

Does Religiosity Matter for Islamic Banks' Performance? Evidence From Indonesia

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ABSTRACT

Islamic banks have grown rapidly across the world for the last two decades. Individuals' religiosity is considered as one of the important determinants of Islamic banks' rapid expansion, even though at some point religiosity could have a detrimental effect on the economy. This paper addresses the impact of regions' religiosity on Islamic banks' profitability and stability. Using a data of 146 Islamic rural banks in Indonesia from 2012q1 to 2015q4, we find that religiosity matters for Islamic banks' performance. We also find in this paper that Islamic banks located in the regions with higher religiosity level have better profitability and stability than those located in the less religious provinces. Additionally, this effect is more pronounced for small Islamic banks and those located outside Java island. This paper also discusses an important policy implication based on the results.

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INTRODUCTION

Islamic finance has grown rapidly across the world for the last two decades. They show remarkable growth in term of their assets at around 20% per year (Hussain, Shahmoradi, & Turk-Ariss, 2016). The pool of Islamic finance assets reached US\$ 1.7 trillion in 2015 with approximately 80% derived from Islamic banks (Islamic Financial Service Board, 2016). Such a rapid development suggests an increasing role of Islamic banks in the process of economic development (Soedarmono, Pramono, & Tarazi, 2017). The development of Islamic banks has assisted macro economic efficiency (Gheeraert & Weill, 2015) and their existence alongside conventional banks in the dual market has also spurred banking sector development (Gheeraert, 2014).

Islamic banks operate their business based on Islamic principles. Islam prohibits Riba (interest), implying that Muslims cannot get financial intermediation from conventional banks who have been presented in the market. Islamic banks, therefore, are viewed as a solution for Muslims who need a formal financial service regarding their business or consumption. Pious Muslims are supposed to be the main target of Islamic banks, as they believe that any activities related to riba are prohibited in Islam. However, after more than 30 years of Islamic banks existence, their share compared to the global financial assets is not more than 3% (Meslier, Risfandy, & Tarazi, 2017). In Islamic countries, Islamic banks indeed have significant share such as in Saudi Arabia (51%) or Kuwait (45%), but in contrast, it also has deficient proportion in the other Muslim countries like Indonesia (3.7%) or Turkey (5.5%) (Ernst and Young, 2016). Many Muslims in fact still uses conventional banks. It is not necessarily that they are not religious . Many aspects could determine the choice of the type of financial institution, e.g. Muslims' education, financial literacy, technological development of banking services, branch location, etc. Religiosity could be only one of the factors.

Nevertheless, regarding the development of Islamic banking and economy, individual piousness might play a major role as suggested by some prior works. Farooq and Zaheer (2015) suggests that Islamic banks are less prone to deposits withdrawal during financial panics. Their religious commitment prevents him from taking their money even in a bad financial situation. Additionally, Farooq and Zaheer (2015) find that Islamic banks are more likely to grant new loan during a financial panics, showing their real contribution to the economy. Baele *et al.* (2014) find that default rate for Islamic loan is less a half than conventional loans and Islamic loans are less likely to default during a Ramadan month (Muslim holy month). Baele *et al.* (2014) concluded that individual piousness might play a role in determining loan default in Islamic banks. Gheeraert (2014) documents that the existence of Islamic banks can accommodate faithful people to have Islamic deposit and this condition can support banking sector development. In a similar vein, this condition can help macro economic efficiency for Muslim countries (Gheeraert & Weill, 2015).

On the contrary, some evidence also reveals the negative impact of religiosity. Demirgüç-Kunt *et al.* (2013), by using sample covers more than 60,000 adults from 64 countries , documents that Muslim are significantly less willing to have an account in the formal financial institution. Respondents argue that religion is one of their barriers for having a deposit account in the bank. Their religion forbids them to put their money in the interest-based financial

institutions. Naceur *et al.* (2015) find that although physical access to financial services has grown rapidly in Muslim-dominated countries, the use of these services has not increased quickly. This empirical evidence might indicate that one's adherence to a religion could become a barrier to financial inclusion in a country.

In addition, we also argue that although Islamic banks could be a solution for pooling the fund from pious Muslims, Islamic banks receive many critics that could prevent them from obtaining the public fund maximally. Islamic banks are expected to give an alternative mode of financial intermediary based on the profit and loss sharing (PLS) principle by using equity contracts both in the deposit and lending. Regarding deposits, because Islamic depositors are "quasi-shareholders", they are not expected to receive interest-like (fixed rate) return (rate) as in conventional banks. A large number of empirical works conclude that Islamic deposits are mimicking conventional deposits (e.g., Cevik and Charap (2011), Chong and Liu (2009), Ito (2013), Saraç and Zeren, (2014)). They use reserves to smooth their return payment to depositors (Farook, Hassan, & Clinch, 2012). In the case of Islamic lending, the concept of PLS suggests the use of *mudaraba* (equity investment) or *musharaka* (partnership) because these equity contracts will help small entrepreneurs to start their business. However, the proportion of equity contracts is very low up to now (Alam & Parinduri, 2016). Most Islamic banks even do not use PLS at all and replace it with markup contracts (e.g., *murabaha* (trading with deferred payment), *ijara* (leasing), or *salam* (forward delivery sale)). Even though markup contracts are Sharia compliant (approved by Islamic law), Islamic banks are not expected to use this contracts too much because it could be a backdoor to interest (Aggarwal & Yousef, 2000).

