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VAR Analysis: What Drives The Profitability of Islamic Commercial Banks?

St. Elmiana Febri Syahputri[1] ; Laila Masruro Pimada[2]

Abstract

Third-party funds of Islamic commercial bank in period of 2015-2021 have been increasing, as well as the matter of financing. However, the profitability of Islamic commercial bank during those years were fluctuating below 1,5% which affected the average of Return on Assets in 2015-2021 below a healthy level of 1,1%. In 2017, the third-party funds and financing has been increased, but ROA value tended to be constant, while in 2020, the increase of third-party funds and financing was inversely proportional to ROA ratio value that was actually decreased. This phenomenon incompatibility with theory has stated that the higher distribution of financing, it would determine the higher ROA ratio. Since, banking sector was often regarded as a heart of driving force of the country's economy and profitability was significant for banking continuity. It needed to conduct a research on determinants that affected profitability of Islamic commercial banks. Hence, this research was aimed to analyze the effects of third-party funds, NPF, Operational Cost, and SBIS on ROA. The method in this research was quantitative with vector auto regression model as the analysis method. Based on the result of estimation, the third-party funds, NPF, and Operational Cost did not affect, but SBIS affected positively on ROA.

Keywords : *Profitability; Islamic Commercial Banks; Vector Auto Regression.*

INTRODUCTION

The main function of banking according to (Saunders, 2008) is an intermediary party of financing sector, which has activities of purchasing surplus funds from household sector, government or business sector, where the funds

[1]Universitas Brawijaya, Malang, Indonesia
[2]Universitas Brawijaya, Malang, Indonesia
Email : sridewi@unissula.ac.id

will be distributed or divided to the economic units which are experiencing fund deficit. (Lovett, 1997) has found that the banking sector is frequently considered as a heart and driving force of economy of a country. It was concluded that banking sector plays an important role in supporting the economic growth of a country, therefore the bank as an intermediary institution should be effective and efficient in fund management (Toumi, 2020). To achieve those two goals, banking sector must optimize the use of funds and technology, so the process of fund collection and distribution could go well. This attempt is aimed to realize a stable financial system and advance a sustainable national economy.

According to (Ismail, 2013), three main functions of Islamic banking are to collect public funds and manage its distribution to underfunded community of people, and provide Islamic banking services. The more funding interest either for business capital, investment, or consumptive purpose of society of business entity will affect the growth of Islamic banking funding (Ubaidillah, 2016). The increase of market share and great potential of basic consumer are not apart from a fact that Indonesia is a country with the largest Muslim population in the world. In addition, the high increase in the Islamic financial industry sector from year to year has attracted the interest of policy makers, bankers and financial academics to look at the Islamic financial industry (Ledhem & Mekidiche, 2020). This research object will be focused on Islamic commercial banks. Inasmuch as based on the statistics of sharia banking 2021, Islamic commercial bank has the greatest branch office networks and total assets, thus, it can represent the value of Islamic banking in Indonesia.

Due to the significance of role and function of the Islamic banking in Indonesia, every bank should always focus on their performance in order to stay in a healthy and efficient category. Return on Assets (ROA) is the most accurate indicator that is used to measure bank performance and assess bank capability in asset management in order to yield a maximum profit (Sudarsono, 2017). The high ROA ratio will determine the greater amount of profit (Dendawijaya, 2003). Moreover, Bank of Indonesia prioritizes profitability of the assessed bank based on the assets, which the most of assets are derived from the third-party funds (Wibowo & Syaichu, 2013), so, the performance of Islamic commercial banking in this recent research is projected with ROA value.

Table 1. Third-party Funds, Financing & Return on Assets

Year	Third-party Funds (Billion Rupiah)	Financing (Billion Rupiah)	ROA%
2015	174.895	153.968	0.49%
2016	206.407	177.482	0,63 %
2017	238.393	189.789	0,63 %
2018	257.606	202.298	1,28 %
2019	288.978	225.146	1,73 %
2020	322.853	246.532	1,4 %
2021	365.421	256.219	1,55 %

Source: Sharia Banking Statistics of Financial Service Authority (2022)

Based on the regulation of Bank of Indonesia 6/23/DPNP, the category of a healthy ROA is about 1,25%<ROA≤1,5%, the higher percentage of profitability, the better performance of a banking sector, to put in another word, the sustainability of banking sector activity will be guaranteed (Kasmir, 2003). Third-party funds of Islamic commercial banking in period of 2015-2021 have been increasing, as well as the distribution of financing. But, the profitability of Islamic commercial bank within those periods are fluctuating below 1,5% which has affected to the ROA average in 2015-2021 is under the healthy category of 1,1%. In 2017, the third-party funds and financing is inversely proportional to ROA value which is actually decreased. Those phenomena are not in line with the theory (Kasmir, 2004) which has said that the greater distribution of financing, the higher ROA, since the financing is the main activity of Islamic banking (Dendawijaya, 2003).

