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Agus Widarjono (Indonesia)

# Estimating Profitability of Islamic Banking in Indonesia

**Agus Widarjono**

Department of Economics,
Faculty of Economics, Universitas
Islam Indonesia Yogyakarta
Jl. Ringroad Utara, Condong
Catur, Sleman, Yogyakarta, 55283,
Indonesia

## Abstract

The Islamic banking industry in Indonesia had experienced rapid growth since the government passed the Islamic banking law in 2008. Although growing fast but the market share of Islamic banking was still low. To increase the market share of Islamic banking, it was necessary to encourage Islamic banking performance. One of the performances of Islamic banking investigated in this study was profitability. We examined the profitability of Islamic banking using both internal and external factors. The method used to estimate the profitability of Islamic banking was the Autoregressive Distributed Lag Model (ARDL) method with monthly data. The estimation results showed that both internal and external factors affect the profit of Islamic banking. Asset, FDR, efficiency, and NPL affect profitability. An important variable affecting profitability were the bad financing (NPF). While the external factor influencing the profit of Islamic banking was the exchange rate and inflation. The implication of this result was that Islamic banking must be able to manage well the bad financing. Since NPF also depends on macroeconomic conditions, the government must be able to manage macroeconomic performance well such as stabilizing the exchange rate.

**Keywords**: Autoregressive Distributed Lag Model; External Factor; Internal Factor; Islamic Banking; Profitability

**JEL Classification**: G21, G24

✉ Corresponding Author:
**Agus Widarjono**:
Tel.+62 274 881 546;
Fax.+62 274 882 589
E-mail: agus.widarjono@uii.ac.id

## Abstrak

*Industri perbankan syariah di Indonesia telah mengalami pertumbuhan yang cepat sejak pemerintah mengesahkan undang-undang perbankan syariah pada tahun 2008. Meskipun berkembang pesat tetapi pangsa pasar perbankan Islam masih rendah. Untuk meningkatkan pangsa pasar perbankan Islam, perlu untuk mendorong kinerja perbankan Islam. Salah satu kinerja perbankan syariah yang diteliti dalam penelitian ini adalah profitabilitas. Kami menguji profitabilitas perbankan syariah menggunakan baik faktor internal dan eksternal. Metode yang digunakan untuk memperkirakan profitabilitas perbankan Islam adalah metode ARDL dengan data bulanan. Hasil estimasi menunjukkan bahwa baik faktor internal maupun eksternal memengaruhi laba perbankan syariah. Aset, FDR, efisiensi, dan NPL memengaruhi profitabilitas. Variabel penting yang memengaruhi profitabilitas adalah pembiayaan buruk (NPF). Sedangkan faktor eksternal yang memengaruhi laba perbankan syariah adalah nilai tukar dan inflasi. Implikasi dari hasil ini adalah bahwa perbankan syariah harus dapat mengelola pembiayaan yang bermasalah dengan baik. Karena NPF juga bergantung pada kondisi ekonomi makro, pemerintah harus mampu mengelola kinerja makroekonomi dengan baik seperti menstabilkan nilai tukar.*

**Kata Kunci:** Autoregressive Distributed Lag Model; *Faktor Eksternal; Faktor Internal; Perbankan Syariah; Profitabilitas*

Islamic banking in Indonesia is an integral part of the Indonesian Banking Architecture (API). The establishment of an Islamic bank based on the principles of sharia occurred in the 1990s. The government through Law No. 7 of 1992 allows a bank to apply a profit-loss sharing system for its operations. The law is a legal umbrella for banks to perform their operations based on sharia principles. In 1992, Bank Muamalat Indonesia (BMI) was the first Islamic bank in Indonesia. Then to support the previous Law, the government issued Law No.10 of 1998. In Article 1, paragraph 3 states that banks can be grouped into two conventional banks and Islamic banks based on sharia principles.

The government realizes that the establishment of Islamic banking is a necessity in Indonesia as a Muslim country. The operation of an Islamic bank is one part of efforts to achieve a welfare state as the main national development goal based on economic democracy. The desire of the Indonesian people to have banking based on the concept of Islamic Sharia got political support from the legislature. The House of Representatives approved the Islamic Banking Law. 21 in 2008 as the legal basis for the operation of Islamic banking in Indonesia.

The existence of this Islamic banking Law causes the Islamic banking to experience rapid growth. The rapid development of Islamic banking has implications for the increasing number of Islamic banks in Indonesia. In 2002 there were only 2 Islamic Commercial Banks and 3 Islamic Business Units which are part of conventional banks that open Islamic business units. Until 2014 there were 34 Islamic banks where 12 banks are Islamic commercial bank, and 22 are Islamic business unit. The increasing number of Islamic banks has an impact on the widespread Islamic banking network throughout Indonesia. In 2002 the Islamic banking office was still below 150 offices. But less than ten years in 2010, the number of Islamic banking offices throughout Indonesia has been above 1000 offices that is 1447 offices.

