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ISLAMIC BANKS' MARKET POWER, STATE-OWNED BANKS, AND RAMADAN: EVIDENCE FROM INDONESIA

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We use a monthly dataset to analyze whether Islamic banks have greater market power compared with their conventional counterparts. Using a sample of Indonesian banks, we find that Islamic banks possess greater market power than conventional banks. This condition does not hold, however, when we compare state-owned Islamic and conventional banks. We also find some specific determinants of Islamic banks' market power: the Ramadan holy month (positive impact), the proportion of profit-and-loss sharing in their financing (negative impact), and the presence of a Sharia board (positive impact). Interestingly, Ramadan benefits not only Islamic banks but also conventional banks. Our findings support prior literature emphasizing the role of religiosity in Islamic banks' behavior.

Keywords: Lerner index; Islamic banks; ownership; religiosity; Ramadan; Indonesia.

JEL Classification: D40, G21, G32, Z12

1. Introduction

A bank operating based on Islamic law is widely known as an Islamic bank. Islamic banks are not allowed to charge interest when lending to their clients. Alternatively, Islamic law allows them to make a profit by using various Islamic contracts. *Mudaraba* (profit-sharing) and *musharaka* (partnership) contracts are considered the backbone of Islamic banking operations because they are based on profit-and-loss sharing (PLS) principles. The most popular instrument is the *murabaha* (cost-plus or markup) contract, because it is the most feasible Islamic bank contract in the business world today. A *murabaha* contract provides unique protection for the credit risk faced by Islamic banks because they are *collateral-by-contract* (Shaban *et al.*, 2014).

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Islamic banks show remarkable asset growth of about 15% per year (The Economist, 2014). A recent report from Ernst and Young (2016) demonstrates that around USD 920 billion, or 93% of the world's Islamic banking assets, are in nine Muslim countries: Bahrain, Indonesia, Kuwait, Malaysia, Pakistan, Qatar, Saudi Arabia, Turkey, United Arab Emirates. In these countries, Islamic banks operate alongside conventional banks in a dual banking system. This condition raises the issue of competition between the two bank types. Given that conventional banks existed in the market before Islamic banks, the latter might face difficulties in obtaining customers, lending to businesses, or expanding market share. These challenges might induce Islamic banks to set lower prices to attract more clients, resulting in low market power. A study by Weill (2011) reports evidence that Islamic banks cannot possess greater market power than their conventional peers because Islamic banks attempt to avoid moral hazard problems. Islamic banks set lower loan rates than conventional banks to allow their clients easier loan repayment.

We note, however, that Islamic banks principally target Muslims or devout Muslims who do not want to participate in conventional banking activities for religious reasons (Demirgüç-Kunt *et al.*, 2013). Because they operate in predominantly Muslim countries, Islamic banks might have a better position in the market and might find it easier to acquire Muslim clients compared with conventional banks. Islamic banks thereby could possibly set higher prices for their customers because of this condition. Some studies highlight that Islamic banks express a higher degree of market power than conventional banks (Turk-Ariss, 2010; Hamza and Katchouli, 2014; Cupian and Abduh, 2017). The presence of Islamic banks could also increase competition in the dual banking markets. In this way, even conventional banks' pricing behavior will be affected by Islamic banks' market power. Meslier *et al.* (2017) find that conventional banks set higher deposit rates than Islamic banks, and they set rates even higher when their market power is lower. Conventional banks do so to attract customers in response to heightened competitive pressure in dual markets resulting from the presence of Islamic banks.

Market power is defined as the difference between banks' price of product and marginal cost, divided by price. Our first aim in this study is thus to examine whether, in a Muslim-dominated country such as Indonesia, Islamic banks enjoy greater market power. The era of Islamic banks in Indonesia began in 1992, when Bank Muamalat Indonesia first started operating in the Indonesian banking market. This first full-fledged Islamic bank was founded by the Indonesian Ulema Council, Indonesia's top Muslim clerical body. The legal basis for the operation of Islamic banks at that time was not strong because it was based only on the part of the Act of the Republic of Indonesia Number 7 of 1992. The new regulation to promote Islamic banking was introduced in 1998 through the Act of the Republic of Indonesia Number 10 of 1998. After this regulation was issued, many conventional banks, including state-owned banks, started to open Islamic windows. Some of the Islamic windows then become full-fledged Islamic banks after several years of operating as Islamic windows. As of the end of 2015, Indonesia had 12 full-fledged Islamic banks and 22 Islamic window banks, with more than 2,500 offices and branches dispersed in almost 34 provinces. To promote Islamic banks' share and soundness, the central bank of Indonesia has formulated many programs jointly with the Indonesian Financial Services

Authority. These promotions have resulted in more than 30% annual growth of Islamic banks in the last 10 years, double that of their conventional bank peers.[1]

The Indonesian banking industry is concentrated in government-owned banks. These banks' immense government support could lead to a high market concentration (Cho, 1990). According to data from the central bank of Indonesia, in 2015, total assets of four state-owned banks in Indonesia constituted 40% of the country's total banking industry. Three of the state-owned banks were in the "Big Four" according to their total assets, and one of them was Indonesia's biggest bank with total assets around USD 70 billion. Indonesian government banks operate in both big and small cities. One of them even has a branch in each sub-district to serve citizens with relatively low income. This condition raises our interest in examining whether government-owned conventional banks could have greater market power compared with Islamic banks.

We address the issue of Islamic banks' market power and ownership structure using detailed monthly accounting data from 67 Islamic and conventional banks from 2009 through 2014, yielding more than 3800 observations. We find that Islamic banks have greater market power than their conventional counterparts. This finding suggests that Islamic banks are able to exploit religious customers in the Indonesian banking markets. They can charge a higher price (relative to their marginal cost) than conventional banks. Our result supports the role of religiosity for Islamic banking development, as highlighted in other studies (Baele *et al.*, 2014; Aysan *et al.*, 2017).

