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# Can the Indonesian banking industry benefit from a risk-based deposit insurance system? <sup>¶</sup>

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## Funding information

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## ABSTRACT

A risk-based premium scheme could be a reliable system to determine a fairer deposit insurance premium. This research aimed to assess Indonesian banks' risk profile, including per size classification and ownership as well as to counterfactually simulate a risk-based deposit insurance system for the individual banks. This research combined analysis of variance (ANOVA) and non-parametric approach applied to 75 banks (2008q1-2019q3). The results showed that big banks did not necessarily posture better risk management compared to small banks. Also, under the risk-based scheme, banks with better risk management could be rewarded, while less prudent banks could be punished.

**Keywords** : Deposit; premium; flat-rate; risk-based; banks; insurance

**JELClassification** : C12; C54; G21; G28; G30

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## 1. Introduction

For years since the Indonesian Deposit Insurance Corporation (LPS) firstly operated in 2005, it has collected fees from banks based on a flat rate. On the other hand, within the same periods, there were a numerous evidence showing that banking crisis emerged from an idiosyncratic shock of a particular bank. The Asian Financial Crisis 1997/1998 has brought about a substantial implication to the Indonesian financial system, particularly Indonesian banking industry. The industry experienced a heavy pressure during the crisis which was then signified by liquidated 16 private-national banks and public trust subsequently deteriorated. In order to recover the public trust as well as a response to the crisis, the government adopted a number of policies to heal the banking system and the entire financial system. One of those was the so-called 'blanket guarantee' which guaranteed all banks' liabilities including the public's funds deposited in the banks. This government's policy was enacted in Presidential Decree No. 26 of 1998 on Guarantees Against Payment Obligations for Commercial Banks and in Presidential Decree No. 193 of 1998 on Guarantees Against Payment Obligations of Rural Banks.

The public trust improved accordingly, but they also created other problems. Coverage of the guarantee schemes was considered too broad, so that moral hazard actions surfaced either by the banks or by the depositors. To confront the moral hazard problems and keep the public trust stable as well as sound banking stability system, the government amended the blanket guarantee programme with a limited guarantee scheme. This scheme was regulated in Law No. 24 of 2004 on Deposit Insurance Corporation (LPS) which was obligated to insure depositors' money and the LPS was officially operational as of 22 September 2005 (Government of Indonesia 2004).

To function as a deposit insurer, LPS collects fees from participating banks based on the tariff's scheme it sets up when the banks firstly join. LPS currently collects a premium of 0.1% from monthly average of banks' deposits for each period of January-June and July- December. Or in other words, the participating banks have to pay an annual premium of 0.2% from their monthly average of total deposits (Government of Indonesia 2004; McLeod Ross 2006, 66). By the time, LPS has been given a bigger role, particularly after the Law No. 9 of 2016 on Prevention and Resolution of Financial System Crisis (UU PPKSK) has been enacted. Under the new law, not only does LPS collect fees for the purpose of deposit insurance, but it may also collect other type of contributions from the banking industry once the Banking Restructuring Programme is activated (Government of Indonesia 2016). To resolve banks' financial difficulties, LPS has to rely on its own resources generated from the fee contributions and on the bail-in scheme mandated in the UU PPKSK (Triggs, Kacaribu, and Wang 2019, 14).

In terms of premium's tariff for the deposit guarantee scheme, LPS currently adopts a flat-rate scheme of 0.2% annually regardless of individual banks' asset or risk. Such a flat rate is considered unfair for big banks which tend to have a better risk management, albeit their larger

exposure to the entire banking system. On the other hand, under the flat rate scheme, small banks which tend to have a higher risk for default probably pay less premium than they should have paid. Imposing the same premium rate for all banks implicitly means that risky behaviour is being subsidized by more prudently managed banks (Mcleod Ross 2006, 77).

These propositions bring the flat rate regime in question and it becomes the main motivation of this paper. Should banks with larger risk exposure to the whole banking system be charged more fees? On top, big banks are believed to logically have a better risk management, so do they deserve incentives for that? This paper attempts to assess Indonesian banks' risk profile and then counterfactually simulate a risk-based deposit insurance system for the individual banks. Such scheme will be able to reward more prudently managed banks and to punish banks with risky behaviour at the same time.

This paper postulates two main contributions including one stylized fact and one counterfactual fact. The former reveals that big banks do not necessarily pose lower risks relative to the smaller banks, while the latter incorporates risk-based premium scheme simulation which is currently non-existent yet. The simulation results suggest that a number of banks can be better off as with lower premium, whereas other banks may be worse off as with higher premium. For academicians, the quantitative method used in this paper is applicable for those countries which have many banks in their banking system. And for the policy makers, the facts revealed and formula used here can be considered as a strategy to pursue a more efficient banking system with a higher degree of fairness among banks.

The rest of this paper is structured as follows. The next section revisits the conception of the deposit insurance scheme, then the following describes the methodology. Finally, two next sections discuss the findings and the final section concludes.

## **2. Conception of Deposit Insurance**

### **2.1. Deposit Insurance as a Safety Net**

Banks' risk management in general follows the principles of financial safety nets, consisting of three elements of (i) deposits insurance system, (ii) central bank as lender of last resort, and (iii) prudent regulation framework (Financial Stability Forum, 2001, 7; Yilmaz and Muslumov 2008, 2148). The three elements are expected to contribute to the financial system stability which eventually promotes economic growth.

A deposit insurance system (DIC) plays an important role within the financial system, not only to maintain public trust but also related to bank-runs. It is legally established to explicitly protect eligible depositor's money up to a certain amount of deposits in the event of banks' failure. By design, it guarantees depositor's money in the banks to reduce risks of rush, so that contagious bank-runs can be avoided and social costs due to banking crisis can be minimized (Bernet and

Walter 2009, 8). Hence, this system intentionally aims to promote financial system stability (Anginer and Demirgüç-Kunt 2018, 10; Blair, Carns, and Kushmeider 2006, 6). With the intention of promoting more financial system stability, the system can cover more participation with a higher coverage (Blair, Carns, and Kushmeider 2006, 6).

## **2.2. Explicit vs Implicit System**

In practice, there are two schemes for deposit insurance systems, i.e., explicit or implicit (Bernet and Walter 2009, 19; Hoelscher, Taylor, and Klueh 2006, 2). In an implicit system, there are always government's efforts to bail-out bankrupt banks using taxpayer's money (Demirgüç-Kunt, Kane, and Laeven 2008, 408). They tend to do this because during a crisis period, governments usually face heavy pressures to save the banks particularly if they are also shareholders (Demirgüç-Kunt et al. 2014, 4).

Meanwhile, an explicit deposit insurance system is meant to be a banking insurance instrument such that public funds deposited in the banks are solvent and liquid, meaning that the funds can be repaid back at any time (Bernet and Walter 2009, 19; Blair, Carns, and Kushmeider 2006, 7; Hoelscher, Taylor, and Klueh 2006, 2). An explicit deposit insurance system is also a form of government's support to the national banking system. Without an explicit deposit insurer, bank-runs have always become a real risk because of the banking business nature itself which finances illiquid assets through relatively liquid liabilities (Blair, Carns, and Kushmeider 2006, 7; Ketcha 1999, 225).

