ISSN No:-2456-2165

Determinant of the Efficiency of Islamic Commercial Banks in Indonesia

Ratna Pratiwi Nugroho[1], Elok Sri Utami[2], Novi Puspitasari[3]
Master of Management, Economic and Business Faculty
Universitas Jember, Indonesia

Abstract:-
Purpose: This study aims to analyze what variables affect the efficiency of Islamic Commercial Banks in Indonesia.

Design/methodology/approach: This study uses secondary data involving 9 Islamic Commercial Banks that report quarterly financial statements in full to the Otoritas Jasa Keuangan. The period used is during the first to fourth quarters of 2016 – the first to fourth quarters of 2021. This study uses Data Envelopment Analysis with the help of DEAP software version 2.1 and Tobit Regression Analysis with the help of STATA software version 14.2.

Findings: The results of this study indicate that the variables of Third Party Funds, ROA and ROE have no positive and insignificant effect on the efficiency value. Meanwhile the variables FDR and Operating Cost of Operating Income have no negative and insignificant effect on the efficiency value. Variables CAR and Operating Expenses Operating Income have positive and significant effect on the value of efficiency. However, the variables of Bank Size and NPF have negatif and significant effect on the efficiency value.

***Keywords**:- Efficiency Determinant, Data Envelopment Analysis, Tobit Regression Analysis, Islamic Commercial Bank.*

I. INTRODUCTION

Islamic banks have developed worldwide since the establishment of Mit Ghamr Bank as the first modern Islamic bank in Egypt in the 1960s (Karimah et. al. 2016). This development is evidenced by the success of Mit Ghamr Bank in inspiring and awakening Muslims around the world that Islamic principles can be applied to modern business. The success of the Islamic Bank not only inspires Muslims, but also inspires countries with a non-Muslim majority population such as America and Britain (Irfan et. al. 2014). Countries with a non-Muslim majority population then set up Islamic Banks to meet the growing demand for Islamic Finance products (Kablan and Yousfi, 2013).

Indonesia as a country with the largest Muslim population in the world has developed an Islamic bank. This development has occurred since the implementation of the dual bank system in 1992 through Law No. 7 of 1992. Bank Muamalat Indonesia (BMI) is the first Islamic bank established in Indonesia and followed by the establishment of Bank Syariah Mandiri (BSM). BMI and BSM were then followed by the establishment of 15 new Islamic Banks which were recorded until 2021. The development of Islamic Banks in Indonesia is supported by the government through Sharia Banking regulations in the form of Law No. 21 of 2008. The Law explains that Sharia Commercial Banks in Indonesia are banks that carry out activities based on Sharia Principles.

The reasons for the need for efficiency measurements are:

- The results of the efficiency measurement are used as answers in calculating the performance of the Sharia Commercial Banks. Sharia Commercial Banks performance can be improved through the right decisions and policies.
- The results of the efficiency measurement are used as evidence of how much the Sharia Commercial Banks is capable of optimizing the use of all available resources (Mohamad et. al. 2009).

This study uses a grand theory in the form of Resource-Based Theory (RBT) proposed by Solikha (2010:49). RBT is a thought that developed in strategic management theory and company competitive advantage. Companies can achieve competitive advantage if they have superior resources that can be used efficiently.

The level of performance of a company can be measured from financial statements by analyzing and calculating financial performance ratios, especially profitability. Profitability shows the company's ability to generate profits over a certain period. Companies in generating profits of course use assets and capital owned. The higher the level of profitability, the better the company's financial performance in generating profits. Good financial performance indicates that the company can manage the company's assets efficiently.

II. LITERATURE REVIEW

A. Theory Review

a) Efficiency Concept

Measurement of efficiency is one indicator to determine the performance of a company (Mochtar, et. al. 2008). The measurement of efficiency is based on two points of view of microeconomics. The first point of view is the theory of consumption and the second point of view is the theory of production. Consumption theory explains that efficiency can be done by maximizing the usefulness or satisfaction of the individual. Production theory also explains that efficiency can be done by maximizing profit or minimizing costs (Ascarya, et. al. 2008). Manufacturers can minimize waste through production theory.

b) Efficiency in Islamic Perspective
Efficiency explains that possessions are better used to help the poor and their relatives than to be used for useless things. This is the benefit of the principle of efficiency obtained from avoiding wasteful nature. If it is associated with measuring the efficiency of Islamic Commercial Banks, it requires accuracy and accuracy in managing all inputs in order to produce maximum output for several parties.

