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The Role of Capital on Islamic Bank Spin-Offs in Indonesia

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Abstract

Research Aims - Some Islamic banks have experienced decreasing performance after spinning off from the parent company, and it is presumed that the amount of capital may have contributed to the decline. Hence, this paper aims to find a minimum amount of capital that Islamic banks must own after spin-offs in order to be able to compete in the market and to achieve excellent performance.

Design/Methodology/Approach - We employ the OLS method for small banks (assets below Rp 5 trillion) with variable Capital as the dependent variable and Bank Performance (ROA, ROE, BOPO, and NPL) as the independent variable. We conduct several rounds of regression analysis by including different dummy variables to capture an increase in bank performance when certain capital limits are applied. Various results of the interaction between Capital and Bank Performance are mapped into the frontier line formed by the regression equation. We then compare the frontier results with the actual bank identifier to map the position of each bank relative to the frontier. We add cluster analysis to confirm the results further.

Research Findings - Descriptive statistics of the small banks shows that conventional banks perform better in overall performance, efficiency and risk in comparison with the Islamic banks. Several dummy variables are set to represent the size of bank capital (Rp. 800 billion, Rp. 1 trillion, Rp. 1.2 trillion, and Rp. 1.5 trillion), and all dummy variables are significant; the corresponding coefficient reveals that the higher the capital, the better the average performance. Also, the relationship between performance and bank capital is a non-linear (quadratic) relationship that is convex, indicating that capital is not the only critical factor that contributes to the bank's improvement. The cluster analysis partially confirms that there is a specific pattern of capital in each of the clusters.

Theoretical Contribution/Originality - The result of this study is in line with some previous literature on the relationship between capital and bank performance. In banks with small capital, capital has a positive influence on bank performance but has the opposite effect after reaching a certain point. In the literature related to spin-offs in Islamic banking, there are only a few studies about the performance of small banks after the spin-off and even fewer (or none) that discuss the critical role of capital and its relationship with the bank's performance after the spin-off. Our findings support previous studies conducted by Siswanto (2014).

Managerial Implications in the South East Asian Context - With the implementation of the dual banking system in several southeast Asian countries, many conventional banks have Islamic bank subsidiaries. Findings from this research could help banking regulators in the South East Asian countries to carefully re-evaluate their spin-off strategy for the unit bank, especially regarding the limit of capital requirement before the spin-off. The bigger the capital size, the better the performance of the business unit after the spin-off.

Research Limitation & Implications - This research only uses variable capital as a determinant for the bank's performance after spin-offs. However, as suggested by the resulting R-Squared from the regression formula (66%) and the convex trend line of the frontier analysis, other factors may contribute to the banking performance. Future research should include several other indicators for spin-off success, such as parent-subsidiary relationship (Tubke, 2004; Lindholm-Dahlstrand, 2000) and parent's size (Cristo & Falk, 2006), credit and liquidity position before spin-offs.

Keywords - spin-offs, bank, Islamic bank, ASEAN.

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INTRODUCTION

Islamic banking has been present for 27 years in Indonesia, since the establishment of Bank Muamalat Indonesia in 1992. However, the share of Islamic banking assets accounts for only 5% of the total assets of the national banking industry, consisting of as many as 14 Islamic Commercial Banks and 20 Islamic Business Units (Otoritas Jasa Keuangan, 2019). This figure is much smaller compared to other ASEAN countries such as Malaysia, whose Islamic banking industry is growing steadily with a market share of 34.9% of the total banking industry. In a country with the largest Muslim population in the world, the Islamic banking industry in Indonesia should be able to proliferate. To accelerate the market share and the growth rate of Islamic banking in Indonesia, the government established Act No. 21 of 2008 concerning a long-term policy for the Islamic banking industry development in Indonesia. The Act mandates that the Islamic Business Unit of the conventional bank should separate itself into a full-fledged Islamic Bank when its assets have reached at least 50% of the total value of the parent's assets, or no later than 15 years after the Act's establishment (i.e., by 2023). Thus, it is mandatory for these spin-offs to occur within the next few years.

The spin-off is one of many strategies to increase competitiveness in the market. In contrast with integration strategies such as mergers and acquisitions, a spin-off is a form of divestment strategy where the company releases part or all of its ownership of a business unit. Companies that want to divest can do so through spin-offs or sell-offs. Prezas and Simonyan (2015) note that a spin-off is a mechanism by which the company releases its business unit into a separate business entity, where ownership of the new entity is distributed pro-rata to all company shareholders, while a sell-off is a divestment mechanism where the business unit that is released is sold to parties outside the company. Prezas and Simonyan (2015) also state that spin-offs do not have tax consequences.

There are numerous previous studies that seek to identify the factors influencing companies to choose a divestment method. Among these are Khan and Mehta (1996), Maydew, Schipper, and Vincent (1999), Nixon, Roenfeldt, and Sicherman (2000), Powers (2001), Chen and Guo (2005), and Bergh, Johnson, and Dewitt (2008). The latest of these is the study of Prezas and Simonyan (2015), who argue that overvalued companies tend to choose sell-offs rather than spin-offs and vice versa. Companies spin-off their units usually due to corporate focusing (or re-focusing). By releasing its business units, the company can focus on its core business. Likewise, the released business units will benefit from the flexibility and more space to grow because of the increased autonomy. Also, several previous studies show that spin-offs have a positive impact on parent companies and spin-off companies. Some previous studies linked spin-off to abnormal returns from shares of companies that spun-off. Hite and Owers (1983), Schipper and Smith (1983), and Miles and Rosenfeld (1983) showed that there was an increase in abnormal stock returns when the company announced a spin-off. Also, Chemmanur, Krishnan, and Nandy (2014) stated that spin-offs have positive implications for the total factor productivity and efficiency of the company.

Research about the business unit performance after a spin-off in the Islamic banking industry has shown the opposite results. Some studies show that spin-offs have a significant positive impact on the operational performance of Islamic banks (Nasuha, 2012; Ramdani, 2015; Hamid, 2015; Al Arif, 2014). Other studies show that the performance of Islamic banks decreases after spin-offs from the parent (Al Arif, 2015a; Al Arif, 2015b; Al Arif, 2015c; and Al Arif, Nachrowi, Nasution, & Mahmud, 2017). The latest research by Al Arif, Haribowo, and Suherlan (2018) shows that there has been a decrease in post-spinoff efficiency in Islamic banks in Indonesia. Siswantoro (2014) argues that the performance of the full-fledged new Islamic bank post-spin-off from the parent company is strongly related to its capital. Siswantoro (2014) emphasizes that one of the critical factors for the spin-off process is the capital owned by the bank resulting from the spin-off. Several spin-offs processes show patterns related to capital and performance after the spin-off. An Islamic bank with excellent performance has relatively high capital. Some of these banks have received a substantial capital injection from the parent bank in the 13-20 months after the spin-off. Some other banks already have substantial capital (above Rp 1 trillion) when the spin-off is carried out. Other spin-off bank with relatively low performance have low capital. The regulation stated that the minimum capital of Islamic banks resulting from a spin-off is IDR 500 billion.

