International Journal of Innovation, Creativity and Change. www.ijicc.net
Volume 6, Issue 7, 2019

# Information Analysis, Data Correlation: CAR, FDR, NPF, OER against ROA of Eleven (11) Islamic Banks in Indonesia for 2013-2018

**R. A. E. Virgana[a], Mohamad Anton Athoillah[b], Elis Ratna Wulan[c],** [a]IS Department, Widyatama University, Indonesia [b],[c]Postgraduate School, State Islamic University Sunan Gunung Djati, Indonesia
Email: rae.virgana@widyatama.ac.id, anton_athoillah@uinsgd.ac.id, elis_ratna_wulan@uinsgd.ac.id,

This research has analysed information related to the relationship of CAR data (Capital Adequacy Ratio), FDR (Financial Deposit Ratio), NPF (Non-Performance Finance), and OER (Operational Efficiency Ratio) to ROA (Return On Assets) at eleven (11) Islamic banks in Indonesia in the period 2013 to 2018. The data used is quarterly reports of Islamic Banks in the period 2009 to 2018. The results of this study shows that CAR has a positive effect on ROA which is very significant, with p-value 2.03e-10, CAR coefficient = +0.0440045, so that every increase of 1% CAR results in an increase in ROA of 0.0440045%. For NPF, it has a negative effect on ROA and is not significant, with p-value 0.6418, the coefficient of NPF = −0.0267854, so that every increase in NPF 1% results in a decrease in ROA of 0.0267854%, and vice versa. For OER, it has a negative effect on ROA significantly, with p-value 1.71e-88, OER coefficient = −0.118434, so that every increase in OER of 1% results in a decrease in ROA of 0.118434%, and vice versa. For FDR, it has a negative effect on ROA significantly with p-value 0.0001, the coefficient of FDR = .00.0124499, so that every increase in FDR of 1% results in a decrease in ROA of 0.0124499%, and vice versa.

**Key words:** *Return on assets. Capital adequacy ratio, Financial deposit ratio.*

## Introduction

Islamic banks have the noble task of facilitating the public to be able to transact with banks in ways that are blessed by Allah Subhanahu wa ta'ala, which has justified buying and selling and prohibiting usury, as stated in His Qur'an Al-Baqarah verse 275:

الَّذِينَ يَأْكُلُونَ الرِّبَا لَا يَقُومُونَ إِلَّا كَمَا يَقُومُ الَّذِي يَتَخَبَّطُهُ الشَّيْطَانُ مِنَ الْمَسِّ ۚ ذَٰلِكَ بِأَنَّهُمْ قَالُوا إِنَّمَا الْبَيْعُ مِثْلُ الرِّبَا ۗ وَأَحَلَّ اللَّهُ الْبَيْعَ وَحَرَّمَ الرِّبَا ۚ فَمَنْ جَاءَهُ مَوْعِظَةٌ مِنْ رَبِّهِ فَانْتَهَىٰ فَلَهُ مَا سَلَفَ وَأَمْرُهُ إِلَى اللَّهِ ۖ وَمَنْ عَادَ فَأُولَٰئِكَ أَصْحَابُ النَّارِ ۖ هُمْ فِيهَا خَالِدُونَ

Al-Baqarah: 275, "Those who consume interest cannot stand [on the Day of Resurrection] except as one stands who is being beaten by Satan into insanity. That is because they say, "Trade is [just] like interest." But Allah has permitted trade and has forbidden interest. So whoever has received an admonition from his Lord and desists may have what is past, and his affair rests with Allah. But whoever returns to [dealing in interest or usury] - those are the companions of the Fire; they will abide eternally therein."

Islamic Bank financial statements are a very important component in realizing true and good Islamic Bank governance, to create openness to society and the government. Allah Subhnahu wa ta'ala instructs all of us to pay attention properly and well what he has done, as in His words the Qur'an Al-Ḥasyr verse 18:

يَا أَيُّهَا الَّذِينَ آمَنُوا اتَّقُوا اللَّهَ وَلْتَنْظُرْ نَفْسٌ مَا قَدَّمَتْ لِغَدٍ ۖ وَاتَّقُوا اللَّهَ ۚ إِنَّ اللَّهَ خَبِيرٌ بِمَا تَعْمَلُونَ

Al-Hasyr : 18, “O you who have believed, fear Allah . And let every soul look to what it has put forth for tomorrow - and fear Allah. Indeed, Allah is Acquainted with what you do”.

One important component of financial statements is a financial ratio report containing estimated values from various aspects of the bank's financial condition. Financial report format standards, especially financial ratio reports and so on, are determined by the OJK (Financial Services Authority) of the Republic of Indonesia, in the last 8 years 2010-2018. There are approximately three financial report formats. Although the format, components and layout change, basically the components that compile the financial statements, especially the report on financial ratios outlined are the same. One of the most important components in financial statements, especially the financial ratio report, is the component of the bank's performance ratio, as follows:

1. ROA (Return On Asset), category of Rentability.
2. CAR (Capital Adequacy Ratio), Capital category, CAR by calculating financing risk and market risk or Minimum Capital Provision Obligation (KPMM).

3. FDR (Financial Deposit Ratio), Liquidity category.
4. NPF (Non Performance Finance), Productive Assets category, which is used NPF-Net.
5. OER (Operational Efficiency Ratio) or BOPO (Operational Income Operational Income), Rentability category.

Five (5) of these components represent only a few components, from about thirteen (13) components in the latest financial ratio report (2018). However, the five (5) components were chosen to represent the financial health condition of the bank in this study.

**Literature**

Islamic economic principles (Choudhury, 1986) states that the Islamic economy is not filled by conventional views on economic analysis, but is motivated by the principles of tawheed, and brotherhood, the principle of work and productivity, the principle of equity distribution (zakah, sadaqah, ghanimah, fai, fidth, kharaj). In Islamic economics, it teaches humans how to relate to other humans in their connection with Allah Subhanahu wa ta'ala (Hussain, Grabara, Sharif & Razimi, 2019).

The banking system is undeniable having a close connection with the International Monetary System that was developing during this time (Samuelson & Nordhaus, 2010). It is an institution that has a payment system that can cross national borders; the rate of foreign currency is determined, and the government can influence the rate of exchange. Exchange rate models are, among others, the model that is determined to use the classic gold standard, maybe this is a model that we should follow in sharia terms in relation to Islamic banks. Other models that are currently used by many countries are flexible or exchange rates that move according to the market or exchange rates are managed dynamically by the state, this model has developed since the existence of The Bretton Woods System which left gold as a reference for exchange rates.

