

# The Nexus Between Operational Risk and Profitability in Islamic Banking

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**Abstract**— This paper aims to demonstrate the effect of operational risk on profitability in Islamic banks. The total of 14 Islamic banks in Indonesia for the period of 2016-2018 are selected to be the sample of this study. Operational risk is measured using cost to income ratio and cost to total asset ratio, meanwhile profitability is calculated by return on average asset and return on average equity. Bank's size, which is measured by log of total asset, is used as the control variable in this study. The findings show that the appropriate model in this study is Pooled OLS model and operational risk, which is measured by cost to total asset, is found to be positively related to profitability. This shows that the higher operational cost incurs by Islamic bank, the better the management of their risk.

**Keywords:** *operational risk, profitability, panel data, cost to income ratio, cost to total asset ratio*

## I. INTRODUCTION

With the growing interest in Islamic banking, the effect of risk on Islamic banking has also received quiet attention from scholars. In general, Basel committee recognizes at least four risks needed to be managed in banking system, namely, market risk, credit risk, liquidity risk and operational risk. Among other risks, operational risk is considered to be more complex as it involves many aspects in an organization and also impacted by many factors [1]. [2] mentions that operational risk is integral to all business process compared to credit risk or liquidity risk that are tend to be specific to one business area.

Operational risk refers to the risks caused by the failed internal process, people and systems [3]. In the case of Islamic banks, operational risk may also rises from the possible losses as a result of sharia non-compliance and failure in fiduciary [4]. Scholars point out that the difference in nature between conventional and Islamic banks caused their exposure to operational risks also differs [1]. [5] asserted that the complexity of contracts in Islamic banks increase moral hazard that will give impact on the operational, credit and market performance of the banks. The importance of managing operational risk in Islamic banks has been highlighted by Ahmad et al (2009) as cited in [2] that found operational risk to be the second highest risk after credit risk in the operation of Islamic

banks. [6] explains that lack of the management practices in risk hedging may be one of the causes of the slow growth of Islamic banks. Therefore, it is important to analyse the effect of operational risk on the performance of Islamic banks.

Many researchers try to explore the relationship between operational risk on the performance of banks and yield different results. [7] examines the effect of operational risk on profitability of commercial banks in Kenya and found that it is negatively associated with bank profitability. This result also supported by [5], [8]–[11], however, most of these research use conventional banks as their sample study. One study specifically analyse the impact of Islamic banks risk on profitability in 24 countries in 2015 and found that operational risk has negative effect on two profitability proxies, namely, return on average asset (ROAA) and return on average equity (ROAE). In contrast, study by [12] and [13] found a positive association between operational risk and bank's profitability using conventional banks as their sample study. We believe that there is still limited study that investigates the relationship between operational risk and bank's profitability, especially for Islamic banking. Therefore, this research will try to extend the literatures that discuss the impact of operational risk on Islamic banks' profitability. Our sample study consists of 14 Islamic banks in Indonesia listed in Financial Services Authority (OJK) for the period of 2016-2018. We use the same proxies used by [14] in measuring both profitability and operational risk to demonstrate the impact of independent variable on dependent variable.

The remaining of the paper is as follows. The data source, data collection, variable measurement will be explained in Methodology section. Results section will present the empirical result of this study. The interpretation of the results will be discussed in the Analysis and Discussion section and Conclusion section will conclude this study.

## II. LITERATURE REVIEW

[7] conducts a research on the effect of operational risk in commercial bank in Kenya using cost income ratio as the proxy for operational risk and return on equity (ROE) for profitability. The study is done using 43 commercial banks in Kenya from 2005 – 2014 and found that operational risk is negatively associated with bank profitability. This finding is similar to the findings by [11] that tries to investigate the effect of risks on bank's financial performance in Barbados. The study uses the same proxy as Murithi for measuring operational risk, which is cost income ratio. However, it uses return on asset (ROA) as a proxy for profitability.

Another research is done by [5] in Ghana that tries to demonstrate the impact of credit and operational risks on bank's financial performance. Different to other studies, this research uses bank leverage to measure the operational risk and ROA as well as net income margin (NIM) as the proxy of profitability. By using 24 samples of universal banks, the study shows that operational risk has a positive effect on financial performance. [8] also conducts a similar study but using primary data to measure the effect of operational risk on the organizational performance of banks in Nigeria. This study also yields a similar result that operational risk is indeed is negatively associated with organizational performance.