Unlike non-bank companies, capital is crucial for the success of the bank's performance after the spin-off. Based on the rules of multiple licensing in the Indonesian banking industry, banks with a capital of Rp 500 billion are in category 1, where the bank can only provide limited services to the consumer. Also, the regulation of Islamic banking in Indonesia states that the minimum capital of the Islamic bank resulting from the spin-off is IDR 500 billion. The results of Siswantoro's (2014) study show that the spin-off Islamic banks that have good performance have capital above one trillion Rp, while those with capital below Rp 1 trillion have substandard performance in comparison with the other banks in group 1. Although Siswantoro's (2014) study only uses descriptive statistical approaches, these findings indicate a relationship between the capital and performance of Islamic banks. With a regulatory minimum capital requirement for spin-offs of Islamic banks of only Rp 500 billion, there are concerns that the spin-off Islamic banks will have difficulty competing with other banks. Bank with capital under Rp 1 trillion are categorized as the lowest level of banks with the least varied banking services. Hence, the aftermath of the spin-off will lead to major changes in several Islamic business units of big conventional banks in Indonesia. Several Islamic business units (such as CIMB Niaga Syariah) are business units of large conventional banks that will be downgraded from Category Four banks (banks with the largest capital, which are free to perform various types of banking services) to become Category One banks (banks with the smallest capital and many restrictions). The Indonesian banking regulator has also indicated that they might change the policy of minimum capital for bank spin-offs into a number higher than Rp 500 billion to cater to the need for more varied Islamic banking services.

Regarding the policy, there are still some questions about the relationship between

bank capital and bank performance. Several previous studies (Kashyap, Rajan, & Stein, 2002; Hart & Zingales, 2011; Acharya, Mehran, & Thakor, 2016; Basel Committee, 2010) have stated that banks should increase their capital to stabilize their business, especially following the global financial crisis. In contrast, bankers argue that any obligatory high capital requirement will negatively affect banking performance. This argument is supported by several studies, such as that of Calomiris and Kahn (1991). Berger and Bouwman (2013) stated that the issue of the relationship between capital and bank performance is still relevant when associated with various situations, such as during normal and crisis periods. Therefore, the plan of Indonesia's regulatory authorities to increase the requirements of Islamic bank capital before spin-off needs further study. In addition, according to Čihák and Hesse (2010), Islamic banks have several operational challenges: the difficulty of standardizing products because of the variety of types of contracts used, greater operational risks than those faced conventional banks because of non-standard products, and Islamic banks' limitations in using a variety of financial instruments that function as a means of hedging. The challenge will increase when Islamic banks are charged to increase their capital. Therefore, the plan to increase the minimum capital level for Islamic banks to be spun-off must be supported by relevant empirical results.

This study seeks to answer the initial question that arises from the plan of the banking regulator in Indonesia to increase the minimum capital of Islamic banks required before spin-off—that is, the question of whether the increase in capital has a positive impact on banking performance. If there is a positive relationship between the two, then the improvement plan is appropriate and in accordance with various previous literature that supports the increase in bank capital. We aim to investigate this relationship by looking at the relationship between capital and bank performance (using the frontier approach estimated by the OLS method) and then confirm it using the cluster analysis approach. We chose to use a sample of all banks (Islamic and conventional banks) rather than just choosing a limited sample of Islamic banks. We included several considerations. First, the number of Islamic banks that have been spun-off is very small, amounting to only four banks since 2009. Second, we consider Islamic banks to compete in the same market as conventional banks, and thus the results obtained using all bank samples are very relevant if applied to Islamic banks. Third, we use a sample limited to only banks with capital below Rp 5 trillion, because the amount of capital is very relevant to the issue of spin-offs in Islamic banks. With the current regulations (minimum capital of Rp 500 billion), Islamic banks that will be spun-off will be included in the group of banks with the lowest capital. If the planned increase in capital is applied, Islamic banks will be included in the group of category 2 banks (banks with capital below Rp 5 trillion). Therefore, limiting the sample to the two bank groups is expected to provide the most relevant empirical results in accordance with the context of this study. Our study has a significant difference from the study conducted by Siswanto (2014). By using a sample of conventional banks and Islamic banks, the size of our sample is far greater than that of the sample used by Siswanto (2014). In addition, we use the standard causality method, which is a regression using the OLS method so that inference analysis (rather than descriptive analysis) of the relationship between

capital and bank performance is comprehensive.

Our results show that capital and performance have a linear relationship, where the relationship differs when the sample is grouped based on the level of capital. This pattern implies that capital is not the only factor that contributes to bank performance. We also found that spin-off Islamic banks require capital of between Rp 800 billion and Rp 1.5 trillion in order to achieve good performance, and the cluster analysis confirms this finding. The remainder of this article proceeds as follows. Section 2 presents the literature review regarding Islamic banks and spin-offs. Section 3 discusses the research methods used in this article. Section 4 presents the results and discussion, section 5 discusses managerial implications in the Southeast Asian context, section 6 discusses theoretical implications, and section 7 presents conclusions.

LITERATURE REVIEW

Banks and Islamic Banks

Banks are financial institutions that collect funds from the public in the form of deposits and channel them in the form of loans (Rose & Hudgins, 2012). Apostolik, Donohue, and Went (2009) divide bank activities into three main activities: (1) collecting funds in the form of demand deposits, savings, and deposits; (2) providing financial and banking services such as transfers and payment systems; and (3) channelling the funds in the form of credit. As an incentive, the bank pays deposit interest to the depositor, while the bank sets a loan interest rate for debtors who take loans from the bank. Banks obtain their spread from the difference between loan interest and deposit interest.

Ayub (2013) defines Islamic banks as intermediary financial institutions that carry out their activities based on Sharia principles by avoiding all financial transactions that contain usury, uncertainty, and gambling. Interest, while an essential component in conventional bank operations, is considered usury and is thus prohibited by Sharia principles. Therefore, Islamic banks are interest-free banks, and instead of usury, they apply various forms of contracts following Sharia principles in their operational activities. Also, Islamic banks avoid channelling funds in the form of loans because, in Islam, a loan is considered a social activity that should not create usury (Antonio, 2001). Khan (1986) argues that Islamic banks are banks that are not only interest-free but also utilize equity-based contracts (profit-sharing contracts) in their operations. By applying equity-based contracts in the collection and distribution of funds, Islamic banks indirectly apply the principle of risk-sharing, because the debtor's business risks are borne jointly by the debtor, the bank, and the depositor.

