market share, which was at 10.41% of total national banking assets at the end of the year. Apart from being below the target set, when compared with the market share of conventional banks, the market share of Islamic commercial banks is still meager, even though, in recent years, the growth has been higher than in conventional banking.

Furthermore, Islamic banking has also experienced relatively significant growth in terms of financial performance. Extracted from the Financial Services Authority report (2023), it shows that the provision of capital compared to risk-weighted assets is increasing, above the minimum standards set by the OJK, as stated in Table 2. Then, from the ability to generate profits, both total assets (ROA) and average productive assets (NOM) also show positive progress. In terms of operational cost efficiency (BOPO), it is also getting better, where the BOPO rate is moving away from 100% from year to year. Regarding financing performance (FDR), Sharia banking has experienced a decline in numbers, which is still below the standard set by the OJK of 80 - 100%. On the other hand, Islamic banking has reduced the amount of problematic financing risk (NPF), which is getting smaller.

Table 2. Development of Sharia Banking Financial Performance.

Financial Indicators	2018	2019	2020	2021	2022
CAR (%)	20,39	20,59	21,64	25,71	26,28
ROA (%)	1,28	1,73	1,40	1,55	2,00
NPF (%)	3,26	3,23	3,13	2,59	2,35
FDR (%)	78,53	77,91	76,36	74,25	75,19
BOPO (%)	89,18	84,45	85,55	84,33	77,28
NOM (%)	1,42	1,92	1,46	1,66	2,59

Source: OJK (2023)

Observing the positive growth in the Islamic banking industry in Indonesia, especially in the financial aspect, the higher the risks that will be faced. In this context, OJK, as the supervisor and supervisor of financial business actors in Indonesia, has provided adequate instruments to control these risks. This may not apply to social funds managed by Islamic banking, such as zakat, infaq, shadaqah, waqf, and other benevolent funds. Meanwhile, the mandate of Law Number 21 of 2008 concerning Islamic Banking has been explained that Islamic commercial banks (BUS) and Islamic Business Units (UUS) are obliged to carry out the function of collecting and distributing public funds; Sharia Banks and UUS can carry out social functions in the form of baitul mal institutions, namely receiving funds originating from zakat, infaq, alms, grants, or other social funds and distributing them to zakat management organizations. BUS and UUS can collect social funds originating from cash waqf and distribute them to waqf managers by the wishes of the waqf giver.

Therefore, the study of social fund management is significant because Islamic financial institutions have two roles that must go hand in hand: business entity (*tamwil*) and social entity (*maal*). Therefore, apart from evaluating performance related to profit, Islamic banks also need an evaluation of how the institution carries out its role as a social body, which leads to community welfare.

According to Hayati & Putri (2020), Efficiency can be defined as a comparison between output and input, a company is said to be efficient if it can produce greater output when compared to other companies that use the same amount of input or produce the same amount of output, but the amount of input used less input than other companies. Currently, Islamic banks face a more diversified market share and intense competition (S. Ahmad & Rahman, 2012),

so Efficiency is the key to the market structure desired by the banking industry (Mala et al., 2018). Consequently, Islamic banking must maintain Efficiency because it can positively encourage financial stability (Abbas et al., 2016; Ismail et al., 2013).

This study is preliminary in assessing the performance of Islamic banking in managing social funds, especially in assessing Efficiency. Efficiency is crucial in Islamic banking because it is related to utilizing resources for productive financial activities or output (Miah & Uddin, 2017). Islamic banks also need to evaluate how the institution carries out its role as a social body, which is then expected to become a reference for decision-making or related regulations.

LITERATURE REVIEW

Currently, the literature on efficiency in financial institutions has developed rapidly and is studied by many researchers through parametric and non-parametric approaches. In the context of Islamic banking, studies on efficiency generally conclude that Islamic banking has yet to operate efficiently (S. Ahmad & Rahman, 2012; Hidayati et al., 2017; Rusydiana, 2018; Wahab & Haron, 2017). Islamic commercial banks (BUS) are more efficient than sharia units (UUS) but are less efficient than conventional banks (Abbas et al., 2016; Al-Khasawneh et al., 2012; Rozzani & Rahman, 2013). An efficient Islamic bank is a bank with a small market share and low NPF (Sakti & Mohamad, 2018). Foreign Islamic banks are more efficient than local ones (Ahmad & Luo, 2010).

