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# Determinant of sharia rural bank profitability: Do size and location matter?

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## Abstract

This research analyzes the influence of bank fundamentals, bank size, location, and macroeconomic variables on the profitability of Sharia Rural Banks (SRBs) in Indonesia. Our study investigates 90 banks located on the island of Java. The research period is 2018-2021, using quarterly data. The dynamic panel regression is employed with a GMM method. The findings indicate that strong bank fundamentals, as indicated by large assets, high CAR, and high efficiency, have a positive effect on profitability. There are two other interesting findings in this study. First, large SRBs encourage high profitability. Second, locations with high economic growth and high religiosity foster profitability. Some policy implications can be drawn from our findings. First, SRB must have sufficient capital and a high level of efficiency to increase profitability. Second, a large SRB is the best choice for an SRB to have sound financial performance. Third, SBRs must intensively introduce Sharia banking products to the public to increase their performance because religiosity is an important factor in determining profitability.

**Keywords:** Bank fundamentals, size, location, return on assets, sharia rural bank.

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## Introduction

According to Law No. 21 of 2008, Sharia banking is a business entity that collects funds from the public in the form of savings and deposits and disburses them in the form of financing to improve people's living standards. The law also explains that Sharia banks aim to improve justice, togetherness, and equal distribution of people's welfare in the context of implementing national development. Sharia banks consist of Sharia Commercial Banks and Sharia Rural Banks (BPRS). Based on data from the Financial Services Authority (OJK), there are 14 Sharia Commercial Banks (SCBs), 20 Sharia Business Units (SBUs) of conventional banks, and 163 Sharia rural banks (SRBs) in 2023. Most of the SRBs are on the island of Java with a total of 92 banks.

SRB is a Sharia financial institution, which is different from SCB and SBU. In accordance with Financial Services Authority regulations through No. 3/POJK.03/2016, SRB is a Sharia financial institution oriented towards meeting the community's banking service needs quickly and efficiently without abandoning Sharia principles. To form a healthy SRB that can serve the community well, it must be based on sharia principles with caution. SRB focuses on providing financing to micro, small, and medium enterprises (MSMEs), which are the largest business units in Indonesia.

MSMEs produce many varied products and, in turn, increase the Gross Domestic Product (GDP) and ultimately be able to increase economic growth because most of the business sectors in Indonesia are MSMEs. Apart from that, MSMEs can reduce unemployment and improve people's welfare in Indonesia. However, MSMEs have many obstacles, one of which is limited capital. SRBs contribute to financing products for MSMEs. More importantly, the development of MSMEs can increase the profitability of SRBs (Roy, 2017). For this reason, profitability is a pivotal factor in the smooth performance and operations of SRBs.

The growth and development of SRBs can be seen from the bank's ability to generate profitability. Apart from that, profitability still plays an important role in SRBs because their rate and growth are still lower than conventional rural banks (CRBs) as SRB competitors. For this reason, in order to maintain and increase the growth of SRBs, information is needed about factors, both internal and external components, that influence the profitability of SRBs.

A bunch of studies have analyzed the factors that influence the profitability of SRBs, both internal and external factors. Trinugroho et al. (2017) analyzed the profitability of 161 SRB in the 2012Q1-2015Q4 period. The results document that capital adequacy ratio (CAR), financing deposit ratio (FDR), assets, financing diversification, and GDP have a positive effect on profitability, while the operational efficiency variable measured by the cost-to-income ratio (CIR) has a negative effect on profitability. Apart from that, profitability is also influenced by the religiousness variable. The more religious an area is, the higher the profit rate of SRB.

Widarjono et al. (2020a) examined the impact of market structure and bank-specific variables on profitability in the case of 142 Islamic rural banks from 2013Q1 to 2018Q4. The results show that market concentration has a positive effect on profitability. Bank-specific variables that influence profits are operational efficiency and FDR, while financing risk measured by non-performing financing (NPF) has a negative effect on profitability.

Sudarsono et al. (2021) investigated the influence of internal and external variables on profitability by taking a sample of 82 SRBs from December 2012 to December 2018. The results reveal that total financing and total funding had a positive effect on profitability. However, the bank stability and bank size variables had a negative effect on profitability. Meanwhile, the inflation variable had a negative effect on profitability.