The third-party funds and financing can affect ROA of Islamic banking (Angraini, 2018). According to (Dendawijaya, 2003), a bank cannot run its function without any fund, because in the perspective of banking, the fund collection is like a driving and flowing force of a business entity. The most reliable funds are from third-party funds, because it has contributed a large percentage. Therefore, the great amount of bank profitability is determined by the amount of third-party funds that have been collected (Setiawan & Indriani, 2016). However, the different research result stated by (Sudarsono, 2017) and (Sihombing & Yahya, 2016) in their researches that the third-party funds cannot affect ROA.

Islamic bank does not only manage the funds for financing purposes, but also for the transactions in money market among Islamic banks(Qorifah, 2016). The surplus liquidity that is not distributed to financing purpose can be allocated into Certificate of Sharia Indonesian Bank (SBIS). (Kawiryawan & Hapsari, 2015) and (A'la & Mawardi, 2015) in their researches have written that SBIS can affect ROA of Islamic banking. The bank will tend lessen idle money which do not result profit and put them into instrument of SBIS, so when the reward rate of this certificate increases, it will be more profitable. On the other hand, a different result showed by (Sudarsono, 2017) and (Qorifah, 2016) in their researches that SBIS will not affect ROA.

Within the practice, the distribution of financing can trigger some problematic financing or it is called as a default case. The problematic financing of a bank is assessed through the value of Non Performing Financing (NPF) ratio. According to the researches of (Iskandar & Laila, 2016) and (Ubaidillah, 2016), NPF can affect ROA of Islamic banking. If the ratio of NPF is high, it is able to affect the aspect of income decrease earned by the bank because of the high rate of default financing ratio. This situation will certainly affect to the decrease of profit amount (Ali, 2004). The different result was stated by (Qorifah, 2016) and (Wibowo & Syaichu, 2013) in their researched that NPF cannot affect ROA.

(Qorifah, 2016) in her research has stated that Operational Cost affects the level of ROA. The bank should always focus on operational cost ratio, because through this operational cost ratio, it can indicate the bank efficiency in executing the operational activities (Wibowo & Syaichu, 2013). If the operational income is higher, it means the bank can run the business activities efficiently. This condition will obviously affect the income level, because if the ratio of operational cost decreases, ROA value will increase (Qorifah, 2016). Reversely, (Janah & Siregar, 2018) and (Sudarsono, 2017) have found different result that the operational cost will not affect ROA.

Research gap in this research the first is empirical gap because it is based on the results of different previous researches. The second is methodological gap because the previous researches used path analysis and multiple linear regressions, while this recent research uses VAR model. The urgency of this research is because the banking sector is often regarded as a heart and driving force of the country's economy (Lovett, 1997) and the profitability is important

for the sustainability of banking sector (Kasmir, 2003), it is necessary to conduct research on the determinants that affect the profitability of Islamic commercial banks. So the contribution of this research is to analyze the effect of the DPK, NPF, BOPO and SBIS variables on the profitability of Islamic commercial banks which are proxied by the ROA ratio.

LITERATUR REVIEW

The theoretical framework explains that ROA affects banking sustainability (Kasmir, 2003), the higher level of ROA ratio, bank profit will turn higher as well (Dendawijaya, 2003), ROA is affected by financing distributed by the bank (Kasmir, 2004). However, in fact the theory is not in accordance with the phenomena that occur. The increase of financing amount is inversely proportional to ROA of Islamic commercial bank that is actually stagnant and decreased. Because of the discrepancy between the theory and the phenomenon that occurs, it is necessary to carry out further research regarding what factors affect the ROA of Islamic commercial banks. This literature review contains the theories and concepts for each variable, as well as an overview of the analysis of differences and similarities from previous similar research.

Profitability of Sharia Bank

Return on Assets (ROA) is one of profitability ratio that is exerted to assess the capacity of asset management by the bank management in order to gain profit maximally. The higher value of ROA, it will determine the higher profit, thus, it is referred that the bank position turns better in asset use and management (Dendawijaya, 2003). ROA can also represent the performance of bank, because the highlight in this ratio is the aspect of bank profitability which is calculated according to productive assets which the majority of funding sources are from community or third party (Janah & Siregar, 2018). One of factors that will affect bank capacity to acquire external financing is profitability, because the level of business efficiency and profit will be analyzed and measured based on ROA (Rodoni & Ahmad, 2014). Profitability is the bank's way of maximizing profits with the funds it has. this can be done by maximizing financing, the higher the

financing distributed the more profits will be obtained (Notoatmojo, 2018). According to (Zarrouk, Jedidia, & Moualhi, 2016) ROA is calculated as follows:

$$\text{ROA} = \frac{Profit\ After\ Tax}{Total\ Assets} \times 100\%$$

According to (Angraini, 2018) in her research, one of factors that can influence ROA ratio is third-party funds and financing. As the more third-party funds and financing are collected, the greater chance of bank to distribute those funds into productive activities and businesses, thus, the profit will increase as well (Kasmir, 2004). However, the distribution of financing can bring any problematic financing, according to (Iskandar & Laila, 2016), NPF can affect ROA. If NPF value turns high, it will impact badly on profitability, because the bank must bear a loss from the decline of profit share resulted from the distribution of financing (Dendawijaya, 2003).