Based on the explanations mentioned above, the impact of religiosity on the Islamic banks' performance remains inconclusive. This paper will contribute to the debate by examining the association between religiosity, bank profitability, and financial stability. The issue of Islamic banks' performance has not lost its popularity, especially among academician. Mollah *et al.* (2016) investigate the influence of the different governance structure in Islamic banks. They concluded that Islamic banks' governance structure allows them to take higher risks and achieve better performance because of product complexities and transaction mechanism. Mollah and Zaman (2015) on the other hand find a positive contribution of Sharia board that exists only in Islamic banks, although the enforcement and regulatory mechanism are needed for them to be more efficient. As those two papers associate governance and performance, none of them focuses on the role of religiosity. To the best of our knowledge, there is also no paper outside these two that examines religiosity-performance nexus in the Islamic bank's context.

We use the data from a single country Indonesia to deal with the purpose of this study. Our decision to choose Indonesia is not without reasons. Firstly, Indonesia is the biggest Muslim country in the world regarding the number of the Muslim population (Risfandy, Husa, & Asrihapsari, 2016). According to Pew Research Center (2009), Indonesia has approximately 203 million Muslims. Secondly, a survey of Gallup in 2010 shows that Indonesia is one of the most religious Muslim countries in the world. With the score 99 out of 100, Indonesian people pioussness is considered higher than Egypt (97) or Saudi Arabia (93). Thirdly, Indonesia is an archipelago state consisting 34 provinces. This condition enables us to investigate the impact of religiosity between provinces in the mainland (Java) or outside (non-Java).

Using quarterly data from 2012q1 to 2015q4 of a 146 Islamic rural banks sample from 21

provinces in Indonesia, we find that religiosity matters for Islamic banks performance. Islamic banks existing in the region with higher religiosity index show better profitability and stability. The results remain strong after controlling for both bank and region-specific variables. We also observe that big Islamic banks are not affected by regions' religiosity. This might be because a well-established Islamic bank could have better loan portfolio and various source of the fund compared to a small bank, enabling them to be less dependent on the religious clients. We also find that regions' religiosity has a stronger influence on Islamic banks operating outside the main island (Java). The possible reason behind this is that because Java is characterized by more population, better education, and better economic condition. The number of Islamic banks in Java island is also higher than those outside Java, making them have the better efficiency to deal with the pressure of competition.

The contribution of this paper is twofold. First, our paper contributes to the debate of the impact of religiosity in Islamic banks context. Our result supports prior research revealing the positive impact of religiosity. In some case, e.g., when Islamic banks are substantially large and when Islamic banks exist outside the main island, we find that religiosity is no longer significant. Therefore, the impact of religiosity differs between bank size and location. Second, the present paper builds a new measure of religiosity. We created an index from Muslim participation in the Hajj (pilgrimage). Prior literature (e.g., Farook *et al.* (2012) among others) using Muslim population as a religiosity measurement. One might say that a high Muslim population does not necessarily indicate a high level of piousness because conventional banks still become the first choice among Muslims. Islamic banks still have a small share in the most of the Islamic countries. Our measurement is proposed to anticipate this issue.

The rest of the paper is organized as follows. The data, methodology, and descriptive statistics are presented in Section 2. Section 3 provides empirical results. Section 5 concludes.

DATA, METHODOLOGY, AND DESCRIPTIVE STATISTICS

Data

For the purpose of this paper, our main data source is quarterly financial statements of 161 Islamic rural banks located in 31 provinces in Indonesia over the period of 2012q1-2015q4 which are published on the website of Indonesian central bank. Region-level variables are extracted from Indonesian Central Bureau of Statistics (BPS). We winsorize our bank-level data at 1% and 99% levels to eliminate extreme values. Our final sample consists of 1,917 bank-quarter observations.