Risfandy and Pratiwi (2022) explored the effect of income diversification and other internal factors on profitability during COVID-19 by taking data from 164 SRBs in the 2020 Q4 -2021 Q3 period. The findings indicate that income diversification has a negative effect on profitability. Assets have a positive effect on profitability, while the cost-to-income ratio and COVID-19 have a negative effect on profitability.

Furthermore, Putri and Widarjono (2023) analyzed the impact of funding liquidity risk and bank stability, along with other bank-specific variables, on the profitability of SRBs on the island of Java. There were 83 SBRs studied in the 2017-2021 period using quarterly data. The results find that funding risk and stability have a positive effect on profitability. The CAR has a positive effect on profitability, but assets, CIR, and NPF have a negative effect on profitability. An interesting finding is that stability funding risk can increase profits only in the case of large SRBs.

This paper analyzes the determinants of profitability by taking the case of SRBs on the island of Java. SBRs on the island of Java were chosen because the majority of SBRs are located on the island of Java. The determining factors for profitability consist of internal conditions and macroeconomic conditions. Bank size will influence Islamic bank's performance (Ibrahim et al., 2017). Meanwhile, a region's religiosity level will also influence the profitability of SBRs in Indonesia (Trinugroho et al., 2017). Accordingly, this research also explores the effect of size and location on profitability. The contribution of this research is to include size and location in influencing profitability. To the best of our knowledge, the effect of size and location has not been addressed by previous empirical studies.

Bank size is measured by total Assets. Large total assets measure the large bank. They can obtain economies of scale so they can reduce costs and thus increase profitability (Ibrahim et al., 2017). A strand of empirical studies shows that total assets have a positive effect on the profitability of Sharia banks (Trinugroho et al., 2017; Widarjono & Anto, 2020; Sutrisno & Widarjono, 2022).

**H1: Assets positively influence on profitability.**

An important factor for controlling financing risk is bank capital. Islamic banks with high capital adequacy ratios (CAR) reveal sound performance in financial management as well as in covering losses. CAR is an income ratio measured by capital adequacy to accommodate losses that may be faced by SBRs. Large capital can reduce financing problems and increase profitability. Trinugroho et al. (2017), Yusuf (2017), Almunawwaroh and Marliana (2018), and Putri and Widarjono (2023) documented that the CAR has a positive effect on profitability. These findings indicate that if the CAR increases, it will have a positive effect on the profitability of SBRs.

**H2: CAR has a positive effect on profitability**

The financing deposit ratio (FDR) is another bank's internal factors that likely have an impact on the profitability of SRB. FDR is a financial ratio which are used to measure the amount of funds disbursed to other parties from funds deposited by customers. A bank with a high FDR indicates that the bank can channel its funds well to customers in the form of financing. The higher FDR means that the bank can manage funds optimally, so profitability is likely higher as well. Based on research conducted by Trinugroho et al. (2017), Yusuf (2017), Almunawwaroh and Marliana (2018), Al Iqbal and Budiyanto (2020), Widarjono and Anto (2020), and Sudarsono et al. (2021) found that FDR had a positive effect on profitability.

**H3: FDR positively influences profitability.**

The cost-to-income ratio (CIR) is an internal bank variable influencing profitability. CIR is the ratio of costs to income (Widarjono et al., 2023). CIR is an instrument for measuring the operational efficiency of Islamic banks. Banks with low CIR show good efficiency because the income received is higher than the costs incurred. Banks with high efficiency enhance profitability. Meanwhile, banks with a high CIR indicate operating inefficiencies because the income received is less than the costs incurred, and this, in turn, reduces profitability. Studies conducted by Trinugroho et al. (2017), Fitriyah and Sholikhin (2019), and Putri and Widarjono (2023) indicated that CIR has a negative effect on profitability.

**H4: CIR has a negative influence on profitability**

NPF is included in the bank's internal factors that greatly influence profitability. NPF is the ratio of financing defaults to total financing. A high level of NPF indicates high levels of impaired financing and it lowers income and profitability. On the other hand, the lower NPF enhances income and profitability. Studies by Fitriyah and Sholikhin (2019), Fatmawati and Hakim (2020), and Widarjono and Anto (2020) concluded that NPF had a negative effect on the profitability of SRBs.

**H5: NPF negatively affects profitability**

Macroeconomic conditions also influence the profitability of SBRs. If macroeconomic conditions improve, banks will be able to channel funds well and on the other hand, customers will also have the ability to repay their loans on time manner. Several studies show that economic growth has a positive effect on the profitability of SBRs Trinugroho et al. (2017) and Widarjono and Anto (2020).