## **2.3. Deposit Insurer's Funding**

A stable funding is essential for an effective deposit insurance system as well as to maintain public's trust. Insufficient funds may cause delayed resolution of failed banks, raise costs substantially, and worsen deposit insurer's credibility.

## **2.4. Funding**

IADI (2009, 3) discusses three options how a deposit insurer raises funds: (1) ex-ante funding; (2) ex-post funding; and (3) a hybrid approach which combines ex-ante and ex-post. Each option offers advantages and disadvantages. In ex-ante funding, insurer's funds stand-alone and the funds are always available for depositors as compensation when needed, as long as the premium has reflected potential losses and costs incurred (Bernet and Walter 2009, 36; Blair, Carns, and Kushmeider 2006, 11). Ratio between the funds' size and total covered deposits is important to maintain. This ex-ante funding gives advantage of quicker resolution of failed banks compared to ex-post funding which may ensure a better public confidence.

## **2.5. Deposit Insurance Premium**

There are generally two types of deposit insurance premium, i.e. flat rate and risk-based premiums. Under the former, the same ad valorem tariff is applied to all banks. The only

difference between banks is the individual nominal basis. Banks with larger amount of deposits will pay larger fees. This type of premium scheme is uncorrelated with their risk exposure, so that it is considered unfair. Banks with lower risks effectively subsidize banks with higher risks and expenses of loss are distributed unevenly among insured banks (Hoelscher, Taylor, and Klueh 2006, 21; Mumtaz and Jadoon 2018, 3).

On one side the flat rate has a stabilizing effect, but on the other side, it also susceptible to moral hazard problem (Guizani and Watanabe 2016, 16). Banks do not have incentives to improve their risk profiles. In a system without deposit insurer, a risky bank has to offer higher interest rates to attract depositors. In contrast, in a banking system with deposit insurer, depositors need not demand for more interests because the insurer guarantees their deposits regardless of risks they have.

Under risk-based premium, alternatively, the amount of premium incurred by banks is correlated with their risks. That said, each bank poses different abilities to attract depositors. The risk-based premium also has implication of making banks reluctant to take more risky activities since they have to pay more premium. It is then believed that this system will reduce banks' risk exposure and mitigate moral hazard problem (Hoelscher, Taylor, and Klueh 2006, 21; Schich 2009, 72).

There are at least three approaches to determine the risk-based premium as suggested by Gómez-Fernández-Aguado, Partal-Ureña, and Trujillo-Ponce. (2014, 1549), i.e.: (i) using a single indicator; (ii) using a composite indicator; and (iii) using default risk model. The first two stand on the accounting-based indicators as a banking soundness measures such as capital adequacy, asset quality, profitability and liquidity. The difference between them is that the second aggregates adjusted information from various variables (see for example De Lisa et al. 2011, 127).

### **3. Methodology and Data**

This paper combines multiple approach starting from indicators' selection, categorization and composite score's calculation to analysis of variances (ANOVA) and risk-based premium simulation. The ANOVA in particular is applied to the composite risk scores of different groups of banks based on their size class and ownership.

#### **3.1. Selection of Indicators**

This first step of indicators' selection follows the existing literatures such as Ognjenovic (2017, 136) and Gómez-Fernández-Aguado, and Antonio Partal-Ureña (2013); (2014), 1551). They use indicators covering four main banking aspects consisting of capital adequacy, asset quality, profitability and liquidity. Gómez-Fernández-Aguado, and Antonio Partal-Ureña (2013); (2014), 1551) label these aspects as the core indicators. They then add several supplementary indicators

for each aspect. This paper utilizes the same core indicators as theirs and some supplementary indicators are added only on the profitability aspect (see Table 1).

**Table 1.** Selected Indicators for Risk-Based Premium of Deposit Insurance

Classification	Core Indicators		Supplementary Indicators	
	Indicator	Ratio	Indicator	Ratio
<b>Capital Adequacy</b>	Capital Adequacy Ratio (CAR)	$= \frac{\text{Regulatory Capital}}{\text{Risk Weighted Assets}}$		
<b>Asset Quality</b>	Non-Performing Loans (NPL) Ratio	$= \frac{\text{Nonperforming Loans}}{\text{Gross Loans}}$		
<b>Profitability</b>	ROA (return on assets)	$= \frac{\text{Net Income}}{\text{Average Total Assets}}$	ROE (return on equity),	$= \frac{\text{Net Income}}{\text{Shareholder's Equity}}$
			NIM (net interest margin)	$= \frac{\text{Net Interest Income}}{\text{Interest - earning Assets}}$
			Cost to Income Ratio (CIR) or BOPO	$= \frac{\text{Operating Expenses}}{\text{Operating Income}}$
<b>Liquidity</b>	LDR (loan to deposit ratio).	$= \frac{\text{Total Loans}}{\text{Total Deposits + Equity Capital}}$		

Source : Gómez-Fernández-Aguado, *et al*, 2013; 2014 (modified)

### 3.2. Categorization and Threshold

The selected indicators are then categorized into five groups based on each indicator's distribution for the entire sample of 75 banks from 2008q1 to 2019q3 and five different scores are assigned subsequently. The lowest score is 1 (very low risk) and the highest score is 5 (very high risk). The grouping is conducted based on value distribution percentile for each indicator following European Commission method used in Gómez- Fernández-Aaguado, and Antonio Partal-Ureña (2013, 2014, 1552). Such method is recognized as a nonparametric method since there are no parameters to be estimated.

One important highlight is that the indicators have two different characteristics. One group has characteristic of the larger the better, i.e. Capital Adequacy Ratio (CAR), Return on Assets (ROA), Return on Equities (ROE), and Net Interest Margin (NIM). The other group has the opposite characteristic of the lower the better, i.e. Non-Performing Loan (NPL), Cost-to-Income Ratio (CIR) or Operational Expense over Operational Income (BOPO), and Loan-to-Deposit Ratio (LDR). Table 2 presents the score clustering and thresholds for each selected indicator in more detail.

