Does market structure matter for Islamic rural banks’ profitability?

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Abstract

This study investigates the impact of the market structure including bank-specific factor and macroeconomic conditions on profitability of Islamic rural banks in Yogyakarta and Central Java provinces. We employ the Structure Conduct Performance (SCP) and Relative Market Power (MRP) hypothesis using static and dynamic panel data regression over the periods 2013Q1-2018Q4. Diagnostic tests obviously confirm that the dynamic panel regression is more appropriate in estimating profitability because of the dynamic behavior of profitability, instead of the static panel regression. Based on the Concentration Ratio (CR) and the Herfindahl-Hirschman Index (HHI), both provinces face imperfect competition market. Market share positively affect profitability but market concentration has no impact on profitability. The results clearly show that our study supports the RMP hypothesis but fail to confirm the SCP hypothesis. Some control variables such as the level of efficiency and financing rate also affect profitability. A high level of operating efficiency increases more profits and low non-performing financing produce more profits. Our findings suggest that improving operating cost eventually is the key in capitalizing the power of market share.

Keywords:
Islamic rural bank; Market concentration; Market share; Profitability

JEL Classification: G21, G24

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1. Introduction

Based on assets and financing, Indonesian Islamic banks are grouped into large and small Islamic banks. Large Islamic banks consist of Islamic commercial banks and Islamic bank windows in which conventional banks open Islamic business units. Meanwhile, small banks consist of Islamic rural banks (IRB). The number of Islamic commercial banks was 31 in 2008 and rose to 34 in 2018. The number of IRBs was 132 in 2008 and slightly increased to 165 in 2018, spreading across 27 provinces in Indonesia. Islamic rural banks are an important part of the financial intermediary in Indonesia because most of the firms are in the form of micro, small and medium enterprises. The total assets of Islamic rural banks in 2018 amounted to Indonesian Rupiah (IDR) 12,362 trillion. However, majority of Islamic rural banks are located on Java Island, comprising 103 Islamic rural banks. Of the 103 BPRS, 37 BPRS (35.92 percent) are located in Yogyakarta special province, hereafter called Yogyakarta (12 Islamic banks) and in Central Java province (26 Islamic banks).

Furthermore, Islamic rural bank market is obviously close imperfect competition market. Our study selects Central Java and Yogyakarta due to high concentration ratio. Based on the total assets and financing of Islamic rural banks in December 2018, the concentration ratio (CR4) for assets and financing in Yogyakarta were 53.20 percent and 50.84 percent, respectively. Meanwhile the concentration ratio (CR8) of assets and financing in Central Java were 67.25 percent and 67.19 percent, respectively. Referring to this market structure, the Islamic rural bank market in Yogyakarta and Central Java is an imperfect competitive market because the market is concentrated. With the market concentration of the Islamic rural bank in Yogyakarta and Central Java, does imperfect market affect the profitability of Islamic rural banks in both regions?

The relationship between the market structure and Islamic bank’s profitability can be investigated using structure conduct performance (SCP) and relative market power (RMP). SCP states that high market concentration ratio cause to collusive behavior to obtain more profit so it hypothesizes a positive relationship between market concentration and profits. Several previous studies such as Chen & Liao, (2011), Perera et al. (2013), and Khan et al. (2018) showed that bank profitability associates with an imperfect market. By contrast, several studies indicate that bank profitability is not associated with market concentration but depend on the market share of each bank known as relative market power (RMP). Smirlock (1985) proposes a hypothesis of the relationship between market share and profit. The large market share can create different products to create market power. Accordingly, bank capitalizes its market power to determine the premium price and generate supernormal profits. Several studies such as Mirzaei et al. (2013) and Hamid (2017) support the RMP theory.

A number of empirical studies have been conducted in analyzing the profitability of Islamic banking. Bashir (2003) examined the profitability of Islamic banking using panel data consisting of 8 countries in the Middle East during the period 1993-1998. Both bank specific factors such as asset and macro-economic condition such as economic growth link to profitability. Trabelsi & Trad (2017) analyzed the profitability of 94 Islamic banks operating in 18 countries during the 2006-2013. They found that bank capital is the main factor to earn more profit. Several studies have also been conducted in Southeast Asian countries such as Malaysia and Indonesia. Choong et al. (2012) found that internal factors such as financing risk, CAR and external factors such as affect the profitability of Islamic banking in Malaysia. In addition, they found market concentration measured with HII positively affects profitability, implying that profitability of Islamic bank depends on market structure in which more imperfect market is higher profitability.