It should be emphasized that all the research above is only focused on the financial analysis of Islamic banking. Furthermore, researchers consider that previous studies have missed one crucial aspect of Islamic banking operations as one of the main pillars of the development of the Islamic economic system in the world, namely the social aspect. This is very important because Islamic financial institutions have two roles that must go hand in hand: business entities (*tamwil*) and social entities (*maal*), as mandated by Law No. 21 of 2008 concerning Islamic Banking. In this article it is explained that Sharia Banks and UUS are obliged to carry out the function of collecting and distributing public funds and can carry out social functions in the form of *baitul mal* institutions, namely receiving funds originating from zakat, infaq, alms, grants, or other social funds and

distribute them to zakat management organizations (RI, 2008).

Therefore, apart from evaluating performance related to profit, Islamic banks must also evaluate how the institution carries out its role as a social body. Research on social fund management in Islamic banking, especially in Indonesia, is still relatively minimal, including research conducted by Putra et al. (2018), which aims to analyze the level of efficiency of social funds in Islamic banks using Data Envelopment Analysis (DEA) techniques in sharia commercial banks (BUS) in Indonesia in 2013-2017 with an output-oriented VRS approach. The input variable is the receipt of zakat and benevolent funds, while the output variable is the use of zakat and benevolent funds. The results of Islamic bank efficiency calculations show that during the observation period, there were 5 BUS that were efficient in managing their social funds.

Based on the research gap above, this research will analyze the efficiency level of Islamic banking in managing social funds. Furthermore, this research also uses a more specific analysis tool than several previous studies, namely Data Envelopment Window Analysis (DEWA).

2. RESEARCH METHOD

The research objects are 9 Islamic Commercial Banks (BUS) in Indonesia. Research objects are selected based on the available data that researchers can access. Data was obtained using the documentation method in the form of annual data accessed from the annual reports of each Islamic bank for 2018 - 2022. The determinants of social efficiency in Islamic banking in Indonesia were analyzed in two stages.

First, efficiency analysis with Data Envelopment Window Analysis (DEWA) using EMS 1.3 Software. The input variables (X) used are the receipt of zakat funds (X1) and the receipt of benevolent funds (X2). Then, the output variables (Y) used are the use of zakat funds (Y1) and the use of benevolent funds (Y2). Second, the DEWA measurement score will be used as a dependent variable, and the *pooled tobit model* will be used to analyze the determinants of the level of social efficiency of Islamic banking in Indonesia. The independent variables whose influence will be tested are independent Amil Zakat Institution (LAZ) ownership (dummy 0 and 1), ROA, FDR, and CAR.

2.1. Data Envelopment Window Analysis (DEWA)

One frontier approach that is generally used to calculate bank efficiency is Data Envelopment Analysis (DEA). Data Envelopment Analysis calculates efficiency values for all Islamic banking units. Data Envelopment Analysis is a procedure specifically designed to measure efficiency values that use many inputs and many outputs, where combining these inputs and outputs cannot be done.

DEA is applied to a set of homogeneous units, called decision-making units, and seeks to maximize the efficiency of each unit as defined through the ratio of the weighted sum of outputs to the sum of weighted inputs (Davoodi & Rezai, 2012). The concept behind this method is to allow each unit to weigh its production inputs and outputs in such a way that it achieves the maximum possible efficiency compared to other units in the sample (Thore & Tarverdyan, 2022). Put differently, each unit is allowed, in effect, to consider its production practices as best by weighing inputs and outputs most favorably (Charnes et al., 1978).

The disadvantage of DEA is that efficiency measures are defined relative to the best practice limits of the sample examined. As a result, DMUs that are considered efficient are only efficient with others in a given sample (Sathye, 2003). Therefore, it is generally meaningless to compare scores between two different samples because all calculations are based on best practice limits whose differences are unknown. As a result, even comparing the efficiency of the same unit in two different periods needs to be made more credible. To overcome the subtle point of DEA that hinders the comparison of efficiency scores over time (i.e., changes in efficiency), one can move from the so-called contemporary perspective, where a unique frontier is derived for each period, to the so-called intertemporal perspective where a single frontier covering the entire period is defined (Asmild et al., 2004).