Methodology

To examine the impact of religiosity on Islamic rural banks' profitability and stability, we construct an equation as follows:

$$Performance_{it} = \alpha + \beta_1 Hajj_j + \gamma Bank\ controls_{it} + \delta Region\ controls_{jt} + \varepsilon_{it} \quad (1)$$

Subscript i, j, t , stand for variability in the bank-level, region-level, and time dimension respectively. Performance is either profitability or stability. To measure banks' profitability, we follow Ghani *et al.* (2016) and Tan (2014) by using ROA (return on assets) and ROE (return on equity). We also follow Mollah and Zaman (2015) by using ROAA and ROEA for robustness check. Regarding banks' stability, we use z-score following some prior work in banks' stability and risk taking (Alraheb & Tarazi, 2017; T. Beck, Demirgüç-Kunt, & Merrouche, 2013; Fu, Lin, & Molyneux, 2014; Soedarmono, Machrouh, & Tarazi, 2011). Z-score is calculated as follows:

$$ZROA_{it} = \frac{ROA_{it} + CAR_{it}}{SDROA_{it}} \quad (2)$$

$$ZROE_{it} = \frac{ROE_{it} + 1}{SDROE_{it}} \quad (3)$$

CAR is capital assets ratio, SDROA is standard deviation of ROA, and SDROE is standard deviation of ROE. For robustness checks, we will also use natural logarithm of z-score ($\ln ZROA$ and $\ln ZROE$) because z-score is right-skewed.

Hajj is an index from 0-4 to measure provinces' level of religiosity. It is created based on four characteristics related to a hajj or pilgrimage: (1) quota of Hajj given by the government to the province, (2) number of years each people in the province should wait before leaving for Hajj, (3) number of people in each province has registered for Hajj, (4) number of people in each province having their hajj departure time postponed (they have to wait again) even though they have fulfilled all of the administration requirements. Each characteristic is converted into dummy variable equal to one if the value is higher than its median and zero otherwise. We consider hajj as a proxy of religiosity because in the five pillars of Islam that must be followed by Muslims, performing pilgrimage is in the fifth (highest) level. A Muslim should spend more than \$ 2,500 to register for Hajj. It is almost similar to the one-year average salary of Indonesian people.

Bank controls is a vector of bank-level control variables. We employ several variables that have been used in previous literature. First, we control for bank solvency by using the capital asset ratio (CAR). Second, the loan to deposit ratio (LDR) is included to measure bank liquidity. The greater value of this ratio suggests that bank allocates more money for lending compared to the money they collect from depositors. The impact of LDR can be in two directions. One may argue that higher loan given means higher money that can be collected which produce more profit for the banks. However, it can be argued also that higher loan compared to its deposits means lower liquidity. Banks with lower liquidity reflect an inability to manage sudden decreases in the loan or an immediate increase in their assets. This may lead to higher risk and thus lower bank performance. Third, we account for bank efficiency by employing the cost to income ratio. Higher bank profitability is associated with better bank profitability and stability. Fifth, we use bank size, measured by the natural logarithm of banks' total assets (LNTA). On the one hand, the large-sized banks are able to produce more profit because they may have many depositors, good management, and good governance. On the contrary, the bigger banks may be faced with complex structure and bureaucracy. This may lead banks to operate less effective, bear high operational costs, and thus reduce profitability. To sum up, we do not

make prior expectation for bank-fundamental controls as they can associate in two directions.

Region controls is a vector of region-level variables. It consists of HHI, GrGDP, and PMPOP. HHI is Herfindahl-Hirschman Index. It is the level of banking concentration in each region. It is calculated by aggregating squared of the market share of each bank. The index values between “0” and “1”, with higher value suggests higher concentration or lower competition. GrGDP is the growth of regions’ GDP (GrGDP). In Indonesia, each region could have significant differences regarding their economic development. According to Indonesian Statistical Bureau, for instance, the regional GDP from the capital city (Jakarta) is Rp 1,149 trillion. It is more than ten times compared to Bali which has GDP Rp 121 trillion. PMPOP is a percentage of Muslim population. Islamic banks indeed established in the Muslim-majority areas. Therefore, the proportion of Muslims compared to non-Muslims in each province might have an impact on profitability since Islamic banks principally aim Muslim clients.

Estimation technique

To estimate equation (1), we use Pooled Ordinary Least Squares (OLS) controlled for bank and time fixed effects. Our approach is similar to Hilary and Hui (2009) who investigate the impact of religion on corporate decision making in the U.S. We also follow Hilary and Hui (2009) by using robust standard errors clustered at the bank-level to correct heteroscedasticity and autocorrelation problems.

Descriptive statistics

Table 1 provides the descriptive statistics of variables. The average ROA is 0.70%, while the mean of ROAE is 4.81%. The average Hajj index is 3.01 out of 4, while the average Muslim population at the provincial level is 94%. The mean of HHI is 0.72. Turn to the bank control variables, the average capital ratio (CAR) is 18.28%, while the average of loan to deposit ratio (LDR) is 128.21%. For the provincial control variables, the mean growth of regions’ GDP is 5.38% while the mean of the Muslim population is 94.08%.