**H6: GDP positively influences profitability**

COVID-19 has caused a lockdown policy, so economic activity has also declined. As a result, production of goods and services has decreased. Furthermore, economic growth also experienced a decline. Covid-19 caused low profitability of Islamic banks. Some studies document that Covid-19 reduces the profits of Islamic banks (Sutrisno & Widarjono, 2022; Risfandy & Pratiwi 2022; Alabbad & Schertler, 2022; El-Chaarani, 2023)

**H7: COVID negatively affects profitability**

## Method

Panel data is used in this study. The author selects samples from 90 SRBs in Jawa island. SRBs in Banten consist of 7 banks, SRBs in West Java include 26 banks, SRBs in Central Java comprise 24 banks, SRBs in Yogyakarta consist of 12 banks, and SRBs in East Java comprise 21 banks. The study spans from 2018 to 2021 with quarterly data. The final data set in this research is 1440 observations using balanced panel data.

The variables used in this study are return on assets (ROA), total assets, capital adequacy ratio (CAR), nonperforming financing (NPF), financing-to-deposit ratio (FDR), cost-to-income ratio (CIR), and GRDP. The financial data of each SRB is obtained from secondary data originating from financial reports reported to the OJK (Indonesian Financial Service Authority) and can be accessed online (www.ojk.go.id). Meanwhile, GRDP data per province is obtained from the central statistics agency (www.bps.go.id).

### Empirical Model

A dynamic panel regression model is used in this study. Panel data is a combination of time series and cross-section data. Panel data regression can have two advantages. First, it can provide a lot of information, so that the degree of freedom obtained is greater. Second, the ability to overcome problems that may arise due to omitted variable problems. This research uses dynamic panel regression. There are two main reasons for using dynamic panel data regression. First, dynamic panels overcome the problem of endogeneity in the regression model equation (Šeho et al., 2021; Khattak et al., 2022). Second, the profitability is permanent, so dynamic panels are more suitable than static panels (Yanikkaya et al., 2018); Widarjono et al., 2020a; Khattak et al., 2022). The following is the dynamic panel data regression used:

$$ROA_{it} = \beta_0 + \beta_1 ROA_{it-1} + \beta_2 Lasset_{it} + \beta_3 CAR_{it} + \beta_4 FDR_{it} + \beta_5 CIR_{it} + \beta_6 NPF_{it} + \beta_7 LGDRB_{it} + \beta_7 COVID_{it} + e_{it} \quad \text{.... (1)}$$

ROA is the return on asset bank, asset is a total asset, CAR is the capital adequacy ratio, FDR is the financing to deposit ratio, CIR costs to income ratio, NPF is nonperforming financing, GDRP is a gross domestic, regional product, COVID is pandemic Covid starting the second quarter of 2020.

Sharia bank performance is greatly influenced by bank size (Widarjono et al., 2020a) and location (Trinugroho et al., 2017). For further analysis, our study divides SRBs based on their assets and location to investigate the impact of size and location on profitability, First, if the assets are higher than the median then it is categorized as a large SRB. On the contrary, if the assets are smaller than the median then it is grouped as a small SRB. Second, this research covers all SRBs on the island of Java which consists of 5 provinces. To find out whether the location of the SRB affects profitability, this study uses a dummy variable (D). The equation (1) can be rewritten as:

$$ROA_{it} = \beta_0 + \beta_1 ROA_{it-1} + \beta_2 lasset_{it} + \beta_3 CAR_{it} + \beta_4 FDR_{it} + \beta_5 CIR_{it} + \beta_6 NPF_{it} + \beta_7 LGDRB_{it} + \beta_8 COVID_{it} + \beta_9 D1_{it} + \beta_{10} D2_{it} + \beta_{11} D3_{it} + \beta_{12} D4_{it} + e_{it} \quad \text{... (2)}$$

D is a dummy location where D1=1 for Banten, D2=1 for West Java, D3=1 for Central Java, and D4=1 for East Java.

**Measures of dependent and independent variables**

The dependent variable is a variable that is explained by the independent variable. The dependent variable used in this research is the Return on Assets (ROA) as a proxy of profitability (Widarjono et al., 2020a; Sudarsono et al., 2021; Risfandy & Pratiwi, 2022).