The theory of econometrics is to determine the causal relationship between one variable and another variable, which is one characteristic of quantitative research with linear regression analysis (Basuki, t.t.).

Research conducted by (Ananda, t.t.) using Islamic Bank quarter seven data between 2010-2012 showed that CAR, NPF, FDR and OER had a negative effect but FDR and OER had a significant effect. Other research by (Purwanto, t.t.) states FDR and NPF have a positive

effect on earnings. The same research was carried out by (Sudaryo & Haera, 2018) that FDR has a strong relationship to ROA and NPF has a moderate relationship to ROA.

The same research was carried out by (Nugrohowati & Bimo, 2019) and showed that total assets and CAR have a negative effect on NPF; OER has a positive effect on NPF. Research was also done by (Wibowo & Syaichu, t.t.) and showed that OER has a significant negative effect on ROA while CAR and NPF has no effect. Research was also conducted by (Pramudhito, t.t.) that CAR, OER, FDR significantly influences ROA, while NPF is not significant towards ROA. Another research (Sripancawatimartiningsih, t.t.) showed that CAR, NPF, OER significantly affected ROA, but FDR does not affect ROA.

Research by (Rasyidin, 2016) states FDR as one of the health assessments of Islamic Banks. Similar research (Zulpahmi & Rizqiana, 2018) showed that OER has a positive and significant effect on murabaha margins, and NPF has a negative and not significant effect on murabahah margins. Other research states (Susilawati & Ali, t.t.) that NPF has a negative influence on mudharabah financing.

The study of predicting causality relationships used panel data in research (Dritsakis & Stamatiou, 2018) for the data period 1970-2015 using panel analysis. Another research was also conducted by (Mikhailitchenko, 2016) to estimate share capital and consumption of fixed capital in Australia between 1990-2013. Other causality studies such as (Hakim & Subanti, t.t.) showed Job opportunity and income panel data in Indonesia from 1995 to 2005 and in other economic forecasting studies (Hakim, t.t.). Research was also conducted by (Baltagi, 2006) in the Data Panel Econometrics - theoretical contributions and empirical applications. Similar research builds modeling using panel data regression performed by (Mayastuti, Fathurahman, & Wahyuningsih, 2014). Another research panel assessed the euro adoption effect and the bank (Georgantopoulos, Tsamis, & Agoraki, 2015).

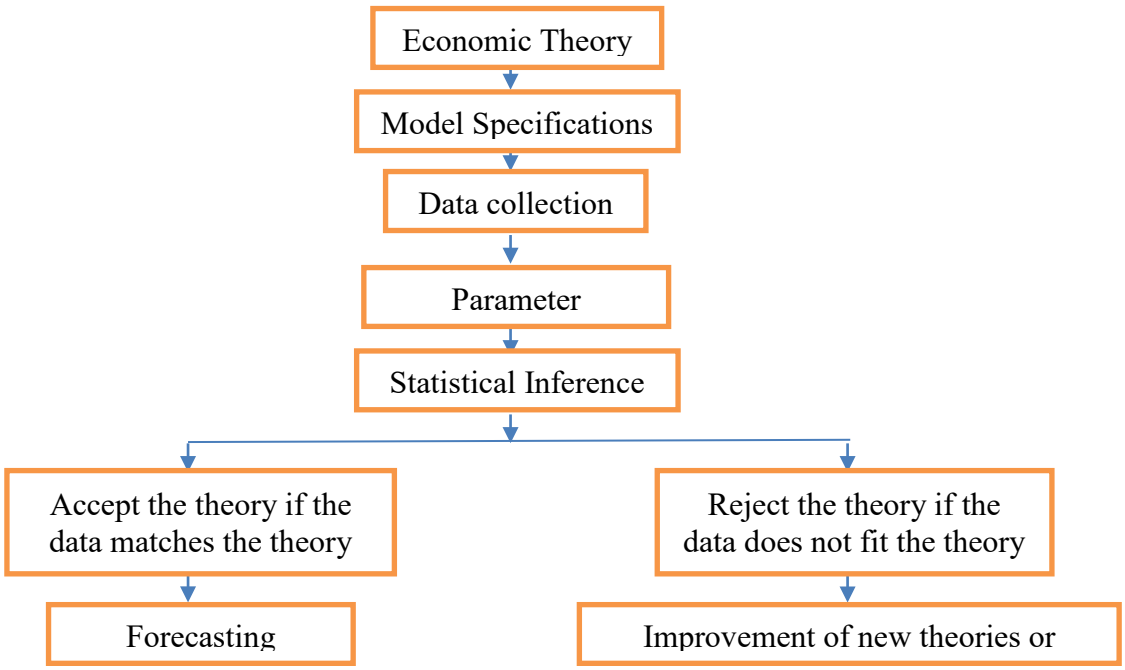
In this study, the statistical device used is Gretl (Adkins, t.t.); a special statistical software for econometric case studies, which stands for GNU Regression, Econometric and Time-series Library, has the slogan "By econometrician, for econometrician." The version used in this statistical analysis is gretl 2019a Linux x86_64 build date 2019-01-24.

Time series research, panel data, cross section using Gretl has been widely used as research conducted by (Shi, 2014) *time series* – U.S. GDP and Government Revenue Expenditures between 1980-2013. Then research uses other panel data (Pérez & López, t.t.) teaching and learning econometrics using Gretl. Other research (Mixon Jr & Smith, 2006) involves teaching undergraduate econometrics with Gretl.

Other tools for time series statistics have been studied such as eviews (Iqbal, Si, & Si, t.t.) ("Modul Praktikum Eviews," t.t.) (Dr. E.Lucky Maretha S., M.Si, t.t.) nor R statistical programming (Torres-Reyna, t.t.), however, Gretl has a simple and integrated peculiarity, which according to researchers is not on other devices.

**Metodologi**

**Figure 1.** Econometrics Research Procedure (Damodar Gujarati, 1978)




The steps in econometric research methodology are as follows:

Step 1: The model to be built must be based upon economic theory (Microeconomic Theory, Macroeconomic Theory and Economic Development Theory)

Step 2: Specify the model, including:

a. The independent variable or explanatory variable and the dependent variable that will be included in the model.
b. Priori assumptions regarding the value and parameter mark of the model.
c. Mathematical form of the model.

Step 3: Estimating the model with the right econometric method, including:

a. Data collection.
b. Investigate whether there is a violation of classical assumptions.
c. Investigate identification requirements if the model contains more than one equation.

d. Choose the right econometric technique for estimating the model.

