

## Shariah bank efficiency in Indonesia: Does competition matter?

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### Abstract

This paper analyzes the influence of competition with bank-specific and macroeconomic variables as control variables in influencing the cost efficiency of Sharia commercial banks in Indonesia. Our research examines all Shariah banks (34 banks) from 2015 to 2020 using quarterly data. The estimation method is panel data regression. The results indicate that fierce competition causes an increase in the cost efficiency of Shariah commercial banks. However, the effect of competition on cost efficiency is more pronounced in full-fledged Shariah banks than in Shariah bank subsidiaries of conventional banks. Banks with strong fundamentals can encourage efficiency. For example, bank size, equity, and income diversification have a positive effect on bank efficiency. However, a high NPF reduces efficiency. Furthermore, negative external shocks such as Covid-19 reduce cost efficiency.

Keywords: efficiency, competition, bank-specific variable, Shariah bank

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### INTRODUCTION

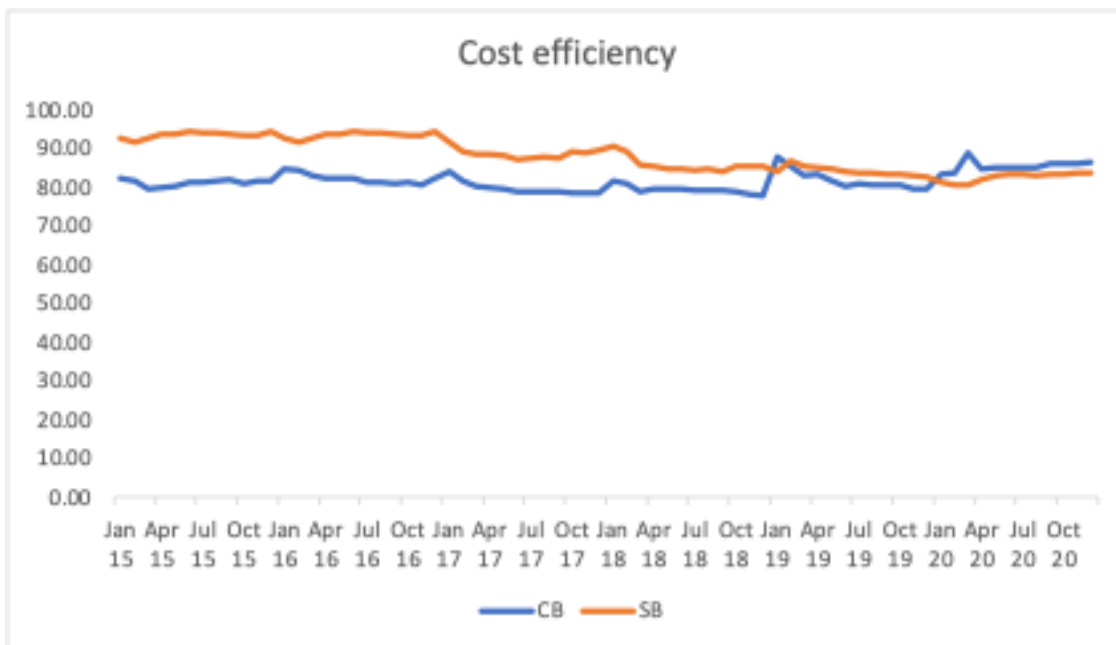
As a country with a majority Muslim population, the community's need to have a banking system based on the foundation of Shariah values is a necessity. The 1990s were a milestone in the establishment of Shariah banking based on Shariah principles. With Law Number 7 of 1992, the Indonesian Government permits a bank to provide a profit loss-and-sharing scheme for its operations even though it has not specifically regulated bank operations based on Shariah values. Bank Muamalat Indonesia (BMI) was established in 1992 as the first Shariah bank in Indonesia. The government, through Law Number 10 of 1998, increasingly recognizes the existence of Shariah banking (Widarjono et al., 2020). Article 1 paragraph 3 clearly states that banks can be classified into two types, namely Shariah banks as well as conventional banks.

