Productivity of Islamic Banks in Indonesia: Social Funds versus Financial Funds*

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Abstract

Under the Act No. 21 of 2008, Islamic banks in Indonesia as an intermediary institution are obligated to manage the resources simultaneously, the financial funds as well as the social funds, e.g. zakah, infaq, and sadaqah. This study aims to investigate the productivity change of social funds and financial funds of Islamic Banks in Indonesia. Non-parametric tests of Malmquist Productivity Index (MPI) is applied to annual data from period 2012 to 2017, encompassing post-reform of banking authority from Bank Indonesia to The Financial Services Authority (OJK) at 2012. The samples are nine Islamic banks in Indonesia which were able to provide the data during observation period. The results indicate that social funds are more productive than financial funds and productivity change tends to trade off. The productivity of social funds is progressed by 8.2% while the financial funds is regressed by 5.4%. Overall, the productivity change of Islamic banks is influenced by technological aspect rather than the efficiency aspect. Besides, BRI Syariah is the best performer in managing financial funds while BCA Syariah as the best performer in social funds. It implies that the policymakers may strengthen the supervisory and coaching to increase the Islamic banks' productivity in both activities.

Keywords: Financial Funds, Islamic Bank, Productivity, Social Funds, Technological Changes.

JEL Classification Code: C2, G3, K2, N2, P4, R5.

1. Introduction

Islamic banking has appeared on the financial systems as a new intermediary institution (Abbas, Hammad, Elshahat, & Azid, 2016). More than 300 Islamic banks operate worldwide and spread across 50 economies in both Muslim

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and non-Muslim countries (World Bank & IDB Group, 2016). The banking sector also controlled 73% of assets which reached USS $ 1.6 Trillion in 2016 and Iran, Saudi Arabia, and Malaysia are the market leaders (Reuters, 2017). Therefore, the growth of Islamic banking is one of the fastest in the financial industry (Olson & Zoubi, 2017).

The research on productivity analysis of financial institutions has developed quite rapidly and has been studied by many researchers. Few studied has discussed the productivity analysis of social funds in Islamic banks. For instance, Islamic Banks in Indonesia have different intermediation role that another country after the government issued an Act (The Act No. 21 of 2008) that obligated the Islamic banks to manage the financial funds and social funds simultaneously. It is also a unique and special case for Indonesia.

2. Literature Review/Research Background

As in the infancy stage, in many countries, the market share of Islamic banks are still meagre as compared with the conventional banks, including Indonesia although the

most populations are Muslim (Pambuko, Ichsan, & Anto, 2018). However, we highlight that Islamic banks in Indonesia also have reached enormous growth in the past six years. Table 1 shows the growth of assets, deposits, and financing is still outstanding were grew by 19.08%, 18.47%, and 18.54%, respectively on average from December 2012 until October 2018. Its more competitive than conventional banks despite the market share per December 2018 is 5.92% which only increased by 25.3% in the last six years (OJK, 2018).

Based on the performance, the Islamic banking industry is feasible to be limelight for Islamic banks managers, stakeholders, and policymakers (Kamarudin, Sufian, Loong, & Anwar, 2017). This thing emphasizes that Islamic banks ready to compete with conventional banks. Therefore, Islamic banks need to improve efficiency and productivity as the booster to control costs and maximize revenues to enhance the competitiveness in the industry (Akhtar, 2010). Besides, productivity analysis is fundamental because it is one of performance measurement and is possible to be a factor that is regarded in decision making (Hseu & Shang, 2005).