Table 2 shows the list of provinces in our sample as well as the average value of variables used in the present paper. Our sample consists of 21 provinces (from whole 34 provinces) in Indonesia. Islamic rural banks are not always presented in each province especially when the population of Muslim is not substantially high. Some provinces only have one Islamic rural banks. Most of Islamic rural banks carry out their activities at Java island, DI (Daerah Istimewa/ special region) Yogyakarta, DKI (Capital city) Jakarta, Jawa Barat (West Java), Jawa Tengah (Central Java), Jawa Timur (East Java), and Banten). Our sample also shows that most of the provinces have more than 75% Muslim population, except Bali (13%).

Table 3 exhibits the correlation matrix of variables. There is no collinearity issue among explanatory variables as all correlations between them are less than 0.4. The correlation between our Hajj index and the proportion of Muslim population at the provincial level is only 0.16.

Table 1. Descriptive statistics and variables explanation

Variable	Explanation	Obs.	Mean	S.D.	Min	Max
ROA	Return on assets to proxy profitability.	1917	0.0070	0.0276	-0.1043	0.0540
ROE	Return on equity to proxy profitability.	1917	0.0481	0.1692	-0.4385	0.3705
ZROA	Z-score from ROA to proxy stability.	1917	6.4825	4.4768	-1.4286	26.1005
ZROE	Z-score from ROE to proxy stability.	1917	6.1841	0.9986	3.3130	8.0864
ROAA	Return on average assets to proxy profitability.	1620	0.0076	0.0293	-0.1086	0.0558
ROAE	Return on average equity to proxy profitability.	1612	0.0243	0.3068	-1.8518	0.3959
lnZROA	Natural logarithm of ZROA.	1883	1.6913	0.6507	-2.2887	3.2620
lnZROE	Natural logarithm of ZROE.	1917	1.8059	0.1903	1.1979	2.0902
Hajj	An index from 0-4 to measure provinces' level of religiosity, created based on four characteristics related to Hajj: (1) quota of Hajj given by the government to the province, (2) number of years each people in the province should wait before leaving for Hajj, (3) number of people in each province has registered for Hajj, (4) number of people in each province are postponed to do Hajj (they have to wait again) even though they have fulfilled all of the administration requirements. Each characteristic is converted into a dummy variable equal to one if the value is higher than its median and zero otherwise.	1917	3.0136	1.2165	0	4
HHI	Herfindahl-Hirschman Index to measure market concentration.	1917	0.7297	0.2605	0.2379	1.0000
CAR	Capital asset ratio to measure bank solvency.	1917	0.1828	0.1253	0.0624	0.7102
LDR	Loan to deposit ratio to measure bank liquidity.	1917	1.2821	0.5561	0.3144	2.7580
CIR	Cost to income ratio to measure bank efficiency.	1917	0.0424	0.0618	0.0004	0.4082
Size	Natural logarithm of total asset to measure banks' size.	1917	16.7482	1.0476	14.3611	20.2390
GrGDP	Growth of regions' GDP (in percentage)	1917	5.4463	2.1964	-4.0700	34.2200
PMPOP	Percentage of Muslim Population (in decimal)	1917	0.9402	0.0901	0.1337	0.9819

Table 2. Descriptive statistics by region

Province	# Banks	ROA	ZROA	Hajj	HHI	CAR	LDR	CJR	Size	GrGDP	PMPOP
DI Aceh	9	-0.002	7.307	1	0.797	0.216	1.360	0.038	16.089	1.821	0.982
Bali	1	-0.008	12.655	1	1	0.378	1.048	0.339	15.860	6.608	0.134
Bangka Belitung	1	0.021	4.933	1	1	0.123	0.838	0.008	19.716	4.868	0.890
Banten	8	0.012	10.836	4	0.625	0.306	1.383	0.038	16.899	6.061	0.947
Bengkulu	1	0.008	3.589	0	1	0.097	1.195	0.018	17.700	5.760	0.973
DI Yogyakarta	11	0.005	3.874	1	0.402	0.109	0.903	0.030	16.974	5.236	0.919
DKI Jakarta	1	-0.008	2.589	4	1	0.083	2.758	0.084	16.861	6.254	0.854
Jawa Barat	26	0.010	6.630	3	0.700	0.184	1.406	0.042	17.023	5.685	0.970
Jawa Tengah	24	0.007	4.867	4	0.661	0.136	1.125	0.043	16.633	5.304	0.967
Jawa Timur	26	0.007	6.321	4	0.725	0.178	1.414	0.041	16.703	5.970	0.964
Kalimantan Selatan	1	-0.014	5.688	3	1	0.181	0.728	0.025	16.547	5.067	0.967
Kalimantan Tengah	1	-0.029	9.941	1	1	0.320	1.207	0.013	15.886	6.463	0.743
Kepulauan Riau	1	0.001	2.169	0	1	0.062	1.464	0.013	17.616	6.680	0.793
Lampung	8	0.019	9.951	3	0.958	0.272	1.385	0.068	17.087	5.466	0.955
Maluku Utara	1	0.017	16.472	0	1	0.466	1.464	0.017	16.610	5.917	0.743
Nusa Tenggara Barat	3	0.033	8.460	4	0.832	0.215	1.169	0.010	17.300	8.178	0.965
Riau	1	-0.012	4.492	2	1	0.144	1.037	0.034	16.221	2.256	0.880
Sulawesi Selatan	6	0.005	10.325	4	0.663	0.297	1.609	0.063	16.054	7.708	0.896
Sumatera Barat	7	0.006	3.726	1	0.876	0.103	1.217	0.028	16.852	5.867	0.974
Sumatera Selatan	1	0.030	8.353	3	1	0.214	1.233	0.045	16.215	5.400	0.969
Sumatera Utara	8	-0.004	5.104	3	0.688	0.154	1.062	0.048	16.230	5.535	0.661
Total	146										
Region average		0.007	6.483	3.014	0.730	0.183	1.282	0.042	16.748	5.446	0.940