Since the government enacted the Shariah Banking Law No. 21 of 2008, the Shariah banking industry has been growing fast (Sutrisno & Widarjono, 2022). In 2002, the number of commercial Shariah banks was 8 Shariah banks consisting of 2 Shariah Commercial Banks and 6 Shariah Banking units, while Shariah rural banks were 83. The number of rural Shariah banks was 131. The number of Shariah banks has been relatively stable since 2011. The total number of Shariah commercial banks was 32 in 2022, consisting of 12 Shariah commercial banks and 20 Shariah bank subsidiaries, and 167 Shariah rural banks. More importantly, Shariah banking in Indonesia is ranked 10th in the world with total assets of US 39 million.

One important issue related to the performance of Shariah banks is cost efficiency (Ibrahim et al., 2017). As the last player in Shariah banking in Indonesia, in general Shariah banks have not achieved a high level of efficiency. This can be proven by the more expensive products of Shariah banking compared to conventional banks. For example, Murabahah financing as debt-financing products, like conventional banks, are more expensive than interest rates (Widarjono & Rafik, 2023). Likewise, Shariah banks have not been able to provide competitive returns compared to conventional banks (Widarjono et al., 2023).

Cost efficiency is greatly influenced by the market structure and internal conditions of Shariah banks. A competitive market will cause banks to strive for efficiency so they can compete in the market (Saif-Alyousfi et al., 2020; Nyangu et al., 2022). Currently, the Shariah banking market is an imperfectly competitive market, so this condition does not support efficiency. Apart from that, the size of Shariah

banks is still small compared to conventional banks. Indeed, the Bank Syariah Indonesia (BSI), the largest Shariah bank, which is a merger of three Shariah banks, is ranked 7th in Indonesian banking with total assets of IDR 271.29 trillion. However, the average Shariah bank assets are 14 trillion. With a small size, efficiency is very difficult to achieve because economies of scale cannot yet be achieved. Figure 1 shows cost efficiency as measured by the cost-to-income ratio between Shariah banks and conventional banks. The cost efficiency of Shariah banks is generally more expensive than conventional banks, although since 2020, it has been equivalent to conventional banks, even lower.



**Figure 1.** Cost efficiency between Shariah banks (SBs) and conventional banks (CBs)  
Source: The authors

A bunch of empirical studies have examined the efficiency of Shariah banks. Several studies analyze internal factors or bank-specific variables in determining the level of efficiency of Shariah banks. Strong bank fundamentals such as assets and CAR drive the efficiency of Shariah banks in the Gulf Cooperation Council (GCC) countries (Alqahtani et al., 2017) and Bangladesh (Chowdhury et al., 2023). Efficiency is also influenced by Bank Regulation and Supervision in the case of 108 Shariah banks in 26 countries that practice Shariah banking (Mohd Noor et al., 2020). In contrast to previous research, Al Arif et al. (2020) include market structure in influencing the efficiency of Shariah banking in Indonesia. By using the Herfindal-Hirschman Index (HHI) and Concentration Ratio (CR) to measure market competition, their study indicates that low competition reduces the level of efficiency.

This research examines the influence of competition along with some bank-specific variables on the cost efficiency of Indonesian Shariah banks. This research contributes to the Shariah bank literature in several ways. First, to the best of our knowledge, empirical studies that examined the influence of competition on the cost efficiency of Shariah banks in Indonesia are limited. Second, our study employs the Lerner Index to measure competition, while previous studies used HHI or Concentration ratio (Al Arif et al., 2020). The Lerner Index is more powerful in measuring market competition compared to HHI or CR (Lerner, 1934; Koetter et al, 2012). Third, for further analysis, we split between full-fledged Shariah banks and Shariah bank subsidiaries of conventional banks. Even if there are some previous studies investigating cost efficiency, they do not distinguish between full-fledged Shariah banks and Shariah bank subsidiaries.

**LITERATURE REVIEW**

Empirical studies on the effect of competition on bank efficiency, to date, are scarce. The quiet life hypothesis (QLH) proposed by Hicks (1935) is a pioneer in examining the relationship between

competition and efficiency. The theory of quiet life proposes that firm efficiency is related to firm composition. This is associated with the theory of market structure, in which market power can be stratified from perfect competition, oligopoly, monopoly, and monopolistic competition. Utilization of input for an optimized output is associated with the relative market power of the firm. In other words, firms with high market power enjoy quiet life and do not need to operate efficiently without worrying about their performance as well as their competitors (Smirlock, 1985). High market power does not force them to minimize the cost because they are not under any pressure to compete with their competitors. Accordingly, low competition leads to inefficiency, and, by contrast, high competition generates efficiency.