The basic idea in this latter framework is to treat each unit as if it were a different unit in each reporting period. Thus, the performance of a unit in a certain period is compared with its performance in other periods as well as with the performance of other units. Although, in this latter perspective, year-on-year comparisons can be made, this approach implicitly

assumes that there have been no substantial technical changes over the entire period (Shawtari et al., 2018).

This method was initially proposed by Charnes et al. (1984) to measure efficiency in cross-sectional and time series data. Furthermore, when window-DEA is applied, the number of observations taken into account is multiplied by a factor equal to the window width, which is quite helpful when dealing with small sample sizes as it improves the method's discriminant ability (Webb, 2003). So, this research uses an analysis technique, namely a non-parametric method analysis technique called Data Envelopment Window Analysis (DEWA).

2.2. Tobit Regression

The second stage of data analysis in this research uses the method Pooled Tobit to analyze the determinants of the level of social efficiency of Islamic banking in Indonesia. By first getting the efficiency value in the first stage using the DEWA method, this value will be explained using several independent variables to determine the influence of these variables on the efficiency level. The Tobit method is used because the data used in this research is censored; if the Ordinary Least Square (OLS) method is used, the regression results will be biased and inconsistent (Wicaksono et al., 2023).

According to Suhardi & Llewelyn (2001), the Tobit method assumes that the independent variables have unlimited value (non-censored); only the dependent variable is censored; all variables (both independent and independent) are measured correctly; no auto-correlation; no heteroscedasticity; there is no perfect multicollinearity; and the mathematical model used is correct. This kind of data structure is called censored data. The Tobit regression equation in this research is as follows:

$$DEWA_{it} = \beta_0 + \beta_1 (dummy_ROA)_{it} + \beta_2 (FDR)_{it} + \beta_3 (CAR)_{it} + v_{it}$$

3. RESULT AND DISCUSSION

3.1. First Stage: Efficiency Measurement

The results of measuring the social fund's efficiency of 9 Indonesian Islamic banks through the Data Envelopment Window Analysis (DEWA) approach in the 2018-2022 period can be seen in Table 3.

Tabel 3. Level of Efficiency of Islamic Banking Social Funds

Banks	2018	2019	2020	2021	2022
PT. Bank Syariah Indonesia	0,9678	0,9895	1	1	1
PT. Bank Muamalat Indonesia	0,9678	1	1	1	1
PT. BCA Syariah	0,9973	1	1	0,9669	1
PT. Bank Victoria Syariah	0,9607	1	0,8991	1	1
PT. BTPN Syariah	0,8529	0,8587	0,9395	0,8115	0,7682
PT. Bank Aceh Syariah	0,3810	0,4587	1	0,9444	1
PT. Bank Panin Dubai Syariah	1	1	0,8799	1	1
PT. Bank Mega Syariah	0,5997	0,7175	0,8437	0,9906	1
PT. Bank Syariah Bukopin	1	0,8498	1	1	1
Mean	0,8586	0,8749	0,9514	0,9682	0,9706

Source: EMS 1.3 output (processed data)

Based on the results of calculating the efficiency of social funds at nine Islamic Commercial Banks (BUS) in Indonesia in 2018 – 2022, it is known that Islamic banks were only able to achieve almost perfect efficient conditions in the last two years, namely 2021 and 2022. The previous three years were not able to achieve this. Achieving efficient conditions can be seen from the average efficiency value < 1 . This shows that from 2018 to 2019, Islamic banks experienced a misallocation of resources, resulting in inefficiency in managing social funds in the form of zakat and benevolent funds. Interestingly, during the observation period, only 3 DMUs experience inefficiency and are spread over three different periods. In 2020, the Sharia banks that experienced inefficiency were Bank Panin Syariah and Bank Mega Syariah. In 2021, the Islamic banks experiencing inefficiency are 5 Islamic banks with an average value of 0.9535. In 2022, the Islamic bank that experienced inefficiency was Bank BTPN Syariah, with a value of 0.7682. In other words, the three Islamic banks could not achieve efficient conditions throughout the observation period.