c) Third Party Funds
Wiroso (2005) concludes that Third Party Funds are funds from the public entrusted to Islamic banks that do not conflict with Islamic principles.

d) Bank Size
Basyib (2007: 122) concludes that Bank Size is a ratio used to assess the size of a Sharia Bank in various ways. One way to assess the size of an Islamic bank is to know the total assets owned.

e) Capital Adequacy Ratio (CAR)
Dendawijaya (2005: 121) concludes that CAR is a minimum capital adequacy ratio that contains risk. The risk in question is in the form of financing, securities, claims on other banks and so on.

f) Non Performing Financing (NPF)
Hilda and Atina (2017) conclude that NPF is the ratio used to measure financing risk in Islamic banks.

g) Other Income
Warkum (2002: 165) concludes that other income is income derived from sources outside the main operational activities.

h) Total Financing
UU no. 10 of 1998 concerning banking explains that financing is the provision of money or claims based on mutual agreement between Islamic banks and other parties being financed.

i) Financing to Deposit Ratio (FDR)
Pambuko (2016) concluded that FDR is the amount of financing originating from community association funds.

j) Operating Expenses Operating Income
Teuku, et. al. (2015) concluded that the Operating Cost of Operating Income is the ratio resulting from the comparison between operating expenses and operating income. Operating expenses represent financing for operational activities such as salaries and interest expenses. Operating income is income generated during operational activities such as financing distribution.

k) Return On Assets (ROA)
Moh Zamil (2007: 70-71) concludes that ROA is a ratio used to measure the ability of Islamic banks to earn net income.

l) Return On Equity (ROE)
Moh Zamil (2007: 70-71) concludes that ROE is a ratio used to measure the ability of Islamic banks to earn net income.

B. Hypotheses Develophment

a) Third Party Funds and Efficiency Value
Third party funds used as financing capital make Islamic banks more profitable than using funds from other sources. The larger the Third party funds owned, the greater the financing disbursed by Islamic banks. The amount of financing disbursed can be interpreted that the Islamic Bank has an efficient performance.

The theoretical study is in line with the empirical study conducted by Lili et. al. (2020), Teuku et. al. (2015), Gishkori and Ullah (2013), Iqbal (2010) and Nugroho (2010) with the conclusion that TPF has a significant positive effect on efficiency. Based on theoretical and empirical studies, the following hypotheses are formulated:

H1: Third Party Funds has a significant effect on efficiency

b) Bank Size and Efficiency Value
Some of the advantages if Islamic Banks have high total assets, among others:

- Islamic banks can carry out their operational activities more broadly.
- Islamic banks adopt more sophisticated technological developments so as to generate maximum profits with minimal costs.

This theoretical study is in line with empirical studies conducted by Hilda and Atina (2017), Puspita (2017), Fafa et. al. (2015), Gishkori and Ullah (2013), Ismail (2012) and Fathony (2012) with the conclusion that Bank Size has a significant positive effect on efficiency. Based on theoretical and empirical studies, the following hypotheses are formulated:

H2: Bank Size has a significant effect on efficiency

Capital Adequacy Ratio (CAR) and Efficiency Value

The higher the CAR level, the better the capital position owned by Islamic Banks in minimizing the risk of disbursement of financing. A good capital position allows Islamic banks to carry out their operational activities optimally and efficiently. The high level of CAR can also mean that Islamic Banks have complied with the capital regulations stipulated by Bank Indonesia. The regulation is in the form of Bank Indonesia regulation No. 25/5/BPPP on 29 May 1993.

The theoretical study is in line with the empirical study conducted by Ibnu et. al. (2020), Karimah (2016), Widiarti et. al. (2015) and Ghozali (2013) with the conclusion that CAR has a significant positive effect on efficiency. Based on theoretical and

ISSN No:-2456-2165

empirical studies, the following hypotheses are formulated:

H3: CAR has a significant effect on efficiency

c) Non Performing Financing (NPF) and Efficiency Value
The higher the financing risk, the resulting Islamic Bank operating inefficiently. As a result of the high level of NPF, it can worsen the quality of financing and the number of non-performing loans becomes more. The poor quality of financing and the increasing number of non-performing financing will have an impact on reducing the profits of Islamic banks.