**Table 2.** Risk Profile and Threshold

Classification	Ratio	Profile and Thresholds				
		1 (very low)	2 (low)	3 (medium)	4 (high)	5 (very high)
<b>Capital Adequacy</b>	<b>CAR (%)</b>	21.49	17.74	15.69	13.34	<13.34
	(%, percentile)	60-100	40-60	25-40	10-25	0-10
<b>Asset quality</b>	<b>NPL (%)</b>	1.00	2.10	3.70	6.00	<6.00
	<b>ROA (%)</b>	3.27	2.31	1.58	0.79	<0.80
<b>Profitability</b>	(%, percentile)	80-100	60-80	40-60	20-40	0-20
	<b>ROE</b>	21.50	13.78	8.47	4.13	<4.14
	(%, percentile)	80-100	60-80	40-60	20-40	0-20
	<b>NIM</b>	7.27	5.80	4.96	4.05	<4.08
	(%, percentile)	80-100	60-80	40-60	20-40	0-20
<b>Liquidity</b>	<b>BOPO</b>	70.76	79.60	86.09	93.39	>93.34
	(%, percentile)	0-20	20-40	40-60	60-80	80-100
	<b>LDR</b>	72.40	82.73	89.76	98.76	>99.08
(%, percentile)	0-20	20-40	40-60	60-80	80-100	

Source: Gómez-Fernández-Aguado, *et al*, 2013; 2014 (modified)

### 3.3. Weights and Composite Scores

Next step is to give weights for each indicator and assign weighted composite risk profile for all indicators. The weighting method is based on principal component analysis (PCA) which is a latent model. This PCA method assesses collinearities or commonalities among individual indicators and then structures composite indicators which capture as much general information as possible of individual indicators. Hence, the weights assigned are more statistically based. There are two stages in determining the weights where the weights for profitability indicator are firstly estimated and then the composite score for profitability follows formula:

$$I_{profitabilitas} = w_1ROA + w_2ROE + w_3NIM + w_4BOPO \quad (1)$$

where  $I_{profitabilitas}$  is the composite score for profitability resulted from the weighted average of the four sub-indicators.  $w_1$  to  $w_4$  are the respected weights for each sub-indicator. The second stage is estimating the weights for each of capital adequacy, asset quality, profitability, and liquidity following formula:

$$I_{risiko} = w_{car}modal + w_{npl}kualitas + w_{pro}profitabilitas + w_{ldr}likuiditas \quad (2)$$

where  $I_{risiko}$  is the weighted average composite score of the four indicators.

### 3.4. Risk Profiling and Premium Simulation of Individual Banks

Equations (1) and (2) are then applied to each of 75 banks for each period of realized data. The weighted average composite score is eventually used for simulation of effective tariff for risk-based deposit insurance premium. Based on this effective rate, several scenarios are then simulated from a base premium to several other different scenarios for each bank. The costs of annual risk-based premium of individual banks are finally estimated thereafter.



### 3.5. Analysis of Variances (ANOVA)

The ANOVA method used here is mean equality test with idea of testing hypothesis of each subgroup having the same risk level. Variations between groups have to equal to variation within groups. Sums of squared between and within groups are defined as:

$$SS_B = \sum_{g=1}^G n_g (\bar{x}_g - \bar{x})^2 \quad (3)$$

$$SS_w = \sum_{g=1}^G \sum_{i=1}^{n_g} (x_{ig} - \bar{x}_g)^2 \quad (4)$$

where  $x_{ig}$  is  $i$ -th observation in subgroup  $g$  and  $i = 1, \dots, n_g$  for group  $g = 1, 2, \dots, G$ . Meanwhile,  $\bar{x}_g$  is the sample average of  $g$  and  $\bar{x}$  is the whole sample average.  $F$  – statistic for mean equality testing follows formula:

$$F = \frac{SS_B/(G-1)}{SS_w/(N-G)} \quad (5)$$

where  $N$  is the total number of observations and  $F$  – statistic has  $F$  distribution with numerator's degree of freedom of  $(G - 1)$  and denominator's degree of freedom of  $(N - G)$ .

The  $F$  – statistic testing is next carried out to two categories of banks. First is based on group of size or the so called BUKU<sup>1</sup>, which consists of four groups of banks of BUKU I, II, III, dan IV. Second is based on banks' ownership which consists of six groups of state owned banks, private commercial banks allowed for foreign exchange transaction, private commercial banks not-allowed for foreign exchange transaction, regional government-woned banks, subsidiaries of state owned banks, and foreign banks.

### 3.6. Data

All data used in this paper is secondary data sourced from the Indonesian Financial Services Authority (OJK) and publication reports of individual banks. The sample periods cover quarterly data ranging from 2008q1 to 2019q3.

## 4. Profiling and Assessment of Risk

### 4.1. Analysis of Banking Risk Indicators

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<sup>1</sup> BUKU = *Bank Umum Kegiatan Usaha* (Commercial Bank Business Activities) is classification of banks based on their core capitals: BUKU I – less than Rp1 trillion; BUKU II - Rp1 to Rp5 trillion; BUKU III- Rp5 to Rp30 trillion; BUKU IV – more than Rp30 trillion (Regulation of Bank Indonesia No. 14/26/PBI/2012 on Business Activities and Offices Network Based on Banks' Core Capital)

Risk assessment in this research is conducted based on five levels of risk from 1 to 5, i.e., very low, low, medium, high, and very high, respectively (see Table 2). Since the composite risk score is obtained from the banking performance indicators, individual banks' strengths and weaknesses can be then analysed through each indicator of capital adequacy, asset quality, profitability, and liquidity. Comparing the composite risk score with each banking performance indicator will map the banking risk profile. Table A1 in Appendix column 5 to 11 displays individual banks' sub-indicators on average between 2018q3 and 2019q2. This selected particular period is meant to give the whole picture for one-year period as well as to avoid the seasonal effect of a quarterly data series. The average number of each individual bank is then compared with the thresholds in Table 2 to get the heat map picture in Table A1 in Appendix.

### ***Indicator of Capital Adequacy***

One essence of a prudent regulation in the banking sector is to ensure that all entities are solvent so as being required to meet a minimum capital requirement. This regulation on capital requirement which refers to Basel II and III is designed to cover potentially incurred losses due to credit risk, market risk, and operational risk. An increase in CAR indicates a better bank's solvency which may in turn affect financial system stability (Gómez- Fernández-Aguado, Partal-Ureña, and Trujillo-Ponce. 2014, 1553).

In terms of this solvency aspect, 46% of 75 banks in this research (accounted for 35 banks) posture very low risk. It means that these banks have CAR above threshold or minimum requirement. Out of the 35 banks, 57.1% or 20 banks are BUKU II, while there are only 2 big banks (BUKU IV) out of 6 being sorted into this category (see Table 3).

**Table 3.** Weighting Based on PCA

Indikator		Weight	
		Core Indicators	Supplementary Indicators
Capital Adequacy	CAR	32.53%	
Asset quality	NPL	26.63%	
Profitability		20.96%	
	ROA		62.08%
	ROE		19.84%
	NIM		11.87%
	BOPO		6.20%
Liquidity	LDR	19.88%	

Source: authors' estimation

### ***Indicator of Asset Quality***

This indicator measures bank's ability to manage and control credit risk correlated to banks' claims over disbursed loans. The claim is commonly the majority of banks' assets as well as the banks' core business. NPL is the main indicator which reflects the assets' quality in credit

portfolio. A higher NPL ratio signals a deteriorating quality of banks' credit portfolio (International Monetary Fund 2019, 89), despite the fact that NPL IA a backward looking indicator or it always comes later after a problem arises (Gómez- Fernández-Aguado, Partal-Ureña, and Trujillo-Ponce. 2014, 1553). Based on this indicator, there are only 9 of 75 banks in this research which pose a very low risk at which 3 banks are BUKU III, 5 banks are BUKU II, and 1 bank is BUKU I. The rest varies from 16 banks with low risk to 4 banks with very high risk. This result indicates that big banks do not necessarily have lower credit risks.