Spin-Offs in Islamic Banking

To remain competitive in the market, companies often use divestment strategies. A spin-off is one such strategy. Prezas and Simonyan (2015) state that a spin-off is a mechanism by which the company releases its business unit into a separate

business entity, where ownership of the new entity is distributed pro-rata to all company shareholders, while a sell-off is a situation where the company releases or sells its business units to other parties. There are several reasons for the company to spin-off. Wachtell, Lipton, Rosen, & Katz (2016) stated that some of the reasons for spin-offs include: refocusing for core businesses when believed to be to company's competitive advantage, achieving a certain level of capital structure, giving a new identity to spin-off business units, or as part of equity-based compensation. Wachtell, Lipton, Rosen, & Katz (2016) also mentioned that spin-offs have several weaknesses, including potential loss of revenue and joint cost, disrupted business/operation as a result of the spin-off, and parent companies losing the benefits of diversification. Sahaym (2013) added that the new company resulting from a spin-off faces an identity crisis in the industry. Finding from previous studies reveal that spin-offs have positive implications, including positive abnormal returns for parent companies for three years (Hite & Owers, 1983; Schipper & Smith, 1983; Miles & Rosenfeld, 1983), improved operational performance (Daley, Mehrotra, & Sivakumar, 1997; Desai & Jain, 1999), and increased efficiency and total factor productivity of the company (Chemmanur et al., 2014).

In the Islamic banking literature, there are not many studies related to spinoffs. Apart from the fact that there are still very few Islamic banks that have resulted from spin-offs (i.e., Islamic business units released into full-fledged Islamic banks), the attention paid to the issue of spin-offs is also relatively small compared to other issues in Islamic banking. Siswanto (2014) states that a spin-off in Islamic banking is usually motivated by the desire to improve the financial performance of Islamic banks, the opportunity to improve networks and investment, to engage in financial restructuring, to increase capital strength, to obtain independent management, and to meet consumer demand. Several studies show that spin-offs have a significant impact on the operational performance of Islamic banks (Nasuha, 2012; Ramdani, 2015; Hamid, 2015; Al Arif, 2014). However, several other studies show that the performance of Islamic banks decreases after spin-offs are carried out (Al Arif, 2015a; Al Arif, 2015b; Al Arif, 2015c; and Al Arif et al., 2017). Al Arif et al.'s (2018) latest research concluded that the efficiency of Islamic banks declined after the spinoff was carried out.

In the context of the Islamic banking industry in Indonesia, studies related to the capital and performance of spun-off Islamic banks are still very limited. Siswanto (2014) specifically highlighted the issue of capital adequacy in the newly spun-off Islamic bank. He stated that capital has a vital role in determining the performance of Islamic banks after the spinoff. The parent banks usually give the capital to their business units. The greater the capital owned by the Islamic bank, the higher the likelihood that the bank will achieve excellent performance. With simple descriptive analysis, Siswanto (2014) shows that the newly spun-off Islamic banks with good performance on average have relatively large capital (at least Rp 1 trillion) during the spin-off period, or the parent bank gradually adds capital to the Islamic bank. Siswanto (2014) argues that Islamic banks resulting from spin-offs without any capital enhancement have lower and stagnant, or even worsening, performance.

The issue of capital is noteworthy, considering that Islamic banking law in Indonesia states that the parent bank only requires Rp 500 billion starting capital to spin-off its Islamic business unit. With this minimum amount of capital, the new Islamic bank will have limitations in conducting banking business activities. The Islamic banking regulations in Indonesia state that banks with minimum capital (under Rp 1 trillion) are only allowed to carry out basic banking activities such as depository services and channeling credit, while banks with higher capital are allowed to provide other banking services. However, the study conducted by Siswantoro (2014) still has many limitations, because it only uses descriptive statistical analysis approaches with very limited samples.

RESEARCH METHOD

Data and sample

The data used in this study are financial statements of conventional banks, Islamic commercial banks, and Islamic business units; all are obtained from the Financial Services Authority. The sample used in this study covers all banks (conventional and Islamic banks) that are in the group of banks with capital below Rp 5 trillion. In the banking industry in Indonesia, banks with capital below Rp 5 trillion are divided into two groups: group 1 banks (banks with capital below Rp 1 trillion) and group 2 banks (banks with capital of Rp 1-5 trillion). We do not limit the sample to only Islamic banks that have been spin-off due to several considerations. First, the number of full-fledged Islamic banks that have been created by spin-offs is very small, amounting to only four banks since 2009, which would significantly limit the choice of the method to be used. Second, we consider Islamic banks to compete in the same market as conventional banks, so that the results obtained using all bank samples are very relevant if applied to Islamic banks. Third, we use only a sample of banks with capital below Rp 5 trillion because this level of capital is very relevant to the issue of spin-offs in Islamic banks. There are four categories of Islamic banks in Indonesia based on the multiple licensing policy, with the lowest category (banks with capital under Rp 5 trillion) being able to perform only basic banking business with a minimum variety of services, while the highest category (Category 4) can access all sorts of banking business, such as performing treasury operations in Indonesia and in foreign countries, as well as worldwide capital participation in other financial institutions (up to 35% of capital). With the current regulations (minimum capital of Rp 500 billion), spin-off Islamic banks will be included in the group of banks with the lowest capital. Conversely, if the planned increase in capital is applied, Islamic banks will be included in the group of category 2 banks (banks with capital below Rp 5 trillion). Therefore, the selection of a bank sample with a capital of under Rp 5 trillion will be very relevant to the issues currently being faced by the Islamic banking regulator in Indonesia.

RESEARCH METHODOLOGY

This study aims to find the capital thresholds that need to be fulfilled by newly spun-off Islamic banks in order to achieve the desired performance. This study uses the OLS approach and uses bank performance variables (ROA, ROE, BOPO, and

NPL) as the dependent variable and Capital as the independent variable. Other independent variables include the capital threshold (dummy variable) and Interaction variable between the dummy variable and the capital variable. We will refer to the equation with the term “frontier” because the interaction between bank performance and capital is illustrated by the frontier line formed by the regression equation. When we compare the frontier results with the actual conditions of the bank, we can map the position of each bank relative to the frontier. Banks whose positions are below the frontier are banks that are less than optimal in producing operational performance, as in the context of the efficient frontier approach (Coelli, Rao, O’Donnell, & Battese, 2005).