Independent variables are variables that explain the dependent variable. The independent variables consist of bank fundamentals and macroeconomic variables. Bank fundamental variables encompass bank size, bank capital, financing, operating efficiency, and financing risk. The bank size can be measured from total assets (Sutrisno & Widarjono, 2024). Bank capital is measured by the capital adequacy ratio (CAR) (Widarjono & Misanam, 2024). CAR is a measure used to assess bank solvency by considering the risk of loss. Banks with strong capital can reduce financing risk problems. The financing-to-deposit ratio (FDR) is a proxy of bank financing (Sutrisno & Widarjono, 2022). The FDR is the ratio of total bank financing with total third-party funds. The higher FDR means the bank's ability to disburse funds is also greater. Operating efficiency is measured by the cost-to-income ratio (CIR) (Widarjono et al., 2023). Financing risk is measured using Non-Performing Financing (NPF), which is calculated by the ratio of non-performing financing to total financing (Widarjono et al., 2020b).

Macroeconomic variables include macroeconomic Gross Regional Domestic Product (GRDP) and the Covid 19 as an external shock. GRDP is measured using the Gross Domestic Regional Product of each province at constant prices. The COVID-19 pandemic was analyzed using dummy variables. The dummy variable in this research is to separate data variables before the Covid-19 pandemic and during the Covid-19 pandemic. This examined different impacts between data before and during the COVID-19 pandemic. Before the second quarter of 2020, the dummy variable was 0, and starting in the second quarter of 2020, when COVID-19 took place, it was 1. Table 1 presents the dependent and independent variables and their measurement

Table 1. Variable and its definition

| Variable | Definition |
|---|---|
| ROA | The ratio of net income to total assets (%) |
| LAsset | Natural logarithm of total Asset |
| CAR | The ratio of Equity to Assets weighted risk (%) |
| FDR | The ratio of total financing to third-party fund (%) |
| CIR | The ratio of operating expense to operating income (%) |
| NPF | The ratio of financing default to total financing (%) |
| LGRDP | Natural logarithm of GRDP |
| Covid-19 | Before Covid-19 =0, during Covid-19=1 |

**Estimation Method**

Equations (1) and (2) are dynamic panel regression equation methods since that equation incorporates the lag of the dependent variable, namely ROA(-1), as one of the independent variables. As we estimate using the fixed effect method, there will be a correlation between the error ($e_{it}$) and the lag of the dependent variable ($ROA_{it-1}$). The correlation between $ROA_{it-1}$ and $e_{it}$ violates the exogeneity assumption of the fixed effect method (FEM). The FEM method will produce biased estimates. To overcome the problem of endogeneity and inconsistent estimators in panel dynamic regression, the General Method of Moment (GMM) is needed using instrumental variables.

The difference and system GMM are widely employed to estimate the dynamic panel regression, such as equations (1) and (2). The difference GMM was developed by Arellano and Bond (1991) and the system GMM was initiated by Arellano and Bover (1995). Yet, our research utilizes the system GMM method, which produces more robust estimators compared to the different GMM (Blundell & Bond, 1998). Furthermore, some tests are needed to warrant that the system GMM is applicable. First, the Hansen test is for the instrument validity test. Second, the Arellano-Bond (AR) test checks the presence of autocorrelation problems.

## Results and Discussion

Table 2 depicts summary statistics of the variables studied. During the research period, the average ROA was 1.24 and stable, with a standard deviation of 5.10. Based on OJK regulation, SRBs on the island of Java perform sound Sharia bank. The average total assets were IDR 83.0380 billion with a large standard deviation (94.59 billion), indicating that variations in SRBs are quite high. The average CAR was 28.29% and it exceeds the threshold of 15% according to OJK regulations. These results imply that SRBs can accommodate losses as well as unexpected shocks. The average FDR was 95.82%. A high FDR can indicate that SRB likely carries out its function in distributing financing to customers very well. The average CIR was 63.33%, implying that operating costs to generate income are quite moderate. The average NPF was 10.18%, suggesting that financing defaults are quite high because it is above the maximum threshold of 5% according to OJK regulations.