Many empirical researches have examined the profitability of Indonesian Islamic banks such as
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Warninda (2014), Sriyana (2015), Hosen & Rahmawati (2016), Setyawati et al. (2017), Trinugroho et al. (2017), Widarjono (2018), Aisyah & Hosen (2018), Sutrisno & Widarjono (2018), Al Arif & Awwaliyah (2019), Widarjono (2020a), Widarjono (2020b). The existing empirical studies of Indonesian Islamic banks employ panel data as well as time series data. The objects studied include Islamic commercial banks and Islamic rural banks. The results show that several bank specific factors such as assets, CAR, efficiency and non-performing financing and external factors such as economic growth and inflation evidently affect bank profits.

Based on existing empirical studies, however, a few empirical researches addressed the impact of market structure on Indonesian Islamic banks’ profitability. Trinugroho et al., (2017) applying the SCP hypothesis over the period 2012Q1-2016Q4 documented that market concentration measured with HHI positively affects Indonesian Islamic rural banks’ profitability. This result supports the SCP hypotheses. Islamic rural banks in Java, however, can obtain more benefit than those outside Java due to high imperfect competition market. More interestingly, small Islamic rural bank can capitalize market concentration to earn more profit than large Islamic rural bank. The SCP hypothesis also exists for Indonesian Islamic commercial bank from 1999-2011 (Nurwati et al., 2014). Al Arif & Awwaliyah (2019) investigated the impact of market structure on Islamic commercial banks from 2012Q to 2016Q4 using both SCP as well as MRP hypothesis. By contrast, they found that market concentration and market share do not affect profitability. These findings fail to confirm both SCP and MRP. In addition, their findings indicate that the imperfect competitive market of Islamic banking industry in Indonesia does not lead to the collusive behavior among Islamic commercial banks.

This research examines the impact of market concentration and market share on profitability of Islamic rural banks. Research on the profitability of Islamic banks in Indonesia in this study is obviously different from previous empirical research. First, previous empirical studies apply the relationship between market structure and profitability for Indonesian conventional commercial banks such as Naylah & Cahyaningratri (2020) and Indonesian Islamic commercial banks such as (Nurwati et al., 2014) and (Al Arif & Awwaliyah, 2019). Second, in addition to static panel regression, our study also applies the dynamic panel data. The dynamic panel regression is more appropriate to the static panel data as the dependent variable such as profitability is persistent to some extent (Khan et al., 2018). Some existing studies applied static panel regression such as Sriyana (2015), Setyawati et al. (2017), Nurwati et al. (2014), and (Al Arif & Awwaliyah, 2019). Third, to the best our knowledge, research on the impact of market structure on profitability of Islamic rural bank is rare. Indeed, the study of Trinugroho et al. (2017) addressed the relationship between market concentration and Islamic rural banks’ profitability using static panel data.

2. Method, Data, and Analysis

This study examines the impact of market structure on the profitability of Islamic rural banks in the provinces of Yogyakarta and Central Java. The model used in this study follows previous research such as Smirlock (1985), Hamid (2017), and Al Arif & Awwaliyah (2019). The profitability model of Islamic rural banks is a panel regression model as follows:

\[ Y_{it} = \rho_0 + \rho_1MS_{it} + \rho_2CR_{it} + \sum_{j=1}^{n} \theta_j X_{jit} + \alpha_i W_{it} + \epsilon_{it} \]  (1)

Based on Equation (1), Islamic rural bank’s profitability depends on market structure encompassing market share (MS) and market concentration ratio (CR), Islamic bank specific variables (X_{jit}) and macroeconomic conditions (W_{it}). Islamic rural banks’ profitability is measured with return on as-
ROA). Market share (MS) is the Islamic bank’s asset overall total assets. Our study employs the Herfindahl-Hirschman Index (HHI) to measure market concentration ratio. HHI is calculated by using \( HHI = \sum_{i=1}^{n} MS_i^2 \). Islamic bank specific factors consist of asset, Capital Adequacy Ratio (CAR), Financing Deposit Ratio (FDR), efficiency (CIR), Financing Risk (RISK). Islamic bank efficiency is operating efficiency measured by ratio of cost over income. Financing risk (RISK) is loan loss provision over total financing. The macroeconomic variable is regional economic growth which measures the growth of the gross regional domestic product (GRDP) in each province.