Nowadays, the literature on productivity in financial institutions has developed quite rapidly and has been studied by many researchers. For Islamic banking, studies on productivity generally conclude that Islamic banks' productivity continues to increase (Afiatun & Wiryono, 2010; Arjomandi, Harvie, & Valadkhani, 2012; Rodoni, Salim, Amalia, & Rakhmadi, 2017). After spinning off, Islamic banks also increased their productivity (Norfitriani, 2016; Pambuko, Usman, & Andriyani, 2019). It also applies to the conditions after Islamic banks are merged (Kamarudin, Hue, Sufian, & Anwar, 2017). The full-fledged Islamic banks experience higher productivity than Islamic windows (Sufian, 2007). Foreign Islamic banks are more productive than domestic one (Kamarudin et al., 2017). But, other researchers mention that Islamic banks have to regress its productivity (Bahrini, 2015; Johnes, Izzeldin, & Pappas, 2015; Sufian, 2005).

However, to the best of our knowledge, the previous research is only focused on the financial analysis of Islamic banking. It had missed an essential aspect of the Islamic banks' operations as one of the principal pillars for developing the Islamic economic system, namely the social issue. It is a fundamental cause of Islamic financial institutions have two roles that must do simultaneously, business entity (*tamwil*) and social entity (*maal*). Article 4 of Indonesian Law Number 21 of 2008 explained that Islamic Banks are obliged to carry out the function of collecting and distributing public funds and can carry out social services in the form of *Baitul Mal* institutions, such as receiving funds derived from *zakat*, *infaq*, alms, grants or other social funds and channel them to zakat management organizations, if any (RI, 2008). The performance of financial funds and social funds are expected to be different, especially in its purposes. Financial funds are expected to increase shareholders' wealth through maximizing profits (Olson & Zoubi, 2008), while social funds are used to realize social welfare through social investment elements.

3. Data and Methodology

3.1. Malmquist Productivity Index

Malmquist Productivity Index (MPI) forms a measure of productivity change and efficiency evaluation of a DMU among two periods (Caves, Christensen, & Diewert, 1982; Nishimizu & Page, 1982; Renaud, 1971). It is based on the output distance function. Implicitly, the assumption built into this comparison is all DMUs have equal access to production technology. Therefore, this method can be compared among DMUs and estimated with a single production frontier (Huang, Juo, & Fu, 2015).

Malmquist productivity index (MPI) generates primary output called total factor productivity (TFP) as the representation of overall productivity. It can be decomposed into two components, namely efficiency change and technological change. For measuring the productivity, Fare, Grosskopf, Norris, and Zhang (1994) use a linear programming model based Data Envelopment Analysis (DEA) with the non-parametric Malmquist productivity index. Output-based Malmquist productivity index specifies as follows (Fare et al., 1994).

Table 1: The Performance of Islamic Banks in Indonesia 2012-2018 (IDR x Million)

	Dec-12	Dec-13	Dec-14	Dec-15	Dec-16	Dec-17	Dec-18	Average Growth
Asset	195,018	242,276	272,343	296,262	356,504	424,181	454,249	
Growth (YoY)	**34.06**	**24.23**	**12.41**	**8.78**	**20.33**	**18.98**	**12.53**	**18.76**
Deposit	147,512	183,534	217,858	231,175	279,335	334,888	355,919	
Growth (YoY)	**27.81**	**24.42**	**18.70**	**6.11**	**20.83**	**19.89**	**11.03**	**18.4**
Financing	147,505	184,122	200,177	213,989	249,087	286,913	313,989	
Growth (YoY)	**43.69**	**24.82**	**8.72**	**6.90**	**16.40**	**15.19**	**11.99**	**18.24**

Source: OJK (2018)

$$m_0(y_{t+1}, x_{t+1}, y_t, x_t) = \left[\frac{d_0^t(x_{t+1}, y_{t+1})}{d_0^t(x_t, y_t)} x \frac{d_0^{t+1}(x_{t+1}, y_{t+1})}{d_0^{t+1}(x_t, y_t)} \right]^{\frac{1}{2}} \dots \dots (1)$$

It reflects the production point's productivity (x_{t+1}, y_{t+1}) relative to the production point (x_t, y_t). This index is the geometric mean of two output-based Malmquist index. One index uses period t technology and the other period t+1 technology. An index higher than one represent the positive TFP growth from period t to t+1 (Coelli, Rao, O'Donnell, & Battese, 2005). In an output-oriented evaluation, index more than 1 indicates the progress in productivity, while index equal to 1 indicates the status quo and index less than 1 indicates the regress in productivity.