Step 4: Evaluate or test to decide whether estimates - parameters of the parameters have been theoretically meaningful and statistically significant, including:

a. Priori economic criteria
b. Criteria for statistic's
c. Econometric criteria

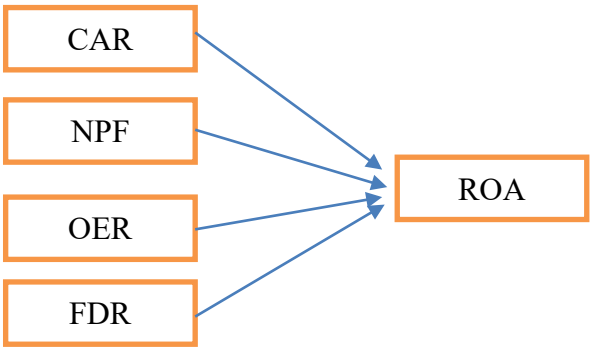
Step 5: Test the strength of model forecasting.

Step 6: Statistical Inference. Do the results of statistical and econometric tests support the theory, if it does not support repeat check the data back and give supporting reasons to achieve the results are not in accordance with the theory.

**Economic Theory**

The instrument research model correlates the relationship of CAR, NPF, OER, and FDR to ROA, as follows:

**Figure 2.** Correlation of the relationship between CAR, NPF, OER, and FDR against ROA




Research hypothesis:

1. The first hypothesis states that CAR has a positive and significant influence on Return on Assets.
2. The second hypothesis states that NPF has a negative and not significant effect on ROA.
3. The third hypothesis states that OER has a negative and significant effect on ROA
4. The fourth hypothesis states that FDR has a negative and significant effect on ROA.

**Model Specifications**

The panel - time-series data model is chosen closest to the existing data model, there are 11 banks with each bank having 24 reports starting from 2013Q1 to 2018Q4. Processing statistical data using GRETL is a special statistical software for econometric case studies, which stands for GNU Regression, Econometric and Time-series Library, has the slogan "By econometrician, for econometrician." The version used in this statistical analysis is gretl 2019a Linux x86_64 build date 2019-01-24. The following is the data processing process that starts from the time-series panel data specification model, as follows:

One or more non-numeric variables were found.
These variables have been given numeric codes as follows.

String code table for variable 1 (Bank):
1 = 'BSM'
2 = 'BNIS'
3 = 'VICS'
4 = 'BRIS'
5 = 'MUA'
6 = 'BUKS'
7 = 'BCAS'
8 = 'MAYS'
9 = 'MEGS'
10 = 'PDBS'
11 = 'BJBS'

String code table for variable 2 (Tahun_Triwulan):
1 = '2013Q1'
2 = '2013Q2'
3 = '2013Q3'
4 = '2013Q4'
5 = '2014Q1'
6 = '2014Q2'
7 = '2014Q3'
8 = '2014Q4'
9 = '2015Q1'
10 = '2015Q2'

11 = '2015Q3'
12 = '2015Q4'
13 = '2016Q1'
14 = '2016Q2'
15 = '2016Q3'
16 = '2016Q4'
17 = '2017Q1'
18 = '2017Q2'
19 = '2017Q3'
20 = '2017Q4'
21 = '2018Q1'
22 = '2018Q2'
23 = '2018Q3'
24 = '2018Q4'

The number of cross-sectional units = 11, is eleven data (11) Islamic Banks are used, and Number of time periods = 24, is data used between 2013-2018, so there are six (6) years multiplied by four years. (4) quarterly reports, so that (6) * (4) = 24 quarterly reports for 6 years for each Islamic Bank.

*Summary statistics*:

| | Mean | Median | Minimum | Maximum |
|---|---|---|---|---|
| CAR | 23.664 | 17.965 | 10.160 | 193.35 |
| NPF | 2.5907 | 2.6300 | 0.0000 | 13.540 |
| ROA | 0.40288 | 0.79000 | -20.130 | 8.1800 |
| OER | 95.387 | 92.825 | 53.530 | 217.40 |
| FDR | 99.326 | 92.135 | 55.000 | 424.92 |

| | Std. Dev. | C.V. | Skewness | Ex. kurtosis |
|---|---|---|---|---|
| CAR | 21.192 | 0.89554 | 5.2794 | 34.710 |
| NPF | 1.6793 | 0.64818 | 0.93175 | 5.2544 |
| ROA | 2.8654 | 7.1123 | -3.3358 | 17.220 |
| OER | 20.983 | 0.21998 | 3.2070 | 13.356 |
| FDR | 37.153 | 0.37406 | 5.8637 | 43.269 |

| | 5% perc. | 95% perc. | IQ range | Missing obs. |
|---|---|---|---|---|
| CAR | 12.040 | 61.290 | 8.6700 | 0 |

| | | | | |
|---|---|---|---|---|
| NPF | 0.0000 | 4.7975 | 2.4875 | 0 |
| ROA | -5.5950 | 3.1425 | 1.0575 | 0 |
| OER | 71.695 | 133.02 | 9.9150 | 0 |
| FDR | 77.293 | 156.12 | 11.868 | 0 |

To develop a model specification that is suitable for processing this data, the model selection process will be carried out: Pooled OLS versus Fixed Effects versus Random Effects (GLS), as follows:

***Model Pooled Ordinary Least Squares (OLS)***

Model 1: Pooled OLS, using 264 observations
Included 11 cross-sectional units
Time-series length = 24
Dependent variable: ROA

| | coefficient | std. error | t-ratio | p-value | |
|---|---|---|---|---|---|
| Const . | 12.4388 | 0.348028 | 35.74 | 4.02e-102 | *** |
| CAR | 0.0302513 | 0.00569048 | 5.316 | 2.29e-07 | *** |
| NPF | 0.0321798 | 0.0471543 | 0.6824 | 0.4956 | |
| OER | −0.122353 | 0.00374712 | −32.65 | 8.49e-94 | *** |
| FDR | −0.0117211 | 0.00324276 | −3.615 | 0.0004 | *** |

Mean dependent var 0.402879 S.D. dependent var 2.865413
Sum squared resid 329.4520 S.E. of regression 1.127837
R-squared 0.847432 Adjusted R-squared 0.845076
F(4, 259) 359.6523 P-value(F) 2.0e-104
Log-likelihood −403.8353 Akaike criterion 817.6707
Schwarz criterion 835.5504 Hannan-Quinn 824.8553
rho 0.494271 Durbin-Watson 0.976585
Excluding the constant, p-value was highest for variable 4 (NPF)