Table 3. Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) ROA	1.00															
(2) ROE	0.88	1.00														
(3) ZROA	0.28	0.13	1.00													
(4) ZROE	0.88	1.00	0.13	1.00												
(5) ROAA	1.00	0.87	0.27	0.87	1.00											
(6) ROAE	0.81	0.91	0.16	0.91	0.81	1.00										
(7) lnZROA	0.43	0.36	0.90	0.36	0.42	0.43	1.00									
(7) lnZROE	0.87	0.99	0.17	0.99	0.87	0.92	0.41	1.00								
(8) Hajj	0.07	0.06	0.06	0.06	0.07	0.07	0.10	0.05	1.00							
(9) HHI	0.08	0.05	0.17	0.05	0.08	0.05	0.17	0.04	-0.13	1.00						
(10) CAR	0.09	-0.05	0.98	-0.05	0.08	0.00	0.84	0.00	0.04	0.16	1.00					
(11) LDR	0.09	0.03	0.32	0.03	0.09	0.06	0.25	0.04	0.08	0.05	0.31	1.00				
(12) CIR	-0.20	-0.19	0.10	-0.19	-0.20	-0.18	0.02	-0.19	0.03	-0.03	0.15	0.07	1.00			
(13) Size	0.25	0.31	-0.25	0.31	0.25	0.24	-0.20	0.28	-0.03	-0.03	-0.31	0.04	-0.11	1.00		
(14) GrGDP	0.12	0.10	0.04	0.10	0.12	0.09	0.05	0.09	0.31	-0.03	0.02	0.05	0.02	0.08	1.00	
(15) PMPOP	0.05	0.07	-0.12	0.07	0.04	0.05	-0.06	0.06	0.16	-0.06	-0.13	0.07	-0.28	0.09	-0.07	1.00

EMPIRICAL RESULTS

Baseline regressions

Table 4 provides the baseline regression to examine the effect of religiosity on Islamic banks' profitability and stability. As we can see, we introduced several bank-level and country-level control variables. We also consider bank and time fixed effects to allow for bank and time heterogeneity. After controlling for all possible determinants of bank performance, it is clearly shown from the Table 4 that the coefficients of Hajj index as the proxy of religiosity is positively associated with profitability and stability. The coefficients remain significant at 1% and 5% levels across different measures of performance (ROA, ROE, ZROA, ZROE). The baseline results suggest that in the province with a high level of religiosity, Islamic banks are more likely to have better performance. Religious clients might have a strong commitment to choose Islamic banks and to keep stay with Islamic banks according to their religious beliefs. This result supports Baele *et al.* (2014) who find that Islamic loan is less likely to be default compared to conventional loans. Our results also confirm other works (Farooq & Zaheer, 2015; Gheeraert, 2014; Gheeraert & Weill, 2015).

Religiosity and Islamic banks' size

Cihak and Hesse (2010) suggests that Islamic banks' size is considered to be a major determinant of Islamic banks performance. They find that small Islamic banks are stronger than large Islamic banks. To investigate whether size also matters for the impact of religiosity, we go deeper by splitting our sample into the large and small banks. As shown in Table 5, the effect of Hajj index on Islamic banks' profitability is more pronounced for small banks. The coefficients of Hajj are positive and significant for small banks. We do not find any significant impact of Hajj for large banks subsample. A plausible explanation behind this is that large banks have better loan portfolio and funding source compared to small banks. They are able to diversify their income in order to have better profitability and stability. This condition could enable large Islamic banks to have less attention to the religious clients. On the other hand, small Islamic banks will focus on the religious customer in order to expand their business. They need customers who less affected by the price of financial intermediation. This type of client might be found from the religious clients because they are less concerned with the price and their decision to choose Islamic banks is pure because of their beliefs.