Panel regression in Equation (1) is static panel regression. There are three methods that are often used to estimate panel regression. The first method assumes no differences in behavior between objects and the second and third method propose different behavior between objects. The first method combines data without considering any different objects known as the pooled panel regression. The second approach consists of the fixed effect and random effect methods. The fixed effect method assumes that there is no autocorrelation problem in one object over different time periods. Meanwhile, the random effect method assumes that autocorrelation exists over time in one object. The different behavior between objects in the fixed effect and random effect methods is estimated using dummy variables. The different intercept of the dummy variables is what distinguishes the behavior between objects. Pooled and fixed effect methods can be estimated using the classical Ordinary Least Squares (OLS) method while the random effect method must be estimated using the Generalized Least Squares (GLS) approach due to autocorrelation problems.

The profit in Equation (1) is obviously static. However, the profit is persistent to some extent where the profit of the previous period eventually influences the current profit (Zarrouk et al., 2016). Therefore, the model must include the previous profit in the static panel of the Equation (1). As we include the lag dependent variable \( Y_{it-1} \) is one of the independent variables, we explicitly have a dynamic panel regression. The dynamic panel regression in Equation (1) can be written in the following equation:

\[
Y_{it} = \rho_0 + \rho_1 Y_{it-1} + \rho_2 MS_{it} + \rho_3 CR_{it} + \rho_4 RISK_{it} + \sum_{j=1}^{\theta_j} X_{jit} + \alpha_i W_{it} + e_{it} \tag{2}
\]

When estimating Equation (2), a correlation between \( Y_{it-1} \) and error exists and violates the exogeneity assumption. The OLS method produces a biased estimate. In overcoming the problem of endogeneity and inconsistency of estimators in Equation (2), an instrumental variable (IV) is needed. There are two approaches in the GMM method, namely the difference GMM method (Arellano & Bond, 1991) and the GMM system method (Arellano & Bover, 1995) to overcome endogeneity.

Based on Equations (1) and (2) above, the market structure is measured by market share (MS) and market concentration ratio using HHI. This equation model can be employed to test the RMP hypothesis and SCP hypothesis. The RMP hypothesis is tested by using null hypothesis \( \rho_2 = 0 \) against alternate hypothesis \( \rho_2 > 0 \). This first hypothesis states that high banking profits are related to high market share. While the SCP hypothesis is verified by using null hypothesis \( \rho_3 = 0 \) against alternate hypothesis \( \rho_3 > 0 \). This second hypothesis means that high bank profits are related to high market concentration ratios.

Asset represents Islamic bank size. Large asset exhibits the high power to leads to abnormal revenue so it is expected to be a positive link to profit (Widarjono, 2018). CAR shows that a bank maintains well its equity. High CAR represents an Islamic bank’s ability to obtain more profit by expanding its business it is hypothesized to have a positive effect on profitability (Zarrouk et al., 2016). The FDR shows an Islamic bank’s ability in provid-
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We expect FDR has a positive effect on profit (Mirzaei et al., 2013). Efficiency measured with operating cost over operating income (CIR) indicates that higher CIR is lower efficiency and vice versa so we expect that CIR negatively links to profit (Trinugroho et al., 2017). Ratio of loan loss provision over total financing (RISK) represents Islamic bank financing risk (Widarjono et al., 2020). Higher financing risk shows higher bad financing so it lowers Islamic bank to create profit (Sutrisno & Widarjono, 2018). Economic growth at province level represents the macroeconomic condition at province level. The good macroeconomic condition encourages Islamic rural banks to earn more profit so it is linked to a positive relationship economic growth and profitability (Hamid, 2017).