***Model Fixed Effects***

Model 2: Fixed-effects, using 264 observations
Included 11 cross-sectional units
Time-series length = 24

Dependent variable: ROA

| | coefficient | std. error | t-ratio | p-value |
|---|---|---|---|---|
| const | 11.9647 | 0.390098 | 30.67 | 1.54e-86 *** |
| CAR | 0.0440045 | 0.00663399 | 6.633 | 2.03e-10 *** |
| NPF | −0.0267854 | 0.0575130 | −0.4657 | 0.6418 |
| OER | −0.118434 | 0.00377467 | −31.38 | 1.71e-88 *** |
| FDR | −0.0124499 | 0.00322720 | −3.858 | 0.0001 *** |

Mean dependent var 0.402879 S.D. dependent var 2.865413
Sum squared resid 286.3801 S.E. of regression 1.072437
LSDV R-squared 0.867379 Within R-squared 0.854410
LSDV F(14, 249) 116.3235 P-value(F) 1.5e-100
Log-likelihood −385.3407 Akaike criterion 800.6815
Schwarz criterion 854.3207 Hannan-Quinn 822.2354
rho 0.391112 Durbin-Watson 1.165889
Joint test on named regressors -
Test statistic: F(4, 249) = 365.321
with p-value = P(F(4, 249) > 365.321) = 6.93054e-103
Test for differing group intercepts -
Null hypothesis: The groups have a common intercept
Test statistic: F(10, 249) = 3.74499
with p-value = P(F(10, 249) > 3.74499) = 0.000105044

**Model Random Effects**

Model 3: Random-effects (GLS), using 264 observations
Included 11 cross-sectional units
Time-series length = 24
Dependent variable: ROA

| | coefficient | std. error | z | p-value |
|---|---|---|---|---|
| const | 12.2168 | 0.383288 | 31.87 | 6.18e-223 *** |
| CAR | 0.0373563 | 0.00612140 | 6.103 | 1.04e-09 *** |
| NPF | −0.000226004 | 0.0532779 | −0.004242 | 0.9966 |
| OER | −0.120337 | 0.00370866 | −32.45 | 5.88e-231 *** |

```
  FDR        −0.0122702     0.00320336    −3.830      0.0001    ***

Mean dependent var   0.402879   S.D. dependent var  2.865413
Sum squared resid    336.4290   S.E. of regression    1.137523
Log-likelihood      −406.6016   Akaike criterion      823.2032
Schwarz criterion    841.0829   Hannan-Quinn          830.3878
rho                  0.391112   Durbin-Watson         1.165889

'Between' variance = 0.133847
'Within' variance = 1.15012
theta used for quasi-demeaning = 0.486539
corr(y,yhat)^2 = 0.844202
Joint test on named regressors -
  Asymptotic test statistic: Chi-square(4) = 1475.11
  with p-value = 0
Breusch-Pagan test -
  Null hypothesis: Variance of the unit-specific error = 0
  Asymptotic test statistic: Chi-square(1) = 11.3741
  with p-value = 0.000744768
Hausman test -
  Null hypothesis: GLS estimates are consistent
  Asymptotic test statistic: Chi-square(4) = 7.27475
  with p-value = 0.122062
```

***Comparison Diagnostics of Pooled OLS versus Fixed Effects versus Random Effects***

```
Diagnostics: using n = 11 cross-sectional units
Fixed effects estimator
allows for differing intercepts by cross-sectional unit
            coefficient      std. error     t-ratio     p-value
  ------------------------------------------------------------------------------------------
-
  const         11.9647     0.390098       30.67      1.54e-86 ***
  CAR          0.0440045    0.00663399     6.633      2.03e-10 ***
  NPF         −0.0267854    0.0575130     −0.4657     0.6418
  OER          −0.118434    0.00377467    −31.38      1.71e-88 ***
  FDR          −0.0124499   0.00322720    −3.858      0.0001   ***
```

Residual variance: 286.38/(264 - 15) = 1.15012
Joint significance of differing group means:
F(10, 249) = 3.74499 with **p-value 0.000105044**
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, **in favour of the fixed effects alternative.**)
Variance estimators:
between = 0.133847
within = 1.15012
theta used for quasi-demeaning = 0.486539

Random effects estimator
allows for a unit-specific component to the error term

| | coefficient | std. error | t-ratio | p-value |
|---|---|---|---|---|
| const | 12.2168 | 0.383288 | 31.87 | 1.27e-91 *** |
| CAR | 0.0373563 | 0.00612140 | 6.103 | 3.79e-09 *** |
| NPF | −0.000226004 | 0.0532779 | −0.004242 | 0.9966 |
| OER | −0.120337 | 0.00370866 | −32.45 | 3.16e-93 *** |
| FDR | −0.0122702 | 0.00320336 | −3.830 | 0.0002 *** |

Breusch-Pagan test statistic:
LM = 11.3741 with p-value = prob(chi-square(1) > 11.3741) = 0.000744768
(A low p-value counts against the null hypothesis that the pooled OLS model
is adequate, in favor of the random effects alternative.)
Hausman test statistic:
H = 7.27475 with **p-value = prob(chi-square(4) > 7.27475) = 0.122062**
(A low p-value counts against the null hypothesis that the random effects
model is consistent, **in favour of the fixed effects model.)**

The conclusion for the best model selection specification is seen in point 4, the Fixed Effects model is recommended twice by the Diagnostic Panel tool and has a p-value of 0.000105044 <0.05, while the random effects model has a p-value of 0.122062> 0.05. So, the most suitable regression model for this data is the Fixed Effects model.

**Data Collection**

This study attempts to analyse information related to the relationship of CAR data (Capital Adequacy Ratio), FDR (Financial Deposit Ratio), NPF (Non Performance Finance), and OER (Operational Efficiency Ratio) to ROA (Return On Assets) at eleven (11) Sharia Commercial Banks in Indonesia in the period 2013 to 2018.

There are thirteen (13) Islamic Banks in Indonesia, as follows:

1. PT. Bank Syariah Mandiri (BSM)
2. PT. Bank BNI Syariah (Bank Nasional Indonesia Syariah)
3. PT. Bank Victoria Syariah
4. PT. Bank Jabar Banten Syariah (BJBS)
5. PT. Bank Tabungan Pensiunan Nasional Syariah (BTPN Syariah)
6. PT. Bank BRISyariah (Bank Rakyat Indonesia Syariah)
7. PT. Bank Muamalat Indonesia
8. PT. Bank Syariah Bukopin
9. PT. Bank BCA Syariah (Bank Central Asia Syariah)
10. PT. Maybank Syariah Indonesia
11. PT. Bank Mega Syariah
12. PT. Bank Aceh Syariah
13. PT. Bank Panin Dubai Syariah
14.