Table 4. Regions' religiosity and Islamic banks' profitability and stability

	(1)	(2)	(3)	(4)
	ROA	ROE	ZROA	ZROE
Hajj	0.00134*** (0.000436)	0.00730** (0.00301)	0.0458*** (0.0149)	0.0431** (0.0178)
CAR	0.0452*** (0.00656)	0.148*** (0.0335)	35.70*** (0.224)	0.875*** (0.198)
LDR	0.00208*	0.000921	0.0709*	0.00544

Table 4 . (Cont.)

	(0.00109)	(0.00685)	(0.0372)	(0.0404)
CIR	-0.101***	-0.475***	-3.444***	-2.805***
	(0.0157)	(0.0772)	(0.535)	(0.456)
Size	0.00766***	0.0526***	0.262***	0.310***
	(0.000584)	(0.00348)	(0.0200)	(0.0205)
HHI	0.00611**	0.0334**	0.209**	0.197**
	(0.00241)	(0.0146)	(0.0825)	(0.0861)
GrGDP	0.000649**	0.00359**	0.0222**	0.0212**
	(0.000252)	(0.00142)	(0.00862)	(0.00837)
PMPOP	0.00278	0.0397	0.0951	0.234
	(0.00971)	(0.0519)	(0.332)	(0.306)
Constant	-0.142***	-0.944***	-4.862***	0.328
	(0.0142)	(0.0789)	(0.485)	(0.466)
Bank and Time FE	Yes	Yes	Yes	Yes
N	1917	1917	1917	1917

Notes: See Table 1 for the definition of variables. Robust standard errors are in parentheses. *, **, and *** denote significance in 10%, 5%, and 1% levels respectively

Religiosity and Islamic banks' location

We also look at the difference between Islamic banks located in Java island and those outside Java island. Java is considered as the center of the Indonesian economy and the most developed island (Trinugroho, Agusman, Ariefiento, Darsono, & Tarazi, 2015). For that reason, splitting the sample based on the economic concentration are interesting, particularly when we want to see the impact of religiosity.

The results are displayed in Table 6. It shows that the effect of religiosity on Islamic rural banks' profitability is not significant for banks located in Java. There is two possible explanation. First, Java island is the center of economic activity. Java has more population than outside Java, and they have better education and economic development. The number of Islamic banks mushrooms in Java because of these conditions. Many people need financial assistance to run their business. Consequently, Islamic banks in Java could have the better efficiency to deal with the pressure from market competition, since they have to compete each other to get clients. Islamic banks in Java, therefore, will be less concerned to the religiosity of their customers. Secondly, A Muslim will be faced by a trade-off between their religious commitment and rational preference when they want to make a financial decision (Aysan, Disli, Duygun, & Ozturk, 2017). This condition will also be applied when they want to choose the type of financial intermediation. Our results suggest that Muslims tend to swing from religious commitment to rational preference particularly in the area with a high economic activity such as in Java. They might be religious, but the impact of environment is also powerful.

Table 5. The impact of religiosity on profitability and stability in the large and small banks

	Large Banks				Small banks			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ROA	ROE	ZROA	ZROE	ROA	ROE	ZROA	ZROE
Hajj	0.000344 (0.000368)	0.00248 (0.00340)	0.0118 (0.0126)	0.0146 (0.0201)	0.00227** (0.000972)	0.0163*** (0.00614)	0.0776** (0.0332)	0.0963*** (0.0362)
CAR	0.0572*** (0.00558)	-0.00481 (0.0413)	36.11*** (0.191)	-0.0284 (0.244)	0.0475*** (0.00946)	0.248*** (0.0450)	35.77*** (0.323)	1.461*** (0.265)
LDR	-0.000842 (0.000938)	-0.00649 (0.00839)	-0.0287 (0.0320)	-0.0383 (0.0495)	0.00581*** (0.00187)	0.0278** (0.0108)	0.198*** (0.0637)	0.164** (0.0639)
CIR	-0.0765*** (0.0193)	-0.704*** (0.163)	-2.613*** (0.661)	-4.153*** (0.961)	-0.111*** (0.0202)	-0.425*** (0.0840)	-3.800*** (0.689)	-2.510*** (0.496)
Size	0.00190*** (0.000508)	0.0176*** (0.00396)	0.0650*** (0.0173)	0.104*** (0.0234)	0.0115*** (0.00220)	0.0628*** (0.0110)	0.394*** (0.0750)	0.370*** (0.0648)
HHI	0.00153 (0.00219)	0.0141 (0.0164)	0.0521 (0.0747)	0.0833 (0.0966)	0.0145*** (0.00438)	0.0645*** (0.0238)	0.497*** (0.149)	0.381*** (0.140)
GrGDP	0.000409** (0.000202)	0.00109 (0.00126)	0.0140** (0.00691)	0.00646 (0.00742)	0.00109 (0.000672)	0.00593 (0.00384)	0.0371 (0.0229)	0.0350 (0.0227)
PMPOP	0.0704*** (0.0119)	0.510*** (0.0927)	2.405*** (0.407)	3.006*** (0.547)	-0.0122 (0.0115)	-0.0371 (0.0589)	-0.416 (0.394)	-0.219 (0.348)
Constant	-0.102*** (0.0145)	-0.724*** (0.113)	-3.495*** (0.496)	1.626** (0.665)	-0.202*** (0.0383)	-1.135*** (0.194)	-6.910*** (1.309)	-0.799 (1.143)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	955	955	955	955	962	962	962	962