### ***Indicator of Profitability***

This indicator informs banks' profitability relative to their total assets which measures how efficient those banks in managing assets to generate income (International Monetary Fund 2019, 90). It then potentially amplifies banks' capital, covers losses in the future, builds assets and/or provide dividends (Gómez-Fernández-Aguado, Partal-Ureña, and Trujillo-Ponce. 2014, 1555). One main indicator of profitability is ROA whereby a bank with combined low profitability and high credit risk is vulnerable to macroeconomic shocks (Aspachs et al. 2007, 127). As a result, it then may affect the whole financial system stability. ROA can also be complementary with ROE as a supplementary indicator which is also useful to measure banks' efficiency in utilizing their capital. The other useful supplementary indicators are NIM and CIR or BOPO. NIM measures parts of net interest income (interest income minus interest cost). This ratio relatively measures the importance of how much revenues are generated from banks' intermediation mobilizing savings for investments (International Monetary Fund 2019, 91). Although a higher NIM ratio indicates a lower market's efficiency (Dabla-Norris and Floerkemeier 2007, 5), it shows on the other hand that banks have better financial position which means a lower risk. Meanwhile, CIR (BOPO) which is also known as efficiency ratio measures how efficient banks' productivity is. A higher number is associated with a lower productivity and efficiency (Burger and Moormann 2008, 86) since the banks' space to spur credits gets more limited.

In terms of the profitability indicator of 75 banks in this research, there are 9 banks which show very low-risk profiles based on the ROA solely, while 20 banks pose very high risk. Meanwhile, based on ROE only, there are no banks with very low risk, but at least 18 banks pose low risk which indicate a relatively decent efficiency in utilizing capital. In contrast, there are 20 banks for each of high risk and very high risk, respectively. Similar pictures can be drawn from NIM and CIR indicators. This result indicates that profitability is considered as the weakest aspect in Indonesian banking system. It is not surprising, though bearing in mind the number of banks in Indonesia which creates a high competition among them.

### ***Indicator of Liquidity***

This liquidity indicator measures the banks' ability to repay back all due liabilities. One main indicator here is LDR at which a higher number indicates a lower ability of banks to cover any unforeseen fund requirements. In other words, the banks posture a higher risk. Out of 75 banks

in this research, the risk stemming from LDR varies across samples. Six banks show very low-risk profiles and 15 banks signal low-risk profiles or their LDR levels are better than the threshold. On the contrary, there are 43 banks with high to very high-risk profiles. In other words, these banks have a relatively tighter liquidity compared to the others.

### ***Weighted Composite Risk Profile***

Following risk profiling of each indicator for individual banks as shown in Table A1 in Appendix column 12 to column 18, individual banks' risk behaviour as a whole can then be described based on the composite risk score. This composite risk score for individual banks is composed of risk score of each indicator weighted by principal component analysis (PCA) method. The estimated weights are presented in Table 3.

The resulted composite risk scores of 75 banks in this research can be mapped into four groups as follows:

- (1) Very low to low-risk group (composite scores of 1–2 after being rounded) categorized as group with the lowest risk among the entire sample. There are 10 banks which are labelled as this category and the lowest composite risk score is experienced by BPD Kalimantan Tengah which is a bank of BUKU II and the highest composite risk score in this group is experienced by BPD Jambi (also bank of BUKU II). Bigger banks in this group are BCA (bank of BUKU IV) and bank Mega (bank of BUKU III).
- (2) Low to medium risk group (composite scores of 2–3 after being rounded). In this group, there are 41 banks with the lowest composite risk score experienced by Bank Mestika Dharma which is a bank of BUKU II and the highest composite risk score in this group is experienced by Bank CTBC Indonesia (also bank of BUKU II). Most banks in this group are banks of BUKU II (22 banks) and banks of BUKU III (11 banks). Five big banks of BUKU IV, i.e., BRI, Bank Mandiri, BNI, CIMB Niaga, and PAN Indonesia are also in this group. The rest in this group are three banks of BUKU I or the smallest scale banks in the Indonesian banking industry.
- (3) Medium to high-risk group (composite scores of 3–4 after being rounded) covering 18 banks. These 18 banks consist of 6 banks of BUKU III, 8 banks of BUKU II, and 4 banks of BUKU I.
- (4) High-risk group (composite scores of four after being rounded). In this group, there are two banks of BUKU III, three banks of BUKU II, and one bank of BUKU I.

Referring to the above results, premise that big banks tend to have lower risk or better risk management compared to the small banks can be neglected.

## 4.2. Analysis of Variances (ANOVA)

To analyse further comparison of the risk profiling between different categories of banks, this research carries out analysis of variances in the composite risk scores based on two categories. First is based on group of size or the so-called BUKU, which consists of four groups of banks BUKU I, II, III, dan IV. Second is based on banks' ownership which consists of six groups of state-owned banks, private commercial banks allowed for foreign exchange transaction, private commercial banks not-allowed for foreign exchange transaction, regional government-owned banks, subsidiaries of state-owned banks, and foreign banks. Again, one thing to remember is that the risk scores in this paper are not absolute risk levels, but relative risk measurements in comparison to the other banks in the sample.

### 4.2.1. ANOVA Based on BUKU

Table 4 presents statistics of the composite risk scores per category of BUKU and indicates that the highest risk is experienced by bank of BUKU III or the second-largest size of banks' group. On the other side, bank of BUKU II have the lowest composite risk score on average of 2.62, even lower than the score of BUKU IV banks. In other words, BUKU II banks on average show a lower risk than the larger BUKU IV banks. According to this result, the order of banks groups from the better risk management on average are banks of BUKU II, IV, I, and III, respectively.