The data used is quarterly reports of Islamic Banks in the period of 2009 to 2018. For the complete data panel time-series available based on the eleven (11) Islamic Banks in Indonesia, as follows.

1. PT. Bank Syariah Mandiri, data ada dari tahun 2013-2018.
2. PT. Bank BNI Syariah, data ada dari tahun 2010-2018.
3. PT. Bank Victoria Syariah, data ada dari tahun 2013-2018.
4. PT. Bank Jabar Banten Syariah, data ada dari tahun 2011-2018.
5. PT. Bank Tabungan Pensiunan Nasional Syariah, data ada dari tahun 2014-2018.
6. PT. Bank BRISyariah, data ada dari tahun 2012-2018.
7. PT. Bank Muamalat Indonesia, data ada dari tahun 2013-2018.
8. PT. Bank Syariah Bukopin, data ada dari tahun 2009-2018.
9. PT. Bank BCA Syariah, data ada dari tahun 2010-2018.
10. PT. Maybank Syariah Indonesia, data ada dari tahun 2012-2018.
11. PT. Bank Mega Syariah, data ada dari tahun 2010-2018.
12. PT. Bank Aceh Syariah, data ada dari tahun 2016-2018.
13. PT. Bank Panin Dubai Syariah, data ada dari tahun 2011-2018.

The above data can be summarized as follows:

1. For data starting from 2009, there is one bank.
2. For data starting in 2010, there are three banks.
3. For data starting in 2011, there are two banks.
4. For data starting from 2012, there are two banks.
5. For data starting from 2013, there are three banks.
6. For data starting in 2014, there is one bank.
7. For data starting from 2016, there is one bank.

The sum of all is equal to 13 banks

The conclusion of the many reports per period of the Islamic Bank is that there are:

1. If the data analyzed starts from 2009-2018, then there is only 1 Bank.
2. If the data analyzed starts from 2010-2018, then there are only 4 banks.
3. If the data analyzed starts from 2011-2018, then there are only 6 banks.
4. If the data analyzed starts from 2012-2018, then there are only 8 banks.
5. If the data analyzed starts from 2013-2018, then there are only 11 banks.
6. If the data analyzed starts from 2014-2018, then there are only 12 banks.
7. If the data analyzed starts from 2016-2018, then there is only 1 bank.

Based on the data above, the researchers will only use the 2013-2018 time period with 11 Islamic Banks, because there is one (1) Islamic Bank whose data is exposed starting from 2014, namely BTPN Syariah, and one (1) Islamic Bank again the data is exposed starting from 2016, namely PT. Bank Aceh Syariah, then the time period of the year used between 2013-2018.

Because the data used are quarterly reports, so that in the 12-month period divided by 3, there are 4 reporting periods, which are usually reports per March (1), June (2), September (3), and December (4) as shown in the table below. And researchers will examine in more detail the completeness of the data for the 4 reporting periods of each Islamic Bank used in this study, as follows:

**Table 1:** Completion of Thirteenth Quarterly Reports (13) Islamic Banks in Indonesia for the period 2013-2018

| Name of Islamic Bank | Quarterly Report for the period 2013-2018 |
|---|---|

| | 2013 | | | | 2014 | | | | 2015 | | | | 2016 | | | | 2017 | | | | 2018 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| BSM | | | | | | | | | | | | | | | | | | | | | | | | |
| BNI Syariah | | | | | | | | | | | | | | | | | | | | | | | | |
| Bank Victoria Syariah | | | | | | | | | | | | | | | | | | | | | | | | |
| BJBS | | | | | | | | | | | | | | | | | | | | | | | | |
| BTPN Syariah | | | | | | | | | | | | | | | | | | | | | | | | |
| BRISyariah | | | | | | | | | | | | | | | | | | | | | | | | |
| Bank Muamalat Indonesia | | | | | | | | | | | | | | | | | | | | | | | | |
| Bank Syariah Bukopin | | | | | | | | | | | | | | | | | | | | | | | | |
| BCA Syariah | | | | | | | | | | | | | | | | | | | | | | | | |
| Maybank Syariah Indonesia | | | | | | | | | | | | | | | | | | | | | | | | |
| Bank Mega Syariah | | | | | | | | | | | | | | | | | | | | | | | | |
| Bank Panin Dubai Syariah | | | | | | | | | | | | | | | | | | | | | | | | |
| Bank Aceh Syariah | | | | | | | | | | | | | | | | | | | | | | | | |

Description, Green: Quarterly report data exists, and Red: Quarterly report data does not exist

From the table above, it can be concluded that there are two (2) banks that will be removed from this study, namely:

1. BTPN Syariah
2. Bank Aceh Syariah

For the BTPN Syariah, the data turned out that after being examined in more detail the data for 2014 was only in December, only in 2015-2018 the data was complete. For Bank Aceh Syariah, after being examined in more detail the quarterly report as a new Islamic Bank starts September 2016, only 2017-2018 complete data.

So, the conclusion, from the complete time series data panel above, that fulfils the requirements as data material for this study of thirteen (13) Islamic Banks that can be used in full only eleven (11) Islamic Banks, namely:

1. PT. Bank Syariah Mandiri (BSM)
2. PT. Bank BNI Syariah (Bank Nasional Indonesia Syariah)
3. PT. Bank Victoria Syariah
4. PT. Bank BRISyariah (Bank Rakyat Indonesia Syariah)

5. PT. Bank Muamalat Indonesia
6. PT. Bank Syariah Bukopin
7. PT. Bank BCA Syariah (Bank Central Asia Syariah)
8. PT. Maybank Syariah Indonesia
9. PT. Bank Mega Syariah
10. PT. Panin Dubai Syariah
11. PT. Bank Jabar Banten Syariah (BJBS)

**Estimation Parameters**

The eleven (11) Islamic Bank data will be further examined for each of the five (5) variables used in this study, namely:

1. ROA (Return On Asset), category of Rentability
2. CAR (Capital Adequacy Ratio), Capital category, CAR by calculating financing risk and market risk or Minimum Capital Provision Obligation (KPMM)
3. FDR (Financial Deposit Ratio), Liquidity category
4. NPF (Non Performance Finance), Productive Assets category, which is used NPF-Net
5. OER (Operational Efficiency Ratio) or BOPO (Operational Income Operational Income), Rentability category