A strand of empirical studies has analyzed the nexus between market competition and efficiency in the case of the conventional and Shariah banking industry. Chan et al. (2015) examined the influence of market structure on bank efficiency in the ASEAN-5 in 1998-2012. Bank concentration is measured by the Concentration Ratio (CR) and market power is measured by the Lerner Index. The results show that market concentration has a negative effect on bank efficiency, while the Lerner index has a positive effect on bank efficiency. The results show that higher concentration lowers bank efficiency because banks in higher concentrated markets are content with managing their resources efficiently. Furthermore, banks with high market power can benefit from economies of scale and, consequently, improve the quality of their services under less pressure.

Tan & Floros (2018) examined the link between competition and efficiency in Chinese banks from 2003–2013 using the adjusted Lerner index to measure competition. Efficiency is measured by technical efficiency, pure technical efficiency, and scale efficiency. The results documented that low competition has increased the level of bank efficiency in China. Adjusted Lerner index has a positive effect on technical and pure technical efficiencies, implying that high competition leads to low technical and pure technical efficiencies. Tight competition induces banks to reduce the credit requirement for disbursing loans and as a result, increases the cost of monitoring and reduces efficiency.

There are several studies on the influence of market structure on Indonesian banking efficiency. Muzaroah et al. (2012) examined the influence of market share on the efficiency of Indonesian conventional banking in the 2005-2009 period. The results show that market share has a positive effect on efficiency, implying that banks with higher market share can exercise their market power in pricing higher products and earn supernormal profits. Al Arif et al. (2020) examined the influence of market structure on the efficiency of Shariah banks in Indonesia from 2011 to 2017 using quarterly data. The results show that a large market share increases efficiency. Meanwhile, market concentration with HHI or CR has no effect on the efficiency of Shariah banks. However, the spin-off policy increases market concentration and subsequently increases the efficiency of Shariah banks.

## RESEARCH METHODS

### Data

This study analyzes the influence of market competition along with bank-specific variables on the cost efficiency of Shariah banks in Indonesia. The number of Shariah banks studied was 34, consisting of 14 Shariah commercial banks and 20 Shariah bank subsidiaries of conventional banks. The latter bank is a Shariah subsidiary of conventional banks. The research period is from 2015 to 2020 using quarterly data. The number of observations was 70 observations with unbalanced panel data.

### Model specification

The regression model to analyze the influence of competition along with some control variables on bank efficiency is the panel data regression, following previous empirical studies (Tan & Floros, 2018; Al Arif et al., 2020). The panel data regression can be expressed as follows:

$$CE_{it} = \theta_0 + \theta_1 \text{Lerner}_{it} + \theta_2 \text{Lasset}_{it} + \theta_3 \text{CAR}_{it} + \theta_4 \text{FIN}_{it} + \theta_5 \text{Incdiv}_{it} + \theta_6 \text{NPF}_{it} + \theta_7 \text{LGDP}_{it} + e_{it} \quad (1)$$

Where CE is cost efficiency, Lerner is measuring competition, and some control variables consist of asset, capital adequacy ratio (CAR), financing (FIN), financing diversification (Div), non-performing financing (NPF), and Gross Domestic Product, which represent a business cycle.

The Covid-19 outbreak has caused Indonesia's economic growth to decline since the second quarter of 2020 and has subsequently had an impact on the performance of Shariah banks in Indonesia. To analyze the impact of Covid, the panel regression equation can be written as follows:

$$CE_{it} = \theta_0 + \theta_1 Lerner_{it} + \theta_2 Lasset_{it} + \theta_3 CAR_{it} + \theta_4 FIN_{it} + \theta_5 Incdiv_{it} + \theta_6 NPF_{it} + \theta_7 LGDP_{it} + \theta_8 Covid_{it} + e_{it} \tag{2}$$

Cost efficiency is measured by the ratio of cost to income per unit (Trinugroho et al., 2018; Widarjono et al., 2023). Shariah banks with a lower cost-to-income ratio represent cost efficiency due to lower cost to get per unit income, and Shariah banks with a higher ratio indicate cost inefficiency because of higher cost to generate per unit income.