In January of 2015, there were 2,547 offices consisting of 703 branches, 1,649 Islamic service units and as many as 440 Cash Offices throughout Indonesia. The number of Islamic commercial bank offices in the period 2002-2014 was much more than the offices owned by Islamic business unit. In 2015 out of a total of 2,471 offices, 2,151 offices or 87 percent is owned by Islamic commercial banks while 320 offices or 13 percent belong to Islamic business unit.

As a new industry, the development of the Islamic banking industry is very fast and become one of the fastest growing industries in Indonesia. Islamic banking assets continue to increase. In 2002 the total assets were 4.045 trillion Rupiah, then in October 2017 has increased sharply to 395.889 trillion Rupiah. The sharpest spike occurred in 2003 and 2004 wherein two years there was almost more than 100 percent in asset growth. In the last two years, 2015 and 2016 experienced a slowdown in growth with only 8.87 percent and 20.33 percent per annum respectively.

The development of the Islamic banking industry certainly leads to in creating employment opportunities. Islamic banking cannot only create jobs but also effect on the proliferation of courses in universities related to Islamic banking. In 2005 the number of workers employed in Islamic banking was 4,959 people consisting of 3,523 workers of Islamic commercial banks or 71.04 percent and 1,436 workers in Islamic Business Unit or 19.96 percent of total Islamic banking workers. In 2010 the number of workers was 17,092 people with the composition of 15.224 or 89.07 percent of Islamic bank employees and 1.868 or 11.93 percent of Islamic business unit employees. By 2014 the number of workers in Islamic banking has increased almost tenfold over the past ten years to 45,818 people. The composition of workers was still dominated by those who work in Islamic commercial banks with a total worker of 90.34 percent, and the remaining 9.66 percent of them work in the Islamic business unit.

Thus, the Islamic bank is the main contributor to employment in the banking industry in Indonesia.
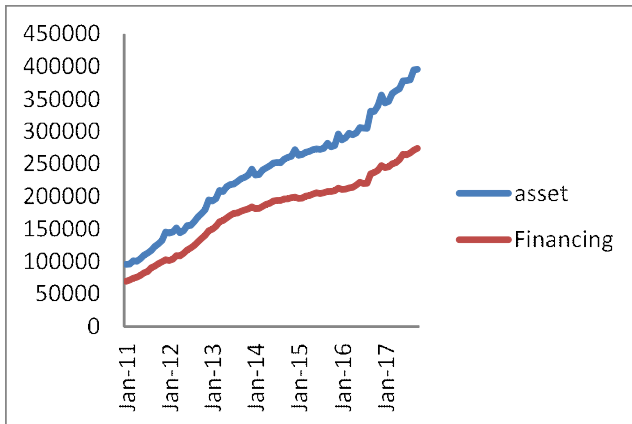


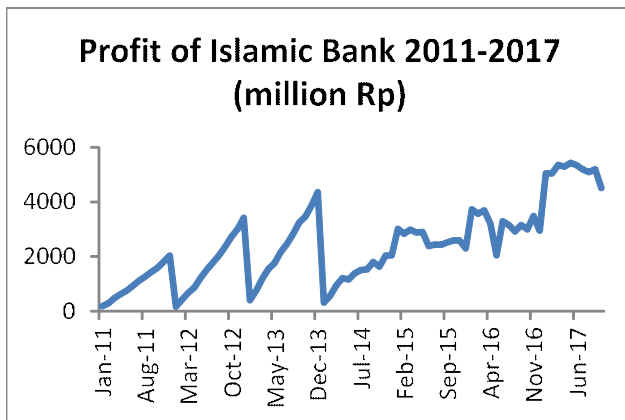**Figure 1.** Asset and Financing of Islamic Banking 2011-2017 (Millions Rupiah)



**Figure 2.** Profit of Islamic Banking 2011-2017 (Millions Rupiah)

The fast development of Islamic banking Industry will certainly be able to support the Indonesian economy because Islamic banking can be one source of investment funding. The Islamic banking funding continues to increase along with the Islamic banking assets. Figure 1 explains a trend of the asset and financing of Islamic banking. From the picture, we can see that there is a positive correlation between assets and financing of Islamic banking. The amount of this financing will further impact on the profitability of Islamic banking industry. One mea-

sure of the performance of Islamic banks is the level of profit measured by return on asset (ROA).

If ROA above 1.5 percent, then Islamic bank is said to be very healthy. If ROA between 1.25 percent and 1.5 percent, it is a healthy bank. If ROA between 0.5 percent and 1.25 percent, it is said to be healthy enough. Whereas if the ROA level below 0.5 percent, then Islamic banks are categorized as unhealthy. The average ROA of Islamic Banking Industry in the period from January 2011 to October 2017 was 1.4 percent. Figure 2 shows the profitability of Islamic banking Industry in the same period in the period. The profit of the Islamic banking industry is still fluctuating. However, there is a positive trend in increasing profit starting in 2014. The profitability of Islamic banking in Indonesia is still relatively low in terms both ROA and profit.