(Qorifah, 2016) in her research has written that operational cost can affect ROA. The low operational cost will indicate that the bank can run business activities efficiently, since when the ratio of operational cost is low, the bank income will increase. The surplus liquidity that is not distributed to financing purposes can be allocated into Certificate of Sharia Indonesian Banking instrument. A previous research done by (Kawiryawan & Hapsari, 2015) has asserted that the Certificate of Sharia Indonesian Banking can affect ROA. Inasmuch as the high rate of certificate return will add the bank income, so it is able to support the rise of ROA ratio.

Third-party Fund Concept in Sharia Banks

Third-party fund are referred to community-owned funds collected either in the form of investment or deposits based on sharia or Islamic principles, which then every collected fund will be distinguished between those who get profit sharing and those who do not get profit sharing. *Wadiah* and *mudharabah* contract are the types of contract that are mostly used in third-party fundraising (Siamat, 2005). The position of third-party funds is very important because the development of the banking and financing sector will increase the profitability of banks in the long run (Al-Harbi, 2019). The total of third-party funds is calculated as follows:

Third-party funds = Saving + Giro + Deposits

The third-party funds are collected from society which comprises of organization, individual, government, cooperation, household sector, foundation, etc. Commonly, the third-party funds are amount of funds with the largest percentage (Rivai & Veithzal, 2007). Sharia banks raise funds from depositors who invest their funds with profits and risks to be calculated by investment management (Bukair, 2019). The more third-party funds are collected; it indicates the better level of public trust in a bank (Sihombing & Yahya, 2016). According to (Angraini, 2018), third-party funds can affect the level of ROA, because the higher amount of third-party funds collected, the bank opportunity to distribute the funds into a sort of productive business entities will be higher as well, so it can increase the profit gain.

Non Performing Financing Concept in Sharia Banks

Non Performing Financing (NPF) is a ratio that is functioned to measure problematic financing to the whole financing distribution. The greater ratio of NPF will determine the lower total income gained from financing, thus, it can give a bad impact on profitability (Wibowo & Syaichu, 2013). If the financing is managed successfully, the level of NPF will be lower. The lower NPF level indicates that the bank is able to minimize problematic financing and gain maximum profit from financing distribution (Sudarsono, 2017). NPF can be influenced by external and internal factors, external factors include monetary and fiscal policies. while the internal factors come from the operational activities of the bank (Wahyuni et al., 2020).

According to (Dendawijaya, 2003), the higher rate of problematic financing will impact badly to the bank profitability which then requires the bank to bear those losses due to the decreased income from financing. Risk management is an important thing that must be considered by banks, this is to avoid bad credit and even bank closure. Therefore, the bank ought to be more alert and tend decreasing financing portion in order to prevent similar financing problems that might occur in the next period (Khan, Khan, & Tahir, 2017). (Antonio, 2001) has asserted that a problematic financing can occur when the customer does not pay or return the financing received and profit share according to the time established. A preliminary research done by (Iskandar & Laila, 2016) has written that NPF can affect ROA. If NPF value is higher, the bank should bear the loss of reduced

profit portion that have been received from financing distribution and will affect profitability decline (Dendawijaya, 2003). NPF Ratio is calculated as follows:

$$\text{NPF} = \frac{\textit{Amount of Problematic Financing}}{\textit{Total Financing}} \times 100\%$$

Operational Cost Concept in Sharia Banks

Operational cost ratio is a percentage of operational cost comparison to operational income. The operational cost is taken as a measurement tool of bank efficiency in running business activities. The lower level of operational cost, the more efficient operational cost that should be spent (Dendawijaya, 2003). Based on the regulation of Bank of Indonesia 6/23/DPNP, operational cost is defined as an efficiency ratio, since it is able to illustrate the capability of bank management in regulation and control of operational cost spent to the return received from those operational activities. In the context of banking, it would be more effective to compare profit with cost efficiency to identify revenue efficiency, as revenue will affect the overall performance and profitability of the bank.The lower operational cost can minimize bank opportunity to encounter troubles (Kamarudin, Sufian, & Nassir, 2016). (Qorifah, 2016) in her research has found that the operational cost can affect ROA, the lower level of operating cost, the higher operational income and bank can efficiently run the business activities. The ratio of operational cost is calculated as follows:

$$\text{Operational Cost} = \frac{\textit{Operational Cost}}{\textit{Operational Income}} \times 100\%$$

Indonesian Sharia Bank Certificate Concept in Sharia Banks

Monetary policies are aimed to regulate stability of exchange rate which is interrelated to the amount of money circulated among society (Hapsari, 2013). To overcome this phenomenon in 2008 based on the regulation of Bank of Indonesia 10/11/PBI/2008 on Improvement of Islamic monetary instrument, Bank of Indonesia has established Indonesian Sharia Bank Certificate (SBIS) in the bank implementation by using *ju'alah* contract and short term contract. Within the implementation, the return level of SBIS is assigned according to the interest rate on the instrument of conventional Indonesian bank certificate. Regarding

to the great amount of return that will be received, it enables Islamic banks to be interested to allocate surplus liquidity into SBIS instrument (Kawiryawan & Hapsari, 2015). (Kawiryawan & Hapsari, 2015) in their research have written that SBIS can affect ROA, since if the surplus liquidity is put into instrument of SBIS, so when the return level of certificate turns high, the bank will gain additional income that can support the increase of ROA ratio.