Conversely, banks that are in the frontier or above the frontier are banks whose performance is optimal (according to the level of capital) or above average. The regression equation used in this study is as follows:

$$y_{it} = \alpha + \beta_1 BIG_i + \beta_2 CAP_{it} + \beta_3 CAP_{it}^2 + \beta_4 BIG_i * CAP_{it} + \beta_5 BIG_i * CAP_{it}^2 + u_{it}$$

Where the variable y_{it} is the bank performance (ROA, ROE, NIM, BOPO, and NPL) at the $-it$ in time $-t$ period, and CAP_{it} is the capital at the $-it$ on the t -period. BIG_i is a dummy variable that represents the threshold of bank capital. This study uses several capital thresholds to differentiate between big and small-sized banks (banks with capital under Rp 3 trillion). The capital thresholds used are Rp 800 billion, Rp 1 trillion, Rp 1.2 trillion, and Rp 1.5 trillion; we aim to observe which capital threshold will produce the highest performance. The capital threshold between Rp 800 billion and Rp 1.5 trillion is deemed most appropriate within the Indonesian banking industry. Capital below Rp 800 billion becomes irrelevant, because the Islamic bank business unit is expected to grow its capital from the minimum capital requirement of Rp 500 Billion, and the threshold above Rp 1.5 Trillion is considered too high and will be perceived as a regulatory burden by the banking industry, as a capital threshold that is too high will hinder the banking business unit from spinning off. We use several capital thresholds and group banks in the sample that have capital above these thresholds to identify their average performance. The variable has a value of 1 if the bank in the sample has capital above a certain threshold and 0 if otherwise. In the above equation, we include capital in the form of quadratic (CAP_{it}^2) to capture the non-linear relationship between capital and bank performance. If capital (squared) does not have a significant effect on bank performance, the relationship between capital and bank performance is linear. If the opposite, then the relationship is non-linear. This implies that at a certain point, the increase has the opposite effect on the performance of the bank. This method is similar to the method used by Fama and MacBeth (1973) when proving the relationship between systematic risk and average return. In banks with low capital (under Rp 5 trillion), raising capital does not automatically make them able to maximize their business banking services, because the regulations limit the bank’s activities until its capital is at a certain level to upgrade them into a higher category.

We also use the interaction variable ($BIG_i * CAP_{it}$ and $BIG_i * CAP_{it}^2$) between the bank capital and the status of bank capital in the sample. The sample used to estimate

the above equation will be grouped based on bank capital because of the presumed difference in the interaction between capital and bank performance in each group of banks. The focus of this study includes banks with IDR 5 trillion capital, because the spin-off Islamic banks are in this category.

In estimating the regression equation (frontier) above, the steps taken are as follows:

1. Filter the entire sample of banks in Indonesia and group them based on capital. Banks under Rp 5 trillion were selected as a sample for this study.
2. Identify outliers that exist in the dependent and independent variables in the sample. Banks with outlier values are excluded from the sample.
3. Estimate the regression equation above using the OLS method. The treatment standard error (with Newey West method) is used to make OLS robust estimation results clear from various possible violations of the OLS assumptions.
4. Form a frontier line based on the estimation results in point 3.

In addition to using frontier analysis, this study also uses the cluster method to confirm previous findings. This study utilizes a hierarchical cluster because it is the ideal cluster method, as well as because the data used in this study are not large; thus, the estimation of hierarchical cluster algorithms should be easy and not problematic. The variables used to form the cluster are bank performance indicator variables such as ROA, NOM, BOPO, NPL, and capital.

In this study, the cluster will be formed twice, namely by (1) including all performance variables mentioned above, and (2) excluding capital from the clustering process. As capital is considered to be the main differentiator between clusters, the consistency of clusters formed can be tested by removing capital in the cluster analysis. The aim is to find out whether cluster results are found without entering capital as the same variable as the cluster results that include capital variables.

The stages carried out in cluster analysis are as follows:

1. Use the same data as used in the frontier analysis.
2. Perform cluster estimation using the hierarchical cluster. Determine how many clusters are formed based on the dendrogram and then store the results of clustering groups on the data worksheet.
3. Conduct descriptive analysis of several bank performance variables in each cluster to see the distinct characteristics of each cluster.
4. Repeat steps 1 to 3 for cluster analysis without entering the capital variable.

RESULTS AND DISCUSSIONS

Descriptive statistics

Table 1 shows descriptive statistics of bank performance for banks with capital below Rp 5 trillion during the period of 2008-2017. Panel A in the Table shows the

grouping of bank performance by year, and panel B shows the grouping of bank performance by type (conventional banks and Islamic banks). Panel A in Table 1 reveals that several bank performance indicators related to profitability (ROA, ROE, and NIM) show a decreasing trend in the period. In 2008, the average ROA of banks with capital below Rp 5 trillion is 2.51%, and it continues to decline until 2017 (an average ROA of 1.32%). Similarly, the average NIM of banks with capital below Rp 5 trillion was 6.77% in 2008 and decreased to 5.41% in 2017. The decrease in ROA and NIM could be due to an increase in the BOPO ratio. BOPO, as one of the bank's efficiency indicators, increased from 2008 (79.40%) to 2017 (89.27%). The increase in BOPO shows that bank operational costs increased, causing banks to experience a decrease in efficiency. The standard deviation (number in brackets) of each bank performance indicator in each year is much lower than the mean of the indicator. This result shows that disparities or differences in performance among individual banks in the bank group with capital below Rp 5 trillion tend to be low. Only the ROE indicator shows that there is a high standard deviation in certain years, namely from 2015 to 2017. This implies that in these three years, there were significant differences in performance between individual banks included in the bank group with capital below Rp 5 trillion. Several banks have very good performance and there are some banks have poor performance.