The issue of religiosity we discuss in this article is strengthened by the significant impact of Ramadan month on Islamic banks' market power. During Ramadan, Islamic banks' market power increases significantly. Islamic banks offer a variety of products during Ramadan that could attract customers to follow Sharia more closely. Islamic banks most likely are able to set a higher price for banking services during Ramadan because their customers (Muslims) tend to be more religious during this holy month. Interestingly, Ramadan month benefits not only Islamic banks but also conventional banks. Because they too are in a Muslim environment, conventional banks also attract clients by offering some special products (promotions) for Ramadan.

In this study, we also find that Indonesian banks' ownership structure matters for their market power. The state-owned Islamic banks do not have significantly better market power than state-owned conventional banks, suggesting the overall superiority of state-owned conventional banks who possess nearly half of the market share in Indonesia's banking industry. Even though Islamic banks enjoy greater market power relative to the overall banking market in Indonesia, they have not surpassed state-owned conventional banks. This evidence supports prior literature reporting banks' benefiting from government ownership (e.g., Iannotta *et al.*, 2013) because they obtain more protection than non-state-owned banks. A study by Nys *et al.* (2015) reveals that the political connections of most government-owned banks enable them to collect more deposits at a higher price compared with privately owned banks, resulting in greater market power.

[1] Despite this growth, however, after more than 20 years since the first Islamic bank was founded, market share of Islamic banks in Indonesia constitutes only 5% of the overall banking industry.

In this work, we also conduct further investigation into some specific determinants of Islamic banks' market power that cannot be examined in a conventional banking context. We find that Islamic banks' market power, besides being influenced by the same fundamental conditions as conventional banks, also is affected by the Islamic holy month (Ramadan), the existence of Sharia boards, and the PLS contract used in Islamic lending. Islamic banks' market power tends to increase during Ramadan month, implying that these banks can set higher pricing for their clients at this time than in other months. The presence of Sharia boards also has a positive impact on Islamic banks' market power. Their existence could increase customer trust in Islamic banks, allowing customers to accept higher pricing in order to obtain banking services that follow their religious beliefs. Finally, we find that Islamic banks that offer a considerable degree of PLS lending have lower market power. This condition could be because Islamic banks try to decrease loan default probability by increasing monitoring costs, which reduces their loan margins.

Our work contributes to the literature in several respects. First, to the best of our knowledge, this study is the first to examine Islamic banks' market power based on monthly datasets. Our dataset enables us to examine the movement of Islamic and conventional banks' Lerner index on a monthly basis. The recent literature on Islamic banks' market power uses yearly data (see, e.g., Kabir and Worthington, 2017; Meslier *et al.*, 2017) and thus cannot explore the effects of a month-long event such as the Ramadan holy month. Secondly, we address the importance of the role of ownership structure in a bank's market power, especially that of state-owned banks. Although many other studies in banking literature focus on the area of ownership structure, the study using the Islamic banks sample is insufficient. Thirdly, in this study, we also further investigate the specific determinants of Islamic banks' market power, which has not been highlighted in prior studies. Prior literature investigates Islamic banks' market power by comparing Islamic and conventional banks (e.g., Turk-Ariss, 2010; Weill, 2011) using exactly similar determinants of market power. They do not consider the principal differences between Islamic and conventional banks, such as the existence of Sharia boards.

Our paper proceeds as follows. Section 2 describes the methodology. Section 3 reports the empirical results. Section 4 concludes.

2. Methodology

2.1. *Data*

We use a month-level dataset of Indonesian banks extracted from the website of Bank Indonesia. The data reflect state-owned banks, privately owned banks, and Islamic banks. We do not differentiate between full-fledged Islamic banks and Islamic-window banks because both have similar characteristics regarding ownership. For instance, similar to Islamic-window banks, most full-fledged Islamic banks are owned 99.9% by their parent (conventional) banks. For these banks, their name is similar to their parent bank except for adding the word "Sharia." Our final dataset covers 67 Islamic and conventional banks from 2009 through 2014. It has 3844 observations after winsorizing extreme values.

2.2. *Lerner index*

We use the Lerner index to measure banks' market power. The index essentially is the markup of the banking product's price over marginal costs. When a bank can set a high price over its marginal costs, it is considered to have high market power:

$$\text{Lerner}_{it} = \frac{\text{Price}_{it} - \text{Marginal Cost}_{it}}{\text{Price}_{it}}. \tag{1}$$

Price is the ratio of total revenue to total assets, whereas marginal cost is computed using the following equation:

$$\text{Marginal Cost}_{it} = \left(\beta_1 + \beta_2 \ln \text{TA}_{it} + \sum_{j=1}^{2} \beta_{2j} \ln W_{j,it}\right) \frac{\text{TC}_{it}}{\text{TA}_{it}}. \tag{2}$$

The coefficients in Equation (2) are obtained from the two-factor price trans-log cost function as follows:

$$\ln \text{TC}_{it} = \propto_0 + \sum_{j=1}^{2} \alpha_1 \ln W_{j,it} + \frac{1}{2} \sum_{j=1}^{2} \sum_{k=1}^{2} \beta_{jk} \ln W_{j,it} \ln W_{k,it} + \beta_1 \ln \text{TA}_{it}$$
$$+ \frac{1}{2} \beta_2 (\ln \text{TA}_{it})^2 + \sum_{j=1}^{2} \beta_{2j} \ln \text{TA}_{it} \ln W_{j,it} + \varepsilon. \tag{3}$$

TC is the total cost, which is the sum of total interest expense and non-interest expense. TA is the total assets. Our trans-log cost function follows Fu *et al.* (2014) by using a two-factor price: price of purchased fund (W_1) and price of labor and physical capital (W_2). The former is computed by dividing interest expense by total customer deposits, and the latter is the ratio of non-interest expense to fixed assets.