Research on the profitability of Islamic banks has been widely conducted. Bashir (2003) investigated the determinant of profitability in an Islamic bank in Middle East Countries. Profitability variable is measured by three measurements, i.e., Ratio of before-tax profit to total assets, ROA, and ROE. The variables affecting the profit consist of bank characteristics, macroeconomic conditions, tax indicators, the financial structure of the bank. The method used was panel data regression from 8 countries encompassing Bahrain, Egypt, Jordan, Kuwait, Qatar, Sudan, Turkey, and U.A.E with period 1993-1998. There are several measures of Islamic bank profits that are ROA, ROE, and ratio of profit to total assets. The result shows that bank characteristics namely asset and financing and macroeconomic condition have a positive effect on bank profit while tax has a negative effect on Islamic bank profit.

Ramadan (2011) examined the profitability of Islamic banks in Jordan. His research analyzed internal factors and external factors that influence the profitability of Islamic banks. The method used is panel data regression. There are two measures of profit that are profit margin and ROA. The results

show that well-capitalized banks, the efficiency of management and higher credit risk result in higher return on asset. In addition, the credit risk, the efficiency of management and efficiency of operating expenses positively affect profit margin. However, the study indicates that bank size and non-interest earning do not have an impact on profitability.

Siddique, Khaleequzzaman, & Atiq-ur-Rehman (2012) investigated the determinants of the Islamic banking industry's profitability in Pakistan. The method used was panel data regression with nine Islamic banking during the 2004-2012 period. The profit rate is measured by ROA. Variables affecting Islamic bank profits consist of internal and external factors. The internal factor such as total assets, capital ratio, liquidity, number of branches, and external factors such as interest rate, inflation affect profitability in the short run and long run. However, the study indicates that an external factor was relatively less important than an internal factor. The empirical results on Islamic banking profit in Pakistan have also been conducted by Akhtar, Ali, & Sadaqat (2011) and Khan, Ijaz, & Aslam (2014). The results showed that both internal and external factors affect the profits of Islamic banks in Pakistan.

Choong, Thim, & Kyzy (2012) analyzed the profitability of Islamic commercial banks in Malaysia. The method used was panel data regression with common effect technique. Research period was from 2006-2009 with 11 Islamic commercial banks. The profit variable is measured by ROA and ROE. The variables affecting the profitability of Islamic banks consist of internal and external factors. Their study also incorporated market conditions of Islamic commercial banks measured by market concentration levels. The empirical results showed that credit risk, liquidity and concentration ratio affect profitability and credit risk is the most significant factor affecting profitability.

Setyawati et al. (2017) examined the profitability of Islamic banks in Indonesia. Their research

applied to panel data regression during 2004-2012. The profit variable is measured by ROA. The variables are affecting the profit rate consist of internal and external variables. In addition, this study also analyzed the impact of the global crisis on the benefits of Islamic banks in Indonesia. The empirical results showed that non-performing financing and inflation affected the profitability of Islamic bank in Indonesia. More interestingly, the profitability of Islamic bank was better after the global economic crisis.

Research on the profitability of Islamic banks has been conducted for Islamic banks across countries. Aliyu & Yusof (2016) investigated the profitability rate of Islamic Bank within the composition of cost efficiency from seven countries of three regions between 1995 and 2013. Panel regression was applied. ROA measures the profitability of Islamic bank. The independent variables include both internal as well as an external factor. The empirical results indicated that internal factor such as capitalization ratio, cost efficiency, operating income, revenue gain, other securities, and macroeconomic variables explain the rate of profitability in those countries. The self-interaction of cost efficiency indicates a cost-efficient preference.

Many other studies have previously been conducted to analyze the profitability of an Islamic bank with both internal and external factors. Objects studied were within country or across countries such as Warninda (2014), Sriyana (2015), and Hosen & Rahmawati (2016) for Indonesia; Wasiuzzaman & Tarmizi (2009) for Malaysia; Rahman & Akhter (2015) for Bangladesh; Karim, Sami, & Hichem (2010) and Alharbi (2017) for the case of across countries. The results show that both internal and external factors affect the profits of Islamic banks. However, both internal and external factors affecting the profits of Islamic banks differ across countries at different magnitudes.

Research on the profitability of Islamic banks in Indonesia in this study is different from previous

research. First, this study analyzes the profitability of all Islamic banks or Islamic banking Industry using time series data with monthly data. Previous empirical studies in Indonesia analyze individual Islamic bank by applying panel data such as Sriyana (2015) and Setyawati et al. (2017); Hosen & Rahmawati (2016) and Aisyah & Hosen (2018) using data envelopment analysis. Second, this study includes internal and external variables in influencing the profitability of Islamic bank in Indonesia. Some previous researches on the profitability of Islamic banking have included internal and external factors but have not included exchange rate. Indonesia is an open economy with a level of economic openness relatively high, over 30 percent so that the exchange rate greatly affects the macroeconomic conditions and the profitability of Islamic banking.