This theoretical study is in line with the empirical studies conducted by Faza and Nadratuzzaman (2014) and Firdaus and Hosen (2013) with the conclusion that NPF has a significant negative effect on efficiency. Based on theoretical and empirical studies, the following hypotheses are formulated:

H4: NPF has a significant effect on efficiency

d) Other Income and Efficiency Value
The higher the level of income obtained, the income can be used to increase financing expenditures. The addition of financing disbursement was due to the fact that other incomes were able to be managed efficiently so that they could obtain even higher incomes. Based on theoretical studies, the following hypotheses are formulated:

H5: PL has a significant effect on efficiency.

e) Total Financing and Efficiency Value
The higher the level of total financing, the higher the Islamic Bank in generating income through operational activities. The high level of total financing can be interpreted that Islamic Banks in managing the distribution of financing are carried out efficiently. The theoretical study is in line with the empirical study conducted by Lili et. al. (2020), Puspita (2017), Kariamah et. al. (2016), Widiarti et. al. (2015) and Gishkori and Ullah (2013) with the conclusion that *Total Financing* has a significant positive effect on efficiency. Based on theoretical and empirical studies, the following hypotheses are formulated:

H6: *Total Financing* has a significant effect on efficiency.

f) Financing to Deposit Ratio (FDR) and Efficiency Value
The higher the FDR, the more risk the liquidity condition of the Sharia Commercial Banks, because the total funding provided exceeds the funds raised. The lower FDR indicates the lack of efficiency of the Sharia Commercial Banks in disbursing financing because the entire set of funds is not channeled to those in need. If the FDR ratio of the Sharia Commercial Banks is at the standard set by Bank Indonesia, which ranges from 80% to 110%, the profit earned will increase because the Sharia Commercial Banks is able to channel its financing efficiently (Sufian and Noor, 2009).

This theoretical study is in line with the empirical study conducted by Hilda and Atina (2017) with the conclusion that TPF has a significant positive effect on efficiency. Based on theoretical and empirical studies, the following hypotheses are formulated:

H7: FDR has a significant effect on efficiency

g) Operating Costs Operating Income and Efficiency Value
If the Operating Costs Operating Income rate exceeds the stipulation of 60% to 70%, then the Islamic Bank can be interpreted as inefficient in carrying out operational activities in obtaining income. Inefficient operational activities resulted in decreased income because the ability to produce financing products was not optimal. Islamic banks that can minimize the Operating Costs Operating Income ratio can be interpreted that the bank operates efficiently. Banks that are able to operate efficiently can directly reduce expenses so that the income earned will increase.

This theoretical study is in line with the empirical study conducted by Novarini (2008) with the conclusion that Operating Costs Operating Income has a significant negative effect on efficiency. Based on theoretical and empirical studies, the following hypotheses are formulated:

H8: Operating Costs Operating Income has a significant effect on efficiency.

h) Return On Assets (ROA) and Efficiency Value
The higher the ROA level, the higher the net profit obtained. Islamic banks that can obtain maximum net profit can be interpreted that the bank has an efficient performance. The theoretical study is in line with the empirical study conducted by Ibnu et. al. (2020), Hilda and Atina (2017), Puspita (2017), Fafa et. al. (2015), Firdaus and Hosen (2013) and Yudistira (2004) with the conclusion that ROA has a significant positive effect on efficiency. Based on theoretical and empirical studies, the following hypotheses are formulated:

H9: ROA has a significant effect on efficiency.

i) Return On Equity (ROE) and Efficiency Value
The higher the ROE level, the more efficient the management of capital in carrying out operational activities. Operational activities carried out by Islamic Banks are in the form of financing distribution using their own capital. The more efficient the Islamic Bank in managing capital, the more distribution of financing to obtain maximum profit. A lot of income shows that the performance of Islamic banks in managing their own capital can be said to be efficient.

ISSN No:-2456-2165

The theoretical study is in line with the empirical study conducted by Karimah et. al. (2016), Firdaus and Hosen (2013) and Guphta et. al. (2008) with the conclusion that ROE has a significant positive effect on efficiency. Based on theoretical and empirical studies, the following hypotheses are formulated:

H10: ROE has a significant effect on efficiency

III. RESEARCH METHOD

This research is included in the type of explanatory research. Explanatory research is research related to efforts to explain why a phenomenon occurs and examine causal relationships between variables (Gratton and Jones, 2010:198).