3.2. Data and Selection of Variables

This study conducts in Indonesia, and at present, there are 14 Islamic banks and 20 Islamic Windows. The sample of the study is 9 Islamic banks (Table 2) as we cannot reach the desired input-output variables. Data has collected from the Islamic banks' annual reports and other related documents over the period of 2012 to 2017 (with a total of 54 DMU's). The period is used following the changes in the authority of supervisory and coaching for the financial industry from Bank Indonesia to the financial services authority (OJK) based on the Law Number 21 of 2011.

Table 2: List of Selected Islamic Banks

Bank Muamalat (BMI)
Bank Syariah Mandiri (BSM)
Bank Mega Syariah (BMS)
Bank Rakyat Indonesia Syariah (BRIS)
Bank Panin Syariah (BPS)
Bank Syariah Bukopin (BSB)
Bank Negara Indonesia Syariah (BNIS)
Bank Central Asia Syariah (BCAS)
Bank Victoria Syariah (BVS)

DEA analysis sets the requirements to achieve optimum results, one of it is the number of observations. For this reason, the observed number of Islamic banks should be equal to or larger than the number of input and output variables (Boussofiane, Dyson, & Thanassoulis, 1991). Based on the literature review, we acquire three output variables and two input variables for financial funds; and two output variables and two input variables for social funds. Hence, the requirement has met.

For financial funds, the outputs are y1: operating income, y2: other operating income, and y3: financing; while the inputs are x1: revenue sharing for the investment fund, and x2: other operating expenses. For social funds, the outputs are y1: zakat distribution and y2: charity distribution; while the inputs are: x1: zakat fund and x2: charity fund. All variables are denoted in a million (IDR).

The selected variables of financial funds are used as indicated by Kamarudin et al. (2017) who state that financial institutions are seen as intermediating funds between savers and investors. Moreover, the intermediation approach is used where Islamic banks collect the deposits and other liabilities and finance it in productive sectors. Then, the selected variables of social funds developed from available data which is reported by Islamic banks.

Table 3 shows the descriptive statistics for 9 Indonesian Islamic Banks related to the input and output variables for all years of 2012 to 2017.

The statistics in Table 3 shows that there are large variations between DMU's of Indonesian Islamic banks concerning the input and output variables. For financial funds, the variable of the other operating income has the largest degree of variation. On the other hand, in term of the social funds' variables, charity distribution has the largest degree of variation while the other social funds' variables also had large variations. In this case, only a few Islamic banks have conducted the funding and distributing the social funds as well as their activities in managing the financial funds based on quantity. We assume that social funds are the secondary activities for Islamic banks, especially in Indonesia.

Table 3: Summary of Descriptive Statistics about Islamic Banks (IDR x Million)

Variable		Max	Min	Mean	Std. dev
Financial Funds	Operating Income (y1)	7,493,417	83,490	1,910,783	2,058,973
	other operating income (y2)	1,192,864	6,740	245,358	309,533
	Financing (y3)	79,715,798	848,958	19,490,506	22,300,458
	revenue sharing for investment fund (x1)	3,352,239	39,461	858,540	890,619
	other operating expenses (x2)	5,581,408	34,308	1,028,319	1,210,619
Social Funds	Zakat Distribution (y1)	50,794	0	7,704	10,819
	Charity Distribution (y2)	37,111	0	1,996	5,738
	Zakat Fund (x1)	37,282	0	7,310	9,317
	Charity Fund (x2)	73,738	12	5,014	13,960

4. Results and Discussion

The Malmquist Productivity Index (MPI) elaborated into three components: technological change (TECHCH), efficiency change (EFFCH), and productivity change (TFPCH). The trends of Islamic banks' productivity for the last six years as well as the patterns of the three components are described as follows.