Third, this research uses a time series regression analysis known as an Autoregressive Distributed Lag Model (ARDL). The advantage of this method is that it can capture the short and long run condition of profitability. Meanwhile, Sriyana (2015), Hosen & Rahmawati (2016), and Setyawati et al. (2017) applied panel regression.

Therefore, this study aimed to investigate the profitability of Islamic banking in Indonesia to determine factors affecting Islamic bank profitability. Empirical results of this study can be used as a strategy and policy of Islamic bank in Indonesia in increasing their profit.

## METHODS

This research analyzes the profitability of Islamic banking in Indonesia. The profitability Islamic banking is the profitability of all Islamic banking as an Islamic bank industry, not individual Islamic bank, both Islamic commercial bank and Islamic business unit. The latter type is a conventional bank which opens Islamic bank. Therefore, the profitability measured by ROA and profit is the ROA

and profits of all Islamic banks. This study uses monthly time series data from January 2011 to October 2017. Selecting in 2011 due to since that year the number of Islamic banks is relatively stable. The number of Islamic commercial bank was less than 5 in the 2006-2009 periods, but then it has been stable since 2011 by 11 Islamic commercial bank and 23 Islamic unit business.

This Islamic banking profit research follows previous studies such as Bashir (2003), Karim, Sami, & Hichem (2010), Ramadan (2011), Siddique & Khaleequzzaman (2012), and Setyawati et al. (2017). The profitability level of Islamic banks is influenced by both the internal factors and external factors namely macroeconomic conditions. Method to analyze the profitability of Islamic banking is a dynamic regression model known as the ARDL model. In this study the profitability of Islamic banking can be written in the following equation:

Profit = f (ASSET, FDR, NFP, OER, GDP,

$\qquad$ inflation, and exchange rate) $\qquad$ (1)

Then, in term of the regression equation, the equation (1) can be expressed as follow:

The Islamic bank's profit is a function of the bank's internal factors and macroeconomic condi-

$$Profit_t = \beta_0 + \beta_1 ASSET_t + \beta_2 FDR_t + \beta_3 NFP_t +$$
$$\beta_4 OER_t + \beta_5 INF_t + \beta_6 EXC_t + \beta_7 IPI_t +$$
$$e_t.. \qquad\qquad (2)$$

tions as the external factors. The internal factors consist of financing deposit ratio (FDR), ASSET, non-performing financing (NPF), and operational efficiency ratio (OER). The external factors consist of gross domestic product (GDP), inflation (INF), and exchange rate (EXC).

The profitability of Islamic banking is measured by two methods, namely profit and ROA. Asset data is the size of Islamic banking. FDR is fi-

nancing the deposit ratio. NFP is the ratio of non-performing financing to total financing. OER is the ratio of operational expense to operational revenue. Inflation data is monthly inflation data which is calculated based on the consumer price index. The exchange rate is the rupiah exchange rate against the US dollar. Production of goods and services measured in the form of GDP is reported on a quarterly basis. Then, the industrial production index (IPI) is used as a proxy for the production of goods and services.

The FDR variable indicates an ability of Islamic bank in financing its fund to public either profit loss sharing such *mudharabah* or *musyarakah* or not profit loss sharing financing such *murabahah*. The greater the financing is, the greater the profit of Islamic banks. This variable is expected or hypothesized to have a positive effect on the profitability of Islamic banks. The asset banking variable describes the size of Islamic banking. The greater assets show that Islamic bank can provide more financing capability to the public. Thus, this variable is expected to have a positive impact on Islamic bank. NPF describes bad financing to the public. The greater NPF means more bad financing and thus will lower the bank's profitability. The NPF variable is expected to negatively affect the profit. The OER variable shows the level of efficiency of Islamic banking. The higher efficiency level is expected, the higher the profitability of Islamic banking.

IPI variable which is a proxy of the GDP shows the amount of output of goods and services produced. The high level of output will increase Islamic bank financing so it will increase the profitability of Islamic banks. Thus, the IPI variable is expected to have a positive effect on the profitability of Islamic banks. The inflation rate describes the development of prices of goods and services. The high rate of inflation causes the purchasing power of the people to decline. The decrease in purchasing power further affects the ability of banks in financing to the public. This inflation variable is expected

to negatively affect the profitability of Islamic banks. The exchange rate reflects the purchasing power of the domestic currency against foreign currencies. If there is depreciation or the purchasing power of domestic money decreases then the expenditure on imported goods increases. Depreciation will cause an increase in the price of goods and services because most of the production of goods and services in Indonesia depends on imported raw materials. The exchange rate variable is expected to have a negative effect on Islamic banking.