	ROA	ROE	NIM	BOPO	NPLG	NPLN	CAR
<i>Panel A: grouped by year</i>							
2008	2.51 (1.81)	14.53 (12.59)	6.77 (2.84)	79.40 (15.87)	2.80 (2.48)	1.51 (1.36)	27.88 (17.74)
2009	2.26 (1.77)	14.05 (12.79)	6.41 (2.79)	79.76 (19.74)	2.53 (2.16)	1.56 (1.47)	26.59 (20.47)
2010	2.40 (1.9)	15.40 (14.35)	6.48 (3.5)	80.92 (15.72)	2.36 (2.18)	1.22 (1.33)	27.48 (23.54)
2011	2.12 (1.67)	13.66 (13.02)	5.92 (3)	80.50 (16.58)	1.95 (1.6)	1.06 (1.05)	24.15 (16.99)
2012	2.03 (1.37)	15.02 (12.59)	5.57 (2.91)	78.80 (17.94)	1.90 (1.86)	1.04 (1.21)	22.51 (17.02)
2013	2.09 (1.39)	13.71 (10.72)	5.79 (2.88)	80.00 (16.02)	1.66 (1.63)	0.85 (0.78)	23.30 (20.56)
2014	1.69 (1.37)	10.30 (10.07)	5.11 (2.75)	83.97 (15.46)	2.65 (2.58)	1.52 (1.39)	20.72 (11.43)
2015	1.16 (1.75)	7.76 (12.56)	4.76 (2.61)	85.38 (22)	2.97 (2.5)	1.62 (1.29)	25.75 (21.93)
2016	1.06 (2.86)	12.17 (31.34)	5.59 (2.12)	90.87 (27.08)	3.23 (2.89)	1.83 (1.4)	27.28 (18.42)
2017	1.32 (1.94)	14.19 (23.26)	5.41 (1.93)	89.27 (19.86)	3.15 (2.47)	1.69 (1.28)	27.16 (13.5)
<i>Panel B: Conventional vs. Islamic Banks</i>							
Conventional Banks	1.96 (1.87)	13.24 (15.81)	6.18 (2.64)	82.11 (19.31)	2.42 (2.22)	1.34 (1.27)	25.15 (18.02)
Islamic Banks	1.34 (1.5)	12.13 (17.27)	1.64 (1.83)	86.26 (13.49)	5.64 (3.17)	2.85 (1.6)	26.26 (25.36)

Table 1.
Descriptive Statistics of Bank Performance in Indonesia (%)

Descriptive statistics in this table use two measures, the average and the standard deviation. Numbers in brackets are the standard deviations of each bank performance indicator. The data are from a sample of banks with capital below IDR 3 trillion. ROA is the return on assets, ROE is the return on equity, NIM is net interest margin, BOPO is the ratio of operating expenses to operating income, NPLG is gross non-performing loans, NPLN is net non-performing loan, and CAR is capital adequacy ratio. All numbers in the table are expressed in percentages.

The credit risk in the bank group with capital below Rp 5 trillion shows an increasing trend, as shown by the average of NPL indicators (NPL Growth and Net NPL). For the NPLG indicator, the bank's NPLG average was 2.80% in 2008, increasing to 3.15% in 2017. The increase indicated that the decline in indicators of bank profitability (ROA and NIM) and efficiency (BOPO) could be due to the increased default rate in the bank with capital under Rp 5 trillion. An increase in NPLs has resulted in an increase in Impairment of financial assets, and bank thus must increase the loan loss provision.

Table 1 also reveals that banks included in the group of banks with capital below Rp 5 trillion have relatively healthy capital conditions. The average CAR of banks in this group is in the range of 22%-27%, far above the minimum capital requirement of 12% set by the regulator.

Panel B of Table 1 also shows the average and standard deviations of performance indicators based on the type of bank (conventional banks and Islamic banks). In terms of profitability performance, the average profitability of Islamic banks is lower than that of conventional banks. As can be seen from the average ROA, ROE, and NIM of Islamic banks, all indicators are lower than those of conventional banks. Regarding the level of efficiency, Islamic banks have a higher average BOPO compared to conventional banks. Credit risk indicators (NPLG and NPLN) also show that the average NPL of Islamic banks is higher compared to that of conventional banks. This indicates that Islamic banks have lower performance compared to conventional banks, where Islamic banks have a capital adequacy ratio that is slightly higher than that of conventional banks. The overall performance of Islamic banks is inferior to that of conventional banks, and a separate study is needed to identify factors that have contributed to the low performance of Islamic banks in Indonesia.

Frontier Analysis of Capital Performance of Banks

Table 2 shows the estimation results of the regression model in equation (1). In the table, we use the ROA variable to represent the bank's performance. We also estimate the other indicator variables (ROE, NIM, BOPO, and NPL) as dependent variables, but we do not display them because they have more or less the same results with the result presented in table 2. We can provide the results if requested.

The regression analysis on equation (1) is conducted several times, including different dummy variables to capture an increase in bank performance when certain capital limits are applied. Therefore, columns 1-4 in table 2 show the regression results of equation (1) at each different capital limit. In each estimate, the interaction variable between the dummy variable and the capital variable (M_Big and M2_Big) is included but uses different definitions. For example, in column 1 (threshold Rp 0.8 trillion), the definition of the dummy variable M_Big and M2_Big is the dummy variable for banks that have capital above the set limit (in this case 0.8 T). The dummy variable will be equal to 1 for banks with capital above 0.8 T and 0 otherwise. We do the same for the 1 T, 1.2 T and 1.5 T limits. Thus, we can compare the variations in the effect of each capital limit on the performance of bank capital.

The capital limit with the highest impact on bank performance can be considered the ideal capital limit that should be met by the new Islamic bank spin-off in order to achieve a good level of performance. We use the R-Squared indicator as a basis for the optimal level of capital with the highest impact on bank performance. We also included the *year fixed effect* to anticipate changes in the banking sector during the sample period. In the 2008-2017 period, regulations in the Indonesian banking sector developed quite dynamically in response to the global financial crisis that occurred in 2007-2008.

Table 2 shows that the *D_Big* variable, which is the dummy variable for banks with capital above the limit, shows a significant result on all capital limits. For example, in column 1 of Table 2, the capital limit is IDR 0.8T, and the *D_Big* variable has a positive coefficient of 1.889 and a significant confidence level of 99%. Banks with capital above Rp 0.8 trillion have an average performance better than that of banks with capital below Rp 5 trillion. When compared to the coefficient of the dummy variable, the coefficient on the capital limit of Rp 1.2 trillion is higher than the other capital limits, being equal to 2.69 and significant at the 99% confidence level. That is, banks with capital above Rp. 1.2 trillion have an average performance higher than the average performance of other banks. Table 2 also shows that the relationship between performance and bank capital is a non-linear (quadratic) relationship that is convex. That is, the bank's performance will continue to increase along with the increase in capital. However, after reaching a certain level of capital, the relationship between bank performance and capital will be negative. This implies that capital is not the only critical factor to improve bank performance on an ongoing basis, especially for banks with relatively low capital. Business conduct, product differentiation, and other factors also need to be considered to improve bank performance.

This finding is slightly different from the previous findings by Siswantoro (2014), who indirectly concluded that there was a positive correlation between capital and bank performance. Banks in group 1 have a capital limit of Rp 1 trillion, while banks in group 2 have a capital limit of Rp 5 trillion. Banks with existing capital of Rp 500 billion will have a significant increase in performance if the bank increases its capital to Rp 1.2 trillion, because the increase in capital will automatically upgrade the bank from group 1 to group 2. This upgrading serves the bank as it comes with permission for the bank to conduct more banking business activities; hence, it will eventually affect the bank's profitability. However, when the bank increases its capital again (e.g., from Rp 1.2 trillion to Rp 3 trillion) it can have a negative impact on the bank's performance, as the business activities the bank can engage in do not change, since the bank remains in group 2. However, a significant increase can occur if the bank increases its capital to more than Rp 5 trillion, as the bank can then again access a higher group, thus enabling the bank's access to more varied business activities. In practice, however, banks rarely increase their capital by very large amounts in the short term. A visual illustration of the estimation results shown in Table 2 can be seen in Figure 1.