Our study employs Islamic rural banks located in Yogyakarta and Central Java, comprising 34 Islamic banks. Period of study covers from 2013 to 2018 using quarterly data. We finally have a balance panel data comprising 816 observations. All financial data such as ROA, ROE Asset, CAR, FDR, CIR and RISK are sourced from the Indonesian Financial Services Authority or Otoritas Jasa Keuangan (OJK). Meanwhile, the macro variable data is extracted from the Indonesian Central Bureau of Statistics (BPS). Table 1 displays variables being studied, hypothesis and source of data.

3. Results

Market structure

Before discussing the effect of market structure on the profitability of an Islamic rural bank, we analyze the market structure of Islamic rural bank in Yogyakarta and Central Java. One way to measure the market power of Islamic bank employs the concentration ratio (CR). CR which is often used is the CR-4 and CR-8. Both measure the market share of 4 and 8 biggest Islamic bank in the market. The number of Islamic rural banks in Yogyakarta and Central Java being study was 10 and 24 Islamic banks, respectively. The market power of Islamic rural banks is measured by the largest assets of 4 Islamic banks for the case in Yogyakarta and 8 Islamic banks in Central Java.

Figure 1 shows CR-4 and CR-8 for Islamic rural banks in Yogyakarta and Central Java. The CR-4 of Islamic rural banks in Yogyakarta and in Central Java

| Table 1. Variable, expected sign and source |
|-------------------------------------------|
| Variable | Hypotheses | Source |
| ROA (%)  | +           | Indonesian Financial Service Authority (OJK) |
| ROE (%)  | +           | Indonesian Financial Service Authority (OJK) |
| HHI (%)  | +           | Indonesian Financial Service Authority (OJK) |
| Market Share (%) | +           | Indonesian Financial Service Authority (OJK) |
| Asset (IDR billion) | +/-          | Indonesian Financial Service Authority (OJK) |
| CAR (%)  | +           | Indonesian Financial Service Authority (OJK) |
| FDR (%)  | +           | Indonesian Financial Service Authority (OJK) |
| CIR (%)  | -           | Indonesian Financial Service Authority (OJK) |
| RISK (%) | -           | Indonesian Financial Service Authority (OJK) |
| GRDP (%) | +           | Central Bureau of Statistics (BPS) |
Java exceeds 40 percent, meaning that the Islamic rural banks market in the two provinces is an oligopoly market. However, the oligopoly power of Islamic rural banks in Yogyakarta is much greater because its value is above 60 percent, even the Islamic rural market in Yogyakarta is considered a strict oligopoly. Apart from using CR, market power can also be measured using the Herfindahl-Hirschman Index (HHI). The HHI for Islamic rural banks in Yogyakarta is higher than the HHI for Islamic rural banks in Central Java. The HHI confirms that the Islamic rural banks market in Yogyakarta is more imperfect competitive market than those in Central Java.

Descriptive statistics

The descriptive statistics for variables are displayed in Table 2. The average ROA is 1.65 percent and this profit rate of Islamic rural banks exceeds a minimum ROA of 1.5 percent. However, the ROA between Islamic banks is quite high by with the standard deviation of 5.3104 and there are even banks with a negative ROA (-52.33 percent). Likewise, the profit based on ROE, ROE pattern clearly is the same as ROA. The average ROE is quite high (20.76 percent) but the variation in ROE is quite high with a standard deviation of 37.14. Market structure based on HHI, is 8.63 with a small standard deviation (1.92). This condition shows that the market structure does not change much from time to time. The average market share is 5.57 percent with a standard deviation of 4.63. The average market share is small, but with a fairly large standard deviation, there are several Islamic rural banks that are quite dominant in the market with the highest market share rate of 20.85.