A. *Conceptual Framework*

Figure 1 explains that the efficiency value of Islamic Commercial Banks is generated using the Data Envelopment Analysis (DEA) method through predetermined input and output variables. The conceptual framework also explains what variables affect the efficiency of Islamic Commercial Banks in Indonesia. These variables were generated from the Tobit regression analysis method through the calculation of the dependent variable (Y) and the independent variable (X). The dependent variable (Y) in this study is the value of the efficiency generated through the DEA method.

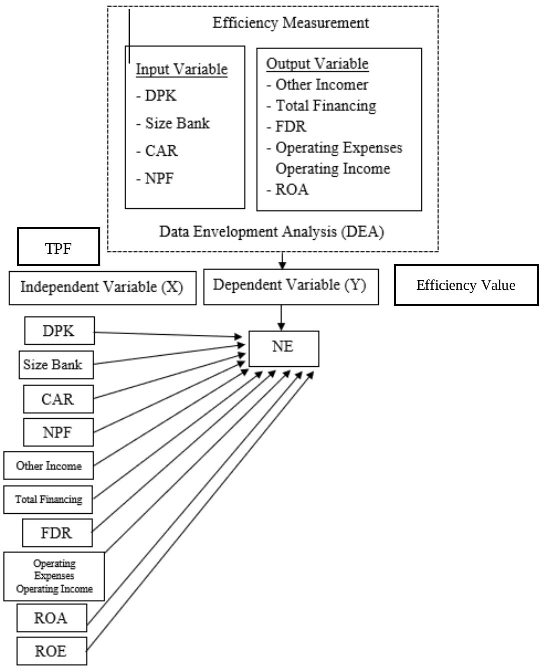

Fig. 1: Conceptual Framework

B. *Operational definition and variables measurement*

- Efficiency Value. The whole of company's activities with the use of minimal input to achieve the maximum amount of output.
- Third-Party Funds. Funds originating from the public are then collected by banks in the form of demand depostis, savings deposits and time deposits. Here is the formula used in this study:

Third-party funds = Savings + Time Deposit + Current Account

- Bank Size. A measure that is assessed based on the wealth of the bank related to the hope it can provide hope in the future. Here is the formula used in this study:

Bank Size = Total Assets owned by the Bank

- Capital Adequacy Ratio (CAR). The bank's minimum reserves are used as capital availability in the event of a loss in its activities. Here is the formula used in this study:

$$CAR = \frac{Capital}{Risk - Weighted\ Assets}\ x\ 100\%$$

- Non Performing Financing (NPF). The number of loans that have difficulty paying off. Here is the formula used in this study:

$$NPF = \frac{Total\ Troubled\ Financing}{Total\ Financing\ Granted}\ x\ 100\%$$

- Other Income. Income obtained from sources outside the company's main activites and does not include operating income. Here is the formula used in this study:

Other Income = Disposal of Assets + Grants or Receivables that are considered uncollectible

- Total Financing. Total funding provided by one party to another to support the investment plan. Here is the formula used in this study:

Total Financing = Musyarakah + Mudharabah + Murabahah + Salam + Istishna' + Other

- Financing to Deposit Ratio (FDR). Financing disbursed by Islamic Commercial Banks from Third Party Funds that have been collected. Here is the formula used in this study:

$$FDR = \frac{Amount\ of\ Funds\ given}{Total\ Third\ Party\ Funds}\ x\ 100\%$$

- Operating Expenses Operating Income. The level of efficiency of the bank in carrying out its operational activities. Here is the formula used in this study:

$$Operating\ Expenses\ Operating\ Income = \frac{Total\ Operating\ Expenses}{Total\ Operating\ Income}\ x\ 100\%$$

- Return On Assets (ROA). The bank's ability to earn a profit from its assets. Here is the formula used in this study:

$$ROA = \frac{Total\ Net\ Profit}{Total\ Assets}\ x\ 100\%$$

- Return On Equity (ROE). The ability of a company to generate profits from investments made by shareholders in the company. Here is the formula used in this study:

$$ROE = \frac{Profit\ After\ Tax}{Owner's\ equity}\ x\ 100\%$$

ISSN No:-2456-2165

C. Types and sources of data

The sampling technique used is purposive sampling method which aims to obtain a representative sample based on the specified criteria. The criteria are to have all the financial statements of Islamic Commercial Banks published on the official website of the Financial Services Authority in a row during the period of Quarter I to Quarter IV/2016 - Quarter I to Quarter IV/2021.