Table 2 shows that the year effect shows a declining trend from 2008-2017 in all regression models. The year effect in Table 2 above shows the average difference in bank performance (ROA) each year relative to the average performance of the bank as a whole. Year effects in 2015-2017 are negative, indicating that the average performance of banks in the group of banks with capital below Rp 5 trillion continues to decline. Although not statistically significant, these results confirm the results displayed in the descriptive statistical section. All estimation results of the

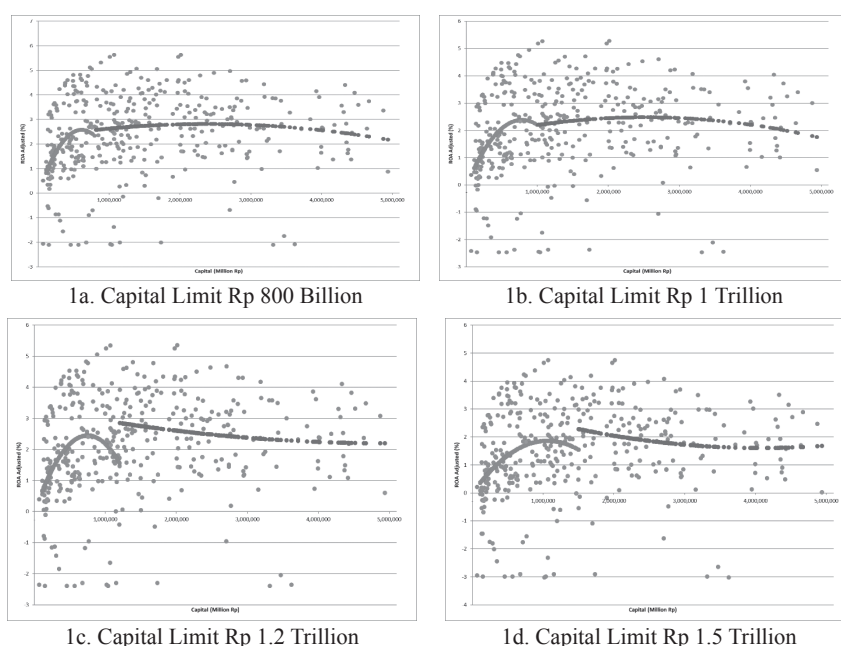


Figure 1.
Frontier Analysis of Capital
and ROA

Variable	Threshold 0.8 T		Threshold 1 T		Threshold 1.2 T		Threshold 1.5 T	
	Coef	p-value	Coef	p-value	Coef	p-value	Coef	p-value
2008	1.107389	0.000139	1.275197	0.000000	1.294184	0.000000	1.493458	0.000000
2009	0.899871	0.002564	1.070335	0.000029	1.081000	0.000003	1.293278	0.000000
2010	0.985544	0.001159	1.165044	0.000006	1.165772	0.000000	1.386677	0.000000
2011	0.652369	0.037661	0.839314	0.001670	0.834330	0.000418	1.073349	0.000001
2012	0.507268	0.108506	0.689875	0.010820	0.668866	0.005909	0.921976	0.000033
2013	0.513123	0.105271	0.685412	0.012953	0.697787	0.005166	0.917828	0.000079
2014	0.058195	0.855502	0.228942	0.413886	0.255041	0.313349	0.466960	0.048896
2015	-0.432928	0.184273	-0.248002	0.376925	-0.227853	0.370591	-0.011856	0.960396
2016	-0.239004	0.476078	-0.058094	0.843727	-0.031559	0.905021	0.181622	0.468533
2017	-0.327044	0.340147	-0.142710	0.636408	-0.139651	0.608845	0.111615	0.662839
D_Big	1.888630	0.000046	1.603847	0.001554	2.693323	0.000032	2.433499	0.014974
M	5.71E-06	0.000689	4.33E-06	0.000163	4.32E-06	0.000000	2.96E-06	0.000002
M2	-4.64E-12	0.025300	-2.70E-12	0.020355	-2.72E-12	0.000049	-1.37E-12	0.001029
M_Big	-5.64E-06	0.001008	-4.18E-06	0.000567	-4.95E-06	0.000000	-3.56E-06	0.000162
M2_Big	4.61E-12	0.026285	2.65E-12	0.022661	2.81E-12	0.000033	1.45E-12	0.000864
R-Squared	0.66600		0.66553		0.66790		0.66474	
F test	110.600	0.0000	110.370	0.0000	111.549	0.0000	109.978	0.0000

The frontier analysis is done using the OLS method with *year effect* as the control variable. The period of 2008-2017 is used as a dummy variable to capture the year fixed effect. The dependent variable used is Return on Assets (ROA). D_Big is a dummy related to the size of bank capital, equal to 1 for banks with capital above the capital limit (Rp 800 billion, Rp 1 trillion, Rp 1.2 trillion, and Rp 1.5 trillion) and 0 for others. M is a capital variable, M2 is the capital variable squared, M_Big is an interaction variable between capital and dummy of a large bank (D_Big), and M2_Big is an interaction variable between capital (squared) and a dummy of bank's capital. The numbers in the p-value column show the probability value of each variable coefficient.

Table 2.
Results of Regression
(Frontier)

regression models in Table 2 indicate that R-Squared is quite high, equal to 66% with an F-test, significant at a 99% confidence level. This shows that the regression model used in this study is able to capture the relationship between bank and capital performance quite well.

To confirm the findings above, we use a cluster analysis approach to group banks with capital below Rp 5 trillion based on the performance of each bank (ROA, ROE, BOPO, NIM, and NPL). Cluster estimation is done twice, first by entering all performance indicators including capital as a variable cluster and, later, only using performance indicators other than capital as a variable cluster. Graph 2 shows the results of cluster analysis with both approaches. By using all indicators, banks with capital below IDR 5 trillion are categorized into 4 clusters. Because the variable capital is used as the base of categorization, the hierarchical cluster algorithm makes Capital as the variable with the strongest impact in determining the bank's position in the cluster. Cluster 1 (coloured purple) has capital under Rp 800 billion, cluster 2 has capital between Rp 800 billion to Rp 1.55 trillion, cluster 3 has capital between Rp 1.55 trillion and Rp 3 trillion, and cluster 4 has capital above Rp 3 trillion. These results are consistent with the results of the frontier estimation described earlier.