Market competition is measured by the Lerner Index (Lerner, 1934). Lerner index is the markup of the price over marginal cost as

$$Lerner = [(Price - Marginal\ cost) / Price] \tag{3}$$

The price of Shariah bank products is measured by total income over total assets (Risfandy et al., 2020; Widarjono et al., 2022). To derive marginal cost, the trans-log cost function with two inputs is utilized (Fu et al., 2014; Risfandy et al., 2020). The trans-log cost function is written as

$$TC_{it} = \delta_0 + \sum_{k=1}^2 \delta_k \ln W_{k,it} + 0.5 \sum_{k=1}^2 \sum_{l=1}^2 \beta_{kl} \ln W_{k,it} \ln W_{l,it} + \theta_1 \ln TA_{it} + 0.5 \theta_2 [(\ln TA_{it})^2 + \sum_{k=1}^2 \theta_{2k} \ln W_{k,it}] \ln W_{k,it} + \epsilon_{it} \tag{4}$$

The total cost (TC) encompasses profit-loss sharing expenses and other expenses. TA denotes the total assets. W1 is the costs of profit-sharing financing divided by total deposits, and W2 is the other operating costs divided by fixed assets. Ln denotes the natural logarithm. The marginal cost (MC) is the first derivative of TC with respect to the total asset in equation (4) and is measured as follows.

$$MC_{it} = (\theta_1 + \theta_2 \ln TA_{it} + \sum_{k=1}^2 \theta_{2k} \ln W_{k,it}) \cdot TC_{it} / TA_{it} \tag{5}$$

Bank size is measured by the natural logarithm of assets (Lasset). Capital adequacy ratio (CAR) is Equity divided by assets weighted risk (Sutrisno & Widarjono, 2022). Financing (FIN) is the ratio of total financing to total assets (Risfandy et al., 2017). Income diversification is measured by income from non-financing activities. Income diversification (Incdiv) is measured as (Laeven & Levine, 2007; Čihák & Hesse, 2010)

$$Incdiv = [1 - ((FIN - NFIN) / TFIN)] \tag{6}$$

Where FIN is income from financing, NFIN is income from non-financing activities.

Non-performing financing (NPF) is the ratio of financing default to total financing (Widarjono et al., 2020). LGDP is the natural logarithm of GDP at constant price 2010. Covid is Covid-19 outbreak started in the second quarter of 2020.

**RESULTS AND DISCUSSION**

Table 1 displays descriptive statistics for the variables studied. The cost efficiency of Shariah banks, as measured by the average cost-to-income ratio, was 85.38%. The cost efficiency is less than the threshold of 94% required by OJK, implying that the Shariah bank industry is a sound bank. The average lender index that measures competition is 0.2761, meaning that banks set their prices above their costs by

27.61%. Average assets were 13.77 trillion with a standard deviation of 20.22, meaning that there are large variations between Shariah banks. CAR, on average, was 21.34%, which is above the threshold of 12%. Financing risk, which is measured by non-performing financing (NPF), on average, was 3.91%, below the threshold of 5%.

**Table 1.** Descriptive statistics

Variable	Mean	Std. dev.	Min	Max
CE	0.8538	0.1521	0.1684	2.1740
Lerner	0.2761	0.6406	-2.0828	2.3984
Asset	13.7719	20.2162	0.3516	126.9000
CAR	0.2134	0.0662	0.1016	0.8865
FIN	0.7528	0.1702	0.2711	1.2572
Incdiv.	0.2522	0.3106	-7.1018	0.5000
NPF	0.0391	0.0422	0.0001	0.4399
GDP	2552.2210	167.5542	2158.0400	2818.8130
Covid	0.1410	0.3483	0.0000	1.0000

Source: Data processed

Table 2 presents the correlation between independent variables to test the possibility of multicollinearity problems. The highest value of the correlation coefficient is 0.4367, namely between cost efficiency and NP. In general, the correlation coefficient value is below 0.5 so it can be concluded that there is no multicollinearity problem, thus producing a robust estimator.