Estimation method to analyze the profitability of Islamic banking is the ARDL model as a dynamic regression model. The ARDL regression method begins with testing stationary data. This test is performed to see whether data show in equilibrium or disequilibrium condition. There are several tests of stationary data. In order for the test results unbiased, this study uses two stationary tests. Both tests are Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) test. The ADF test formulation is as follows:

$$\Delta Y_t = \gamma Y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta Y_{t-i+1} + e_t \tag{3}$$
$$\Delta Y_t = \alpha_0 + \gamma Y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta Y_{t-i+1} + e_t \tag{4}$$
$$\Delta Y_t = \alpha_0 + \alpha_1 T + \gamma Y_{t-1} + \sum_{i=2}^{p} \beta_i \Delta Y_{t-i+1} + e_t \tag{5}$$

Where:
$Y$ = variable being tested
$\Delta Y_t = Y_t - Y_{t-1}$
$T$ = time trend

While the PP test formulation is as follows:
$$\Delta Y_t = \gamma Y_{t-1} + e_t \tag{6}$$
$$\Delta Y_t = \alpha_0 + \gamma Y_{t-1} + e_t \tag{7}$$
$$\Delta Y_t = \alpha_0 + \alpha_1 T + \gamma Y_{t-1} + e_t \tag{8}$$

Both tests are performed with null hypothesis $\gamma = 0$ for ADF and $\lambda = 1$ for PP. Stationary data is based on the statistical value of ADF and PP obtained from the value of computed t value and with the critical value of Mackinnon. If the absolute value of the ADF (PP) statistic is greater than the

Mackinnon critical value, then the data is stationary and if otherwise, the data is not stationary.

The equation of the ARDL model for equation (1) can be written as follows:

$$\Delta Profit_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta Profit_{t-1} + \sum_{i=1}^{n} \beta_{2i} \Delta SSET_{t-1} +$$
$$\sum_{i=1}^{n} \beta_{3i} \Delta FDR_{t-1} + \sum_{i=1}^{n} \beta_{4i} \Delta NPF_{t-1} +$$
$$\sum_{i=1}^{n} \beta_{5i} \Delta OER_{t-1} + \sum_{i=1}^{n} \beta_{6i} \Delta IPI_{t-1} +$$
$$\sum_{i=1}^{n} \beta_{7i} \Delta INF_{t-1} + \sum_{i=1}^{n} \beta_{8i} \Delta EXC_{t-1} +$$
$$\delta_1 Profit_{t-1} + \delta_2 ASSET_{t-1} + \delta_3 FDR_{t-1} +$$
$$\delta_4 NFP_{t-1} + \delta_5 OER_{t-1} + \delta_6 INF_{t-1} +$$
$$\delta_7 EXC_{t-1} + \delta_8 IPI_{t-1} + e_t \qquad (9)$$

$\Delta$ is the first difference operator, $\beta_0$ is the drift component, $\beta_{ji}$ and $\delta_i$ are estimated coefficient, and $e_t$ is white noise residuals.

The left-hand side is the profitability of Islamic banking. The right-hand side is the explanatory variables. The first until eight estimated coefficient with summation signs ($\beta_{1i}$–$\beta_{8i}$) associates with the short run dynamic of the model and the remaining estimated coefficient ($\delta_1$–$\delta_8$) show the long run relationship.

Bound testing approach (Pesaran, Shin, & Smith, 2001) is applied to examine the presence of long rung relationship or co-integration test between PROFIT, FDR, ASSET, NFP, OER, INF, EXC, and IPI. Following Pesaran, Shin, & Smith (2001), the Bound testing procedure is based on the F test. The hypothesis of this test is no co-integration among the variables being tested against the existence of co-integration among the variables being tested. The formula of this hypothesis can be written as follows:

$$H_0: \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = \delta_8 = 0 \quad (10)$$

Null hypotheses state that a co-integration among the variables do not exist

$$H_a: \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_7 \neq \delta_8 \neq 0 \qquad (11)$$

Alternate hypotheses state that co-integration among the variables exist

The critical F value of the co-integration test is based on the critical value developed by Pesaran, Shin, & Smith, (2001). There are two critical F values namely lower bound or I (0) and upper bound or I (1). If the computed F value is greater than the upper bound value, then there is co-integration between dependent and independent variables. If the computed F value is smaller than the lower bound, there is no co-integration. Meanwhile, if the computed F value between the lower bound and upper bond then there is no decision.

The ARDL version of the error correction model of equation (9) can be expressed as follow:

$$\Delta Profit_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta Profit_{t-1} +$$
$$\sum_{i=1}^{n} \alpha_{2i} \Delta SSET_{t-1} + \sum_{i=1}^{n} \alpha_{3i} \Delta FDR_{t-1} +$$
$$\sum_{i=1}^{n} \alpha_{4i} \Delta NPF_{t-1} + \sum_{i=1}^{n} \alpha_{5i} \Delta OER_{t-1} +$$
$$\sum_{i=1}^{n} \alpha_{6i} \Delta IPI_{t-1} + \sum_{i=1}^{n} \alpha_{7i} \Delta INF_{t-1} +$$
$$\sum_{i=1}^{n} \alpha_{8i} \Delta EXC_{t-1} + \vartheta ECT_t + u_t \qquad (12)$$

## RESULTS

The results of the stationary test using the ADF and PP method are shown in Table 1. The test results show that ROA, PROFIT, OER, IPI, and INF stationary variables at the level data. Meanwhile, Asset, FDR, NPF, and EXC variable are not stationary at level data. However, all variables are stationary at the first difference level data. In other words, there are some variables integrated on I (0) and the other variable integrated on I (1). These results indicate that the exact model to estimate is the ARDL model because the level of integration of the variables has different levels of integration.