**Table 4.** Statistics of risk scores by BUKU

Category of BUKU	Number of observations	Average risk scores	Standard deviation
1	470	2.67	0.75
2	1692	2.62	0.85
3	1081	2.78	0.78
4	282	2.63	0.58
Total	3525	2.68	0.80

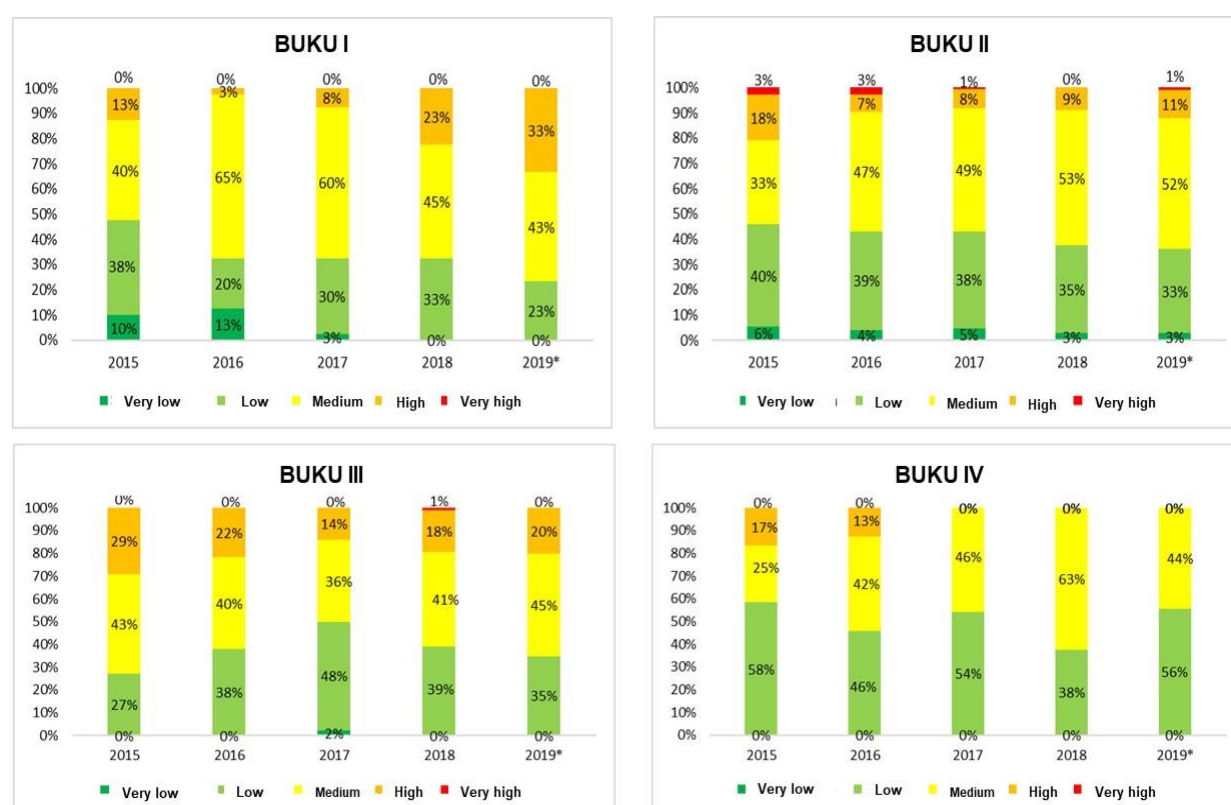
Source: Authors' estimation

For further analysis, Figure 1 displays the risk distribution per BUKU for the last 5-year period (2015–2019q3). The percentage numbers are proportion of risk per category. For example, 10% of BUKU I in 2015 at very low risk means as much as 10% of BUKU I banks in 2015 postures very low risk. Between 2015 and 2016, there was a decline in risk for all groups of banks, from BUKU I to BUKU IV banks. As part of the financial system, banking sector is also susceptible to macroeconomic shocks. Signified macroeconomic shocks in 2015 were such as China's currency devaluation and the Fed's monetary policy shift which hiked the monetary policy rate for the first time since the global financial crisis in 2008. On the other side, there was a positive catalyst from the Indonesian domestic economy in 2016, i.e. tax amnesty programme which brought in liquidity to the banking system.

From 2017 to 2018, overall banks' risk rose. Proportion of banks with high risk of BUKU I, II, and III increased between these periods. At the same time, for banks of BUKU IV, the proportion of banks with low and medium risks shifted from 54% to 46% in 2017 to 38% and 62%,

respectively in 2018. This gave overall picture of escalating risks across all groups of banks during the period. Main sources of the pressures were trade war between the US and China and again the Fed's monetary policy's moves.

Between 2018 and 2019, there seemed to be an anomaly where banks of BUKU I, II, and III experienced a risk's increase, whereas banks of BUKU IV experienced a declining risk. The proportion of high-risk banks of BUKU I, II, and III rose from 2018 to 2019. Conversely, the proportion of medium risk banks of BUKU IV decreased from 62% in 2018 to 44% in 2019 and the proportion of low-risk banks went up from 38% in 2018 to 56% in 2019. This finding indicates that there could be a positively idiosyncratic factor that only affected big banks. Nevertheless, a further analysis is needed since the sample period of 2019 just covers three quarters, not the whole year of 2019.



**Figure 1.** Distribution of risks by BUKU  
Source: Authors' estimation.

#### 4.2.2. ANOVA Based on Banks' Ownership

In this subsection, test of equality of means is conducted on banks based on their ownerships, i.e. state-owned banks, private commercial banks allowed for foreign exchange transaction, private commercial banks not-allowed for foreign exchange transaction, regional government-owned banks, subsidiaries of state-owned banks, and foreign banks. Over all sample observations, regional government owned and foreign banks have the lowest average risk scores (see Table 5). On the other hand, subsidiaries of state-owned banks have the highest average risk score. These banks consist of Bank Syariah Mandiri, BRI Syariah, BRI Agro, dan Bank Mandiri

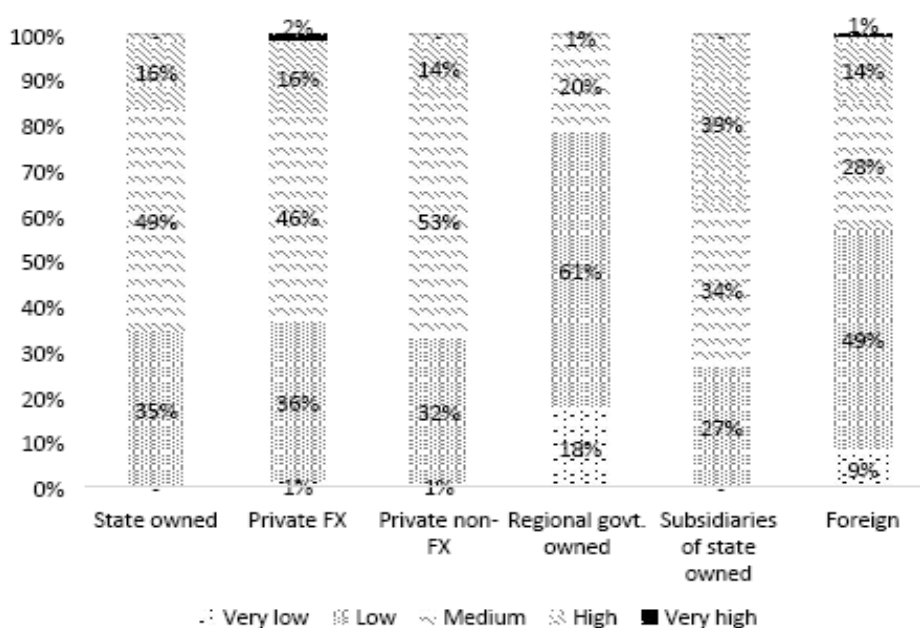
Taspen. The high-risk score can be explained by their business activities. Sharia banks by nature have relatively higher risk compared to conventional banks, while banks like BRI Agro posture high risk because its credit is mostly disbursed to CPO commodity sector which is susceptible to commodity price fluctuation.