4.1. The Outline of the Islamic Banks Productivity Index

The Islamic Banks' productivity in this study divided into two parts, the financial funds' productivity analysis as well as social funds. The productivity in financial funds (Figure 1 (a)) is progress only on 2014-2015 by 14.4%, and the social funds (Figure 1 (b)) is happening on two periods, 2013-2014 and 2015-2016 by 42.2% and 56.4%, respectively. The result also shows TECHCH and TFPCH have identical patterns over the period, while EFFCH has a different pattern, both of financial funds and social funds.
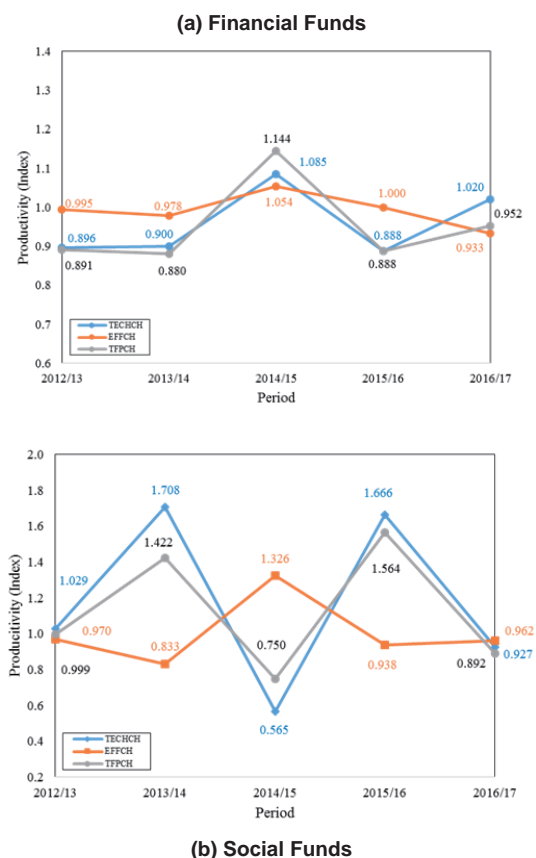

(a) Financial Funds

(b) Social Funds

Figure 1: The Trend of Productivity Change of Islamic Banks during 2012-2017

Similarly, Table 4 and Table 5 illustrate the recapitulation of productivity change, efficiency change, and technological change. The results show the productivity of Islamic banks is more affected by technological change rather than efficiency change (Rodoni et al., 2017). Therefore, the movement of Islamic Banks to response the technological changes are more effective than their achievement in efficiency. According to Abbas et al. (2016), Islamic banks should care about presenting new technologies and capital equipment that deliver positive changes in the production frontier. It can be the availability of sufficient ATM networks, changes in traditional payment point systems with mobile and internet banking and supported by the availability of quality human resources that reduce error rates, cost of training, and improve service excellence.

Table 4 illustrates the productivity change of financial funds of 9 Islamic banks in Indonesia for all years 2012 to 2017. The results indicate that TFPCH means for financial funds is regress by 5.4% (0.946). The result lends strong support to previous studies conducted by Bahrini (2015); Johnes, Izzeldin, and Pappas (2015); and Sufian (2005). The regress in financial funds' productivity is due to the deterioration in technological change (TECHCH) by 4.5% (0.955) and the deterioration in efficiency change (EFFCH) by 0.9% (0.991). Moreover, the deterioration in efficiency change is caused by the regress in pure efficiency change (PECH) or managerial aspects by 1.2% (0.988) despite the scale efficiency change (SECH) progresses by 0.3% (1.003).