Theoretical Frameworks

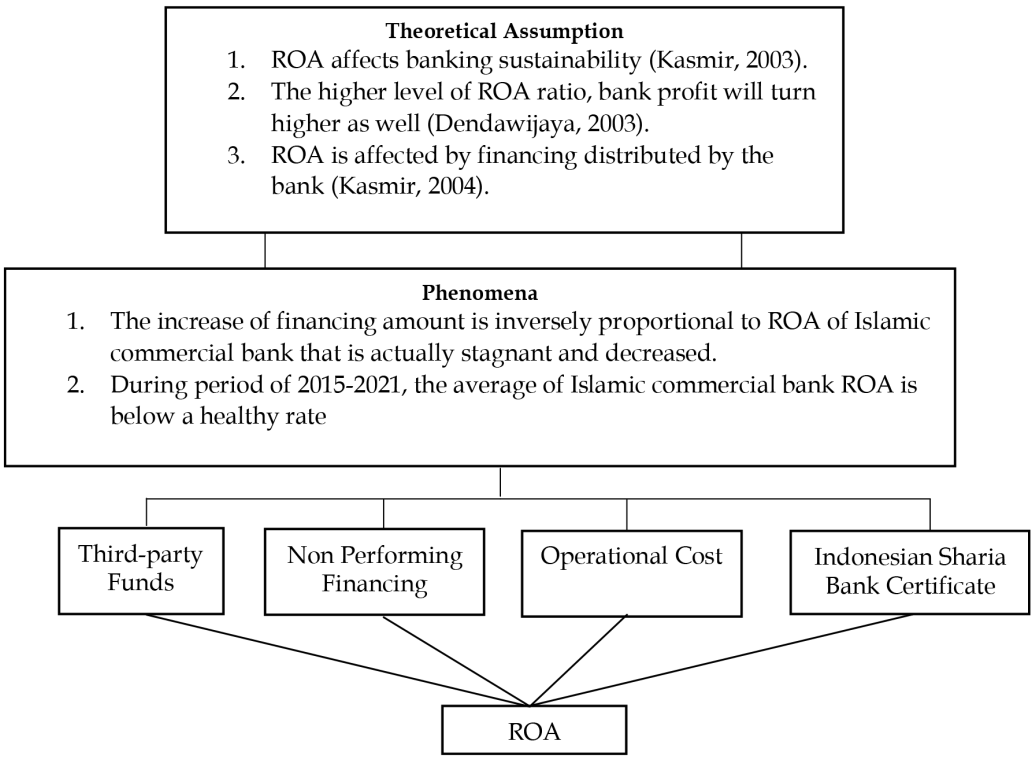

Figure 1: Theoretical Frameworks

Research Hypothesis

Relation between Third-party Funds and ROA

Previously explained in the literature review regarding the concept and explanation of each variable. In the case of this third-party fund, the higher amount of third-party funds that are collected, banks might have the higher

chance to distribute those funds into productive activities or businesses. Thus, the profit gained by the bank will be also increase (Kasmir, 2004). It is concluded that the third-party funds can affect positively to ROA ratio. This finding is line with the previous researches done by (Angraini, 2018) and (Setiawan & Indriani, 2016) that have written similar conclusion.

H_1: Third-party funds can affect positively to ROA of Islamic Commercial Banks.

Relation between Non-Performing Financing and ROA

The greater amount of problematic financing will impact badly to the profitability of bank, which then requires the bank to bear loss due to the reduced portion of profit gained from financing distribution (Dendawijaya, 2003). If NPF turns high, it will affect a decrease of bank income and then certainly impact to the profit gain, which is indicated from the low ROA level of Islamic bank (Ali, 2004). In short, NPF can affect negatively to ROA ratio. This finding is in line with the previous researches done by (Iskandar & Laila, 2016) and (Ubaidillah, 2016) that have stated similar result.

H_2: NPF can affect negatively to ROA of Islamic Commercial Banks.

Relation between Operational Cost and ROA

It is important for Islamic banks to notice operational cost ratio, since through this operational cost ratio, it can indicate the bank efficiency in running operational activities (Wibowo & Syaichu, 2013). The low operational cost indicates that the bank is able to run the business activities efficiently. This condition will then affect income gain, as when the ratio of operational cost is low, the ratio of ROA will increase (Qorifah, 2016). In short, the ratio of operational cost can affect negatively to ROA ratio. This finding is in line with the previous researches done (Wibowo & Syaichu, 2013) and (Qorifah, 2016) that have found similar result.

H_3: Operational Cost can affect negatively to ROA of Islamic Commercial Banks.