In cluster 1, the bank capital limit is Rp 800 billion and the next limit is Rp 1.55 trillion, similar to the findings of the estimated frontier results in the previous section. Next, from the list of variables used as a basis for clustering, the variable Capital is removed. This is done to ascertain whether a performance-based group exists with a certain capital pattern and whether the capital affects the performance. The results of cluster estimation excluding capital variables can be seen in Graph 2(b). In Graph 2(b), 4 clusters are formed and grouped based on performance. Cluster 1 (purple) is the lowest-performing bank cluster compared to other clusters. In the distribution of banks based on capital (X-axis) in Graph 2(b), it can be seen that banks that perform well or badly have a diverse range of capital. That is, the clusters based solely on bank performance cannot identify the relationship between bank capital and performance.

To clarify the cluster analysis of this stage, Table 3 presents descriptive statistics from the four clusters shown by Graph 2. A chart from Table 3 shows descriptive statistics from the first cluster result, and panel B in Table 3 shows descriptive statistics from the cluster analysis of variables excluding the variable capital. Panel A

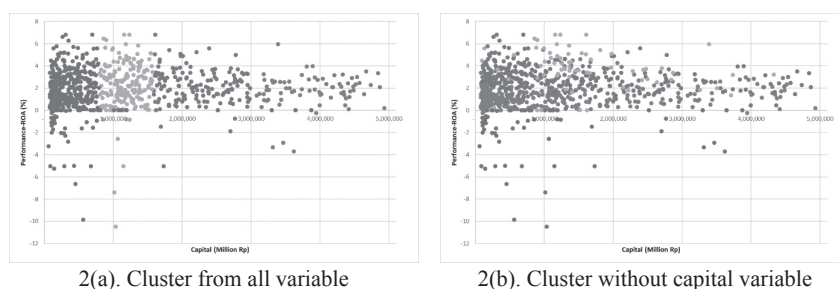


Figure 2.
Results of Cluster Estimation

in Table 3 shows that the average bank performance increases in clusters 1 and 2, but in clusters 3 and 4 the increase is not as large as clusters 1 and 2. Moreover, the average ROA of banks in cluster 2 is higher than the average ROA of the banks in cluster 1, but the average ROA of bank in cluster 3 is lower compared to cluster 2. The decline in performance also continues in bank cluster 4. The table shows that banks in clusters 1 and 2 have higher performance, but performance decreases in clusters 3 and 4. The average capital amounts of bank clusters 1 and 2 are Rp 332 billion and Rp 1.18 trillion, respectively. This also confirms the findings of the estimation results of the previous frontier. Panel B of Table 3 presents descriptive statistics from the four clusters shown in graph 4. Clusters with the best performance are clusters 2 and 3, because they have better performance averages than clusters 1 and 4. From the descriptive statistics of the average capital in each cluster, there is no one specific pattern of capital level in each cluster. Furthermore, by observing the percentile limits of 25%, 50%, and 75% of the capital distribution in each cluster, it can be seen that the distribution of capital in each cluster is relatively similar. Banks with large capital and banks with small capital are found in all clusters.

To further observe the relationship between capital and bank performance using the cluster analysis approach, a combination of the two cluster approaches is used, including, first, clusters using all variables including capital, and second, clusters without entering the capital variable. The results of the combination are presented in Table 4. In Table 4a, one can see the number of banks included in the intersection of clusters according to performance and clusters according to capital. Based on performance, the highest number of banks is in cluster 1. Likewise, with the capital

Cluster	ROA (%)	ROE (%)	NIM (%)	BOPO (%)	NPLG (%)	NPLN (%)	CAR (%)	Capital (Million Rp)	25%	50%	75%
<i>Panel A: All Variables (Including Bank Capital)</i>											
1	1.71	10.91	6.33	85.92	2.32	1.35	26.26	332,694	NA	NA	NA
2	2.21	13.46	5.39	76.42	2.42	1.36	27.09	1,182,151	NA	NA	NA
3	2.18	17.50	5.35	79.83	2.73	1.39	21.93	2,207,829	NA	NA	NA
4	1.79	16.65	4.95	83.47	3.34	1.61	21.05	3,895,964	NA	NA	NA
<i>Panel A: Without Bank Capital</i>											
1	1.40	6.94	5.09	88.38	2.47	1.56	26.19	1,006,086	191,383	535,060	1,411,077
2	3.09	29.20	7.61	75.12	2.01	0.84	19.10	1,401,484	445,126	1,019,312	2,003,002
3	3.45	10.57	4.34	47.52	2.55	1.34	34.03	997,454	997,454	1,357,117	1,930,981
4	-2.64	-17.12	4.96	125.21	6.20	3.13	38.69	148,352	148,352	431,900	1,026,322

Table 3.
Descriptive Statistics of Bank
Performance from Cluster
Analysis

4a. Number of Banks in Cluster based on Capital and Performance

		Cluster Based on Bank Capital			
		1	2	3	4
Cluster Based on Performance	1	268	85	71	35
	2	121	54	66	30
	3	9	37	22	6
	4	30	6	4	3

4b. Percentage of Banks in Cluster based on Capital and Performance

		Cluster Based on Bank Capital			
		1	2	3	4
Bank Performance	Poor	35.18%	10.74%	8.85%	4.49%
	Good	15.35%	10.74%	10.39%	4.25%

Table 4.
Combination of Clusters

cluster, the highest number of banks is in the cluster 1. From the intersection, a matrix can be arranged as shown in table 4b, where performance clusters are simplified into two clusters of performance, “Good” and “Poor”.

Table 4b shows that 35.18% of all banks in the sample fall into the category of poor clusters and small capital (under Rp 800 billion), while 15.35% are in good performance clusters. In other capital clusters (cluster 2-4), the percentages of banks in the poor and good categories are relatively balanced. The implications of the data presented in Tables 4a and 4b above suggest that banks with low capital (cluster 1) have a greater probability of underperforming than banks with higher capital (clusters 2-4). In capital cluster 1, around 70% of banks in the cluster perform poorly, and the rest perform well.

The findings above show that capital has a non-linear convex relationship with bank performance. These results are consistent with some of the previous literature (Acharya et al., 2016; Basel Committee, 2010; Hart & Zingales, 2011; Kashyap et al., 2002), which supports the idea of strengthening banking capital, especially following the global financial crisis. However, in the context of the banking industry in Indonesia, the non-linear convex relationship means that the increase in capital is only effective to a certain point, and the relationship turns negative as long as the bank is still hindered in increasing the variety of banking services due to the multiple licensing policy. As long as the bank is still in a lower group category with limited access to banking services, an increase in capital does not always have a positive effect on bank performance. This finding is in line with the findings of Calomiris and Kahn (1991). In addition, our findings are also different from the findings of Čihák and Hesse (2010), which state that small Islamic banks are in better financial conditions than small conventional banks. Our results show that many Islamic banks that fall into the category of low-capital banks (under Rp 5 trillion) have performance below that of the conventional banks in the same group.