The next step is to estimate the ARDL model. There are two models. The first model used the ROA variable as the dependent variable. The second model applied the profit variable as the dependent variable. The ARDL model is very sensitive to the lag used. To get the optimum lag, this study ap-

plied the Akaike Info Criterion (AIC) method. The result of the ARDL model estimation that results in the best model for the first and second model is shown in Table 2. In the first model using ARDL (1,0,0,0,4,0,4) shows that from 21 independent variables there are eight statistically significant at the level of α = 10 percent or less. While in the sec-

ond model using ARDL (1,0,0,1,4,3,0,4) indicates there are nine independent variables which are statistically significant at α = 10 percent or less from all 17 independent variables.

The next step is to test the co-integration between dependent variable with independent variables by using bound test. This co-integration test

**Table 1.** Stationary Test

| | Level | | | | First | | | |
|---|---|---|---|---|---|---|---|---|
| | Constant | | Trend | | Constant | | trend | |
| | ADF | PP | ADF | PP | ADF | PP | ADF | PP |
| ROA | -2.771** | -2.729** | -3.214*** | -3.208*** | -8.988*** | -11.530*** | -8.944*** | -11.448*** |
| Profit | -2.460 | -2.361 | -4.011*** | -4.011*** | -10.461*** | -11.138*** | -10.393*** | -11.050*** |
| ASSET | 0.282 | 0.296 | -1.935 | -2.067 | -1.021 | -12.357*** | -1.016 | -12.304*** |
| FDR | -1.341 | -1.218 | -2.306 | -2.213 | -10.736*** | -10.721*** | -10.808*** | -10.866*** |
| OER | -1.100 | -1.821 | -2.717 | -3.902** | -15.065*** | -19.834*** | -14.980*** | -20.215*** |
| NPF | -1.314 | -1.779 | -1.957 | -2.393 | -5.611*** | -11.682*** | -5.570*** | -11.602*** |
| IPI | -0.192 | -0.562 | -7.084*** | -7.107*** | -10.620*** | -35.875*** | -10.572*** | -35.528*** |
| INF | -8.218*** | -6.840*** | -8.215*** | -7.101*** | -8.439*** | -17.351*** | -8.442*** | -17.638*** |
| EXC | -0.851 | -0.873 | -1.083 | -1.392 | -6.997*** | -6.924*** | -6.989*** | -6.909*** |

Note: ***; **;* are stationer at α= 1%, 5%, and 10% respectively

**Table 2**. ARDL Estimation

| | Model 1 | | Model 2 | |
|---|---|---|---|---|
| Variable | Coefficient | t-Statistic | Coefficient | t-statistic |
| C | -7687.444* | 5368.150 | -4.107** | -2.324 |
| Lag of Dependent Variable | 0.552*** | 0.096 | 0.494*** | 5.369 |
| ASSET | 0.012** | 0.006 | 0.000* | 1.471 |
| FDR | 33.275 | 29.020 | 0.030*** | 2.894 |
| NPF | -206.202 | 212.927 | -0.076 | -1.289 |
| NPF(-1) | 278.535 | 215.082 | - | |
| OER | 3.218 | 25.514 | -0.003 | -0.264 |
| OER(-1) | 27.442 | 27.040 | 0.017** | 1.719 |
| OER(-2) | 18.682 | 27.095 | 0.015* | 1.515 |
| OER(-3) | -1.804 | 27.045 | 0.002 | 0.161 |
| OER(-4) | 65.322** | 25.691 | 0.023** | 2.534 |
| IPI | 24.462 | 29.394 | 0.010 | 1.007 |
| IPI(-1) | 21.056 | 30.163 | - | - |
| IPI(-2) | 13.142 | 29.885 | - | - |
| IPI(-3) | -69.303** | 29.103 | - | - |
| EXC | -0.563*** | 0.179 | 0.000*** | -5.300 |
| INF | 152.688 | 178.399 | 0.027 | 0.417 |
| INF(-1) | 350.575* | 179.856 | 0.075 | 1.126 |
| INF(-2) | 553.485*** | 207.753 | 0.204*** | 2.690 |
| INF(-3) | 57.103 | 176.022 | -0.008 | -0.117 |
| INF(-4) | 666.081*** | 181.108 | 0.210*** | 3.137 |

Note: ***; **;* are statistically significant at α= 1%, 5%, and 10% respectively

is also very sensitive to lag. The optimal lag length is determined based on the AIC method. Co-integration test result is shown in Table 3. In the first model, the optimum lag length is 7 with the computed F value is 4.7868. This computed F value is greater than the upper critical bound $\alpha$ = 1 percent.