The average asset of Islamic rural banks is IDR 34.92 billion, but there is a bit high gap between Islamic rural banks. The highest asset is IDR 196 billion and the lowest is IDR 2.37 billion. The average of CAR is 17.95 percent which is clearly above the threshold of 12 percent but with a high standard deviation of 14.41. High CAR reflects that Islamic rural banks prudentially act because of high non-performing financing (Trinugroho et al., 2018). Financing rate is definitely high with average of 90.43. High FDR represent the aggressiveness of Islamic rural banks channeling their financing due to new players in Indonesian rural bank market. The level of operating efficiency using cost income ratio (54 percent) is fairly good, slightly above 50 percent, meaning that an increase in income by 100 percent requires at cost by 50 percent. Islamic rural banks in Yogyakarta and Central Java slightly encounter higher financing risk with loan loss provision of 3.63 percent, a bit higher than at national level of 2.68 percent (Widarjono et al., 2020). Regional economic
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growth in both provinces is above 5 percent but with low standard deviation (0.53) there is no big economic growth gap between them.

Table 3 displays the correlation coefficient among the independent variables to warrant no perfect multicollinearity among them. Generally, the coefficients of correlation between variables are less than 0.8. The highest correlation is between MS and ASSET (0.76), followed by correlation between MS and HHI (0.46) but the rest of them obliviously is small. These results clearly indicate that multicollinearity problems are not found.

We now turn to discuss the regression results regarding the profitability of Islamic rural banks using static and dynamic panel regression models. We begin with a static panel regression model. Table 3 shows the static panel regression model with ROA as a proxy of Islamic bank’s profitability. In the static panel model, there are three methods consisting of pooled method, fixed effect method and random effect method. Based on the F test and the Hausman test which follows chi distribution, the fixed effect is the best model to estimate panel static. The coefficient of determination (R^2) is 0.211. This result is fairly reasonable due to high variation among Islamic rural banks. The coefficient of asset is positive and significant. It may imply that the bigger Islamic rural bank can generate a significantly more

Table 2. Descriptive statistics

| Variable   | Mean | Std. Dev. | Maximum | Minimum |
|------------|------|-----------|---------|---------|
| ROA (%)    | 1.6517 | 5.3104    | 72.0000 | -52.3300 |
| ROE (%)    | 20.7656 | 37.1429   | 179.5300 | -368.9900 |
| HHI (%)    | 8.6336 | 1.9175    | 12.1754 | 6.6235 |
| MS (%)     | 5.5727 | 4.6331    | 20.8528 | 0.5174 |
| ASSET (billion) | 34.9160 | 31.9057   | 196.0000 | 2.3739 |
| CAR (%)    | 17.9456 | 14.4135   | 257.0000 | 0.8100 |
| FDR (%)    | 90.4335 | 24.8806   | 344.0000 | -9.1500 |
| CIR (%)    | 54.0019 | 23.9296   | 262.4579 | 0.0400 |
| RISK (%)   | 3.6298 | 44.0270   | 1256.6020 | 0.0000 |
| GRGDP (%)  | 5.2978 | 0.5317    | 7.3900 | 3.8800 |

The number of observations is 816 consisting 34 Islamic rural bank and covering 2013Q1 - 2018Q4.

Table 3. Correlation matrix

|       | HHI | MS  | ASSET | CAR  | FDR  | CIR  | RISK | GRGDP |
|-------|-----|-----|-------|------|------|------|------|-------|
| HHI   | 1.00|     |       |      |      |      |      |       |
| MS    | 0.46| 1.00|       |      |      |      |      |       |
| ASSET | 0.08| 0.76| 1.00  |      |      |      |      |       |
| CAR   | -0.07| -0.16| -0.13 | 1.00|      |      |      |       |
| FDR   | -0.12| -0.11| -0.07 | -0.10| 1.00|      |      |       |
| CIR   | -0.05| -0.25| -0.22 | 0.28| -0.08| 1.00|      |       |
| RISK  | -0.03| -0.05| -0.05 | 0.27| 0.01| 0.17| 1.00|       |
| GRGDP | 0.03| 0.03| 0.09  | -0.04| -0.03| 0.00| -0.01| 1.00|
profit. The coefficient of inefficiency is negative and significant. This means that as the Islam bank’s operations definitely are inefficient, it reduces the profitability of Islamic banks.