For further analysis, Figure 2 presents the risk distribution by ownership of all samples. The percentage numbers are proportion of risk per category. For the whole sample, most state-owned banks and private banks posture medium risk, while regional governments and foreign banks pose lower risk. Additionally, subsidiaries of state-owned banks posture medium-high risk. Moreover, from 2018 to 2019q3 solely, development of risks varied across banks. For instance, 63% of medium risk state-owned banks improved, but others deteriorated within the period. Regional governments' banks, subsidiaries of state-owned banks, and private banks showed the same pattern. Different from the pattern, foreign banks showed overall improvement with medium risk banks improving to low risk.

**Table 5.** Statistics of risk scores by banks' ownership

Category of Ownership	Number of observations	Average risk scores	Standard deviation
State owned banks	188	2.82	0.69
Private banks FX	1927	2.81	0.76
Private banks non-FX	423	2.81	0.68
Regional government owned banks	611	2.05	0.65
Subsidiaries of state owned banks	188	3.13	0.80
Foreign banks	188	2.49	0.86
Total	3525	2.68	0.80

Source: Authors' estimation



**Figure 2.** Distribution of risks by banks' ownership of all samples 2008q1-2019q3  
Source: Authors' estimation

## 5. Counterfactual Analysis of Risk-Based Premium

Finally, this section discusses simulation results of risk-based deposit premium for individual banks which cover: (i) tariff set up, and (ii) comparison of costs for banks between flat-rate and risk-based rate.

### 5.1. Simulating the Risk-Based Deposit Premium

#### 5.1.1. Tariff Set Up

The composite risk scores are here used to simulate a couple of different scenarios of premium tariff with 0.10%, 0.15%, 0.20%, 0.25%, and 0.50% as the base premium rates. Each of these base premium rates is multiplied with the risk scores of each bank to obtain the deposit premium for individual banks.

Those base premium rates are meant to keep revenue neutrality for LPS. It means that if the premium tariff system shifts from flat-rate to risk-based rate, the LPS's revenue based on the existing system will not be noticeably affected. The base premium rates also hold assumption of no different risks that banks have to pay in order LPS to meet its revenue target (Bretschneider and Benna 2017, 64). A similar move had been experienced by the European Banking Authority in 2014 which was branded as contribution rate. This contribution rate applied identical rates for all participating banks for certain years. Another important thing to consider is the regulations ruling on LPS premium tariff's set up. Referring to the Law of LPS, a risk-based deposit premium rate can be implemented as long as the gap between the lowest and the highest is not more than 0.5%.<sup>4</sup> Combining this regulation with the simulation results in Table A2 in Appendix column 6 to 10, there are two suggested options, i.e., 0.10% and 0.15% which yield gaps of 0.31% and 0.47%, respectively. Albeit so, it cannot also be neglected to consider the implication to the banks' costs. Therefore, a base rate of 0.10% is more appealing than a base rate of 0.15%. It can still be lower than 0.10% though.

#### 5.1.2. Deposit Insurance Premium

The deposit insurance premium is calculated by multiplying risk-based premium rate with banks' third-party funds presented in Table A2 in Appendix column 11 to 13. Based on the results, banks with lower composite risk scores will pay lower deposit insurance premiums and vice versa. For illustration, BPD Kalimantan Tengah which has the lowest score will be charged the lowest premium rate of 0.124% compared to the existing flat-rate scheme of 0.20% or the bank can save about 38%. A similar story will be experienced by other nine banks, i.e. Bank Mega, BCA, BPD Jawa Timur, BPD Kalimantan Barat, BPD Lampung, BPD Sulawesi Tengah, Citibank NA, BPD Sulawesi Selatan – Sulawesi Barat, dan BPD Jambi. Conversely, banks with higher risk will have to pay premiums higher than based on flat-rate scheme of 0.20%.

To sum up, the risk-based premium scheme will reward banks with better risk management, while on the other side punish banks with less prudent management. Meanwhile



for LPS, the risk-based premium scheme will not lower their deposit premium revenue. Based on the calculation for 75 banks in the sample, LPS will generate more premium revenues based on risk-based scheme than based on flat-rate scheme.

## 6. Conclusion

Risk-based premium scheme can be a reliable system to determine fairer deposit insurance premium since it has accounted for a broad aspect covering capital adequacy, asset quality, profitability, and liquidity. The research results show that big banks do not necessarily have better risk management. Banks of BUKU II are found to posture lower composite risk scores on average compared to banks of BUKU III and IV. Based on their ownership, banks of subsidiaries of state-owned banks pose the highest risk on average, while regional-government-owned banks display the lowest risk. In addition, referring to the premium simulation, the risk-based premium scheme will reward banks with better risk management, while on the other side punish banks with less prudent management. This reward and punishment scheme can be beneficial for the whole Indonesian banking system. Banks with higher risk profile will have to pay relatively higher premium, implying that those with limited capital may be forced to consolidate with other banks unless the owners are willing to inject more capital. On one side this is not good news for some banks, but on the other side, the whole banking system in the country may become more efficient as the number of banks reduce.

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**Table A1.** Profile of indicators and risks of individual banks.