**Table 2.** Correlation matrix

	CE	Lerner	Lasset	CAR	FIN	Incdiv	NPF	LGDP
CE	1							
Lerner	0.0486	1						
Lasset	0.2501	0.0894	1					
CAR	-0.2078	0.0512	-0.2133	1				
FIN	0.2756	-0.0689	0.2788	-0.0909	1			
Incdiv	0.0575	0.0435	0.0864	-0.0522	0.0448	1		
NPF	0.4367	0.0158	-0.0514	-0.0591	0.1992	0.1141	1	
LGDP	-0.1480	-0.0526	0.0794	0.1154	-0.1663	-0.0420	-0.1293	1
Covid	-0.0088	-0.0658	0.0808	0.1034	-0.1582	-0.0344	-0.0496	0.2938

Source: Data processed

### Baseline regression

We estimate panel regression as equation (2) utilizing three methods, namely Pooled Least squared (PLS), fixed effect (FE), and random effect (RE). However, our study does not present the PLS method for conveying the space. In addition, we estimate our model without year effect (model 1) and with year effect (Model 2). Table 3 shows findings for all Shariah banks as the baseline regression with model 1 and model 2. According to the F-test, LM-test, and Hausman test, the best model is fixed effect for model 1 and model 2.

Our discussion begins with the main variable of this research, namely market competition as measured by the Lerner Index. The Lerner index is positive and significant for model 1 and model 2. These findings document that banks operating in imperfect markets are not encouraged to operate efficiently due to high market power. However, if a bank operates in a competitive market because of low market power, it encourages banks to improve cost efficiency. This efficiency is needed so that banks can compete in the market according to the quiet life hypothesis theory. This finding supports previous research, such as Chan et al. (2015) in the case of banking in ASEAN and Tan and Floros (2018) in the case of banks in China.

**Table 3.** All Shariah Banks

Variable	Model 1		Model 1	
	FE	RE	FE	RE
Lerner	0.0147** (0.0070)	0.0150** (0.0070)	0.0145** (0.0069)	0.0150** (0.0070)
Lasset	0.0375*** (0.0135)	0.0249*** (0.0094)	0.0448*** (0.0137)	0.0263*** (0.0085)
CAR	-0.8947*** (0.0804)	-0.7730*** (0.0778)	-0.8873*** (0.0795)	-0.7208*** (0.0767)
FIN	0.0855** (0.0355)	0.0942*** (0.0347)	0.0658** (0.0357)	0.0757** (0.0348)
Incdiv	-0.0463*** (0.0112)	-0.0446*** (0.0114)	-0.0461*** (0.0112)	-0.0435*** (0.0115)
NPF	1.4829*** (0.1577)	1.6744*** (0.1446)	1.5348*** (0.1575)	1.7579*** (0.1407)
LGDP	-0.0499 (0.0643)	-0.0302 (0.0594)	0.2432* (0.1271)	0.2608** (0.1310)
Covid	0.0277*** (0.0101)	0.0293*** (0.0102)	0.0296** (0.0170)	0.0301** (0.0176)
Cons.	1.0767 (0.8441)	0.9489 (0.8221)	-3.2946* (1.8381)	-3.3100* (1.9078)
Year effect	No	No	Yes	Yes
No. obs.	702		702	
No. banks	34		34	
R-sq. Within	0.2789		0.3016	
R-sq. overall	-	0.2736	-	0.2960
Diagnostic test				
F-test	28.9***		28.72***	
LM-test	1743.09***		1709.54***	
Hausman-test	36.17***		79.32***	

Source: Data processed

Note: \*, \*\*, and \*\*\* indicate statistically significant at  $\alpha=10\%$ ,  $\alpha=5\%$ , and  $\alpha=1\%$ .

Next, we move on to control variables. Starting with the asset variable, the Asset has a positive and significant sign at  $\alpha=1\%$  for all models, meaning that the larger the asset, the lower the level of operational efficiency. The bigger the assets the bigger the bank. Large banks lead to control management increasingly inefficient so that the level of bank efficiency also decreases (Havidz & Setiawan, 2015); Ibrahim et al., 2017).

The next variable is the capital adequacy ratio (CAR). CAR is negative and significant at  $\alpha=1\%$  for all specifications. These findings suggest that the bank with higher CAR will increase bank efficiency. CAR shows the bank's capital adequacy in running its business. According to Muhammad et al. (2020), high CAR can be used to develop bank technology better in serving their customers so that this technology can increase operational efficiency.

The financing, which is measured by the ratio of financing and total assets, is negative and significant at  $\alpha=5\%$  in all models. The positive sign of this variable indicates that banks with higher financing generate low bank efficiency. If the quality of bank financing is bad because they do not pay attention to the principle of prudence financing, high financing will increase non-performing financing. Accordingly, the costs that must be incurred to manage financing defaults are increasing and reducing the level of bank efficiency (Rahman et al., 2017).