The results of dynamic panel regression are exhibited in Table 4. Our study employs the two-step difference GMM (method 1) and two-steps system GMM (method 2). The Sargan test of over-identifying restrictions for model displays all valid models due to no evidence of over-identifying restrictions. The lag of dependent variable (ROA$_{t-1}$) is positive and statistically significant. The results obviously confirm the dynamic nature of profitability, implying that dynamic panel model is a fit model to estimate profitability of Islamic rural banks. The coefficient of market share is positive and significant using method 1. The Asset’s coefficient is negative and significant for method 1 but it is contrary to method 2 resulting in a positive sign. The coefficients of financing (FDR) are a positive and significant. Similar to the static model, the coefficients of inefficiency are negative and significant using both method 1 and method 2. Financing risk also has a negative sign and significant. Lastly, using method 1, macroeconomic condition is positive and significant.

**Table 4. Determinants of profitability: ROA, static panel regression**

| Variable | Pooled | Fixed | Random |
|----------|--------|-------|--------|
| $C$      | -10.3000 | -18.5851** | -12.8823** |
|          | (7.1473) | (9.2443) | (7.7118) |
| $HHI$    | -0.0763  | 0.2353  | -0.0685 |
|          | (0.1090) | (0.5242) | (0.1521) |
| $MS$     | -0.0509  | 0.0476  | -0.0533 |
|          | (0.0750) | (0.1393) | (0.0890) |
| $LASSET$ | 1.0015*** | 1.2719*** | 1.1440*** |
|          | (0.4068) | (0.4855) | (0.4402) |
| $CAR$    | 0.0015   | -0.0008 | 0.0001 |
|          | (0.0130) | (0.0145) | (0.0137) |
| $FDR$    | 0.0010   | 0.0026  | 0.0017 |
|          | (0.0064) | (0.0073) | (0.0068) |
| $CIR$    | -0.0734*** | -0.0673*** | -0.0705*** |
|          | (0.0080) | (0.0086) | (0.0082) |
| $RISK$   | 0.0015   | 0.0015  | 0.0015 |
|          | (0.0041) | (0.0040) | (0.0040) |
| $GRGDP$  | -0.0669  | -0.0628 | -0.0853 |
|          | (0.3279) | (0.3316) | (0.3222) |
| R-squared| 0.1508   | 0.2191  | 0.1273 |
| N        | 816     | 816    | 816    |
| F test   | 1.8590  |        |        |
| Chi test | 0.0000  |        |        |

Note: ***, **, and * denote significant at 1%, 5% and 10%, respectively. The number in parentheses shows standard error.
4. Discussion

Our study clearly indicates that the lagged ROA has a positive sign and statistically significant, implying that Islamic rural banks’ profitability in the previous period greatly contribute to current profitability. These results imply that profitability is permanent to some extent because of entry and exists barriers, imperfect market competition, asymmetric information as well as economic upturn and downturn (Hamid, 2017). Consequently, by applying static panel regression, the biased and inconsistent estimators exist. These findings confirm that dynamic panel model is a fit model to estimate profitability of Islamic rural banks. Accordingly, our discussion focuses on results of dynamic panel regression shown in Table 4.

Market share positively affects profitability but market concentration has no impact on profitability. This study confirm relative market power hypothesis in explaining the Islamic rural banks’ profitability in Yogyakarta and Central Java instead of structure conduct performance hypothesis. This study shows that market share evidently generates more profit through such as efficiency and product

| Table 5. Determinants of profitability, ROA, dynamic panel regression |
|---------------|-----------------|-----------------|
| Variable | Difference GMM | System GMM |
|           | (1)            | (2)            |
| ROA(-1)   | 0.1759***      | 0.1900***      |
|           | (0.0079)       | (0.0019)       |
| HHI       | 0.2597         | 0.1532         |
|           | (0.8816)       | (0.2762)       |
| MS        | 0.9622**       | 0.0923         |
|           | (0.4085)       | (0.1621)       |
| LASSET    | -2.0389*       | 0.8777***      |
|           | (1.0921)       | (0.2617)       |
| CAR       | 0.0116         | 0.0098*        |
|           | (0.0158)       | (0.0076)       |
| FDR       | 0.0157**       | 0.0064***      |
|           | (0.0090)       | (0.0019)       |
| CIR       | -0.0449***     | -0.0578***     |
|           | (0.0041)       | (0.0004)       |
| RISK      | -0.0019**      | -0.0001*       |
|           | (0.0011)       | (0.0004)       |
| GRGDP     | 0.2740**       | 0.0709         |
|           | (0.1148)       | (0.0486)       |