No.	Banks	BUKU	Capital adequacy	Asset quality	Profitability				Liquidity	Risk Profile						
			Average, 2018 - 2019							Average, 2018 - 2019						
			CAR	NPL	ROA	ROE	NIM	CIR	LDR	CAR	NPL	ROA	ROE	NIM	CIR	LDR
(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
1	BPD Kalimantan Tengah	2	28.9	0.4	3.8	17.1	8.2	70.0	78.9							
2	Bank Mega	3	22.8	1.8	2.6	13.9	5.2	76.0	69.7							
3	Bank Central Asia	4	23.7	1.4	3.8	17.4	6.2	61.6	80.6							
4	BPD Jawa Timur	3	23.7	3.7	3.4	20.1	6.4	65.1	63.6							
5	BPD Kalimantan Barat	2	24.3	1.9	2.8	15.8	7.2	74.7	77.7							
6	BPD Lampung	1	18.0	1.0	2.1	20.8	5.3	78.4	70.8							
7	BPD Sulawesi Tengah	1	26.7	1.8	2.2	13.9	6.0	78.5	79.6							
8	Citibank NA	3	23.9	2.3	4.1	16.2	5.8	85.1	79.0							
9	BPD Sulawesi Selatan - Sulawesi Barat	2	23.1	0.7	3.5	21.0	6.2	68.7	101.5							
10	BPD Jambi	2	20.9	0.6	2.5	19.1	6.0	79.3	86.1							
11	Bank Mestika Dharma	2	35.6	2.4	3.3	9.9	6.6	66.1	86.4							
12	Bank Bumi Artha	2	25.3	1.6	1.3	5.1	4.1	86.1	81.5							
13	Bank BNP Paribas Indonesia	3	30.4	0.0	2.4	9.5	2.9	92.1	159.3							
14	Bank Tabungan Pensiunan Nasional (BTPN)	3	23.6	1.0	1.7	8.6	6.8	87.2	120.5							
15	Bank SBI Indonesia	2	37.9	2.0	3.7	9.5	4.5	58.7	112.9							
16	Bank ANZ Indonesia	3	35.3	1.8	4.0	9.4	5.1	88.8	127.5							
17	Bank Mandiri Taspen	2	21.1	0.6	2.7	19.5	6.5	79.6	102.3							
18	Bank of America, N.A	2	60.4	0.0	2.1	5.6	3.0	97.2	120.2							
19	Bank Daerah Khusus Ibukota (DKI) Jakarta	3	26.8	3.2	2.1	9.7	5.4	77.1	89.4							
20	BPD Jawa Barat dan Banten (BJB)	3	17.9	1.7	1.9	18.5	6.1	82.5	89.0							
21	Bank Ina Perdana	2	54.7	2.9	0.3	0.7	4.3	95.7	67.5							
22	Bank Woori Saudara Indonesia 1906	2	22.0	2.0	2.6	13.1	4.7	69.7	140.8							
23	Bank Danamon Indonesia	3	22.7	3.1	2.8	10.2	5.8	72.6	96.0							
24	Bank Negara Indonesia (BNI)	4	18.5	1.9	2.7	15.8	5.1	70.9	90.3							
25	BPD Jawa Tengah	3	17.9	2.2	2.4	20.3	6.1	76.8	88.2							
26	Bank Maspion Indonesia	2	21.5	2.0	1.3	5.4	4.5	86.9	97.7							
27	BPD Daerah Istimewa Yogyakarta	2	20.9	4.5	3.0	16.2	7.3	69.1	82.6							
28	Bank Rakyat Indonesia (BRI)	4	21.2	2.3	3.5	19.6	7.2	69.7	92.1							
29	Bank Capital Indonesia	2	18.2	2.9	0.8	8.0	3.7	93.8	53.5							



66	Bank Tabungan Negara	3	17.7	3.1	1.2	12.9	3.9	87.6	110.7										
67	Bank Windu Kentjana - CCBI	2	16.1	2.8	0.6	3.2	4.2	94.6	91.3										
68	Bank Bukopin	3	13.3	5.7	0.3	4.3	2.6	96.9	86.2										
69	Bank Yudha Bhakti	1	20.5	10.6	0.4	2.0	5.4	99.0	100.9										
70	Bank Mayapada International	3	14.8	5.0	0.8	8.4	3.7	91.6	90.6										
71	Bank ICBC Indonesia	3	16.8	4.2	0.3	2.5	2.0	94.0	122.6										
72	Bank Muamalat Indonesia	2	12.3	4.2	0.1	1.3	1.7	97.7	72.9										
73	Bank Kesejahteraan Ekonomi.	1	15.7	3.7	0.5	4.9	4.5	96.1	95.0										
74	Bank MNC Internasional	2	15.4	5.8	0.7	5.1	4.0	94.3	89.9										
75	Rabo Bank Internasional Indonesia	2	17.1	6.2	-2.0	-16.7	2.7	127.9	203.7										

1 = very low risk  
  2 = low risk  
  3 = medium risk  
  4 = high risk  
  5 = very high risk

Sumber : OJK, 2020 (diolah penulis)

**Table A2.** Simulation of different scenarios of risk-based vs flat-rate premium.

No.	Banks	BUKU	DPK 2019 (Rp billions)	Composite Risk Score	Base premium and Risk-based premium rates scenarios					Risk-based premium	flate rate = 0.20%	Deviation (%)
					0.10%	0.15%	0.20%	0.25%	0.30%	Premium Value/year (Rp billions)	Premium Value/year (Rp billions)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11) = (6) x (4)	(12) = 0.20% x (4)	(13) = (11) / (12)
1	BPD Kalimantan Tengah	2	6,553.2	1.2404	0.1240%	0.1861%	0.2481%	0.3101%	0.3721%	8.1	13.1	62.0
2	Bank Mega	3	72,790.2	1.5007	0.1501%	0.2251%	0.3001%	0.3752%	0.4502%	109.2	145.6	75.0
3	Bank Central Asia	4	699,304.6	1.5315	0.1532%	0.2297%	0.3063%	0.3829%	0.4595%	1,071.0	1,398.6	76.6
4	BPD Jawa Timur	3	60,545.9	1.5990	0.1599%	0.2399%	0.3198%	0.3998%	0.4797%	96.8	121.1	80.0
5	BPD Kalimantan Barat <sup>*/</sup>	2	15,196.0	1.6747	0.1675%	0.2512%	0.3349%	0.4187%	0.5024%	25.4	30.4	83.7
6	BPD Lampung	1	5,765.0	1.6899	0.1690%	0.2535%	0.3380%	0.4225%	0.5070%	9.7	11.5	84.5
7	BPD Sulawesi Tengah	1	5,781.9	1.8048	0.1805%	0.2707%	0.3610%	0.4512%	0.5414%	10.4	11.6	90.2
8	Citibank NA <sup>*/</sup>	3	54,826.0	1.8238	0.1824%	0.2736%	0.3648%	0.4560%	0.5472%	100.0	109.7	91.2
9	BPD Sulawesi Selatan - Sulawesi Barat	2	15,634.0	1.8616	0.1862%	0.2792%	0.3723%	0.4654%	0.5585%	29.1	31.3	93.1
10	BPD Jambi	2	7,708.7	1.9325	0.1932%	0.2899%	0.3865%	0.4831%	0.5797%	14.9	15.4	96.6
11	Bank Mestika Dharma	2	8,871.0	2.0382	0.2038%	0.3057%	0.4076%	0.5096%	0.6115%	18.1	17.7	101.9
12	Bank Bumi Artha	2	5,932.3	2.0938	0.2094%	0.3141%	0.4188%	0.5235%	0.6281%	12.4	11.9	104.7
13	Bank BNP Paribas Indonesia <sup>*/</sup>	3	5,306.5	2.1470	0.2147%	0.3220%	0.4294%	0.5367%	0.6441%	11.4	10.6	107.3
14	Bank Tabungan Pensiunan Nasional (BTPN)	3	77,492.9	2.2025	0.2202%	0.3304%	0.4405%	0.5506%	0.6607%	170.7	155.0	110.1
15	Bank SBI Indonesia	2	2,534.4	2.2193	0.2219%	0.3329%	0.4439%	0.5548%	0.6658%	5.6	5.1	111.0
16	Bank ANZ Indonesia	3	7,156.4	2.2334	0.2233%	0.3350%	0.4467%	0.5583%	0.6700%	16.0	14.3	111.7
17	Bank Mandiri Taspen	2	19,864.3	2.3301	0.2330%	0.3495%	0.4660%	0.5825%	0.6990%	46.3	39.7	116.5
18	Bank of America, N.A	2	3,290.2	2.3317	0.2332%	0.3498%	0.4663%	0.5829%	0.6995%	7.7	6.6	116.6
19	Bank Daerah Khusus Ibukota (DKI) Jakarta	3	37,301.7	2.3363	0.2336%	0.3505%	0.4673%	0.5841%	0.7009%	87.1	74.6	116.8
20	BPD Jawa Barat dan Banten (BJB)	3	83,339.7	2.3419	0.2342%	0.3513%	0.4684%	0.5855%	0.7026%	195.2	166.7	117.1
21	Bank Ina Perdana	2	4,002.8	2.3460	0.2346%	0.3519%	0.4692%	0.5865%	0.7038%	9.4	8.0	117.3
22	Bank Woori Saudara Indonesia 1906	2	19,065.4	2.3494	0.2349%	0.3524%	0.4699%	0.5874%	0.7048%	44.8	38.1	117.5
23	Bank Danamon Indonesia	3	111,868.9	2.3801	0.2380%	0.3570%	0.4760%	0.5950%	0.7140%	266.3	223.7	119.0
24	Bank Negara Indonesia (BNI)	4	571,075.7	2.4224	0.2422%	0.3634%	0.4845%	0.6056%	0.7267%	1,383.4	1,142.2	121.1
25	BPD Jawa Tengah <sup>*/</sup>	3	62,445.5	2.4651	0.2465%	0.3698%	0.4930%	0.6163%	0.7395%	153.9	124.9	123.3
26	Bank Maspion Indonesia	2	5,354.2	2.4914	0.2491%	0.3737%	0.4983%	0.6229%	0.7474%	13.3	10.7	124.6
27	BPD Daerah Istimewa Yogyakarta <sup>*/</sup>	2	9,730.9	2.4947	0.2495%	0.3742%	0.4989%	0.6237%	0.7484%	24.3	19.5	124.7
28	Bank Rakyat Indonesia (BRI)	4	969,750.0	2.5207	0.2521%	0.3781%	0.5041%	0.6302%	0.7562%	2,444.5	1,939.5	126.0
29	Bank Capital Indonesia	2	16,107.0	2.5245	0.2524%	0.3787%	0.5049%	0.6311%	0.7573%	40.7	32.2	126.2