Table 2. Summary statistics

| Variable | Observation | Mean | Standard deviation |
|---|---|---|---|
| ROA | 1,440 | 1.2473 | 5.1063 |
| Asset | 1,440 | 83.0380 | 94.5932 |
| CAR | 1,440 | 28.2174 | 18.7111 |
| FDR | 1,440 | 95.8248 | 37.8630 |
| CIR | 1,440 | 63.3390 | 46.4572 |
| NPF | 1,440 | 10.1868 | 13.4956 |
| GRDP | 1,440 | 393665.8000 | 188974.40000 |
| COVID | 1,440 | 0.4375 | 0.49625 |

Table 3 shows the correlation between the variables studied. In general, the correlation between independent variables is low, below 0.6 so there is no serious multicollinearity problem. Accordingly, the coefficient of regression is a robust estimator because it is free from multicollinearity problems.

Table 3. Correlation

| | ROA | Lasset | CAR | FDR | CIR | NPF | LGRDP |
|---|---|---|---|---|---|---|---|
| ROA | 1 | | | | | | |
| Lasset | 0.2176 | 1 | | | | | |
| CAR | 0.0349 | -0.2166 | 1 | | | | |
| FDR | -0.0260 | 0.0082 | 0.0879 | 1 | | | |
| CIR | -0.2568 | -0.0035 | 0.1042 | -0.0029 | 1 | | |
| NPF | -0.2420 | -0.1117 | -0.0210 | 0.0202 | 0.1242 | 1 | |
| LPDRB | -0.0206 | -0.0825 | 0.0557 | 0.0427 | 0.0210 | 0.0153 | 1 |
| COVID | -0.0207 | 0.1487 | 0.1683 | -0.0612 | 0.5418 | -0.1233 | 0.0249 |

**Baseline results**

Our research employs the two-step system GMM to estimate equations (1) and (2). The results of estimating equation (1) as a baseline regression are shown in Table 3. Model 1 presents the findings without COVID-19, while model 2 exhibits the results with the COVID-19 dummy variable. Prior to examining the impact of each independent variable on profitability, the discussion begins with statistical tests for the validity of the two-step system GMM method. First, this study fails to reject the Hansen test, and the number of banks exceeds the number of instruments. These findings imply no proliferation of instrument variables in both model 1 and model 2. Based on these results it can be concluded that the instrument variables used in the dynamic panel regression method are valid in both models. Second, based on the AR (2) test, we fail to reject H0 so that there is no autocorrelation problem in both model 1 and model 2. Third, the previous profitability, namely ROA (-1), has a positive effect on the current profitability in both model (1) and model (2). These findings suggest that the profitability is permanent over time, so the dynamic panel regression is an appropriate method, instead of static panel. These findings are in line with previous studies (Widarjono et al., 2020a; Sudarsono et al., 2021; Khattak et al., 2022).

Table 4. Baseline regression

| Variable | Model 1 | | Model 2 | |
|---|---|---|---|---|
| | Coefficient | P-value | Coefficient | P-value |
| ROA (-1) | 0.474*** | 0.000 | 0.504*** | 0.000 |
| Lasset | 0.417*** | 0.000 | 0.344*** | 0.000 |
| CAR | 0.015*** | 0.000 | 0.011*** | 0.000 |
| FDR | -0.002 | 0.360 | -0.002 | 0.260 |
| CIR | -0.017*** | 0.000 | -0.021*** | 0.000 |
| NPF | -0.027 | 0.235 | -0.023 | 0.283 |
| LGRDP | 0.077 | 0.348 | 0.082 | 0.295 |
| COVID | - | - | 0.536** | 0.028 |
| Constant | -6.455*** | 0.001 | -5.215*** | 0.005 |
| Observations | 1440 | | 1440 | |
| Diagnostic tests | | | | |
| No. of Banks | 90 | | 90 | |
| No. of Instruments | 22 | | 23 | |
| AR (1) | 0.025 | | 0.024 | |
| AR (2) | 0.342 | | 0.334 | |
| Hansen | 0.607 | | 0.557 | |

Note: ***, **, and * show significant at α=1%, α=5%, and α=10%, respectively.

The next step employs a t-test to analyze whether the independent variables individually have an effect on the profitability of SRBs. The coefficient of total assets has a positive sign and is significant in both model 1 and model 2. The coefficient of CAR has a positive sign and is significant in both model 1 and model 2. The coefficient of FDR has a negative sign but is not significant in both models. The coefficient of CIR is negative and significant and the results are consistent in both models. The coefficient of NPF is negative but not significant in both models. The coefficient of GRDP is positive but not significant in both models. COVID-19 is positive and is significant in Model 2.