In terms of related research on Islamic banks, [9] uses 11 Islamic banks in Gulf Cooperation Council regions to see the relationship between operational risk and profitability. This study uses cost income ratio as the measurement for operational risk and ROA as well as ROE as the proxies for profitability. The study shows that operational risk has negative effect on profitability for both measurements (ROA and ROE).

Furthermore, [14] conducts a study on 75 Islamic banks in 24 countries in 2015 to see the effect of credit risk, insolvency risk, liquidity risk and operational risk on bank's profitability. It uses two proxies for operational risk, namely, cost income ratio and operation expenses to total equity ratio. It also uses two measurements to calculate bank's profitability, which is return on average asset (ROAA) and return on average equity (ROAE). The findings show that operational risk also has a negative effect on profitability.

However, similar study using similar proxies conducted by [12] in Tunisia show a different result. The study tries to investigate the determinants of Tunisian banking industry using data from 1980 to 2000. It uses operation expenses to total equity ratio as the proxy for operational risk and shows that it has a positive association with bank's profitability. This finding also supported by the study of [13] that examine the determinants of banks profitability in Macau. Using data from commercial banks in 1993 to 2007, it shows that expense management variable as the proxy of operational risk has a positive association with profitability.

By looking at the results of the previous research, we decided to demonstrate the effect of operational risks on bank profitability. In measuring the profitability we uses two common proxies that are used, namely ROA and ROE. However, we follow the research by [14] that uses

ROAA and ROAE as the variable measurement for profitability as we believe that it will give a more comprehensive measurement. Meanwhile, for the measurement of operational risk, we conclude that cost income ratio is most used in measuring the risk and yield a negative effect. Moreover, when measured using operating expenses to total asset ratio, some studies show a positive association to profitability. Therefore, we use cost income ratio and operating expenses to total asset ratio as the proxy for operational risk. Our hypothesis development refers to the previous study conducted on the similar research, thus, we have at least four hypothesis in this study. The hypotheses are as follow:

H<sub>1a</sub>: There is a negative impact of cost income ratio (OCI) on ROAA

H<sub>1b</sub>: There is a negative impact of cost income ratio (OCI) on ROAE

H<sub>1c</sub>: There is a positive impact of operating expenses to total asset ratio (OCTA) on ROAA

H<sub>1d</sub>: There is a positive impact of operating expenses to total asset ratio (OCTA) on ROAE

## III. METHODOLOGY

### A. Profitability

Profitability refers to the ability of the company to generate profit for a certain period. Studies on bank's profitability generally use return on asset (ROA) and return on equity (ROE) to measure this variable [5], [7]–[9], [11]–[13]. In this study, profitability is measurement using two proxies, return on average asset (ROAA) and return on average equity (ROAE). We refer these measurements based on the study conducted by [14], in which ROAA is the ratio of net profit before taxes divided by average asset and ROAE is the ratio of net profit before taxes divided by average equity.

### B. Operational Risk

According to [3], operational risk in Islamic banks refers to those risk arises from inadequate or failed internal and external business processes that may be caused by the people or the system and also as a result on shariah non-compliance and fiduciary. Two ratios have been widely used in measuring operational risk, namely, cost income ratio and operating expenses to total equity ratio. Studies that used cost income ratio as the proxy of operational risk, usually find a negative association between operational risk and profitability (source). However, when operating expenses to total asset ratio is used, some studies found a positive link to profitability. This study uses both measurements to calculate operational risk. We divide operational costs by comprehensive income (OCI) in calculating cost income ratio and we compare operational costs by total asset (OCTA) to measure the operating expenses to total equity ratio. Both measurements are also used by [14] in their study. Therefore, the hypothesis of this study is as follows:

TABLE I. VARIABLE DEFINITION

Variable	Measurement	Notation
Profitability	Net profit before taxes/ average asset	ROAA
	Net profit before taxes/ average equity	ROAE
Operational Risk	Operational cost/ comprehensive income	OCI
	Operational cost/ total asset	OCTA
Size	Log(Total Asset)	LgTA

Table 1 presents the variable definition used in this study. Profitability as the dependent variable is measured using two proxies, ROAA (Return On Average Asset) and ROAE (Return on Average Equity). Meanwhile, operational risk is the independent variable in this study and measured using, OCI (Cost Income Ratio) and OCTA (Operating Expenses to Total Equity). This study also uses the size of the company as control variable, which is measured by log total asset.