Relation between Indonesian Sharia Bank Certificate and ROA

Fund allocation in the instrument of Indonesian Sharia Bank Certificate (SBIS) might have two benefits at once for Islamic banking, as SBIS is a short-term instrument that can be used as an alternative to manage surplus liquidity, moreover, the Islamic banks will obtain additional income through return of SBIS. The Islamic commercial banks will tend reducing idle money that cannot yield profit while the return level of SBIS is in a high level by allocating the surplus liquidity into the instrument of SBIS, which is more profitable (Kawiryawan & Hapsari, 2015). In short, SBIS can affect positively to ROA ratio, this finding is in line with the researches done by (Kawiryawan & Hapsari, 2015) and (A'la & Mawardi, 2015) that have found similar finding.

H_4: Indonesian Sharia Bank Certificate (SBIS) can affect positively to ROA of Islamic Commercial Banks.

RESEARCH METHOD

This research used quantitative approach, this quantitative approach was used to examine populations or samples whose the data analysis was statistical and aimed to verify research hypothesis that have been formulated by the researchers (Sugiyono, 2010). The type of data in this research was secondary data of time series sourced from Sharia Banking Statistics of Financial Service Authority monthly data in period of January 2015-December 2021. This research was carried out in 2022, and the most recent data available in that year is only up to 2021.

Table 2. Operational Outline of Variable

Variable	Source	Unit	Data Type	Periods
Return on Asset	Sharia Banking Statistics of Financial Service Authority	Percent (%)	Monthly	2015-2021
Third-party Funds	Sharia Banking Statistics of Financial Service Authority	Rupiah (Rp)	Monthly	2015-2021
Non-Performing	Sharia Banking Statistics of Financial Service Authority	Percent (%)	Monthly	2015-2021

Operational Cost	Sharia Banking Statistics of Financial Service Authority	Percent (%)	Monthly	2015-2021
Indonesian Sharia Bank Certificate	Sharia Banking Statistics of Financial Service Authority	Rupiah (Rp)	Monthly	2015-2021

Source: Sharia Banking Statistics of Financial Service Authority (2022).

The research populations were taken from about 15 Islamic commercial banks during period of 2015-2021. The sample determination was done through saturated sampling technique, this technique was used if all population members were taken as the samples. Thus, it was concluded that this research samples were taken from the whole of populations.

Table 3. Research Samples

No.	List Of Islamic commercial banks
1	PT. Bank Aceh Syariah
2	PT. BPD Nusa Tenggara Barat Syariah
3	PT. Bank Muamalat Indonesia, Tbk
4	PT. Bank Victoria Syariah
5	PT. Bank BRI Syariah*)
6	PT. Bank Jabar Banten Syariah
7	PT. Bank BNI Syariah*)
8	PT. Bank Syariah Mandiri*)
9	PT. Bank Mega Syariah
10	PT. Bank Panin Dubai Syariah, Tbk
11	PT. Bank Syariah Bukopin
12	PT. BCA Syariah
13	PT. Bank Tabungan Pensiunan Nasional Syariah
14	PT. Bank Aladin Syariah
15	PT. Bank Syariah Indonesia, Tbk

Source: Sharia Banking Statistics of Financial Service Authority (2022).

VAR model was one of research model which was functioned to analyze relation between variables when the research data was time series type (Widarjono, 2018). According to (Juanda & Junaidi, 2012), commonly, times series data type was not stationary, so if the time series data was analyzed through classical regression method, it could result a biased regression analysis result. To avoid this result, the time series data should be analyzed through times series analysis in this research by using Vector Auto Regression (VAR) analysis method. Previous research done by (Rohman & Karsinah, 2016) on The Determinant Analysis Of Sharia Banks Market Share With Sharia Banks Performance also uses a similar method. Sharia banks performance proxied by internal variables BOPO, CAR, ROA, FDR and NPF.

RESULTS AND DISCUSSION

Analysis Results

Research Data Development

Table 4. Research Data Development

Tahun	ROA (%)	Third-party Funds (Billion)	NPF (%)	Operational Cost (%)	SBIS (Billion)
2015	0.49	174.895	4.84	97.01	8.761
2016	0.63	206.407	4.42	96.23	7.940
2017	0.63	238.393	4.77	94.91	5.105
2018	1.28	257.606	3.26	89.18	4.245
2019	1.73	288.978	3.23	84.45	7.200
2020	1.4	322.853	3.13	85.55	10.039
2021	1.55	365.421	2.59	84.33	180

Source: Sharia Banking Statistics, Financial Service Authority (2022).

The research data development table is only to describe the condition of the data for each variable in the research year. To see the influence between the independent and dependent variable comparing the current year with the previous year, then all the data was taken in the same year. Which in this research the data was taken from 2015-2021.

The development of ROA ratio during period of 2015-2021 was fluctuating. During period of 2015-2019, ROA has been always increased and reached the highest score in 2019 about 1,73%, this was affected by the total financing that have increased from the previous years about 90.423 billion rupiah. While, the lowest score was found in 2015 about 0,49%, since the total financing distributed in this year was only about 55.886 billion rupiah.