2.3. *Econometric specification and variables explanation*

In order to test whether Islamic banks have higher market power than conventional banks, we develop the following equation:

$$\text{Lerner}_{it} = \alpha_0 + \beta_1 IB_i + \beta_2 \text{LoanTA}_{it} + \beta_3 \text{EqTA}_{it} + \beta_4 \text{OpEff}_{it} + \beta_5 \text{LnTA}_{it} + \varepsilon_{it}, \tag{4}$$

where subscripts i and t refer to bank i and month t, respectively. Lerner_{it} is the Lerner index. IB_i is a dummy variable of Islamic banks equal to 1 for an Islamic bank and 0 otherwise. We introduce several control variables used in the previous literature. We use LoanTA_{it}, a ratio of total banks' loans to total assets, to measure default risk (de Guevara *et al.*, 2005; Weill, 2011). A ratio of equity to total assets (EqTA_{it}) is used to proxy banks' capitalization (Efthyvoulou and Yildirim, 2014; Weill, 2011). Banks' operating efficiency (OpEff_{it}) is proxied by a ratio of non-interest expenses to total revenue. Size is measured by the natural logarithm of total assets (LnTA_{it}).

Prior work often highlights the role of religiosity in Islamic banks (e.g., among others, Abedifar *et al.*, 2013; Baele *et al.*, 2014; Meslier *et al.*, 2017). We then follow Baele *et al.*

(2014), Gavriilidis *et al.* (2016), and Lai and Windawati (2017) by investigating the impact of Muslim holy month Ramadan. We augment Equation (4) as follows:

$$\begin{aligned}\text{Lerner}_{it} = {} & \alpha_0 + \beta_1 IB_i + \beta_2 \text{Ramadan}_t + \beta_3 IB_i * \text{Ramadan}_t + \beta_4 \text{LoanTA}_{it} \\ & + \beta_5 \text{EqTA}_{it} + \beta_5 \text{OpEff}_{it} + \beta_6 \text{LnTA}_{it} + \varepsilon_{it}, \end{aligned} \tag{5}$$

where Ramadan_t is a dummy variable equal to 1 if our time index t is in the holy month of Ramadan. The interaction *IB**Ramadan designates whether Ramadan could strengthen Islamic banks' market power.

We next focus on the market power of different ownership structures. We follow Zhu and Yang's (2016) emphasis on state-owned banks, which have a very high share in Indonesia's banking market. We split our sample into three groups: full sample, state-owned banks, and privately owned banks. A state-owned bank has more than 50% of its stock owned by the Indonesian government. A privately owned bank is majority-owned by the private sector (either institutions or individuals, but not the Indonesian government).

In further analysis, we narrow our focus to the Islamic banks sample in order to investigate some specific determinants of Islamic banks' market power. Even though it has been argued that Islamic banks behave similarly to conventional banks, they could differ in some aspects. For instance, despite many studies reporting that Islamic deposits mimic conventional deposits, Meslier *et al.* (2017) find that their drivers are different. Conventional banks' deposits are affected by their market power, whereas Islamic banks' deposits are not affected by it. Motivated by Meslier *et al.* (2017), we develop our equation as follows:

$$\begin{aligned}\text{Lerner}_{it} = {} & \alpha_0 + \beta_1 \text{PLS}_{it} + \beta_2 \text{SSB}_i + \beta_3 \text{BOD}_i + \beta_4 \text{Ramadan}_t + \beta_5 \text{LoanTA}_{it} \\ & + \beta_6 \text{EqTA}_{it} + \beta_7 \text{OpEff}_{it} + \beta_8 \text{LnTA}_{it} + \varepsilon_{it}, \end{aligned} \tag{6}$$

where PLS is the proportion of PLS financing in Islamic banks. SSB_i and BOD_i are dummy variables equal to 1 if the size of SSB and BOD (number of board members) are above their respective medians. A bigger size of SSB and BOD could be associated with higher governance strength (Abdullah *et al.*, 2015). In our data, the median value of SSB members is three, whereas the median value of BOD members is four.

We first put our attention on PLS financing because it is the core element of Islamic banking (Errico and Farahbaksh, 1998). Islamic banks initially set out to promote PLS as a replacement for interest. Although to date PLS instruments do not show significant development, many Islamic banks in Indonesia still use this mechanism, encouraged by the government. Indonesia is among the countries with the highest percentage of PLS practice in Islamic banks (Abedifar *et al.*, 2013; Shaban *et al.*, 2014). Nevertheless, because of the high probability of moral hazard problem in this instrument, we predict a negative association between PLS and Lerner. When an Islamic bank decides to use PLS, it should decrease the probability of moral hazard by either reducing its profit margin or spending more on monitoring costs. Both alternatives will diminish market power.

In addition to PLS financing, the presence of Sharia boards (SSB) — one of the principal differences between Islamic and conventional banks — might also affect Islamic

banks' market power. For instance, it has been reported that religious Muslims are risk averse (Abedifar *et al.*, 2013). In representing Muslim interests, a Sharia board could suggest for Islamic banks to avoid excessive risk (Mollah and Zaman, 2015). By following a Sharia board's suggestion, Islamic banks might charge a lower rate (margin) for their lending in order to allow a business entity that uses Islamic financing to face fewer difficulties regarding loan repayment. Islamic banks, therefore, will have a low price for loan products and consequently low market power.

Thanks to the month-level data we use, this study also reinvestigates the work of Baele *et al.* (2014), which finds a significant impact from the Muslim holy month Ramadan. In Indonesia, Islamic banks during Ramadan often launch a variety of programs, both for profit and non-profit. For instance, in mid-June 2017, Bank Muamalat Indonesia launched its "Ramadan Aid Package" valued at IDR 6 billion.[2] The funds were distributed to 10,000 low-income families and 10,000 orphans in Indonesia.[3] At the same time, Bank Syariah Mandiri, Indonesia's largest Islamic bank, formulated programs to boost consumer loans, mainly housing loans.[4] The bank also launched a pawn gold program to celebrate Ramadan and *Eid-al-Fitr*, whereby customers can bring in their gold to use as loan collateral.[5] By offering special products during Ramadan, therefore, Islamic banks can set prices for their products higher than the market average, yielding higher market power.