D. Research population and samples

The population of this research is 320 quarterly financial reports of Islamic commercial banks in Indonesia and a sample that meets the criteria is 216.

E. Data Analysis Technique

This research uses Data Envelopment Analysis (DEA) method using DEAP software version 2.1 and combined with Tobit regression analysis using STATA software version 14.2. It is intended that the results of data analysis in this study become more complete.

IV. RESULTS AND DISCUSSION

A. Overview of the research subject and object

The research subjects used are all reports of Islamic Commercial Banks in Indonesia that are financial to the Otoritas Jasa Keuangan during the period of the first quarter – of the fourth quarter/ 2016 to the first quarter - of the fourth quarter/ 2021. The sample in this study met the requirements previously determined.

B. Identify the Headings

After getting the efficiency value through the DEA method, then that value will become the dependent variable. The dependent and independent variables will be regressed using Tobit regression analysis. The determinants of efficiency for each independent variable are presented in table I.

H	Dedependent Variables	Independent Variables	Regression Coef.	*p* value
H1	Efficiency Value	Third-party funds	0.002	0.765
H2		Bank Size	-0.010	0.216
H3		CAR	0.000	0.015
H4		NPF	-0.000	0.000
H5		Other Income	0.001	0.002
H6		Total Financing	0.004	0.000
H7		FDR	-0.000	0.570
H8		Operating Expenses Operating Income	-8.820	0.882
H9		ROA	0.000	0.548
H10		ROE	0.000	0.611

Table 1: Tobit Regression Analysis Results

Source: Data processed result using STATA version 14.2

Variables of Third Party Funds, ROA and ROE have no positive and insignificant effect on the efficiency value. Meanwhile the variables FDR and Operating Cost of Operating Income have no negative and insignificant effect on the efficinecy value. Variables CAR and Operating Expenses Operating Income have positive and significant effect on the value of efficiency. However, the variables of Bank Size and NPF have negatif and significant effect on the efficiency value**.**

C. Discussion

a) The effect of Third Party Funds on Efficiency Value

The high third party funds do not always prove that the financing disbursed by the BUS to increase the value of efficiency has also increased. The main reason is because the collected third party funds cannot be managed into a large enough amount of financing or in other words cannot be allocated optimally. Suboptimal financing allocation is defined as the realization of disbursed financing that is not large enough or not commensurate with the high third party Funds raised. Therefore, Islamic Commercial Banks need to balance the receipt of Third Party Funds with the total distribution of financing. If Islamic Commercial Banks have high Third Party Funds but are not optimal in financing distribution, then Islamic Commercial Banks will not get maximum income and profits efficiently.

b) The effect of Bank Size on Efficiency Value

The high total assets owned does not always prove that Islamic Commercial Banks can help smooth operational activities. Some of these operational activities can be in the form of expanding market share and adopting the latest technology to increase profits. The size of the bank which has no significant effect on the value of efficiency can be caused by the behavior of small Islamic banks which are becoming more managerially aggressive and cost-effective to keep the company alive in its operational activities. The results of this study are supported by Ibnu et. al. (2020), Karimah et. al. (2016), Farhana et. al. (2013) and Darrat et. al. (2002).

c) The effect of Capital Adequacy (CAR) on Efficiency Value

CAR is the minimum capital adequacy ratio that contains risk. The risk in question is in the form of financing, securities, claims on other banks and so on. The minimum capital adequacy owned comes from the capital of the Islamic Commercial Bank itself, public funds, loans and others. Sharia Commercial

ISSN No:-2456-2165

Banks that have sufficient minimum capital are better able to minimize risks in financing distribution in the future. Sharia Commercial Banks that can minimize risk because they have a high CAR level can carry out their operational activities optimally and efficiently. The results of this study are supported by Ibnu et. al. (2020), Karimah (2016), Widiarti et. al. (2015) and Ghozali (2013).