Notes: See Table 1 for the definition of variables. Robust standard errors are in parentheses. *, **, and *** denote significance in 10%, 5%, and 1% levels respectively.

Table 6. The impact of religiosity on profitability and stability in Java and non-Java island

	Java				Outside Java			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ROA	ROE	ZROA	ZROE	ROA	ROE	ZROA	ZROE
Hajj	0.000947 (0.000794)	-0.00148 (0.00546)	0.0324 (0.0271)	-0.00871 (0.0322)	0.00399*** (0.000884)	0.0148*** (0.00496)	0.136*** (0.0302)	0.0872*** (0.0293)
CAR	0.0325*** (0.00711)	0.0832** (0.0381)	35.26*** (0.243)	0.491** (0.225)	0.0510*** (0.0124)	0.215*** (0.0601)	35.90*** (0.424)	1.267*** (0.355)
LDR	0.00151 (0.00108)	-0.00239 (0.00805)	0.0514 (0.0368)	-0.0141 (0.0475)	0.00838*** (0.00272)	0.0410*** (0.0138)	0.286*** (0.0930)	0.242*** (0.0814)
CIR	-0.108*** (0.0167)	-0.546*** (0.100)	-3.679*** (0.571)	-3.224*** (0.590)	-0.111*** (0.0307)	-0.386*** (0.125)	-3.777*** (1.048)	-2.280*** (0.738)
Size	0.00787*** (0.000660)	0.0502*** (0.00404)	0.269*** (0.0225)	0.296*** (0.0238)	0.00697*** (0.00121)	0.0582*** (0.00680)	0.238*** (0.0413)	0.343*** (0.0401)
HHI	-0.00133 (0.00304)	0.0179 (0.0192)	-0.0456 (0.104)	0.106 (0.113)	0.0323*** (0.00603)	0.161*** (0.0323)	1.102*** (0.206)	0.947*** (0.190)

Table 6. (Cont.)

GrGDP	0.000666 (0.000803)	-0.00165 (0.00573)	0.0227 (0.0274)	-0.00976 (0.0338)	0.000336 (0.000255)	0.00187 (0.00146)	0.0115 (0.00872)	0.0110 (0.00862)
PMPOP	-0.0219* (0.0121)	-0.0536 (0.0717)	-0.749* (0.414)	-0.316 (0.423)	0.0210 (0.0143)	0.0572 (0.0787)	0.717 (0.489)	0.338 (0.465)
Constant	-0.113*** (0.0156)	-0.723*** (0.102)	-3.858*** (0.533)	1.636*** (0.600)	-0.184*** (0.0248)	-1.253*** (0.132)	-6.288*** (0.847)	-1.495* (0.778)
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1280	1280	1280	1280	637	637	637	637

Notes: See Table 1 for the definition of variables. Robust standard errors are in parentheses. *, **, and *** denote significance in 10%, 5%, and 1% levels respectively.

Robustness checks

To ensure the robustness of our results, we conduct some additional checks. We replaced vector of our dependent variable by ROAA (return on average assets), ROAE (return on average equity), lnZROA (natural logarithm of ZROA) and lnZROE (natural logarithm of ZROE). We show the results in Table 7. As we can see, the results are consistent. We also deal with the endogeneity issues by lagging our bank-level variables (CAR, LDR, CIR). As displayed in Table 8, the results generally unchanged. We also tried to drop PMPOP because it could have a potential relationship with our Hajj index (even though not shown from the correlation coefficient). The results (Table is upon request) show that our index is not affected by removing PMPOP from the model. We also estimated our model using panel corrected standard errors (PCSE) (N. Beck & Katz, 1995) and generalized least squares (GLS) (Parks, 1967) in order to deal with the potential problems of heteroscedasticity and autocorrelation. The results (Table is upon request) are generally similar. Last, to test the consistency of our religiosity measurement (Hajj index), we also regressed bank performance on each component of Hajj (there are four elements as depicted in Table 1). The results (upon request) remain unchanged.