Third-party funds of Islamic commercial bank during period of 2015-2021 have indicated a positive trend or always been increased every year. The lowest amount was in 2015 about 174.895 billion rupiah, while the highest increase was in 2021 about 365.421 billion rupiah.

Non Performing Financing ratio during period of 2015-2021 tended to be fluctuating. The highest value was in 2015 about 4,84% and the lowest score was in 2021 about 2,59%. In 2016, NPF was decreased, but it has increased in the following years. In 2018 and the following years, NPF value tended to decrease until its lowest value in 2021.

Operational Cost ratio during period of 2015-2021 has been decreasing every year. Even though, it had increased in 2020, but the operational cost value in the following years has dropping again. The highest value was in 2015 about 97,01%, while the lowest value was in 2021 about 84,33%.

Indonesian Sharia Bank Certificate (SBIS) of Islamic commercial banks during period of 2015-2021 have been fluctuating. The highest value of 10.039 billion rupiah was in 2020, while the lowest value of 180 million rupiah was found in 2021. In this year, the value of SBIS of Islamic commercial banks experienced a very drastic decline, which it could be seen from the following graphic that is descending quite sharply.

Hypothesis Testing

Stationary Test

The result of stationary testing through ADF test was shown in the following table:

Table 5. Stationary Test

No.	Research Variable	Probability of ADF Test	
		Level	1st Difference
1	Return of Assets	0.4673	0.0000
2	Third-party Funds	0.9981	0.0000
3	Non Performing Financing	0.8374	0.0015
4	Operational Cost	0.7520	0.0000
5	Indonesian Sharia Bank Certificate	0.1722	0.0001

Source: Data processed by the researchers (2022)

Based on the result of stationary test on the table 4, it was indicated that all variables were not stationary at levels which could be seen from probability value > 0,05. However, through stationary test at the first difference level, the probability value turned into < 0,05, this value could conclude that all variables have been stationary.

Lag Optimum Test

The next step after stationary test was lag optimum test which was aimed to determine the length of lag optimum as follows:

Table 6. Lag Optimum Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-645.3035	NA	14.90390	16.89100	17.04320*	16.95188*
1	-612.3219	60.82326	12.13245	16.68369	17.59686	17.04895
2	-591.8038	35.17383	13.74333	16.80010	18.47425	17.46974
3	-564.6681	42.99423	13.27586	16.74463	19.17975	17.71865
4	-536.5496	40.89975	12.74381	16.66362	19.85972	17.94204
5	-505.3182	**41.37139***	**11.59159***	**16.50177***	20.45885	18.08457
6	-484.5887	24.76779	14.36482	16.61269	21.33074	18.49987

Source: Data processed by the researchers (2022).

Based on the table 5, lag 5 was the most optimal lag, since it was recommended by three criteria shown with asterisk (*).

Co-integration Test

The result of co-integration testing through Johansen Co-integration Test was put in the following table:

Table 7. Co-integration Test

Hypothesized No. of CE(s)	Trace Statistic	Max-Eigen Statistic
	Prob.**	Prob.**
None	0.15	0.1713
At most 1	0.4893	0.3353
At most 2	0.8324	0.665
At most 3	0.9503	0.933
At most 4	0.7198	0.7198

Source: Data processed by the researchers (2022)

Based on the result of co-integration testing on table 6, no co-integration was found among research variables. As the probability value of between trace statistic and max-eigen statistic was > 0,05. Therefore, it could continue to use VAR model.

VAR Model Estimation

Based on the result of VAR model estimation, the result was shown in the table below:

Table 8. VAR Estimation

Response Variable	Coefficient & t-statistics
D(ROA)	0.12728628313*D(Y(-1)) **[0.47860]** + 0.414824663234*D(Y(-2)) **[1.45978]** + 0.237410939379*D(Y(-3)) **[0.81738]** + 0.0409879798611*D(Y(-4)) **[0.13636]** + 0.263079023284*D(Y(-5)) **[1.00503]** + 0.00332147426417*D(X1(-1)) **[0.65171]** + 0.00687997329442*D(X1(-2)) **[1.36229]** - 0.0010737287184*D(X1(-3)) **[-0.21031]** + 0.00454670602411*D(X1(-4)) **[0.90936]** + 0.00204449224979*D(X1(-5)) **[0.40493]** - 0.110111174894*D(X2(-1)) **[-0.99386]** + 0.00270986019528*D(X2(-2)) **[0.02513]** - 0.101448468731*D(X2(-3)) **[-1.08948]** + 0.0839494172052*D(X2(-4)) **[0.88796]** + 0.156915023825*D(X2(-5)) **[1.71702]*** + 0.0426867972327*D(X3(-1)) **[1.06846]** + 0.0655102584997*D(X3(-2)) **[1.52233]** + 0.0185235410402*D(X3(-3)) **[0.43852]** + 0.0345209072565*D(X3(-4)) **[0.81843]** + 0.0265012544377*D(X3(-5)) **[0.72519]** - 0.000536471093464*D(X4(-1)) **[-0.57422]** + 0.011511609755*D(X4(-2)) **[0.49812]** + 0.0114469628354*D(X4(-3)) **[0.49370]** + 0.0802990038754*D(X4(-4)) **[3.40514]***** - 0.0564550201923*D(X4(-5)) **[-2.15782]****