d) The effect of Non Performing Financing (NPF) on Efficiency Value
The results of this study are supported by Faza and Nadratuzzaman (2014) and Firdaus and Hosen (2013). NPF is used to measure the risk of non-performing financing caused by customers. There are several disadvantages if Islamic Commercial Banks have a high NPF level, including:
- May result in disruption of the operations of Islamic Commercial Banks in managing revenue optimally.
- Deteriorating the quality of financing and the number of non-performing financing becomes more and more. The poor quality of financing and the increasing number of non-performing financing will have an impact on the decline in the profits of Islamic Commercial Banks.

e) The effect of Other Income on Efficiency Value
Other income is obtained from sources other than the main operational activities. Sources of income outside of operational activities can be in the form of disposal of assets, grants or receivables that are considered uncollectible and others. The higher the level of Other Income obtained, the Other Income can be used to increase the operational costs of Islamic Commercial Banks in the form of financing. The addition of financing disbursement is due to Other Income which can be managed efficiently so that Islamic Commercial Banks can obtain higher income and profits.

f) The effect of Total Financing on Efficiency Value
Total financing is in the form of total supply of money or claims based on the agreement between the Islamic Commercial Bank and other parties being financed. The financed party is obliged to return the money or bill in accordance with a certain period of time. The financing provided aims to support investment plans, both independently and by institutions. Total financing can also be in the form of musharaka, mudharabah, murabahah, greetings, istishna', and others. The higher the level of total financing, the higher the Islamic Commercial Bank in generating income through operational activities. The high level of total financing can be interpreted that Islamic Commercial Banks in managing the distribution of financing are carried out efficiently. The results of this study are supported by Lili et. al. (2020), Puspita (2017), Karimah et. al. (2016), Widiarti et. al. (2015) and Gishkori and Ullah (2013).

g) The effect of Financing to Deposit Ratio (FDR) on Efficiency Value
FDR comes from financing that comes from community association funds. The financing disbursed by Islamic Commercial Banks is expected to provide benefits for the Islamic Commercial Banks themselves. In the results of this study, the higher the FDR level, the lower the liquidity of Islamic Commercial Banks because the total financing does not exceed the funds raised. This is because Islamic Commercial Banks in disbursing financing need to carry out a selection process in measuring the feasibility of financing to prospective customers. The higher the FDR level of a Sharia Commercial Bank is not a benchmark for obtaining high income and profits. The results of this study are supported by Fadhil, et. al. (2017).

h) The effect of Operating Costs on Operating Income on Efficiency Value
Operating expenses operating income is used to compare operating expenses with operating income. Operating expenses represent financing for operational activities such as salaries and interest expenses. Operating income is income generated during operational activities such as financing distribution. The level of operational costs of operating income that exceeds the 60% to 70% stipulation does not always prove that the operational activities of Islamic Commercial Banks in distributing financing are considered inefficient or vice versa. This is due to the inability of Islamic Commercial Banks to suppress financing which affects income. If Islamic Commercial Banks reduce operational costs for financing distribution, Islamic Commercial Banks will lose the opportunity to obtain higher income. The results of this study are supported by Teuku et. al. (2015), Nugroho (2010) and Iqbal (2010).

i) The effect of Return On Assets (ROA) on Efficiency Value
The increase in ROA does not always prove that the distribution of financing by Islamic Commercial Banks to obtain income will increase or vice versa. This is due to the lack of management capability of Islamic Commercial Banks in competing with the management capabilities of other Islamic Commercial Banks that are superior in obtaining income from all assets owned. The ineffectiveness of ROA on efficiency can also be caused by the pattern of efficiency levels where several Islamic Commercial Banks with high efficiency levels experience a decrease in economies of scale (Moh Zamil, 2007). This causes a decrease in costs which will result in lower income for the efficiency of Islamic Commercial Banks. The results of this study are supported by Wahab (2015).

ISSN No:-2456-2165

j) The effect of Return On Equity (ROE) on Efficiency Value
ROE is used to measure net income obtained through own capital after tax deductions. The increase in ROE does not always prove that the distribution of financing by Islamic Commercial Banks to obtain income will increase or vice versa. This can be caused by the management of Islamic Commercial Banks who are less able to manage capital to channel financing efficiently. Inefficient distribution of financing can result in Islamic Commercial Banks losing the opportunity to obtain higher net profits.