Regarding the spin-off issue that will be applied to the Islamic banking industry, our analyses provide several findings that can be discussed further. The convex relationship between capital and bank performance shows that there is a positive relationship between capital and bank performance up to a certain point. In addition, our estimation results show that the biggest increase in performance occurred in banks with capital of Rp 1.2 trillion. Based on these findings, the regulator’s plan to increase the minimum capital level for Islamic banks that will be spun-off is in accordance with existing empirical facts. Our calculation results show that the parent banks that will release their Islamic business units should be asked to provide capital of Rp 1.2 trillion so that the spin-off Islamic bank can achieve good performance in the group (group 2). The current obligatory spin-off capital level of Rp 500 billion is considered too low, as it places spun-off Islamic banks within the lowest capital group. Hence, despite the aim to grow the Islamic banking industry, Islamic banks will face challenges of limited banking operations. Our findings also point to the recommendation that capital alone is not enough to improve the performance of Islamic banks in the long run. After passing a certain point, an increase in

capital that is not accompanied by an increase in types of banking services does not have a positive impact on bank performance. This implies that regulatory authorities should also focus on Islamic banks access to business. Regulators can relax rules related to banking business activities so that banks in Category 2 have flexibility in developing their business. In addition, the findings of this study also support the results of a study from Siswanto (2014), which states that Islamic banks will perform better if they receive additional capital.

MANAGERIAL IMPLICATIONS IN THE SOUTHEAST ASIAN CONTEXT

Many strategies have been implemented by ASEAN countries to reform their banking sectors following the Asian financial crisis of 1997, including mergers and intensification strategies (Remolona & Shim, 2015). The establishment of ASEAN Banking Integration Framework (ABIF) in 2014 by central bank governors of ASEAN members paved the way for further integration among ASEAN banking sectors. Led by several top major banks with regional networks, such as Malayan Bank (Maybank), DBS Group Holding and Bangkok Bank, the ASEAN banking industry is dominated by the ASEAN-5 banking sectors (Indonesia, Malaysia, Philippines, Singapore and Thailand), with other ASEAN members such as Cambodia and Vietnam characterized by smaller, less concentrated banks. Such contrast might prompt regulators from ASEAN countries with smaller industry size to pursue spin-off strategies to increase the industry growth. With the implementation of the dual banking system in several South-East Asian countries such as Malaysia and Indonesia, many conventional banks have Islamic bank subsidiaries that are encouraged to become full-fledged banks. The spin-off strategy for Islamic subsidiary units is a uniquely Indonesian policy; however, the findings from this research could aid banking regulators in the South East Asian countries to carefully re-evaluate spin-off strategies for their unit banks, especially regarding the limit of capital requirement before being spun-off. The bigger the capital size, the better the performance of the business unit after the spin-off.

THEORETICAL IMPLICATIONS

For the literature relating to the relationship between capital and bank performance, this study has several theoretical implications. First, this study supports studies about the strengthening of banking capital. Since 2008, much of the relevant literature has supported the strengthening of banking capital to improve banking performance and stability (Kashyap et al., 2002; Hart & Zingales, 2011; Acharya et al., 2016; Basel Committee, 2010). In addition, Berger and Bouwman (2013) showed that high capital helped banks to survive in both normal and crisis conditions. However, the results of this study differ, especially in the sample of banks with low capital (under Rp 5 trillion). Our results show that the positive relationship between capital and performance only occurs up to a certain level of capital, beyond which a negative relationship occurs. These findings support the literature which states that strengthening capital is not always profitable for banks (Calomiris & Kahn, 1991). We argue that an increase in capital can effectively improve the performance of banks only if they can access various banking services. Limitations on business

activities decrease the positive impact of capital strengthening.

Furthermore, of the eleven Islamic banking unit businesses in Indonesia, only four have resulted from spin-offs, while the others are the result of acquisition. Hence, there are also only a few studies about the performance of small banks after spin-offs, while little to no attention has been paid to discussing the critical role of capital and its relationship with the bank's performance after the spin-off (Siswantoro, 2014; Al Arif et al., 2017; Al Arif et al., 2018). Instead of using only data from spun-off banks, this paper uses a sample from all banks to investigate the relationship between bank capital and performance, because the findings will be beneficial in defining the capital threshold needed to be independent. In addition, this paper does not specifically address the issue of spin-off methods, there are no differences between the effect of banking establishment; either from spin off, acquisition or merger to banking performance; hence, it is relevant to observe not only spun-off banks but a sample of all banks. This research uses only variable capital as a determinant of the bank's performance after spin-offs. As suggested by the resulting R-Squared from the regression formula (66%) and from the convex trend line of the frontier analysis, other factors may contribute to the banking performance. Future research should include several other indicators for spin-offs' success, such as parent-subsidiary relationship (Tubke, 2004; Lindholm-Dahlstrand, 2000), parent's size (Cristo & Falk, 2006), and credit and liquidity position before spin-offs.

CONCLUSION

Descriptive statistics of the small banks show that conventional banks perform better in terms of overall performance, efficiency and risk in comparison with Islamic banks. Several bank performance indicators related to profitability (ROA, ROE, and NIM) show a decreasing trend in the 2008-2017 period, presumably due to an increase in the BOPO ratio that indicates a decrease in overall efficiency. The standard deviation of each bank's performance shows that disparities or differences in performance among individual banks in the bank group with capital below Rp 5 trillion tend to be low. The credit risk indicators show an increasing trend, as shown by the average of NPL indicators (NPL Growth and Net NPL). In the main test, several dummy variables are set to represent the size of bank capital (Rp 800 billion, Rp 1 trillion, Rp 1.2 trillion, and Rp 1.5 trillion), and all dummy variables are significant, with the corresponding coefficient revealing that higher capital is associated with better average performance. Also, the relationship between performance and bank capital is a non-linear (quadratic) relationship that is convex, indicating that capital is not the only critical factor that contributes to the bank's improvement. The cluster analysis partially confirms that there is a specific pattern of capital in each of the clusters, indicating that there is no impact of capital on the formation of clusters. The cluster analysis also shows that, where 70% of banks in the cluster perform poorly and the rest perform well, banks with low capital have a greater probability of underperforming compared to banks with higher capital.

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