The total of 14 Islamic commercial banks in Indonesia are used in this study. We collect the data based on the number of Islamic banks listed in OJK from 2016 to 2018. Therefore, all 14 Islamic banks are used as the sample of this study. In analysing the data, panel data regression analysis is used with the following model:

$$ROAA_{i,t} = a_0 + a_1OCI_{i,t} + a_2OCTA_{i,t} + LgTA_{i,t} + e_{i,t} \quad (1)$$

$$ROAE_{i,t} = a_0 + a_1OCI_{i,t} + a_2OCTA_{i,t} + LgTA_{i,t} + e_{i,t} \quad (2)$$

$ROAA_{i,t}$  refers to return on average asset for bank  $i$  for the year  $t$ ,  $ROAE_{i,t}$  is return on average equity for bank  $i$  for the year  $t$ ,  $OCI_{i,t}$  and  $OCTA_{i,t}$  represent the operational risk for bank  $i$  for the year  $t$ ,  $LgTA_{i,t}$  refers to the size of the bank  $i$  for the year  $t$  and  $e_{it}$  is an error term.

IV. RESULTS

Table 2 represents descriptive statistics for all variables for all 14 banks. It can be seen that Islamic banks have quiet low profitability measured by ROAA (0.6%) and ROAE (2.8%). However, the variation in profitability between banks is relatively small, 4.3% and 28.8% measured by ROAA and ROAE, respectively.

TABLE II. DESCRIPTIVE STATISTICS

Variable	Mean	Std. Dev	Min	Max
ROAA	0.00656	0.043759	-0.1121285	0.1225733
ROAE	0.028010	0.2885258	-0.1333394	0.4723746
OCI	47.153	227.879	-14.545	1463,337
OCTA	0.05537	0.0393	0.0135406	0.1892902
Size	13,0337	0.526796	11.8208	13.992
N=42	n=14	T=3		

A. Regression Results

Table 3 shows the regression result for variable ROAA and ROAE. The test conducted for Pooled OLS, Fixed Effect and Random Effect model. In Panel A, it can be seen that, OCTA and Size shows a significant effect on ROAA, with 1% and 5% significance, respectively in Pooled OLS. Furthermore, in Fixed Effect model, none of the variables are found to be significant. Similar to Pooled

OLS, OCTA and Size also shows its significant effect on ROAA with 1% and 10% significance. OCTA and Size shows a positive magnitude on profitability showing that the increase in each variable will increase the profitability of banks. Moreover, rho shows the proportion of variation caused by individual specific term; in this case, the rho shows the value 27.929 % indicating that the effect on ROAA can be explained by OCTA and Size as much as 27.929%.

TABLE III. REGRESSION RESULTS FOR ROAA

ROAA	Pooled OLS	Fixed Effect	Random Effect
OCI	-2.17x10 <sup>6</sup> (-0.09)	-5.5x10 <sup>8</sup> (-0.00)	8.7x10 <sup>7</sup> (0.04)
OCTA	0.648* (4.49)	0.630 (1.10)	0.606* (3.43)
Size	0.022** (2.08)	0.162 (1.44)	0.0239*** (1.74)
R <sup>2</sup>	0.3707		
R <sup>2</sup> Within		0.084	0.0091
R <sup>2</sup> Between		0.1729	0.5716
R <sup>2</sup> Overall		0.1225	0.3692
Sigma u		0.0795	0.0195
Sigma e		0.0314	0.0314
Rho		0.8648	0.27929
Hausman Test			0.2474
Breusch-Pagan Lagrange Multiplier			0.1467

Note: \* refers to significance level of 1%, \*\* refers to significance level of 5% and \*\*\* refers to significance level of 10%

Furthermore, Hausman test and Breusch-Pagan Lagrange Multiplier test are conducted to choose the appropriate model for the panel data. Hausman test is conducted to choose between Fixed Effect model and Random Effect model and the value of the test shows 0.2474 indicating that fixed effect model is not appropriate for this panel data. Further, Breusch-Pagan Lagrange Multiplier (LM test) is done to choose between Pooled OLS and Random Effect model, the result shows that LM test is not significant (0.1467>0.05) which can be concluded that Pooled OLS is the most appropriate model for this panel data. The regression result for ROAA shows that Pooled OLS is the most appropriate model and variables that affecting ROAA are OCTA and Size with positive magnitude. Therefore, H<sub>1a</sub> and H<sub>1b</sub> are rejected but H<sub>1c</sub> and H<sub>1d</sub> are supported by the findings. The coefficient of determination for this model in Pooled OLS is 37.07%, which means that OCTA and Size can explain ROAA only for 37.07% and the rest is explained by other variables outside the model.