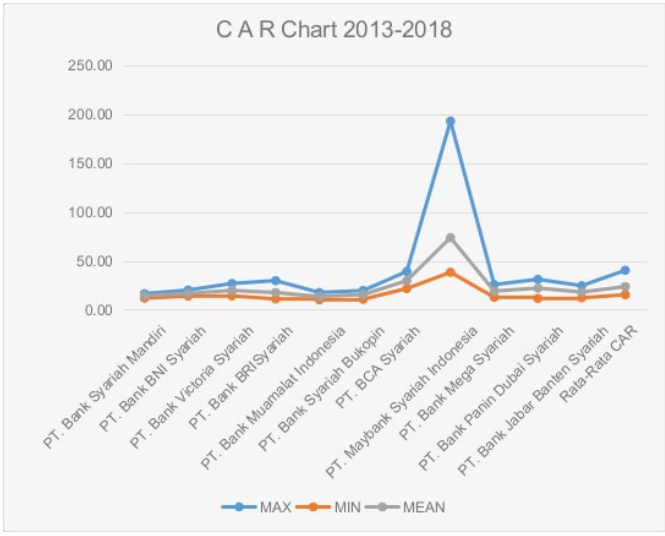
The Time Series used in this study is 6 years period, between 2013 and 2018. The panel data used is six (6) years multiplied by four (4) reporting period multiplied by nine (11) banks, a total of two hundred and sixty-four (264) data lines. The number of cells in the panel data is five (5) variables multiplied by six (6) years multiplied by four (4) the reporting period multiplied by nine (12) banks, a total of one thousand three hundred twenty (1320) cell data. So that the data must be input in this study, a total of all one thousand three hundred and twenty (1320) data input. For example max, min, mean CAR is as follows:

**Table 2:** CAR max min and mean Calculation of Eleven Financial Ratios (11) Islamic Banks 2013-2018

| **C A R** | MAX | MIN | MEAN |
|---|---|---|---|
| PT. Bank Syariah Mandiri | 16.46 | 11.84 | 14.38 |
| PT. Bank BNI Syariah | 20.14 | 14.02 | 16.59 |
| PT. Bank Victoria Syariah | 26.91 | 14.20 | 19.79 |
| PT. Bank BRISyariah | 29.79 | 11.03 | 17.57 |
| PT. Bank Muamalat Indonesia | 17.61 | 10.16 | 13.53 |

| | | | |
|---|---|---|---|
| PT. Bank Syariah Bukopin | 19.65 | 10.74 | 15.48 |
| PT. BCA Syariah | 39.16 | 21.68 | 29.77 |
| PT. Maybank Syariah Indonesia | 193.35 | 38.40 | 73.90 |
| PT. Bank Mega Syariah | 25.76 | 12.70 | 19.08 |
| PT. Bank Panin Dubai Syariah | 31.15 | 11.51 | 22.12 |
| PT. Bank Jabar Banten Syariah | 24.58 | 12.20 | 18.08 |
| **CAR ( Max, Min, Mean)** | **193.35** | **10.16** | **23.66** |

**Figure 3.** Chart max, min, mean movement of the value of CAR eleven (11) Islamic Banks in 2013-2018




**Statistical Inference**

Statistical inference analysis using GRETL is a special statistical software for econometric case studies, which stands for GNU Regression, Econometric and Time-series Library, has the slogan "By econometricians, for econometricians.". The version used in the analysis is gretl 2019a Linux x86_64 build date 2019-01-24

After the specification of the model is confirmed to use the most suitable fixed effects model, the statistical inference process is performed using the Fixed-effects model as follows:
Model 2: Fixed-effects, using 264 observations
Included 11 cross-sectional units
Time-series length = 24

Dependent variable: ROA

| | coefficient | std. error | t-ratio | p-value |
|---|---|---|---|---|
| const | 11.9647 | 0.390098 | 30.67 | 1.54e-86 *** |
| CAR | 0.0440045 | 0.00663399 | 6.633 | 2.03e-10 *** |
| NPF | −0.0267854 | 0.0575130 | −0.4657 | 0.6418 |
| OER | −0.118434 | 0.00377467 | −31.38 | 1.71e-88 *** |
| FDR | −0.0124499 | 0.00322720 | −3.858 | 0.0001 *** |

Mean dependent var 0.402879 S.D. dependent var 2.865413
Sum squared resid 286.3801 S.E. of regression 1.072437
LSDV R-squared 0.867379 Within R-squared 0.854410
LSDV F(14, 249) 116.3235 P-value(F) 1.5e-100
Log-likelihood −385.3407 Akaike criterion 800.6815
Schwarz criterion 854.3207 Hannan-Quinn 822.2354
rho 0.391112 Durbin-Watson 1.165889
Joint test on named regressors -
Test statistic: F(4, 249) = 365.321
with p-value = P(F(4, 249) > 365.321) = 6.93054e-103
Test for differing group intercepts -
Null hypothesis: The groups have a common intercept
Test statistic: F(10, 249) = 3.74499
with p-value = P(F(10, 249) > 3.74499) = 0.000105044

Interpretation of research results as follows:

1. Number of observations, as follows:
   Using 264 observations, 11 cross-sectional times were multiplied by 24 time series length = 264 observations, with 5 variables total data inputting 1320 data.
   Included 11 cross-sectional units, namely 11 Islamic Banks.
   Time-series length = 24, which is time series data used is quarterly data per each Islamic Bank, so 1 year = 4 reports, data used in 2013-2018 = 6 years, so that per Islamic Bank has a report = 4 multiplied by 6 = 24 time series reports.
2. Variable identification
   This study consisted of 5 variables, namely:
   Dependent variable: ROA
   Independent variables: CAR, NPF, OER, and FDR
3. The equation, as follows:

^ROA = 12.0 + 0.0440*CAR - 0.0268*NPF - 0.118*OER - 0.0124*FDR
(0.390) (0.00663) (0.0575) (0.00377) (0.00323)
n = 264, R-squared = 0.867
(*standard errors in parentheses*)

4. Multiple Determination Coefficient

Value of R-squared = 0.867379;

The value of the multiple determination coefficient or R-squared is 0.867379 which means a set of predictor variables (independent variables) can explain the response variable (dependent variable) of 86.7%, while the remaining 13.3% is explained by other variables outside the model not examined in this study.