In Islamic banking, total assets represent bank size. Having large assets helps SRB to operate efficiently and increase its profitability. This research finds that total assets have a positive effect on the ROA of SBRs on the island of Java. This strongly indicates that an increase in total assets increases the profitability of SRBs. This research is supported by previous research, which documented that assets positively link to the profitability of SRBs (Trinugroho et al., 2017; Yusuf, 2017; Widarjono & Anto, 2020).

Capital Adequacy Ratio (CAR) is an important factor in Sharia banking because capital is a component for financing and anticipating loss. SRBs with a high CAR can manage their funds better and, at the same time, cover losses well. This strong capital can increase profitability. In this study, it was found that CAR had a positive effect on the ROA of SRBs on the island of Java. This result suggests that banks with high CAR can strengthen their profitability. Our results are supported by previous research on which banks with high CARs encourage profitability SRBs (Trinugroho et al., 2017; Yusuf, 2017; Almunawwaroh & Marliana, 2018; Putri & Widarjono, 2023).

FDR is an important indicator in Sharia banking for channeling funds. The higher the FDR indicates that banks can channel large funds for financing to generate income. Our findings show that FDR has no effect on the ROA of SRBs on the island of Java. This implies that the higher FDR has no influence on profitability. The strong justification is that SRBs face low operational efficiency (Wasiaturrahma et al., 2020). This research is in line with previous research, which shows that FDR has no effect on the profitability of SRB (Putri & Widarjono, 2023).

CIR is used to measure the efficiency of the Sharia bank. Banks with low CIR show that the income received exceeds the costs incurred. Our study found that CIR had a negative effect on the ROA of SRBs on Java Island. This finding implies that SRBs can carry out their operations efficiently, thereby increasing profitability. The same results were found in previous research that CIR had a negative effect on the profitability of SRBs (Ningsih et al., 2017; Fitriyah & Sholikhin, 2019; Al Iqbal & Budiyanto, 2020).

NPF represents the level of financing risk. SRBs with low NPF levels can generate high profits due to low financing defaults. In this research, it was found that NPF had no effect on the ROA of SRBs on the island of Java. This suggests that NPF does not reduce the profitability of SRBs. Even though the average NPF level is above the threshold, SRBs

can control it well because most financing is in the form of non-profit sharing, which is easy to manage (Hidayah & Karimah, 2023). Previous research results also show that NPF does not affect the profitability of SRBs (Fatmawati & Hakim, 2020).

Macroeconomic conditions also greatly influence the profitability of SRBs. In our research, GRDP has no effect on profitability. This condition occurred because economic growth was relatively low during the research period due to the influence of the COVID-19 pandemic. The findings of this research support previous research, which shows that GRDP has no effect on the profitability of SRBs (Widarjono et al., 2020a; Widarjono & Anto, 2020).

The final independent variable is COVID-19. The result finds that COVID-19 had a positive effect on the ROA of SRBs on the island of Java. This implies that profit loss-sharing financing consisting of ***Mudharabah*** and ***Musyarakah*** as a core of SRB can provide alternative financing when an economic crisis occurs. Profit loss-sharing financing makes it easier for MSMEs to repay their loans because customers are not burdened with fixed financing such as interest rates in conventional banks during the economic downturns (Risfandy, 2018).

**The effect of bank size and location**

For a more in-depth analysis, we split SRBs based on their assets. If their assets are smaller than the Median, then this SRB is grouped into a small SRB, and if their assets exceed the median, then this SRB is classified as a large SRB. Meanwhile, the effect of location on profitability was carried out using a dummy variable, consisting of dummy 1 for Banten, dummy 2 for West Java, dummy 3 for Central Java, and dummy 4 for East Java.

The results of the effect of bank size and location are shown in Table 5. Model 3 presents the results of large SRBs while model 4 indicates the results of small SRBs. Before discussing the effect of each independent variable on profitability, the discussion starts with statistic tests for the validity of the two-step system GMM method. First, the Hansen test shows that we failed to reject the null hypothesis and the number of instruments is smaller than the number of banks. Accordingly, there is no proliferation of instrument variables in Model 3 and Model 4. Based on these results it can be concluded that the instrument variables used in the dynamic panel regression method are valid in both models. Second, based on the AR (2) test, we fail to reject the null hypothesis, so the autocorrelation problem in both model 3 and model 4 is not found. Third, the profitability of the last quarter, namely ROA (-1), has a positive effect on the current profitability in both models 3 and 4. Our findings imply that the profitability of SRBs is permanent over time. For that reason, the dynamic panel regression is a robust method to estimate our model.