Equations (4) through (6) are estimated using a random-effect generalized least squares (GLS) technique because it gives consistent estimates, especially for time-invariant variables and rarely changing variables (see, e.g., Abedifar *et al.*, 2013; Ashraf *et al.*, 2016; Mollah *et al.*, 2016).

3. Results

3.1. *Descriptive statistics*

Table 1 presents the descriptive statistics of our variables. The Lerner index mean is 0.29, indicating that, on average, banks can charge prices to their clients 29% higher than their marginal costs. The average LoanTA, EqTA, and OpEff are 0.64, 0.15, and 0.38, respectively. PLS has a mean of 0.38. These statistics confirm some studies (e.g., Abedifar *et al.*, 2013; Shaban *et al.*, 2014), highlighting Indonesia as one of the countries with a high PLS practice. Our sample contains only nine Islamic banks, so that the mean of IB is very low.

We also provide a correlation matrix as well as a variance inflation factor (VIF) test in Table 2. It shows that our variables do not have a multicollinearity problem.

[2] Approximately USD 0.5 million.
[3] https://ekbis.sindonews.com/read/1213044/178/muamalat-salurkan-rp6-miliar-paket-bantuan-ramadan-1497285479 (page in Bahasa Indonesia).
[4] http://keuangan.kontan.co.id/news/ramadan-bank-syariah-genjot-pembiayaan-konsumer (page in Bahasa Indonesia).
[5] https://bisnis.tempo.co/read/news/2017/05/21/090877248/sambut-ramadan-bank-syariah-mandiri-luncurkan-program-gadai-emas (page in Bahasa Indonesia).

Table 1. Variable Descriptions and Descriptive Statistics

Variable	Description	Obs.	Mean	S.D.	Min	Max
Lerner	Lerner index to proxy market power	3844	0.2998	0.2209	−0.5030	0.7792
LoanTA	Loan to total asset ratio to proxy default risk	3844	0.6424	0.1172	0.3456	0.8007
EqTA	Equity to total asset ratio	3844	0.1591	0.0938	0.0721	0.4645
OpEff	A ratio of total non-interest expense to total income as a measure of operating efficiency	3844	0.3847	0.1118	0.1863	0.6344
LnTA	Natural logarithm of total assets to proxy banks' size	3844	15.7237	1.9897	11.4127	20.4723
PLS	Profit-and-loss sharing ratio, computed as a ratio of PLS loans (*mudaraba* and *musharaka*) to total loans	495	0.3142	0.2040	0.0043	0.8666
IB	Dummy equals 1 if the bank is an Islamic bank and 0 otherwise	3844	0.1337	0.3404	0	1
State-owned	Dummy equals 1 if the bank is state-owned and 0 otherwise	3844	0.1163	0.3206	0	1
State-owned IB	Dummy equals 1 if the bank is a state-owned Islamic bank and 0 if it is a conventional bank (we exclude privately owned Islamic banks)	3521	0.0542	0.2265	0	1
Privately owned IB	Dummy equals 1 if the bank is a privately owned Islamic bank and 0 if it is a conventional bank (we exclude state-owned Islamic banks)	3653	0.0884	0.2839	0	1
Ramadan	Dummy equals 1 during Ramadan and 0 otherwise	3844	0.1694	0.3751	0	1
SSB	Dummy equals 1 if the number of Sharia supervisory boards is 4 (above its median)	514	0.0233	0.1511	0	1
BOD	Dummy equals 1 if members of the board of directors is 5 or more (above its median)	514	0.1848	0.3885	0	1

3.2. *Lerner index comparison: All banks, state-owned banks, and privately owned banks*

Figures 1–3 illustrate how the Lerner index (market power) moves on a monthly basis from 2009 to the end of 2014. These figures compare market power between Islamic and conventional banks. Figure 1 uses the entire sample without any restrictions, whereas Figures 2 and 3 use state-owned banks and privately owned banks, respectively. Figures 1

Table 2. Correlation Matrix for the Full Sample

	Lerner	LoanTA	EqTA	OpEff	LnTA	IB	Ramadan	VIF
Lerner	1							1.33
LoanTA	0.1299	1						1.18
EqTA	−0.0573	−0.3247	1					1.81
OpEff	−0.2333	−0.0473	0.1935	1				1.11
LnTA	0.3573	0.1172	−0.5678	−0.1206	1			1.81
IB	0.1354	0.1369	−0.0099	0.0403	−0.0151	1		1.05
Ramadan	0.0109	0.0335	0.0086	0.0143	0.0028	0.0121	1	1.00

and 3 show that Lerner IB frequently exceeds Lerner CB. These findings suggest that overall, Islamic banks have greater market power than conventional banks. Results are similar for privately owned Islamic banks versus conventional banks. In contrast, when we restrict our sample to state-owned banks, we cannot clearly see the difference, as depicted