This result indicates the existence of co-integration or long-term relationship between ROA as the dependent variable with independent variable encompassing of ASSET, FDR, NPF OER, IPI, EXC, and INF. The optimum lag length in the second model is also 7, and the computed F value is 5.0951. The computed F value is greater than the upper critical bound $\alpha$ = 1 percent. In conclusion, there is a long-term relationship between profit as dependent variables with independent variables consisting of ASSET, FDR, NPF OER, IPI, EXC, and INF.

The next analysis is the long-term coefficient of the ARDL model. The results of the long-term coefficient estimation are shown in Table 4. The first model results show that the bank's internal variables are in line with hypothesis except for OER.

**Table 3.** The Bound Test for Co-integration

| Model | Lag | F Statistic |
|-------|-----|-------------|
| Model 1 | 7 | 4.7868*** |
| Model 2 | 7 | 5.0951*** |

**Note:** The Lower critical Bond value at $\alpha$=10%, 5%, and 10% are 1.92; 2.17, and 2.73 respectively. The Upper critical Bond value at $\alpha$= 10%, 5%, and 1% are 2.89; 3.51, and 3.90 respectively

Assets have a positive and significant effect. The greater the asset is, the greater the ability to give funds to the public so that profits increase. This result is supported by FDR variables that have a positive effect and statistically significant. As expected, the NFP coefficients are negative and statistically significant. This means that worse financing will reduce bank income and will further reduce the profitability of Islamic banks. The level of efficiency measured by the ratio between expenditure and income has a positive and statistically significant. This result is not expected in the hypothesis. This happens because although Islamic bank-

ing has been established since 1990, Islamic banking has been grown rapidly since 2008. Banking industry still needs a lot of network across the country, so it needs a lot of investment. The higher the level of spending is the greater the profit.

The result of the external variable fit to the hypothesis. IPI variables are a positive sign but not statistically significant. The exchange rate is a negative sign and statistically significant. This means that when the rupiah depreciates will cause a decrease in the level of Islamic bank profits. This happens because Indonesia is an open economy country. Domestic production for both domestic and export markets highly depends on imported raw materials. Therefore, domestic economic activity is strongly influenced by the exchange rate. If the exchange rate depreciates, raw materials will be expensive so that it will increase production costs. As a result, the economy will deteriorate so that the Islamic bank profits also decreases. Inflation variable has a positive and significant influence. This result is not in accordance with the hypothesis.

The result of the second model also shows the same result as the first model. Of the four internal variables, two variables are significant. Asset and OER variables have positive and statistically significant. The FDR variable is a positive sign but statistically is insignificant. While the NFP variable is a negative sign but insignificant. Of the three external variables, two variables are statistically significant. The EXC variable is negative and statistically significant while INF is a positive sign and statistically significant. From both models, we can conclude that both internal and external factors affect the profitability of Islamic banking Industry in Indonesia.

The short-run results with the ECM model are shown in Table 5. In both models, the value of correct term error is negative and statistically significant. This suggests that the short-run model is valid and there is co-integration between the dependent and independent variables of both the first and second models.

In the first model, the OER efficiency level variables are negative and statistically significant. The higher the efficiency level is, the higher the profitability of Islamic bank in the short run. The real sector condition variable of IPI has a positive effect on the profit of Islamic bank in the short run. Inflation variables are a negative impact on profitability in the short term. In the second model, two variables consisting of the level of efficiency and inflation affect the Islamic bank's profit in the short run. The level of efficiency and inflation are negative and statistically significant in influencing the profitability of Islamic bank in the short term. Some variable in short run condition is opposite with the long run condition.

## DISCUSSION

There are some the opposite results between the short run and lung run condition. The short condition is an in-equilibrium condition for which need adjustment to get an equilibrium condition or stable condition as expected in economic theory. For example, OER has a negative impact in the short run, but it is a positive impact in the long run. Higher expenditure has reduced the profitability in the short run, but it increased the profitability in the long run. It can be seen that Islamic banking has been grown rapidly because of high investment, so it leads to an increase in profit in the long run. Inflation also has a negative impact in the short run but has a positive

**Table 4.** Long Run Coefficient Estimates of Profitability

| Variable | Model 1 | | Model 2 | |
|---|---|---|---|---|
| | Coefficient | t-Statistic | Coefficient | t-Statistic |
| C | -8.109** | -2.088 | -17150.620 | -1.424 |
| ASSET | 0.000* | 1.429 | 0.026** | 1.669 |
| FDR | 0.060*** | 2.595 | 74.235 | 1.061 |
| NPF | -0.150* | -1.361 | 161.374 | 0.374 |
| OER | 0.107*** | 3.189 | 251.792*** | 2.495 |
| IPI | 0.020 | 1.031 | -23.744 | -0.215 |
| EXC | -0.001*** | -4.770 | -1.257** | -2.588 |
| INF | 1.003*** | 2.934 | 3971.012*** | 3.294 |

Note: ***; **;* are statistically significant at $\alpha$= 1%, 5%, and 10% respectively