5. Adjusted R-squared

S.D. dependent var : 2.865413
S.E. of regression : 1.072437
Within R-squared : 0.854410

Within Value R-squared is the R-squared value that has been corrected by the standard error value. Within r-squared 0.854410, so the standard error value (S. E. of regression) is 1.072437. The standard value of this error is smaller than the standard deviation value of the response variable (S.D. dependent var), which is 2.865413.

So that S. E. of regression <S.D. dependent var, it can be interpreted that this regression model is valid as a predictor model.

6. Simultaneous Test

LSDV F(14, 249) : 116.3235
P-value(F) : 1.5e-100

F Statistic Value or LSDV F of 116.3235, with P-value (F) of 1.5e-100 <0.05, so it can be concluded that H1 is accepted, concluding that in this simultaneous test the dependent variable simultaneously or simultaneously affects significantly dependent variable (independent variable).

7. Probability value (p-value)

For T-partial or T-ratio or T-statistics as follows:

| | t-ratio | p-value |
|---|---|---|
| CAR | 6.633 | 2.03e-10 |
| NPF | −0.4657 | 0.6418 |
| OER | −31.38 | 1.71e-88 |
| FDR | −3.858 | 0.0001 |

The value of t-ratio is compared with the value of t-table, for faster processing we compare the p-value with 0.05 as follows:

CAR : 2.03e-10 <0.05, CAR has a positive effect on ROA very significantly.

NPF : 0.6418> 0.05, NPF has a negative effect on ROA not significant.
OER : 1.71e-88 <0.05, OER has a significant positive effect on ROA.
FDR : 0.0001 <0.05, FDR has a positive effect on significant ROA.

8. Beta coefficient

Beta coefficient is the predictive value of a variable (dependent variable) in the model against the response variable (independent variable).

| | coefficient |
|---|---|
| CAR | 0.0440045 |
| NPF | −0.0267854 |
| OER | −0.118434 |
| FDR | −0.0124499 |

CAR = +0.0440045, plus sign (positive) shows CAR has a positive effect and has a relationship that is directly proportional to ROA, so that every increase in 1% CAR results in an increase in ROA of 0.0440045%.

NPF = .020.0267854, a minus sign (negative) indicates that NPF has a negative effect and has an inverse relationship to ROA, so that every increase in NPF of 1% results in a decrease in ROA of 0.0267854%, and vice versa if NPF falls by 1% resulting in an increase in ROA of 0.0267854 %.

OER = −0.118434, minus sign (negative) indicates OER has a negative effect and has a relationship that is inversely proportional to ROA, so that every increase in OER of 1% results in a decrease in ROA of 0.118434%, and vice versa if OER falls 1% resulting in an increase in ROA of 0.118434 %.

FDR = −0.0124499, a minus sign (negative) indicates that FDR has a negative effect and has a relationship that is inversely proportional to ROA, so that every increase in FDR of 1% results in a decrease in ROA of 0.0124499%, and vice versa if FDR falls by 1% resulting in an ROA of 0.0124499 %.

**Conclusion**

This research has analyzed information related to the relationship of CAR data (Capital Adequacy Ratio), FDR (Financial Deposit Ratio), NPF (Non Performance Finance), and OER (Operational Efficiency Ratio) to ROA (Return On Assets) at eleven (11) Islamic banks in Indonesia in the period 2013 to 2018. The results show that:

The value of the multiple determination coefficient or R-squared is 0.867379 which means a set of predictor variables (independent variables) can explain the response variable (dependent variable) of 86.7%, while the remaining 13.3% is explained by other variables outside the model not examined in this study.

Within r-squared 0.854410, so the standard error value (S. E. of regression) is 1.072437. The standard value of this error is smaller than the standard deviation value of the response variable (S.D. dependent var), which is 2.865413. So that S. E. of regression <S.D. dependent var, it can be interpreted that this regression model is valid as a predictor model.
F Statistic Value or LSDV F of 116.3235, with P-value (F) of 1.5e-100 <0.05, so it can be concluded that H1 is accepted, concluding that in this simultaneous test the dependent variable simultaneously or simultaneously affects significantly dependent variable (independent variable).

The probability value (p-value) compared the p-value with 0.05 as follows:

CAR : 2.03e-10 <0.05, CAR has a significant effect on ROA.
NPF : 0.6418> 0.05, NPF has no significant effect on ROA.
OER : 1.71e-88 <0.05, OER has a very significant effect on ROA.
FDR : 0.0001 <0.05, FDR affects significant ROA.

So that the final conclusion is that for data analysis of 11 Islamic / Islamic Banks for 6 years, 2013-2013, it can be concluded that:

1. CAR has a positive and very significant effect on ROA; with p-value 2.03e-10 <0.05. CAR coefficient = +0.0440045, plus sign (positive) indicates CAR has a relationship that is directly proportional to ROA, so that every increase of 1% CAR results in an increase in ROA of 0.0440045%. Then the first hypothesis states that CAR has a positive and significant influence on acceptable Return on Assets. So that CAR has a positive and very significant effect on ROA.
2. NPF has a negative effect on ROA and is not significant; with p-value 0.6418> 0.05. The coefficient of NPF = .020.0267854, minus sign (negative) indicates that NPF has an inverse relationship to ROA, so that every increase in NPF 1% results in a decrease in ROA of 0.0267854%, and vice versa if NPF falls by 1% resulting in an increase in ROA of 0.0267854%. Then the second hypothesis states that NPF has a negative

effect and is not significant towards acceptable ROA. So that NPF has a negative and insignificant effect on ROA.

3. OER has a negative effect on ROA significantly; with p-value 1.71e-88 <0.05. The OER coefficient = −0.118434, minus sign (negative) indicates OER has a relationship that is inversely proportional to ROA, so that every increase in OER of 1% results in a decrease in ROA of 0.118434%, and vice versa if OER falls 1% resulting in an increase in ROA of 0.118434%. Then the third hypothesis states that OER has a negative effect and is significant towards acceptable ROA. So that OER has a negative and very significant effect on ROA.
4. FDR negatively and significantly affects ROA; with p-value 0.0001 <0.05. The coefficient of FDR = .00.0124499, a minus sign (negative) indicates that FDR has an inverse relationship to ROA, so that every increase in FDR of 1% results in a decrease in ROA of 0.0124499%, and vice versa if FDR falls by 1% resulting in an increase in ROA of 0.0124499%. Then the fourth hypothesis states that FDR has a negative effect and is significant towards ROA acceptable. So that FDR has a negative and significant effect on ROA.

**BIBLIOGRAPHY**

Adkins, L. C. (t.t.). *Using gretl for Principles of Econometrics, 4th Edition Version 1.0*. 494.