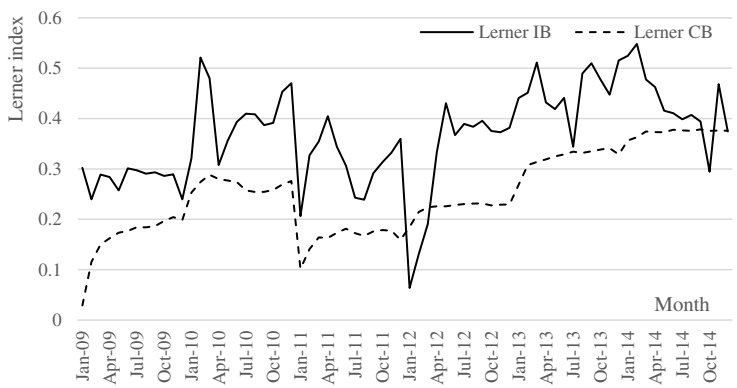

Figure 1. Lerner Index of Islamic and Conventional Banks

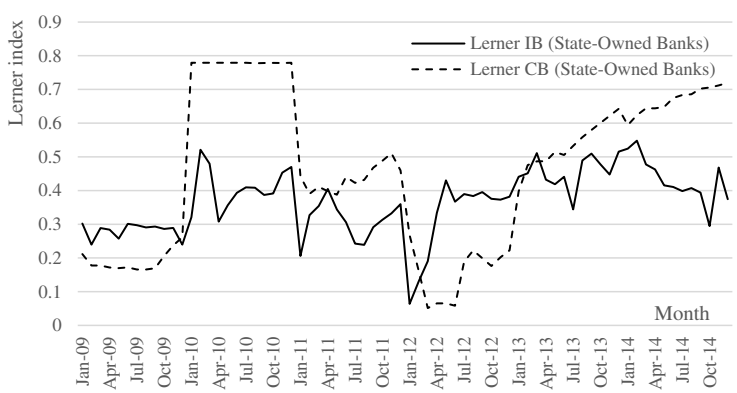

Figure 2. Lerner Index of Islamic and Conventional Banks (State-Owned Banks)

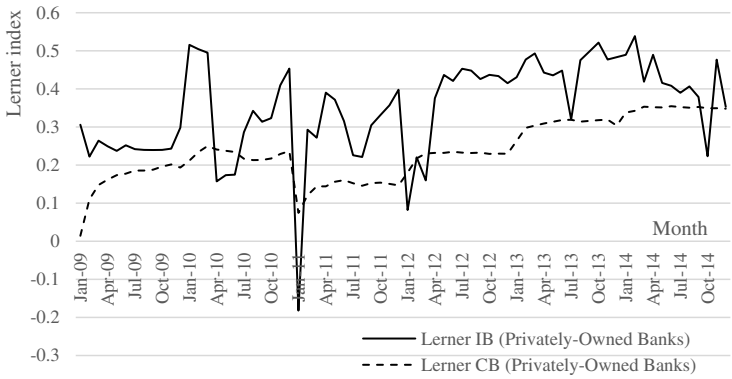

Figure 3. Lerner Index of Islamic and Conventional Banks (Privately Owned Banks)

in Figure 2. Sometimes Islamic banks' market power exceeds that of conventional banks, but other times, conventional banks perform better.

3.3. *Regression analysis*

To confirm what we observe from Figures 1 through 3, we re-run our analysis using Equation (3), with the results displayed in Table 3. After controlling for all bank fundamentals as well as time dummies, we find a significant market power difference (see β_1) between Islamic and conventional banks (columns 1 and 3), except when we examine only state-owned banks. These results are similar to those in Figures 1 through 3. The results suggest that in general, using Indonesia as a sample, Islamic banks have greater market power than conventional banks. In a predominantly Muslim environment, Islamic banks can exploit religious customers by setting higher prices for their banking products. This evidence supports the work of Cupian and Abduh (2017), Hamza and Katchouli (2014), and Turk-Ariss (2010).

Table 4 displays the regression results using Equation (2). After including Ramadan in the analysis, the variable IB remains consistent with our results from Table 3. The Muslim holy month positively influences banks' market power, meaning that during Ramadan, banks can set prices higher than those of conventional banks. Interestingly, even though we do not find that Ramadan particularly increases Islamic banks' market power (β_3), Ramadan is positively associated not only with Islamic banks' market power (γ_2) but also that of their conventional peers (β_2).[6] Ramadan benefits both bank types. Therefore, it is not entirely true that only Islamic banks benefit from Ramadan because, as religion-based institutions, they offer various special products associated with the holy month. Conventional banks also offer promotions during Ramadan. For example, from June 6 to June 17, 2016, Bank Mandiri, Indonesia's largest conventional bank, offered a program called "Ramadhan Hemat dengan Fiestapoin" (Ramadan Save with Fiestapoints).[7] This program

[6] To understand how interaction model works, please see (Brambor, 2005).

[7] http://bankmandiri.co.id/article/promo_hemat_ramadhan.html and http://www.bankmandiri.co.id/promo/promo-ramadhan.pdf (pages in Bahasa Indonesia).

Table 3. Market Power of Islamic and Conventional Banks by Ownership Structure

	(1) All Banks	(2) State-Owned Banks	(3) Privately Owned Banks
IB (β_1)	0.0799***	0.167	0.0826**
	(0.0295)	(0.110)	(0.0401)
LoanTA	0.164**	−0.0141	0.213**
	(0.0834)	(0.135)	(0.0978)
EqTA	0.397**	1.596***	0.357
	(0.195)	(0.552)	(0.208)
OpEff	−0.688***	−0.801***	−0.664***
	(0.150)	(0.190)	(0.170)
LnTA	0.0376***	0.0810**	0.0329***
	(0.00876)	(0.0328)	(0.00979)
Constant	−0.480**	−1.251	−0.442**
	(0.187)	(0.648)	(0.212)
Time dummies	Yes	Yes	Yes
N observations	3844	447	3397
N banks	64	7	57
R^2	0.390	0.730	0.343

Notes: Please see Table 1 for the description of variables. The dependent variable is Lerner index. The equation is estimated using random-effect GLS regression with standard errors (in parentheses) clustered at a bank level. *** and ** denote significance at the 1% and 5% levels, respectively.

offered a discount up to 50% for holders of the Bank Mandiri credit card when they bought products from merchants affiliated with Bank Mandiri. The discount depended on the Fiestapoint (number of points) on the credit card, and this offer was valid only during Ramadan month.