V. CONCLUSION

The results of the test using the Tobit regression analysis method can be concluded that of the 10 independent variables in this study only Variables CAR and Operating Expenses Operating Income have positive and significant effect on the value of efficiency. However, the variables of Bank Size and NPF have negatif and significant effect on the efficiency value.

REFERENCES

[1.] Ascarya, D, Y., dan Guruh, S, R. 2008. *Analisis Efisiensi Perbankan Konvensional dan Perbankan Syariah di Indonesia dengan Data Envelopment Analysis (DEA)*. Paper dalam Buku Current Issues Lembaga Keuangan Syariah 2009, TIM IAEI. Jakarta: Kencana Prenada Media Group.
[2.] Basyib, Fachmi. 2007. *Keuangan Perusahaan*. Edisi Pertama. Jakarta: Kencana Prenada Media Group.
[3.] Darrat, A, F., Topuz, C., and Yousef, T. (2002). Assesing Cost and Technical Efficiency of Banks in Kuwait. *Paper presented at the ERF's 8th Annual Conference 2002.* Cairo, Egypt
[4.] Dendawijaya, L. 2005. *Manajemen Perbankan*. Jakarta: Penerbit Ghalia Indonesia.
[5.] Fafa, Y, P., dan Adityawarman. 2015. Analisis Faktor-Faktor yang Memengaruhi Tingkat Efisiensi Perbankan Syariah di Indonesia. *Diponegoro Journal of Accounting*. Vol.4(3): 1-14.
[6.] Fathony, Moch. 2012. Estimasi dan Faktor-Faktor yang Memengaruhi Efisiensi Bank Domestik dan Asing di Indonesia. *Jurnal Keuangan dan Perbankan*. Vol.16(2): 223-237.
[7.] Farhan, I., Shabri, A., dan Rossazana. 2013. Efficiency of Islamic Bank and Conventional Banks in Malaysia. *Emerald Insight*. Vol.11(1): 92-107.
[8.] Faza, M, F., dan Nadratuzzaman, M. 2014. Efisiensi Bank Umum Syariah Menggunakan Pendekatan Two-Stage Data Envelopment Analysis. *Buletin Ekonomi Moneter dan Perbankan*. Vol.16(2): 167-188.
[9.] Ghozali, S. 2013. Determinan Efisiensi dan Dampaknya Terhadap Kinerja Probabilitas Industri Perbankan di Indonesia. *Jurnal Keuangan dan Perbankan*. Vol.17(1): 123-135.
[10.] Gishkori, M., dan Naeem, U. 2013. Technical Efficiency of Islamic and Commercial bank: evidence from Pakistan. *IOSR Journal of Business and Management*. Vol.7(4).
[11.] Gratton, C., dan Jones, I. 2010. *Reasearch Methods for Sport Studies* Edisi Kedua. New York: Routledge.
[12.] Guphta, K, Omprakash., Yogesh Doshit., dan Aneesh Chinubhai. 2008. Dynamics of Productive Efficiency of India Banks. *International Journal of Operations Research*. Vol.10
[13.] Hilda, S, P., dan Atina, S. 2017. Determinan Tingkat Efisiensi Bank Pembangunan Daerah (BPD) Syariah di Indonesia: Two Stage Data Envelopment Analysis. *Jurnal Ekonomi Syariah Teori dan Terapan Universitas Airlangga*. Vol.5(10): 800-8015.
[14.] Ibnu, M., Rini., dan Alif, I. 2020. Efisiensi Bank Umum Syariah di Indonesia dengan Pendekatan Three Stages Frontier Analysis. *Jurnal Akuntansi dan Keuangan Islam*. Vol.8 (2): 115-129.
[15.] Irfan Majeed, Y., dan Zaman, K. 2014. The Performance and Efficiency of Islamic Banking in South Asian Country. *Journal Seria Management*. Vol.17(2): 223-236.
[16.] Ismail, F, R, A, R., dan M, Shabri, A, M. 2012. Determinant of Efficiency in Malaysia Banking Sector. *International Procedings of Economics Development and Research*. Vol.43: 238.
[17.] Iqbal, Ahmad. 2011. Analisis Perbandingan Efisiensi Bank Umum Syariah (BUS) dan Bank Umum Konvensional (BUK) dengan Stockhastic Frontier Approach (Periode 2006-2009). Tesis. Semarang: Fakultas Ekonomika dan Bisnis Universitas Diponegoro.
[18.] Kablan, Yousfi. 2013. What Drives Efficiency of Islamic Banks Among Regions?. *The Journal of Applied Business Reasearch*. Vol.29 (5): 1411-1420.
[19.] Karimah, S., Novianti, T., dan Effendi, J. 2016. *Kajian Efisiensi Bank Umum Syariah di Indonesia*. Jurnal Al-Muzara'ah. Vol.4, No.1: 2337-6333.
[20.] Lili, P, S., dan Hendri, T. 2020. Efisiensi di Bank Syariah: Studi Empiris Pada Unit Usaha Syariah Bank Pembangunan Daerah di Indonesia. *Jurnal Akuntansi dan Keuangan Islam*. Vol.8(1): 5-20.
[21.] Mochtar, H, S, A., dan Naziruddin, A, S, A. 2006. Eficiency of Islamic Banking in Malaysia: A Stochastic Frontier Approach. *Journal Of Economic Cooperation*. Vol.27 (2): 37-70.
[22.] Mohamad, S., Hassan, T., dan Bader. 2009. Efficiency of Conventional versus Islamic Banks: International Evidence using the Stochastic Frontier Approach (SFA). *Journal of Islamic Economics, Banking, and Finance*.
[23.] Mohd, Zamil, N, A. 2007. Efficiency of Islamic and Conventional Commercial Banks in Malaysia (2000-2004): A Data Envelopment Analysis (DEA) Study. Master Thesis. Selayang: International Islamic University Malaysia.
[24.] Novarini. 2008. Analisis Perbandingan Efisiensi Bank Syariah dengan Metode Data Envelopment Analysis (Periode tahun 2005). *Jurnal Ekonomi dan Bisnis Islam*. Vol.2 (3): 80-116.
[25.] Nugroho, R, A. 2011. Analisis Perbandingan Efisiensi Bank Umum Syariah (BUS) dan Unit Usaha Syariah (UUS) dengan Metode Stockhastic Frontier Analysis