*[] t-stat, *** 1% sig, ** 5% sig, * 10% sig*

Source: Data processed by the researchers (2022)

VAR model estimation was aimed to identify the effect among variables by comparing between t-statistic value and t-table value. If t-statistic value > t-table value, a variable was significant. According to the estimation result on the table 6, the variable with significant effect in ROA was NPF lag 5 with level of 10%, Indonesian Sharia Bank Certificate (SBIS) was significant with level of 1% in lag 4 and level of 5% in lag 5. However, based on the probability limitation that has been set, this research would only accommodate the probability result of 5%.

Impulse Response Function (IRF)

The response from dependent variable when shock was occurred on independent variable could be seen through Impulse Response Function (IRF) analysis. The difficulty to interpret coefficients of VAR estimation result has caused many practitioners using IRF as an instrument of VAR interpretation (Gujarati, 2010). The result of IRF analysis relating to the response between Return on Assets) and Indonesian Sharia Bank Certificate (SBIS) variable was shown in this following chart:

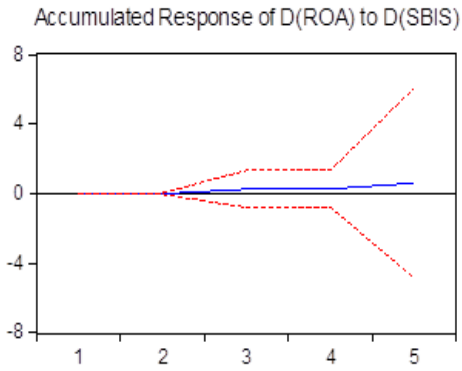

Figure 2: Relation between ROA and SBIS (Period In 5 Months)

The red line on chart 2 was standard error, the smaller interval standard error would refer the more accurate estimation result. Meanwhile, the blue line was Impulse Response Function which has referred ROA response to the shock occurred in variable of Indonesian Sharia Bank Certificate (SBIS). In the first period, ROA did not respond yet to the shock occurred in SBIS. This condition indicated that the shock in SBIS could result indirect effects in the first period. However, in the second to fifth period, ROA has shown positive responses, this has referred that when the return level from SBIS instrument was high, so the ratio of ROA would also increase. Since, when the bank put surplus liquidity into SBIS instrument, so when the level of return gained from SBIS was increasing, the bank would obtain additional income that could support the increase of ROA ratio. In short, it was concluded that H4 which asserted that SBIS can affect positively to ROA ratio was approved.

Variance Decomposition

Variance decomposition analysis was aimed to identify variables with the most dominant effect to the other variables (Ajija, 2011). The following table would show result of variance decomposition analysis of each variable:

Tabel 9. Variance Decomposition

Variance Decomposition of D(ROA)						
Period (Months)	**S.E.**	**ROA**	**Third-party Funds**	**NPF**	**Operational Cost**	**SBIS**
1	0.162060	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.166790	95.72369	0.808379	0.539773	2.380530	0.547629
3	0.337888	23.80740	0.973155	9.218399	1.161555	64.83949
4	0.345584	23.17291	1.052635	12.18281	1.525591	62.06605
5	0.530397	9.860791	0.449490	11.74153	11.93851	66.00967

Source: Data processed by the researchers (2022)

Based on the result of variance decomposition analysis on table 8, it referred that the variable with most dominant effect on ROA in addition to ROA variable itself was Indonesian Sharia Bank Certificate. During the first and second period, the effect of SBIS was not that high, but during the third until fifth period, the effect of SBIS was significantly increasing, the biggest contribution in the fifth period was approximately 66%. This condition was because the bank would gain profit when surplus liquidity put into instrument of SBIS, this profit was derived from the return of SBIS which finally could be used to support the increase of ROA ratio. Additionally, based on the regulation of Bank of Indonesia 10/11/PBI about SBIS return was guaranteed by Bank of Indonesia. Then, the instrument of SBIS would be profitable permanently. Whereas, the third-party funds that have been distributed into financing purpose, it has brought a quite high risk of default during its implementation (Turmudi, 2016).

Discussion

Effects of Third-party Funds to ROA

The result of VAR estimation showed that the third-party funds could not affect ROA. This result was in line with the previous research done by (Sudarsono, 2017) and (Sihombing & Yahya, 2016) which have written the same result. Based on the sharia banking statistic data, the increase of third-party funds was not proportional to the amount of financing distributed, the increase of third-party

funds was about 18% and financing distributed about 15% in 2016, the increase of third-party funds was about 15% and financing distributed about 7% in 2017, the increase of third-party funds was about 8% and financing distributed about 7% in 2018, the increase of third-party funds was about 12% and financing distributed about 11% in 2019, the increase of third-party funds was about 11% and financing distributed about 9%, and the increase of third-party funds was about 13% and financing distributed about 4%. Those percentages have caused the performance of third-party funds not maximal to generate profit.