Our result is partially in line with Baele *et al.* (2014). Whereas they find that Islamic banks benefit from Ramadan by having lower loan default rates than conventional banks, we find that both Islamic and conventional banks' pricing power increases during Ramadan. Our argument is that, in the dual banking system in which Islamic and conventional banks compete, the behavior of both types of banks is linked. Studies of Islamic banks *vis-à-vis* conventional banks mostly conclude that Islamic and conventional banks have few differences regarding financial profile and performance. Beck *et al.* (2013) empirically find small differences between the two bank types regarding business models. Doumpos *et al.* (2017) find an insignificant difference in overall financial strength between Islamic and conventional banks. Johnes *et al.* (2014) conclude that Islamic banks have a similar gross efficiency to conventional ones. Bourkhis and Nabi (2013) investigate the impact of financial crisis on both bank types and conclude that no different effect exists between them. There is also a strand of literature suggesting that Islamic banks mimic their conventional peers in terms of deposit rate setting (see, e.g., Chong and Liu, 2009; Ergeç and

Table 4. Market Power, Ownership Structure, and Ramadan

	(1)	(2)	(3)	(4)	(5)	(6)
	All Banks		State-Owned Banks		Privately Owned Banks	
IB (β_1)	0.0799***	0.0824***	0.167	0.164	0.0826**	0.0864**
	(0.0295)	(0.0288)	(0.110)	(0.112)	(0.0401)	(0.0391)
Ramadan (β_2)	0.335***	0.336***	0.420***	0.414***	0.319***	0.321***
	(0.0367)	(0.0369)	(0.0712)	(0.0723)	(0.0387)	(0.0388)
IB*Ramadan (β_3)		−0.0135		0.0166		−0.0196
		(0.0109)		(0.0198)		(0.0162)
LoanTA	0.164**	0.164**	−0.0141	−0.0130	0.213**	0.213**
	(0.0834)	(0.0834)	(0.135)	(0.136)	(0.0978)	(0.0978)
EqTA	0.397**	0.398**	1.596***	1.601***	0.357	0.358
	(0.195)	(0.194)	(0.552)	(0.547)	(0.208)	(0.208)
OpEff	−0.688***	−0.687***	−0.801***	−0.804***	−0.664***	−0.663***
	(0.150)	(0.150)	(0.190)	(0.192)	(0.170)	(0.170)
LnTA	0.0376***	0.0376***	0.0810**	0.0810**	0.0329***	0.0329***
	(0.00876)	(0.00875)	(0.0328)	(0.0329)	(0.00979)	(0.00978)
Constant	−0.480**	−0.480**	−1.251	−1.251	−0.442**	−0.444**
	(0.187)	(0.187)	(0.648)	(0.649)	(0.212)	(0.212)
Wald test						
IB +		0.0688**		0.1808		0.0667
IB*Ramadan (γ_1)		(0.0338)		(0.1016)		(0.0470)
Ramadan +		0.3225***		0.4305***		0.3011***
IB*Ramadan (γ_2)		(0.0371)		(0.0725)		(0.0404)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
N observations	3844	3844	447	447	3397	3397
N banks	64	64	7	7	57	57
R^2	0.390	0.390	0.730	0.731	0.343	0.343

Notes: Please see Table 1 for the description of variables. The dependent variable is Lerner index. The equation is estimated using random-effect GLS regression with standard errors (in parentheses) clustered at a bank level. *** and ** denote significance at the 1% and 5% levels, respectively.

Arslan, 2013; Saraç and Zeren, 2014, among others). In contrast, Meslier *et al.* (2017) report that conventional banks' deposit rates are affected by Islamic banks' market power. All of these studies suggest that in a dual banking system, it is possible for the behavior of one bank to affect another, and vice versa, regardless of whether they are Islamic or conventional banks. This result could be because of the heightened competition in a dual market. Therefore, during Ramadan, either Islamic or conventional banks could set higher pricing for their customers, resulting in greater market power.

3.4. *Further analysis*

We found previously that Islamic banks' market power is greater than that of banks overall (or when we restrict our sample merely to privately owned banks), but this result is

Table 5. Islamic Banks' Market Power by Ownership Structure

	All Banks (1)	All Banks (2)	Islamic Banks (3)
State-owned IB	0.0889***		
	(0.0274)		
Privately owned IB		0.0770	
		(0.0396)	
State-owned			0.0332
			(0.0644)
Ramadan	0.335***	0.328***	0.185**
	(0.0376)	(0.0379)	(0.0830)
LoanTA	0.174	0.183	0.166
	(0.0932)	(0.0994)	(0.143)
EqTA	0.558***	0.387	0.136
	(0.201)	(0.203)	(0.582)
OpEff	−0.588***	−0.619***	−1.057***
	(0.161)	(0.163)	(0.260)
LnTA	0.0424***	0.0393***	0.0257
	(0.00873)	(0.00893)	(0.0319)
Constant	−0.623***	−0.538***	0.0544
	(0.183)	(0.199)	(0.573)
Time dummies	Yes	Yes	Yes
N observations	3521	3653	514
N banks	58	61	9
R^2	0.423	0.382	0.444

Notes: Please see Table 1 for the description of variables. The dependent variable is Lerner index. The equation is estimated using random effect GLS regression with standard errors (in parentheses) clustered at a bank level. *** and ** denote significance at the 1% and 5% levels, respectively.

statistically insignificant for state-owned banks. Next, we investigate the market power of: (1) state-owned Islamic banks versus all banks; (2) privately owned Islamic banks versus all banks; and (3) state-owned Islamic banks versus privately owned Islamic banks. Table 5 shows the results. In column (1), the variable state-owned IB is significant at the 1% level, meaning that state-owned Islamic banks' market power, in general, outperforms that of all conventional banks in the market. Conversely, in column (2), we could conclude that market power of privately owned Islamic banks is no better than that of all conventional banks. Therefore, it seems that state-owned Islamic banks also benefit from having government ownership. In the last column, when we restrict our sample to Islamic banks only, the variable state-owned is insignificant, meaning that state-owned Islamic banks do not outperform privately owned Islamic banks. Islamic banks have high market power as a whole, but their market power seems to be more influenced by their position as religion-based banks rather than benefiting from government ownership status.