The next variable is income diversification (Incdiv). Incdiv is negative and significant at  $\alpha=1\%$  for all models. These results indicate that income diversification increases bank efficiency. The main source of income for Shariah banks comes from the financing provided. However, Shariah banks will try to diversify their income to enrich their income sources (Le et al., 2022). The bank diversifies income through increasing service products and other products permitted by law. Diversification is intended to spread risk, and a higher level of diversification will reduce financing risk so that it can increase bank efficiency (Zamore et al., (2019).

Financing risk as measured by non-performing financing (NPF) is positive and significant at  $\alpha=1\%$  in all models, meaning that NPF reduces the level of bank efficiency. A bank with a high NPF indicates that the bank is facing high financing defaults. Financing default causes banks to incur extra costs because they must carry out tight monitoring, thereby reducing the level of bank efficiency (Alandejani & Asutay, 2017).

GDP is positive and significant at  $\alpha=1\%$  in the model that includes the year effect (model 2) as not expected. These findings indicate that high economic growth reduces bank efficiency. Currently, Shariah banks have not yet reached the level of economies of scale because their size is small as measured by total assets. Apart from that, Shariah banks also do not have much experience in disbursing their financing, so the costs they have to incur are greater than conventional banks (Widarjono & Rafik, 2023). The existence of diseconomies of scale forces banks to expand their business. As a result, the costs that must be incurred are also high and this further reduces the level of efficiency.

Covid-19 is positive and significant at  $\alpha=1\%$  in model 1 and at  $\alpha=5\%$  in model 2. Our findings imply that Covid-19 has reduced bank efficiency. Covid-19 has caused a decrease in economic activity due to the lockdown policy. The decline in economic activity causes high financing defaults. Impaired financing will increase bank operating costs because banks must incur extra costs to monitor their financing during sluggish economic conditions such as Covid-19 (Alabbad & Schertler, 2022); (El-Chaarani, 2023).

### **Full-pledged shariah banks vs shariah bank subsidiaries**

Sharia banks in Indonesia consist of full-pledged Shariah banks and Sharia bank subsidiaries. Shariah Bank's subsidiaries are conventional banks that open business lines based on Shariah law. The two banks have different management styles in their operations. It is, therefore, interesting to examine cost efficiency between fully-fledged Shariah banks and Shariah bank subsidiaries of conventional banks. Table 4 presents the results of full-fledged Shariah banks. Based on diagnostic tests, the Fixed Effect

method is the appropriate model for model 1 while the Random effect is the applicable method for model 2.

Lerner, as the main variable in this research, has a positive effect on all models. These findings indicate that low competition reduces the level of efficiency while high competition increases efficiency. These findings are in line with the case of all Shariah banks. More importantly, assets have a negative effect on cost efficiency for all models, meaning large assets strengthen the level of bank efficiency. However, these results are different in the case of all sharia banks. Full-fledged Shariah banks are large Shariah banks in the Shariah banking industry in Indonesia. They have achieved economies of scale so that when assets increase, the level of efficiency will increase. CAR increases bank efficiency but NPF reduces bank efficiency. GDP and Covid-19 reduce bank efficiency.

**Table 4.** Full-fledged Shariah banks

	FE	RE	FE	RE
Lerner	0.0466*** (0.0161)	0.0289** (0.0139)	0.0462*** (0.0161)	0.0297** (0.0139)
Lasset	-0.1505*** (0.0440)	-0.0547*** (0.0127)	-0.1433*** (0.0452)	-0.0537*** (0.0138)
CAR	-0.4442*** (0.1482)	-0.5619*** (0.1092)	-0.4197*** (0.1480)	-0.5489*** (0.1114)
FIN	-0.0320 (0.0644)	-0.0682 (0.0578)	-0.0642 (0.0646)	-0.0917 (0.0587)
Incdiv	-0.0434 (0.0629)	0.0422 (0.0563)	-0.0449 (0.0623)	0.0250 (0.0565)
NPF	1.9385*** (0.2188)	2.1416*** (0.1711)	1.9782*** (0.2211)	2.1264*** (0.1767)
LGDP	0.1085 (0.1176)	-0.1049 (0.0920)	0.4749** (0.2232)	0.3878* (0.2211)
Covid	0.0387** (0.0200)	0.0206 (0.0194)	0.0360 (0.0312)	0.0280 (0.0313)
Cons.	1.8266** (1.3792)	3.4363*** (1.3128)	-3.6298 (3.2052)	-3.7642 (3.2257)
Year effect	No	No	Yes	Yes
No. obs.	298		298	
No. banks	14		14	
R-sq. within	0.3368		0.3639	
R-sq. overall		0.5796		0.5969
Diagnostic test				
F-test	5.83***		5.47***	
LM-test	37.30***		38.87***	
Hausman-test	18.54**		12.78	