Ananda, M. A. (t.t.). *(Studi kasus pada Bank Islam di Indonesia Periode 2010 – 2012)*. 90.

Baltagi, B. H. (Ed.). (2006). *Panel Data Econometrics Theoretical Contributions and Empirical Applications*. https://doi.org/10.1016/S0573-8555(2006)274

Basuki, A. T. (t.t.). *PENGANTAR EKONOMETRIKA (DILENGKAPI PENGGUNAAN EVIEWS)*. 136.

Choudhury, M. A. (1986). *Macroeconomic Relations in the Islamic Economic Order*. 166–187.

Damodar Gujarati, G. (1978). *Basic Econometrics BY Gujarati.pdf*.

Dr. E.Lucky Maretha S., M.Si. (t.t.). *eviews 9*. 15.

Dritsakis, N., & Stamatiou, P. (2018). CAUSAL NEXUS BETWEEN FDI, EXPORTS, UNEMPLOYMENT AND ECONOMIC GROWTH FOR THE OLD EUROPEAN UNION MEMBERS. EVIDENCE FROM PANEL DATA. *International Journal of Economic Sciences*, *VII*(2). https://doi.org/10.20472/ES.2018.7.2.002

Georgantopoulos, A. G., Tsamis, A. D., & Agoraki, M.-E. K. (2015). The Euro-adoption effect and the bank, market, and growth nexus: New evidence from EU panels. *The Journal of Economic Asymmetries*, *12*(1), 41–51. https://doi.org/10.1016/j.jeca.2015.01.002

Hakim, A. R. (t.t.). *L.R Klein : Riwayat, Konstribusi, & The Economic Forecasting*. 12.

Hakim, A. R., & Subanti, S. (t.t.). *PERAN SEKTOR EKONOMI PRIORITAS TERHADAP KESEMPATAN KERJA DAN PENDAPATAN DI INDONESIA TAHUN 1995 - 2005 ( ANALISIS INPUT-OUTPUT )*. 16.

Hussain, H.I., Grabara, J., Razimi, M.S.A., & Sharif, S.P. (2019) Sustainability of Leverage Levels in Response to Shocks in Equity Prices: Islamic Finance as a Socially Responsible Investment, *Sustainability*, 11, 3260.

Iqbal, M., Si, S., & Si, M. (t.t.). *Pengolahan Data dengan Regresi Linier Berganda (dengan EViews§)*. 27.

Mayastuti, I. M., Fathurahman, M., & Wahyuningsih, S. (2014). *Pemodelan Faktor-faktor yang Mempengaruhi Tingkat Pengangguran di Kota Samarinda, Balikpapan, Tarakan dan Bontang Menggunakan Regresi Data Panel*. *5*, 10.

Mikhailitchenko, S. (2016). Estimates of Net Capital Stock and Consumption of Fixed Capital for Australian States and Territories, 1990–2013. *Regional Statistics*, *6*(2), 114–128. https://doi.org/10.15196/RS06206

Mixon Jr, J. W., & Smith, R. J. (2006). Teaching undergraduate econometrics with GRETL. *Journal of Applied Econometrics*, *21*(7), 1103–1107. https://doi.org/10.1002/jae.927

*Modul Praktikum Eviews*. (t.t.). 57.

Nugrohowati, R. N. I., & Bimo, S. (2019). Analisis pengaruh faktor internal bank dan eksternal terhadap Non-Performing Financing (NPF) pada Bank Perkreditan Rakyat Syariah di Indonesia. *Jurnal Ekonomi & Keuangan Islam*, *5*(1), 42–49. https://doi.org/10.20885/jeki.vol5.iss1.art6

Pérez, R., & López, A. J. (t.t.). *Teaching and Learning Econometrics with Gretl*. 11.

Pramudhito, R. A. S. (t.t.). *FAKULTAS EKONOMIKA DAN BISNIS UNIVERSITAS DIPONEGORO SEMARANG*. 71.

Purwanto, T. J. (t.t.). *(Studi Kasus PT. Bank Muamalat Indonesia, Tbk)*. 70.

Rasyidin, D. (2016). FINANCING TO DEPOSIT RATIO (FDR) SEBAGAI SALAH SATU PENILAIAN KESEHATAN BANK UMUM SYARIAH (Study Kasus Pada Bank BJB Syariah Cabang Serang). *ISLAMICONOMIC: Jurnal Ekonomi Islam*, *7*(1). https://doi.org/10.32678/ijei.v7i1.34

Samuelson, P. A., & Nordhaus, W. D. (2010). *Economics* (19th ed). Boston: McGraw-Hill Irwin.

Shi, J. (2014). Comprehensive Time-Series Regression Models Using Gretl U.S. GDP and Government Consumption Expenditures & Gross Investment from 1980 to 2013. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2540535

Sripancawatimartiningsih, R. (t.t.). *The Influence of The Macroeconomic factors As Measured by Inflation, Interest (BI Rate) and GDP Growth, Market Share as measured by the share of bank financing and Bank Health Level measured by CAR, FDR, NPF, ROA to Return On Assets (ROA) Islamic Banking in Indonesia*. 16.

Sudaryo, Y., & Haera, N. (2018). *ANALISIS INFLASI, NILAI TUKAR RUPIAH, FINANCING DEPOSIT RATIO (FDR) DAN NON PERFORMING FINANCING (NPF) TERHADAP PROFITABILITAS (ROA) PADA PT BANK SYARIAH MANDIRI PERIODE 2011- 2017*. *17*(2), 10.

Susilawati, S., & Ali, A. G. (t.t.). *PENGARUH PEMBIAYAAN MUDHARABAH TERHADAP NON PERFORMING FINANCING (NPF) PADA BANK PEMBIAYAAN RAKYAT SYARIAH ( BPRS)*. 13.

Torres-Reyna, O. (t.t.). *Getting Started in Fixed/Random Effects Models using R*. 28.

Wibowo, E. S., & Syaichu, M. (t.t.). *ANALISIS PENGARUH SUKU BUNGA, INFLASI, CAR, BOPO, NPF TERHADAP PROFITABILITAS BANK SYARIAH*. 10.

Zulpahmi, Z., & Rizqiana, E. (2018). Pengaruh biaya operasional, Dana Pihak Ketiga (DPK), dan Non Peforming Financing (NPF) terhadap margin murabahah pada Bank Islam di Indonesia. *Jurnal Ekonomi & Keuangan Islam*, *4*(2), 81–86. https://doi.org/10.20885/jeki.vol4.iss2.art4