No of observation 816 816
No of instrument 35 35
Sargan test 0.3525 0.3950

Note: ***, **, and * denote significant at 1%, 5% and 10%, respectively. The number in parentheses shows standard error
differentiation than market concentration. Therefore, instead of structure conduct performance hypothesis, our results confirm the relative market power hypothesis. Our findings support the existing empirical studies such as Mirzaei et al. (2013) for commercial banks in 17 European countries from 1999 to 2008 and (Hamid, 2017) for commercial banks in ASEAN-5 countries encompassing, Malaysia, Singapore, Indonesia, Philippines, and Thailand from 2001 to 2012.

The coefficient of market share is 0.9622, implying that an increase in market share by 1 percent leads to a rise in profit roughly by 0.9622 percent. However, the power of market share in generating more profit is much lower than commercial banks. For instance, the coefficients of market share are 6,793 for commercial banks in some ASEAN countries. The low power of market shares may come for two reasons. First, Islamic bank is a new player in Indonesian banking industry so Islamic banks have not been able to generate a high level of efficiency (Aisyah & Hosen, 2018). Second, Islamic rural banks evidently have a small market share because they must be able to compete with established conventional rural banks (Widarjono et al., 2020).

Specific bank factors also remarkably contribute to the profitability of Islamic rural banks. Financing rate (FDR) has a positive effect on profitability, meaning that the higher the level of financing the greater the profit. The findings are in line with the case of Pakistani Islamic commercial banks (Akhtar et al., 2011) and the case of Indonesian Islamic rural banks (Trinugroho et al., 2017). Low level of efficiency also negatively influences profits. The more efficient in operation, the higher the profit rate and this result supports previous studies such as Khan et al. (2014) for Pakistani Islamic banks and Masood & Ashraf (2012) for Islamic commercial banks from 12 countries in East Asian Countries South, Asian countries Middle East countries, and African Countries.

The financing risk clearly has a negative effect on bank profits. The high financing risk reduces the profit rate of Islamic rural banks, confirming the existing empirical studies (Al-Jafari & Alchami, 2014). The level of financing risk for Islamic rural banks is remarkably high, above maximum threshold of 5 percent, thus hampering the financial performance of Islamic rural banks (Widarjono et al., 2020). The results of this research link to the previous studies for Indonesian Islamic commercial banks (Sutrisno & Widarjono, 2018) and for Indonesian Islamic rural banks (Warninda, 2014).

**Robustness check**

There are two profit measurements that are often used to measure the profitability of Islamic bank, encompassing return on assets (ROA) and return on earnings (ROE) (Zarrouk et al., 2016; Trabelsi & Trad, 2017). To warrant the robustness of our findings using ROA, therefore, we re-estimate the Islamic rural banks’ profitability using ROE as the dependent variable. The estimation results using both the static and dynamic panel regression methods are shown in Tables 6 and 7, respectively.

We start to discuss the results of static panel regression. Our study displays all estimations consisting of pooled method, fixed effect method and random effect method. The diagnostic tests using the F test and the Hausman test obviously confirm that the fixed effect is appropriate method to estimate panel static. The coefficient of determination is 0.2378, slightly higher than the first model applying ROA as dependent variable. Due to high variation of ROE among Islamic rural banks with standard deviation of 37.1429, our result is fairly plausible. The dynamic panel regression both the two-step difference GMM (method 1) and two-steps system GMM (method 2) clearly show that valid no evidence of over-identifying restrictions are found using the Sargan test. More importantly, the lag of dependent variable is positive and statistically significant, obviously showing that ROE is also persistent to some extent. The results distinctly prove that dynamic panel data using GMM method is more applicable than static panel data.
Both static and dynamic panel regression exhibit that market share positively affects profitability (ROE). Our findings support relative market power hypothesis, instead of structure conduct performance hypothesis. The coefficients of market share are 2.0407, 3.4354 and 1.8122 using fixed effect, two-step different GMM and two-step system. These coefficients of market share are much higher than the previous results. The results strongly bolster the model of Islamic rural banks’ profitability using ROA. Some bank characteristic variables such as financing rate efficiency rate also play in part to generate more ROE. However, macroeconomic condition negatively affects profitability, and it is contrary to our hypothesis.