TABLE IV. REGRESSION RESULTS FOR ROAE

ROAE	Pooled OLS	Fixed Effect	Random Effect
OCI	6.78x10 <sup>6</sup> (0.04)	-9.64x10 <sup>6</sup> (-0.04)	0.000031 (0.07)
OCTA	3.079* (2.88)	1.406 (0.31)	2.953 (2.58)**
Size	0.1339*** (1.68)	0.262 (0.29)	0.1358 (1,12)
R <sup>2</sup>	0.2089		
R <sup>2</sup> Within		0.005	0.0022
R <sup>2</sup> Between		0.2035	0.3973
R <sup>2</sup> Overall		0.1115	0.2088
Sigma u		0.19928	0.1255
Sigma e		0.250567	0.25056
Rho		0.38746	0.20059
Hausman Test			0.8186
Breusch-Pagan Lagrange Multiplier			0.2302

Note: \* refers to significance level of 1%, \*\* refers to significance level of 5% and \*\*\* refers to significance level of 10%

Table 4 shows the regression result for ROAE. Similar with the results for ROAA, in Pooled OLS, OCTA and Size are found to be significant on ROAE with significance level of 1% and 10%, respectively. In Fixed Effect model, none of the variables are found to be significant on ROAE, which is similar to the findings of ROAA. Lastly, in Random Effect model, only OCTA is found to be significant on ROAE. In selecting the most appropriate model, Hausman test and LM test are conducted. Based on the results of both test, it can be concluded that Pooled OLS is the most appropriate model for this panel data, in which both test yield insignificant value, 0.8186 and 0.2302 (>0.005) for Hausman test and LM test, respectively. Based on the hypothesis, it can be concluded that H<sub>1a</sub> and H<sub>1b</sub> are rejected and H<sub>1c</sub> and H<sub>1d</sub> are supported. Furthermore, based on the coefficient of determination, it can be seen that OCTA and Size can only explain ROAE for 20.89%, in which the rest 79.11% is explained by other variables outside the model

Therefore, based on the regression results for both variables (ROAA and ROAE), Pooled OLS is the most appropriate model for the panel data and OCTA and Size are found to have a significant effect on ROAA and ROAE.

**V. ANALYSIS AND DISCUSSION**

The results of data analysis show that cost to total asset ratio (OCTA) has a positive and significant effect on both proxies of profitability. However, cost to income ratio is found to be insignificant for both ROAA and ROAE. This finding is differ to the findings found by [5], [7]–[9], [11], [14] that find negative correlation between operational risk and profitability. Their findings show that the higher operational cost, the less profitability will be yield by Islamic banks. This indicates that losses arises from bank’s operation may lead to an increase in operational cost; hence it will decrease bank’s profitability.

Surprisingly, our findings on operational risk and profitability present different results than those previous study as operational risk is found to have a positive relation to profitability showing that the increase in operational risk will increase bank’s profitability. This finding is in line with the findings by [12], [13] that conclude the same result. Our argument is that the proxy

used in measuring operational risk may show a different meaning. We found that cost to total asset ratio (OCTA) is significant in affecting profitability and the positive magnitude show that bank’s overhead cost is passed on its depositors and lenders [12]. Furthermore, OCTA also shows that how well bank manage its assets and liabilities in order to successfully manage their risk [15]. This assumes that the higher operational costs, the bank bears, the better the bank manage their risk, therefore, it will increase its profitability.

In terms of control variable, we found that size has positive and significant effect on bank’s profitability. This finding is in consistent with the finding by [14] and consistent with [16] that greater size of assets contribute to higher profitability (measured by both ROAA and ROAE).

**VI. CONCLUSION**

This study examines the effect of operational cost on profitability of Islamic banks in Indonesia. The operational cost is measured using cost to income ratio (OCI) and cost to total asset ratio (OCTA), while profitability is calculated using return on average asset (ROAA) and return on average equity (ROAE). The findings show that operational risk that is measured by OCTA is found to be positively significant in affecting bank’s profitability. This indicates that the higher operational risks the bank has, the higher the profitability it will yield which also means that the manages its operational risk very well that it increases its profitability.

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