Table 7. Robustness: Changing proxy for dependent variables

	(1) ROAA	(2) ROAE	(3) lnZROA	(4) lnZROE
Hajj	0.00151*** (0.000504)	0.0188*** (0.00645)	0.0317*** (0.00682)	0.00775** (0.00346)
CAR	0.0546*** (0.00811)	0.434*** (0.0762)	4.570*** (0.108)	0.231*** (0.0394)
LDR	0.00203 (0.00130)	0.00983 (0.0126)	-0.0250 (0.0153)	0.00302 (0.00761)
CIR	-0.101*** (0.0189)	-0.758*** (0.194)	-1.136*** (0.193)	-0.556*** (0.0928)
Size	0.00856*** (0.000659)	0.0770*** (0.00772)	0.0353*** (0.00925)	0.0569*** (0.00398)

Table 7. (Cont.)

HHI	0.00484*	0.0606**	0.113***	0.0322*
	(0.00280)	(0.0309)	(0.0321)	(0.0167)
GrGDP	0.000667**	0.00229	0.00146	0.00348**
	(0.000270)	(0.00232)	(0.00305)	(0.00152)
PMPOP	0.00550	0.121	0.00227	0.0428
	(0.0112)	(0.135)	(0.0957)	(0.0605)
Constant	-0.155***	-1.481***	0.179	0.739***
	(0.0168)	(0.203)	(0.189)	(0.0915)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	1620	1612	1883	1917

Notes: See Table 1 for the definition of variables. Robust standard errors are in parentheses. *, **, and *** denote significance in 10%, 5%, and 1% levels respectively.

Table 8. Robustness: Dealing with endogeneity

	(1)	(2)	(3)	(4)
	ROA	ROE	ZROA	ZROE
Hajj	0.00124**	0.00839**	0.0466	0.0495**
	(0.000492)	(0.00343)	(0.0297)	(0.0202)
L.CAR	0.0471***	0.118***	32.95***	0.699***
	(0.00786)	(0.0379)	(0.580)	(0.224)
L.LDR	0.00127	-0.000729	-0.00603	-0.00430
	(0.00132)	(0.00779)	(0.0836)	(0.0460)
L.CIR	-0.0813***	-0.356***	-3.283***	-2.099***
	(0.0166)	(0.0873)	(0.923)	(0.515)
Size	0.00815***	0.0542***	0.202***	0.320***
	(0.000669)	(0.00384)	(0.0392)	(0.0227)
HHI	0.00532*	0.0363**	0.450***	0.214**
	(0.00278)	(0.0167)	(0.157)	(0.0987)
GrGDP	0.000656**	0.00348**	0.0226	0.0205**
	(0.000270)	(0.00149)	(0.0153)	(0.00879)
PMPOP	0.00606	0.0701	-0.0137	0.413
	(0.0110)	(0.0590)	(0.634)	(0.348)
Constant	-0.148***	-0.971***	-3.238***	0.172
	(0.0164)	(0.0906)	(0.956)	(0.534)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	1612	1605	1605	1605

Notes: See Table 1 for the definition of variables. Robust standard errors are in parentheses. *, **, and *** denote significance in 10%, 5%, and 1% levels respectively.

CONCLUSION

There are two strands of literature discussing the impact of religiosity on the Islamic banks' behavior and performance. On the one hand, religiosity is considered to give positive influence to the Islamic banks. As reported by some studies, clients' loyalty to Islamic banks (because of their beliefs) could make Islamic banks have lower default risk and less prone to depositor withdrawal during a bad financial condition. Oppositely, personal piousness could become a barrier for a Muslim to access formal financial institution, as reported by another study. This condition could detriment the process of financial inclusion principally in countries with the Muslim-dominated population.

We, therefore, investigate in this paper the link between religiosity and Islamic banks' profitability as the debate about it still going up to now. For this purpose, we choose Indonesia as our single-country sample for some reasons. We develop an index related to Hajj at the provincial level to measure the religiosity. We study the relation between religiosity and Islamic banks performance because this issue remains an open question. We find in this paper that Islamic banks located in the regions with higher religiosity level have better performance than those located in less religious provinces. This effect is more pronounced for small Islamic banks and those located outside Java Island.

Our results have an important policy implication. We find that, in overall, the existence of religious Muslims could enhance banking system stability through their financial inclusion in Islamic banks. While pious Muslims might limit themselves from interactions with conventional banking practices, regulators should promote Islamic banks outreach since this channel in accordance with their religious beliefs. The government can also collaborate with well-known religious advisors/ religious leader in the country in promoting Islamic banks because religious Muslims might pay more attention to them than regulators.

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