Source: Data processed



Note: \*, \*\*, and \*\*\* indicate statistically significant at  $\alpha=10\%$ ,  $\alpha=5\%$ , and  $\alpha=1\%$ .

Table 5 presents the results of Shariah bank subsidiaries. According to diagnostic tests, the Random Effect method is the appropriate estimation for model 1 and model 2. Lerner, as the main variable in our study, has a positive effect on bank efficiency for all models, indicating that high competition increases bank efficiency, as is the case for all Shariah banks and full-fledged Shariah banks. However, the coefficient of Lerner for Shariah subsidiary banks is smaller than the coefficient of Lerner for full-fledged Shariah banks. This suggests that the effect of competition bank efficiency is more pronounced in the case of full-fledged Shariah banks than in Shariah bank subsidiaries. Assets have a positive effect on bank efficiency for all models, indicating that large assets will reduce the efficiency of subsidiary banks. CAR and income diversification encourage bank efficiency, but financing, NPF, and Covid reduce bank efficiency.

**Table 5.** Shariah bank subsidiaries

	FE	RE	FE	RE
Lerner	0.0189*** (0.0068)	0.0197*** (0.0066)	0.0183*** (0.0067)	0.0186*** (0.0065)
Lasset	0.0415** (0.0214)	0.0324*** (0.0115)	0.0576** (0.0226)	0.0369*** (0.0116)
CAR	-1.0689*** (0.0865)	-1.0465*** (0.0845)	-1.0552*** (0.0860)	-1.0322*** (0.0842)
FIN	0.0809* (0.0483)	0.0818** (0.0409)	0.0837* (0.0491)	0.0724* (0.0409)
Incdiv	-0.0482*** (0.0092)	-0.0488*** (0.0091)	-0.0466*** (0.0092)	-0.0470*** (0.0091)
NPF	0.3911** (0.2287)	0.3029* (0.2023)	0.3989* (0.2260)	0.2988* (0.2005)
LGDP	0.0168 (0.0937)	0.0392 (0.0713)	0.1388 (0.1371)	0.1629 (0.1331)
Covid	0.0294*** (0.0107)	0.0312*** (0.0101)	0.0228* (0.0173)	0.0249* (0.0171)
Cons.	0.0802 (1.1453)	-0.1145 (0.9661)	-1.9346 (1.9542)	-1.9750 (1.9373)
Year effect	No	No	Yes	Yes
No. obs.	404		404	
No. banks	21		21	
R-sq. within	0.3559		0.3813	
R-sq. overall		0.3751		0.3853
Diagnostic test				
F-test	14.9***		15.48***	
LM-test	617.77***		646.25***	
Hausman-test	1.90		2.99	

Source: Data processed

## CONCLUSION

This study analyzes the influence of competition and bank-specific variables as control variables on the cost efficiency of Shariah banks. We investigated all Shariah banks, covering 2015-2020, using quarterly data. The results document that high competition will encourage the level of efficiency of Shariah banks. However, the impact of competition on bank efficiency is stronger in the case of full-fledged Shariah banks. In addition, efficiency is largely determined by bank fundamentals. Banks with strong fundamentals can increase efficiency. Assets, CAR, and financing diversification will increase efficiency. Meanwhile, NPF will reduce the level of efficiency.

There are several important implications in this research. First, competition will increase bank efficiency. Increasing competition can be done by increasing Shariah bank assets. For this reason, the spin-off policy of Shariah subsidiary banks to full-fledged Shariah banks must be carried out immediately. Second, Shariah banks must reduce non-performing financing by strict monitoring, starting from customer selection to financing monitoring, so that bank efficiency can be increased.

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