Over the period, the results for individual Islamic banks confirmed that only one Islamic bank (namely BRI Syariah by 4.1%) is experienced the progress in managing the financial funds and eight other Islamic banks are experienced the regress of their productivity. Islamic banks that experienced the regress of productivity change in managing financial funds are Bank Muamalat (3.0%), Bank Mandiri Syariah (4.1%), Bank Mega Syariah (8.2%), Bank Panin Syariah (19.1%), Bank Bukopin Syariah (1.0%), BNI Syariah (6.1%), BCA Syariah (5.9%), and Bank Victoria Syariah (3.3%).

Furthermore, the progress of BRI Syariah productivity is affected by the progress of efficiency change by 4.5% (1.045) despite the technological change is experienced the regress by 0.3% (0.997). It also happens for 8 Islamic banks that are experienced the regress of their productivity in managing financial funds was entirely due to the inability to respond the technological change (TECHCH < 1). The condition makes Islamic banks still unable to compete with conventional banks as well as the market share is still small (OJK, 2018).

Table 4: Islamic Banks Cumulated Productivity Changes of Financial Funds 2012-2017

firm	Technological Change (TECHCH) 2012-2017	Efficiency Change (EFFCH) 2012-2017	Productivity Change (TFPCH) 2012-2017
BMI	0.957	1.013	0.970
BSM	0.959	1.000	0.959
BMS	0.920	0.998	0.918
BRIS	0.997	1.045	1.041
BPS	0.947	0.853	0.809
BSB	0.969	1.022	0.990
BNIS	0.939	1.000	0.939
BCAS	0.938	1.003	0.941
BVS	0.967	1.000	0.967
mean	0.955	0.991	0.946
max	0.997	1.045	1.041
min	0.920	0.853	0.809
number of increase	0	4	1
number of decrease	9	2	8
number of no change	0	3	0

Table 5: Islamic Banks Cumulated Productivity Changes of Social Funds 2012-2017

firm	Technological Change (TECHCH) 2012-2017	Efficiency Change (EFFCH) 2012-2017	Productivity Change (TFPCH) 2012-2017
BMI	1.097	0.975	1.069
BSM	1.258	0.818	1.029
BMS	1.213	1.023	1.242
BRIS	1.043	0.920	0.959
BPS	1.076	1.094	1.176
BSB	0.910	1.000	0.910
BNIS	0.994	0.980	0.974
BCAS	1.054	1.200	1.265
BVS	1.210	0.976	1.180
mean	1.090	0.993	1.082
max	1.258	1.200	1.265
min	0.910	0.818	0.910
number of increase	7	3	6
number of decrease	2	5	3
number of no change	0	1	0

Table 5 shows the productivity change of social funds of 9 Islamic banks in Indonesia for all the years 2012 to 2017. The results indicate that TFPCH means for social funds are progress by 8.2% (1.082). It supports the findings from Pitaloka, Cholis, Islamiyah, and Pambuko (2018) and Putra, Syifadhiya, Widyastiti, and Pambuko (2018) which are stated that the social funds in Islamic banks are progressed. The progress is supported by technological change's progress (TECHCH) by 9.0% (1.090) while the efficiency change (EFFCH) is regress by 0.7% (0.993). Therefore, the progress of social funds' productivity mainly because of a technological change rather than efficiency change (Djaghballou, Djaghballou, Larbani, & Mohamad, 2018; Pambuko et al., 2019; Pitaloka et al., 2018; Putra et al., 2018; Wahab & Rahman, 2012). This finding is identical with financial funds' analysis.

The analysis on individual banks shows that 6 Islamic banks are experienced the progress in productivity in managing social funds, namely Bank Muamalat, Bank Mandiri Syariah, Bank Mega Syariah, Bank Panin Syariah, Bank BCA Syariah, and Bank Victoria Syariah. In addition, BCA Syariah has the highest progress in productivity by 26.5% and the lowest progress is Bank Mandiri Syariah by 2.9%. In term of assets, the small Islamic banks are more productive than the larger (Sufian & Noor, 2009). Furthermore, three other Islamic banks have experienced the regress in productivity and it due to the regress of technological change.