As explained earlier, we are also interested in investigating some specific determinants of market power, particularly for Islamic banks. The proportion of PLS lending and SSB will affect Islamic banks' market power. We estimate Equation (7) and present the results in Table 6. In the first column, the variable PLS (β_1) is negative and significant at the 1% level. This result suggests that the use of PLS lending will erode banks' market power, as

Table 6. Specific Determinants of Islamic Banks' Market Power

	Islamic Banks (1)	Islamic Banks (2)	Islamic Banks (3)
PLS (β_1)	−0.364***	−0.361***	−0.387***
	(0.0524)	(0.0527)	(0.0621)
SSB (β_2)	0.147**	0.786***	0.149**
	(0.0576)	(0.243)	(0.0589)
BOD (β_3)	−0.119	−0.119	−0.202**
	(0.0742)	(0.0743)	(0.0899)
PLS*SSB (β_4)		−2.038**	
		(0.853)	
PLS*BOD (β_5)			0.240
			(0.182)
Ramadan	0.160***	0.160***	0.169**
	(0.0615)	(0.0617)	(0.0707)
LoanTA	−0.166	−0.164	−0.176
	(0.124)	(0.122)	(0.127)
EqTA	−0.291	−0.295	−0.236
	(0.378)	(0.381)	(0.380)
OpEff	−1.386***	−1.387***	−1.383***
	(0.159)	(0.158)	(0.155)
LnTA	0.0582	0.0580	0.0626
	(0.0347)	(0.0349)	(0.0341)
Constant	0.154	0.156	0.0862
	(0.626)	(0.628)	(0.626)
Wald test			
PLS + PLS*SSB (γ_1)		−2.399***	
		(0.830)	
PLS + PLS*BOD (γ_2)			−0.1474
			(0.1608)
Time dummies	Yes	Yes	Yes
N observations	495	495	495
N banks	9	9	9
R^2	0.567	0.572	0.569

Notes: Please see Table 1 for the description of variables. The dependent variable is Lerner index. The equation is estimated using random effect GLS regression with standard errors (in parentheses) clustered at a bank level. *** and ** denote significance at the 1% and 5% levels, respectively.

we hypothesize. This could be because of the risk inherent in the contract or the probability of loan default. In the case of a *mudaraba* contract, when a borrower defaults, Islamic banks cannot liquidate collateral. To avoid such a scenario, Islamic banks might tend to give a contract with a relatively low profit margin, even though PLS instruments are very risky. Consequently, Islamic banks cannot have high product prices, which lead to low market power. To avoid the probability of default, Islamic banks could also increase the monitoring mechanism on their lending. However, again, it will increase marginal cost and therefore reduce market power as well. All in all, PLS lending is not beneficial for Islamic banks' market power.

We also observe in the first column that SSB has a positive and significant effect on Islamic banks' market power. Sharia boards' existence in Islamic banks gives such banks a "Sharia guarantee" for their customers. Pious Muslims are expected to choose Islamic banks and never use conventional banks, notwithstanding the fact that they have to pay more for such banking services. For them, it is a cost to obtain the halal product. In other words, religious Muslims choose Islamic banks because Sharia boards are there to monitor and ensure that banking practices follow Sharia. This condition could benefit Islamic banks, which can set prices higher to obtain greater market power.

In the second and third columns, we interact PLS with SSB (Sharia board) and BOD (board of directors), respectively. We find that the negative impact of PLS on banks' market power is strengthened when the number of Sharia boards is high. The presence of Sharia boards might tend to suggest Islamic banks to use PLS contracts because PLS is a core element of Islamic banking (Errico and Farahbaksh, 1998; Mollah *et al.*, 2016). The use of PLS by Islamic banks is considered to help entrepreneurs running (start-up) businesses (Khan, 1995), and many Islamic scholars argue that the use of PLS will assist the advancement of the economy (Aggarwal and Yousef, 2000). In a nutshell, Sharia boards might suggest that Islamic banks use more PLS lending without considering its effect on the bank's performance. In the third column, we find that board of directors' governance does not strengthen or diminish the impact of PLS financing. The variable BOD is also not significant in the first column, suggesting that the governance of a board of directors, in this case, has no significant effect on market power.

4. Conclusion

This study examines the market power of Islamic and conventional banks in a dual banking system. Specifically, we investigate whether in a predominantly Muslim environment such as Indonesia, Islamic banks' market power outperforms that of their conventional bank peers. We are also interested in whether banks' market power is influenced by their ownership (state-owned or private). In general, we find that Islamic banks in Indonesia enjoy greater market power than conventional banks. Islamic banks benefit from Indonesia's religious environment, allowing them to set high product prices that possibly lead to greater market power. When we compare state-owned Islamic and conventional banks, however, the scenario is different. Our results suggest that state-owned Islamic banks'

market power does not significantly exceed that of conventional banks. Because of their large market share, state-owned conventional banks are very superior in the market.

We also find that Ramadan benefits not only Islamic but also conventional banks. Both bank types can increase their market power during Ramadan through offering various programs or promotions to attract customers. We find that Islamic and conventional banks tend to behave similarly in response to heightened competition in a dual banking market. We also observe empirically that determinants of Islamic and conventional banks' behavior can differ. Our findings suggest that Islamic banks' market power is also affected by the PLS ratio and Sharia board governance. The former will erode market power, whereas the latter can increase market power. It might be better for Islamic banks to reduce the use of PLS financing because of the risk inherent in this type of instrument.