Model 3 and model 4 produce consistent results with model 1 and model 2. Assets have a positive effect on profitability for both large and small SRBS but the effect of assets on profitability is stronger for small SRBs than for large SRBs. These findings

reject the theory of "too big to fail," which recommends banks should operate in large sizes to get highly efficient management (Ibrahim et al., 2017; Sutrisno et al., 2023). CAR has a positive effect on profitability in the case of small SRBs. FDR negatively affects profitability in the case of large SRBs. CIR has a negative influence on profitability for large and small SRBS, but it has a greater effect on profitability in the case of large SRBs. NPF is negatively linked to profitability in the case of small SRBs. The GRDP negatively influences profitability only for large SRBs. Covid has a positive effect on profitability in the case of large SRBs but it is negatively associated with profitability for small SRBs.

Table 5. The impact of size and location

| Variable | Model 3: Large SRB | | Model 4: Small SRB | |
|---|---|---|---|---|
| | **Coefficient** | **P-value** | **Coefficient** | **P-value** |
| ROA (-1) | 0.679*** | 0.000 | 0.450*** | 0.000 |
| LASSET | 0.356*** | 0.000 | 0.929*** | 0.000 |
| CAR | -0.003 | 0.429 | 0.015** | 0.023 |
| FDR | -0.004*** | 0.000 | -0.003 | 0.289 |
| CIR | -0.020*** | 0.000 | -0.009*** | 0.000 |
| NPF | -0.008 | 0.509 | -0.084*** | 0.000 |
| LGRDP | -1.778* | 0.099 | -0.083 | 0.960 |
| COVID | 0.580*** | 0.000 | -0.302* | 0.090 |
| Banten | 1.683 | 0.311 | -0.385 | 0.883 |
| West Java | 5.084* | 0.081 | -0.449 | 0.924 |
| Central Java | -0.297 | 0.550 | 0.309 | 0.746 |
| East Java | 5.405* | 0.079 | 0.496 | 0.915 |
| Constant | 13.766 | 0.207 | -12.862 | 0.437 |
| Observations | 1440 | | 1440 | |
| Diagnostic tests | | | | |
| No. of Banks | 45 | | 45 | |
| No. of Instruments | 27 | | 27 | |
| AR (1) | 0.005 | | 0.056 | |
| AR (2) | 0.073 | | 0.413 | |
| Hansen | 0.208 | | 0.246 | |

Note: ***, **, and * denote statistically significant at α=1%, α=5%, and α=10%, respectively.

Regarding location, two locations have a positive influence on profitability, namely West Java and East Java, for large SRBs. However, location has no impact on profitability in the case of small SRBs. There are two main reasons that both provinces encourage the profitability of large SRBs. First, the economic growth of these two provinces over 5 years is higher than the other provinces. Second, in these two provinces, the level of religiosity is also very high. The religiosity of a region can be seen from several indicators, one of which is the number of people who are in the process of and have already performed the

Hajj. Based on the calculation of the Hajj index level in the provinces of West Java and East Java, they are 3 and 4, respectively, with a maximum scale of 4 (Trinugroho et al., 2017). Our findings are in line with the results of Trinugroho et al. (2017) for which the religiosity of a region enhances the profitability of SRBs.

## Conclusions

Our study analyzes the influence of bank fundamentals, bank size, location, and macroeconomic variables on profitability for SRBs. We investigate SRBs located on the island of Java. The study period spans from 2018 to 2021. The results clearly indicate that SRB with strong fundamentals can enhance profitability. Large assets, capital adequacy, and a high level of efficiency likely increase profitability. There were two other interesting findings in the study. First, large SRBs ensure to generate high profitability due to efficient management. Second, profitability is also influenced by location, for which locations with high levels of economic growth and high levels of religiosity encourage high profitability.

The results of this research have important policy implications for encouraging the future development of SRBs. First, profitability is strongly influenced by strong bank fundamentals. Capital adequacy and operational efficiency are the keys to the success of SRBs in generating high profitability. Second, the large size of SRB is the best choice for SRBs to have sound financial performance considering that, on average, SBR is relatively smaller compared to conventional rural banks credit as their competitor. Third, the religiosity of a region greatly determines the profitability of SRBs. For this reason, it is necessary to introduce Sharia banking products more intensively to the public so that they are acquainted with Sharia bank products and then finally become customers of SRB.

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