4.2. Productivity of Financial Funds Versus Social Funds

The achievement of Islamic banks in managing financial funds and social funds is known that these two activities have not been able to be synergized to bring out comparative advantages with conventional banks. It can be seen from Figure 2. where Islamic banks that are able to increase their productivity (x > 1) in managing financial funds experience a deterioration of productivity (x < 1) in managing social funds, and vice versa. Therefore, the trade-off behavior occurs in this case and Islamic banks need to improve their business processes in order that both activities can be appropriately managed without sacrificing each other.
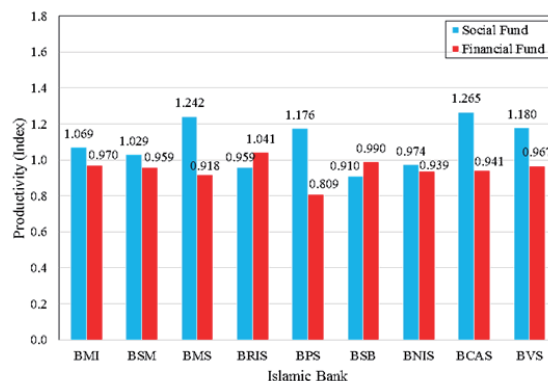
(a) Compared by Companies Means

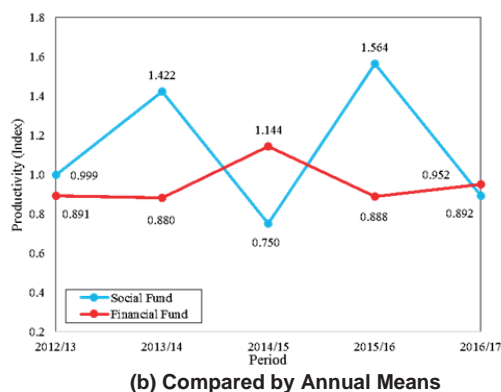**(b) Compared by Annual Means**
Figure 2: Productivity of Financial Funds vs Social Funds

Figure 2(a) shows the productivity change, both financial funds and social funds which are compared to companies' means. There aren't any Islamic banks that can be productive in both activities. The Islamic banks which are experienced the progress in managing financial funds or social funds always experienced the regress for other activities. In addition, the four Islamic banks which are the progress of their productivity for both activities are above the industrial average. The result also supported by the finding on the comparison by annual means in Figure 2(b). The evaluation of six years' observation shows one period on financial funds and two periods on social funds which are experienced the progress of productivity that caused by technological aspects rather than managerial aspects.

5. Conclusion

This study analyzed the productivity change of Islamic banks in managing financial funds and social funds over the period of 2012-2017 using Malmquist Productivity Index and a balanced panel dataset of 54 DMU's from 9 Islamic banks in Indonesia. The results indicate that social funds are more productive than financial funds. The productivity of social funds is progress by 8.2% while the financial funds is regress by 5.4% for the last six years. The Malmquist index also shows that the progress or regress in productivity is due to the technological aspect, Islamic banks should care about presenting new technologies and capital equipment that deliver the positive changes in the production frontier. The most important fact in this study is the trade-off in managing financial funds and social funds for Islamic banks. Therefore, the credential on Article 4 of Indonesian Law Number 21 of 2008 still cannot be carried out properly.

The findings provide the policymakers and Islamic banks' managers an important insight on the banks' performance. The policymakers may strengthen the supervisory and coaching to increase the Islamic banks' productivity in both activities while the Islamic banks' managers should need to improve their business processes to manage both activities simultaneously to avoid trade-off actions.

Due to its limitation, we suggest that this research can be expanded in several works. The researchers consider to extend the observation and comparing it with another country. In addition, the researcher also can discover the determinants of productivity level, especially for social funds, such as bank-specific and macroeconomic conditions.

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