5. Conclusion

This study analyzes the impact of the market structure including some control variables both bank specific factor and macroeconomic conditions on the profitability of Islamic rural banks in Yogyakarta and Central Java. Our study applies the SCP and RMP hypothesis employing static and dynamic panel data regression. Diagnostic test clearly displays that the dynamic panel regression model is more powerful in estimating profitability due to the

| Variable | Pooled | fixed | Random |
|----------|--------|-------|--------|
| C        | -26.1134 | -8.5510 | -9.7465 |
| HHI      | -1.9669*** | -1.6550 | -2.1983* |
| MS       | 1.3910*** | 2.0407** | 1.7481*** |
| LASSET   | 5.5583** | 3.8577 | 4.3865* |
| CAR      | 0.0777 | 0.1056 | 0.0983 |
| FDR      | 0.0545 | 0.0444 | 0.0474 |
| CIR      | -0.5122*** | -0.4372*** | -0.4540*** |
| RISK     | 0.0219 | 0.0158 | 0.0169 |
| GRGDP    | -3.3654* | -3.0834* | -3.2281* |
| R-squared | 0.2227 | 0.2378 | 0.1378 |
| N        | 816 | 816 | 816 |
| F test   | 4.4892 | 4.4892 | 4.4892 |
| Chi test | 0.0000 | 0.0000 | 0.0000 |

Note: ***, **, and * denote significant at 1%, 5% and 10%, respectively. The number in parentheses shows standard error.
dynamic behavior of profitability. The results show that our study supports the RMP hypothesis, instead of the SCP hypothesis. Some control variables such as the level of efficiency and financing rate also affect profitability. A high level of operating efficiency increases more profits and low non-performing financing produce more profits.

There are several important implications of these findings. First, the power of market share is one of the keys to generating more profits. The higher the market share is the higher the profit. Second, improving operating cost is the key in capitalizing the power of market share. The low operating cost eventually results in more market share. Third, Islamic rural banks must be able to reduce the level of financing risk to improve profits. Financing risk can be reduced by balancing PLS and non-PLS contracts.

Our study examines the profitability of Islamic rural banks using the SCP and RMP hypothesis in Yogyakarta and Central Java regions. The two provinces may represent Islamic rural banks in Java, but they do not represent Islamic rural banks outside Java which have different economic and social conditions. Therefore, the future empirical study should consider the Islamic rural banks outside Java. Second, profitability of Islamic banks really depends on the size of the bank (Eihák & Hesse, 2010). Future research should differentiate between small and large rural Islamic banks.

Table 7. Determinants of profitability, ROE, Dynamic Panel Regression

| Variable | Difference GMM | System GMM |
|----------|----------------|------------|
| ROA(-1)  | 0.3915***      | 0.3991***  |
|          | (0.0037)       | (0.0037)   |
| HHI      | -0.8244        | -0.9161    |
|          | (2.1872)       | (3.8464)   |
| MS       | 3.4354*        | 1.8122***  |
|          | (2.4740)       | (0.9369)   |
| LASSET   | -3.5429        | 2.9645*    |
|          | (9.6109)       | (2.0412)   |
| CAR      | 0.0973         | 0.1462     |
|          | (0.2167)       | (0.1840)   |
| FDR      | 0.0183         | 0.0495***  |
|          | (0.0617)       | (0.0188)   |
| CIR      | -0.2473***     | -0.3342*** |
|          | (0.0176)       | (0.0105)   |
| RISK     | -0.0196        | 0.0019     |
|          | (0.0314)       | (0.0392)   |
| GRGDP    | -2.4261**      | -2.4993**  |
|          | (1.0271)       | (0.9911)   |

N 816 816
No of instr. 34 34
Sargan test 0.5237 0.5423

Note: ***, **, and * denote significant at 1%, 5% and 10%, respectively. The number in parentheses shows standard error.
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