ISSN No:-2456-2165

(SFA) (Periode 2005-2009). Tesis. Semarang: Fakultas Ekonomika dan Bisnis Universitas Diponegoro.

[26.] Pambuko, Z, B. 2016. Determinan Tingkat Efisiensi Perbankan Syariah di Indonesia: Two Stages Data Envelopment Analysis. *CAKRAWALA*. Vol.XI(2).

[27.] Puspita, H. 2017. Efisiensi Bank Pembangunan Daerah (BPD) Syariah di Indonesia dengan pendekatan two stage data envelopment analysis periode 2012-2016. Universitas Airlangga.

[28.] Solikha. 2010. Analisis Efisiensi Baitul Maal Wat Tamwil dengan Pendekatan Two Stage Data Envelopment Analysis (DEA). *TAKZIA Journal of Islamic Finance and Business Review*. Vol.5(2): 110-125.

[29.] Teuku, M, H., dan Harjum, M. 2015. Analisis Perbandingan Efisiensi Bank Umum Syariah (BUS) dan Unit Usaha Syariah (UUS) dengan Metode Stochastic Frontier Analysis (SFA) Periode 2010-2013. *Diponegoro Journal of Management*. Vol.4(4): 1-15.

[30.] Wahab. 2015. Analisis Faktor-Faktor Syariah di Indonesia dengan Pendekatan Two Stage Stockhastic Frontier Approach (Studi Analisis di Bank Umum Syariah). *Jurnal Pemikiran dan Penelitian Ekonomi Islam*. Vol.VI(2): 57-76.

[31.] Warkum Sumitro. 2002. *Asas-Asas Perbankan Islam dan Lembaga-Lembaga Terkait*. Ed Revisi. Jakarta: Raja Grafindo Persada.

[32.] Widiarti, A, W., Siregar, H., dan Andati, T. 2015. The Determinants of Bank's Efficiency in Indonesia. *Bank Indonesia: Buletin Ekonomi Moneter dan Perbankan*. Vol.18(2): 129-156.

[33.] Wiroso. 2005. Penghimpun Dana dan Distribusi Hasil Usaha Bank Syariah. Jakarta: PT Grasindo.

[34.] Yudistira, D. 2004. Efficiency in Islamic Banking: An Empirical Analysis of Eighteen Banks. *Islamic Economic Studies*. Vol.12(1): 1-19.