This finding supports research results from previous researchers, such as Endri (2008), Warraich & Khyzer (2013), (Firdaus & Hosen, 2013), and Pambuko (2016). On the other hand, this research is not in line with the findings of Sufian (2014) because it was found that Islamic banks with a small market share had lower levels of efficiency than larger Islamic banks. The cause of the inefficiency conditions above can be identified by looking at the results of the potential improvement analysis. The available information explains that identical sources of problems cause the inefficiency condition for the three Islamic banks above. The cause is the inability to

allocate existing resources in the form of a less-than-optimal output, namely the distribution of zakat and benevolent funds to the community. Therefore, Islamic banks need to increase the distribution of social funds managed directly or through zakat management institutions designated by Islamic banking.

3.2. Second Stage: Determinants of Efficiency

Test of determinants or influencing factors social efficiency in Islamic banking for the 2018-2022 period using the Tobit method can be seen in Table 4 below.

Tabel 4. Tobit Regression Analysis Results

Variable	Coefficient	Std. Error	z-Statistic	Prob
C	0.850730	0.071004	11.98138	0.0000
ROA	0.240328	0.233276	1.030229	0.0429*
FDR	0.000888	0.001149	-0.772915	0.4396
CAR	-1.011925	0.016555	0.720316	0.4713*

Source: EViews 9 output (processed data)

Based on the analysis results in Table 4, it is known that Return on Assets (ROA) has a positive and significant effect. In contrast, the financing-to-deposit ratio (FDR) has no significant effect or has no real influence on the social efficiency of Islamic banking. Then, the Capital Adequacy Ratio (CAR) negatively and significantly affects the efficiency of Islamic banking social fund management.

ROA has a positive and significant effect on the efficiency of Islamic banking, as can be seen from the coefficient value of 0.240328 and Prob. $Z < 5\%$. In other words, the greater the profits obtained from the assets controlled, the more efficient Islamic banking will be in managing its social funds. In line with the information in the previous discussion, these findings indirectly support the research of Sufian (2007), Pambuko (2016), and Firdaus and Hosen (2013).

FDR has no significant effect on social efficiency Islamic banking. This means the amount of funds distributed to the community from Third Party Funds (DPK) needs to make a more critical contribution to the level of social efficiency of Islamic banking. This is made possible by financing activities in Islamic banking, which still need to be integrated with social activities (*maal*). These results do not support the findings of Sufian (2007), Sufian and Noor (2009), and Pambuko (2016).

CAR has a negative and significant effect on Islamic banking productivity, which can be seen from the coefficient value -1.011925 and Prob. $Z < 5\%$. In other words, the greater the Islamic banking capital reserves to cover risks, the lower the level of Islamic banking productivity in managing social funds. Based on the results of DEWA's analysis, it is known that the efficiency of Islamic banking is linear with the level of productivity of Islamic banks, or in other words, Islamic banks that are efficient will be productive, so this may reflect a risk-return trade-off. Indirectly, these results support the findings of Firdaus and Hosen (2013) and Adjei-Frimpong et al. (2014), which revealed that CAR negatively affects efficiency.

4. CONCLUSION

This research was conducted to assess the efficiency level and analyze the determinants of the efficiency of Islamic banking social funds in Indonesia for the 2018-2022 period using the Two-Stage Data Envelopment Window Analysis approach. The first step uses the DEWA approach, and the next uses the Tobit regression model.

The first stage of testing shows that the level of efficiency in managing social funds of Islamic banks in Indonesia shows an improving trend every year. This can be seen from the last two years of the research period, where almost all banks included in the observation had an efficiency value of 1.

The second phase of the research revealed several critical results. Among other things, Return on Assets (ROA) has a positive and significant effect on the social efficiency of Islamic banking, Financing to Deposit Ratio (FDR) has no significant effect or does not have a natural effect on the social efficiency of Islamic banking, then Capital Adequacy Ratio (CAR) has a negative effect and significant.

The available information explains that identical sources of problems from Islamic banks in Indonesia cause inefficiency. This is due to the inability to

allocate existing resources in the form of a less-than-optimal output, namely the distribution of zakat and benevolent funds to the public. Therefore, Islamic banks need to increase the distribution of managed social funds directly or through zakat management institutions, as indicated by Islamic banking.

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