**Table 5.** Short Run Coefficient Estimates of Profitability

| Variable | Model 1 | | Variable | Model 2 | |
|---|---|---|---|---|---|
| | Coefficient | t-Statistic | | Coefficient | t-Statistic |
| D(NPF) | -186.799 | -1.034 | | | |
| D(OER) | 2.788 | 0.131 | D(OER) | -0.005 | -0.562 |
| D(OER(-1)) | -83.318*** | -3.088 | D(OER(-1)) | -0.039*** | -3.135 |
| D(OER(-2)) | -69.062*** | -2.596 | D(OER(-2)) | -0.027*** | -2.321 |
| D(OER(-3)) | -69.979*** | -3.019 | D(OER(-3)) | -0.026*** | -2.776 |
| D(IPI) | 24.311 | 1.029 | | | |
| D(IPI(-1)) | 62.704*** | 2.537 | | | |
| D(IPI(-2)) | 73.694*** | 3.214 | | | |
| D(INF) | 155.951 | 1.104 | D(INF) | 0.006 | 0.117 |
| D(INF(-1)) | -1276.041*** | -5.956 | D(INF(-1)) | -0.397*** | -5.087 |
| D(INF(-2)) | -733.087*** | -4.432 | D(INF(-2)) | -0.216*** | -3.398 |
| D(INF(-3)) | -658.062*** | -4.386 | D(INF(-3)) | -0.204*** | -3.566 |
| CointEq(-1) | -0.440*** | -6.717 | CointEq(-1) | -0.467*** | -5.567 |
| R² | 0.461 | | R² | 0.359 | |
| Adjusted R² | 0.361 | | Adjusted R² | 0.285 | |
| Durbin-Watson | 2.279 | | Durbin-Watson | 2.114 | |

Note: ***; **;* are statistically significant at $\alpha$= 1%, 5%, and 10% respectively

impact in the long run. Inflation in the short run reduces the purchasing power of the consumer and affects negatively to the profitability of producers and finally reduces the profitability of Islamic bank. However, the income of consumers also increased during the period of this study. There was an increasing trend of Income in Indonesia. GDP per capita has been increasing since 2010. GDP per capita was $3125.2 in 2010 and was 3.570 in 2016. The decrease of purchasing power due to inflation was offset by an increasing trend in income so that an increase in income has a positive impact on the profitability of Islamic banking in the long run.

The results of this study are in line with previous studies. The level of profitability of Islamic banking in Indonesia is influenced by internal factors and external factors. But internal factors affecting profitability are different from previous research. This study showed that an important internal factor affecting the profitability of Islamic banking was a bad loan. While other countries are a different internal factor.

Siddique, Khaleequzzaman, & Atiq-ur-Rehman (2012) indicated that deposit and equity were an important factor in influencing the profitability of Islamic bank in Pakistan. Ramadan (2011) showed that non-interest earning mostly affected the profitability of Islamic bank in Jordan. Credit risk mostly affected the probability of Islamic bank In Malaysia (Choong, Thim, & Kyzy, 2012).

External factors affecting the profitability of Islamic banking in this study were inflation and exchange rates. Indonesia is a highly open economy. The domestic economy is greatly affecting the exchange rate. Depreciation of Rupiah deteriorates macroeconomic conditions then it leads to a decrease in profitability of Islamic Banking Industry. Siddique, Khaleequzzaman, & Atiq-ur-Rehman (2012) found that GDP mostly affects the profitability in Pakistan. Choong, Thim, & Kyzy (2012) showed that GDP per capita affected the profitability of the Islamic Bank in Malaysia. However, Ramadan (2011) found that external factor such in-

flation and economic growth didn't influence the profitability of Islamic bank in Jordan.

## CONCLUSION AND SUGGESTIONS

### Conclusion

The estimation results show that in long run condition internal variable that is an asset, FDR, OER have a positive impact on bank profit while the NPF variable has a negative effect on bank profit. The greater the size of the Islamic banking industry is, the greater the profitability. However, if the ability to financing these funds is offset by the presence of a lot of bad financing, then the profitability of Islamic banking industry decreased. This condition is supported by external variables where the depreciation of rupiah caused a deterioration in economic activity and further led to increased bad financing. While in the short run, variables affecting the level of profit are the level of efficiency, conditions of the real sector and inflation. The NPF variable is the most influential variable in the profitability of Islamic banking. The bad financing of Islamic banking is higher than conventional banking. Expansion of financing is necessary to increase profitability. But Islamic banks need to be careful in their financing so that bad financing can be minimized. In addition, non-performing financing is also influenced by macroeconomic conditions such as the rupiah exchange rate. Therefore, the government should be able to maintain the stability of the rupiah to encourage Islamic banking to improve the performance of Islamic banking such as profit.

### Suggestions

This study examines the profitability of all Islamic bank as an Industry. It does not distinguish between Islamic commercial bank and Islamic business unit which is under the conventional bank. There are differences in the type of management between Islamic commercial bank and Islamic business unit. Therefore, for the next research, it should distinguish between the two types of an Islamic bank.

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