The bank income was not only sourced from third-party funds which have been distributed into financing instrument. But, it could be from the other operational income sources like investment service, transfer service, collection service, bank guarantee, safe deposit box, and other types of deposit (pawn fees, state electricity company, payroll, pilgrimage saving, shared ATM, etc), also bank income from the other products and services (Rusdiyanto & Umar, 2016). Furthermore, the third-party funds were not the only one source of bank funds to support a lot of operational activities of Islamic commercial banks, the other source of funds were core capital or CAR ratio. Also, amount of loans from outside parties or other banks, central banks, financial institutions other than bank, etc (Danupranata, 2013).

Effects of Non Performing Financing to ROA

The result of VAR estimation has referred that Non Performing Financing could not affect ROA. This result was in line with the previous research done by (Wibowo & Syaichu, 2013) and (Qorifah, 2016) which have asserted the similar result. Based on the first hypothesis, NPF could affect negatively on ROA ratio, but the research finding has shown that the increase and decline of NPF did not affect ROA. Since, to put into a reality, NPF was observed and evaluated by banking sector (Dendawijaya, 2003), when the ratio of NPF turned high, the bank would automatically reduce the distribution of financing and evaluate the performance, so the bank could avoid from loss. Data of sharia banking statistics has referred that the average of NPF ratio of Islamic commercial banks during period of 2015-2021 was relatively below 5%, so it did not affect ROA.

Effects of Operational Costs to ROA

The result of VAR estimation showed that operational cost did not affect ROA. This result was in line with the previous researches done by (Janah & Siregar, 2018) and (Sudarsono, 2017) which have stated that same research result. Based on the hypothesis testing, operational cost could affect negatively on ROA. However, based on sharia banking statistical data, in 2016 the amount of operational cost has increased about 10% and it was followed by the increase of operational income of 11%, in 2017 the amount of operational cost has declined about 13% and the operational income has also decreased about 12%, in 2018 the amount of operational cost has increased about 5% and operational income has also increased about 11%, in 2020 the amount of operational cost has decreased about 0,01% and operational income has decreased about 1,2%, in 2021 the amount of operational cost has increase about 8% and operational income has increased about 9%. Those data have referred positive effects between operational cost and operational income, discrepancy between data and theory and hypothesis formulated which have caused insignificant results.

Further, (Ali, 2004) has stated that risk of bank loss from operational activities could be borne by Capital Adequacy Ratio (CAR). Based on sharia banking statistics, the average CAR of Islamic commercial banks during period of 2015-2021 was quite high above 20%. Therefore, a high ratio of operational cost would not affect the decline of ROA.

Effects of Indonesian Sharia Bank Certificate to ROA

The result of VAR estimation has shown that SBIS could affect significantly to ROA. Impulse Response Function analysis referred ROA's positive response on shock occurred in Indonesian Sharia Bank Certificate (SBIS). This positive response could refer that the higher return obtained from SBIS instrument would determine the increase of ROA. When the bank allocated surplus liquidity into SBIS instrument, so the bank would gain additional income if the return level of SBIS turned higher, this additional income could support the advance of ROA. This result was in line with previous researches done (Kawiryawan & Hapsari, 2015) and (A'la & Mawardi, 2015) that have found similar result.

Next, on variance decomposition analysis, variable with the most dominant

effect on ROA besides the variable of ROA itself was SBIS. Inasmuch as the bank would gain profit when surplus liquidity was allocated into SBIS instrument, this profit was obtained from the return of SBIS which then able to support the growth of ROA. Moreover, based on the regulation of Bank of Indonesia 10/11/PBI, return of SBIS was guaranteed by the Bank of Indonesia, therefore, this SBIS instrument would bring a permanent profit. On the other hand, the third-party funds which have been distributed into financing purpose, it might bring a quite high risk of default case during its implementation (Turmudi, 2016).

This research result was in line with theory of liquidity preference which asserted that one of factors that could encourage community taking money was interest rate factor. When the interest rate was high, the community urge to hold money tended to decrease, as the interest rate was referred as an opportunity cost of having money (Mankiw, 2007). It was assumed its relation to SBIS, Islamic commercial banks would tend reduce idle money that could not generate profit when the return level of SBIS was in a high rate through strategy of funds allocation into SBIS instrument, so it would be more profitable.

CONCLUSION

This research was conducted to analyze effects of third-party funds, non performing financing, operational cost, and Indonesian sharia bank certificate on return on assets of Islamic commercial banks. To answer this research objective, the researchers used Vector Auto Regression (VAR) model as the analysis method. The result of VAR estimation analysis has indicated that the third-party funds, non-performing financing, and operational cost did not have significant effect, while Indonesian sharia bank certificate have positive effects on ROA. However this research has limitation, since COVID-19 it had happened when the research took place until the time this research was completed. Moreover, COVID-19 situation has impacted sharia banking in Indonesia. For the novelty of the data the researchers would suggest the next researchers to add new data, covering situation during pandemic of COVID-19 until the pandemic status is over.

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