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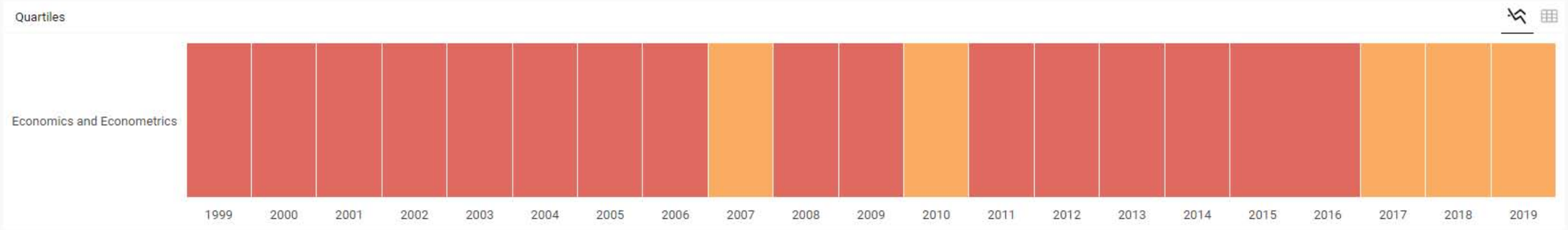
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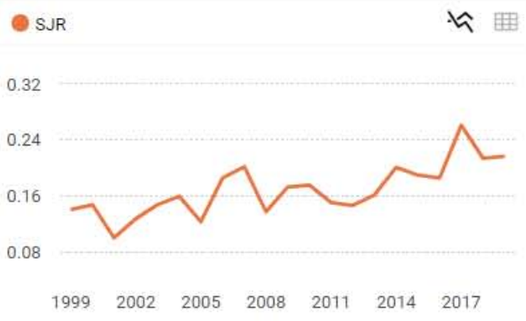

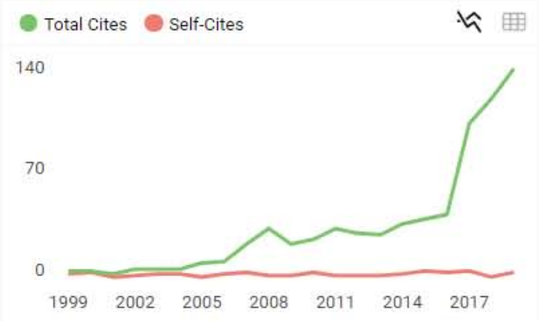

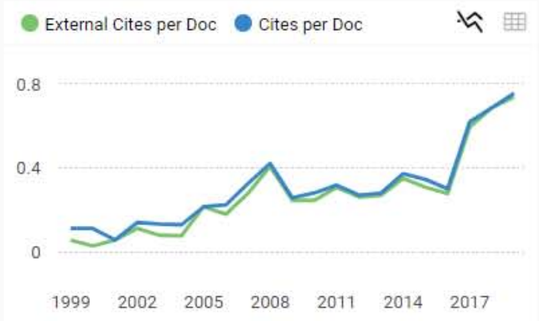

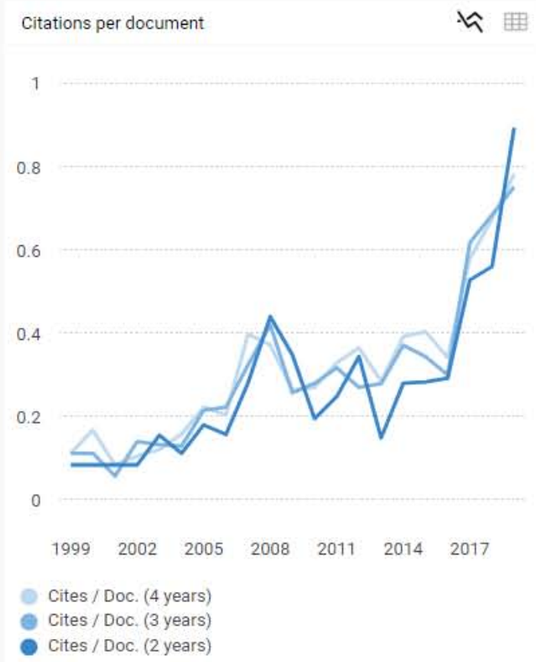

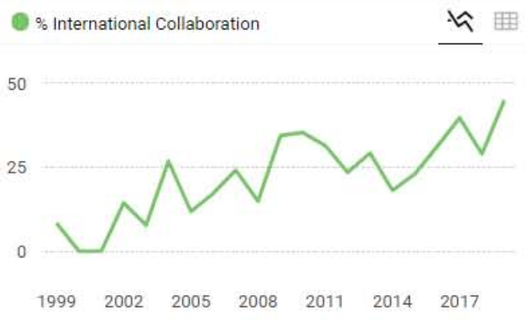

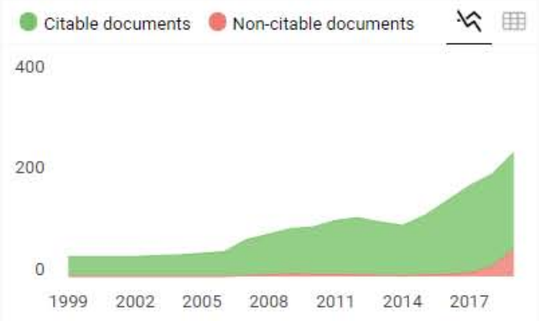

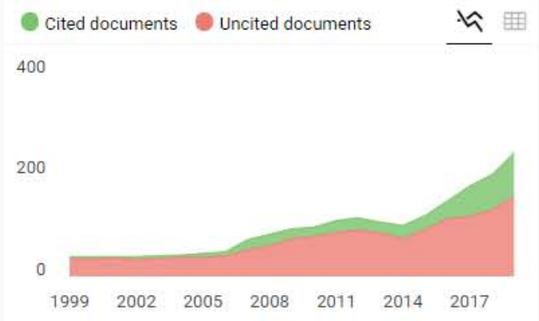

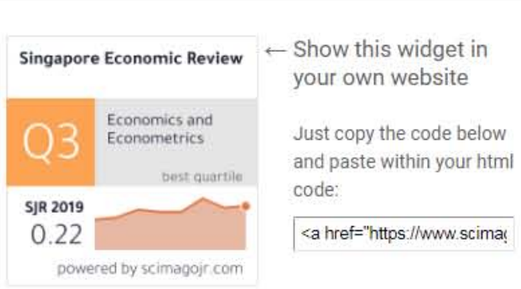

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