30	Bank Mizuho Indonesia	3	24,184.0	2.5634	0.2563%	0.3845%	0.5127%	0.6409%	0.7690%	62.0	48.4	128.2
31	BRI Agro <sup>*/</sup>	2	19,703.9	2.5708	0.2571%	0.3856%	0.5142%	0.6427%	0.7712%	50.7	39.4	128.5
32	Bank Multi Arta Sentosa <sup>*/</sup>	2	11,231.0	2.5716	0.2572%	0.3857%	0.5143%	0.6429%	0.7715%	28.9	22.5	128.6
33	Bank Ganesha <sup>*/</sup>	2	3,295.1	2.5756	0.2576%	0.3863%	0.5151%	0.6439%	0.7727%	8.5	6.6	128.8
34	Bank Shinhan Indonesia	2	4,814.7	2.5757	0.2576%	0.3864%	0.5151%	0.6439%	0.7727%	12.4	9.6	128.8
35	Bank Bisnis Internasional <sup>*/</sup>	1	414.1	2.6075	0.2608%	0.3911%	0.5215%	0.6519%	0.7823%	1.1	0.8	130.4
36	BPD Riau dan Kepulauan Riau	2	19,937.1	2.6746	0.2675%	0.4012%	0.5349%	0.6687%	0.8024%	53.3	39.9	133.7
37	Bank Mandiri	4	815,105.5	2.6757	0.2676%	0.4014%	0.5351%	0.6689%	0.8027%	2,181.0	1,630.2	133.8
38	Bank Mayora	2	4,868.2	2.7057	0.2706%	0.4059%	0.5411%	0.6764%	0.8117%	13.2	9.7	135.3
39	Bank Index Selindo	2	7,519.1	2.7577	0.2758%	0.4137%	0.5515%	0.6894%	0.8273%	20.7	15.0	137.9
40	PAN Indonesia	4	122,748.9	2.7588	0.2759%	0.4138%	0.5518%	0.6897%	0.8276%	338.6	245.5	137.9
41	BRI Syariah	2	34,124.9	2.7862	0.2786%	0.4179%	0.5572%	0.6966%	0.8359%	95.1	68.2	139.3
42	Bank QNB Indonesia	2	15,909.4	2.8360	0.2836%	0.4254%	0.5672%	0.7090%	0.8508%	45.1	31.8	141.8
43	Bank Fama International	1	941.6	2.8560	0.2856%	0.4284%	0.5712%	0.7140%	0.8568%	2.7	1.9	142.8
44	CIMB Niaga	4	195,977.2	2.8734	0.2873%	0.4310%	0.5747%	0.7184%	0.8620%	563.1	392.0	143.7
45	Bank KEB Hana Indonesia <sup>*/</sup>	3	26,618.4	2.8973	0.2897%	0.4346%	0.5795%	0.7243%	0.8692%	77.1	53.2	144.9
46	Bank Commonwealth	2	15,452.0	2.9175	0.2918%	0.4376%	0.5835%	0.7294%	0.8753%	45.1	30.9	145.9
47	Bank Syariah Mandiri <sup>*/</sup>	3	90,494.3	2.9194	0.2919%	0.4379%	0.5839%	0.7298%	0.8758%	264.2	181.0	146.0
48	Bank Royal Indonesia <sup>*/</sup>	1	451.1	2.9424	0.2942%	0.4414%	0.5885%	0.7356%	0.8827%	1.3	0.9	147.1
49	Bank OCBC NISP	3	126,221.6	2.9443	0.2944%	0.4416%	0.5889%	0.7361%	0.8833%	371.6	252.4	147.2
50	The Bangkok Bank Comp. Ltd <sup>*/</sup>	3	9,503.8	2.9652	0.2965%	0.4448%	0.5930%	0.7413%	0.8896%	28.2	19.0	148.3
51	Bank CTBC Indonesia	2	11,010.2	2.9695	0.2970%	0.4454%	0.5939%	0.7424%	0.8909%	32.7	22.0	148.5
52	Bank of India Indonesia	2	2,528.6	3.0656	0.3066%	0.4598%	0.6131%	0.7664%	0.9197%	7.8	5.1	153.3
53	Maybank Indonesia	3	111,257.9	3.0830	0.3083%	0.4625%	0.6166%	0.7708%	0.9249%	343.0	222.5	154.2
54	Bank Sinarmas	2	28,219.9	3.2024	0.3202%	0.4804%	0.6405%	0.8006%	0.9607%	90.4	56.4	160.1
55	Bank Artos	1	599.1	3.2039	0.3204%	0.4806%	0.6408%	0.8010%	0.9612%	1.9	1.2	160.2
56	BPD Sulawesi Utara-Gorontalo	1	11,973.9	3.2339	0.3234%	0.4851%	0.6468%	0.8085%	0.9702%	38.7	23.9	161.7
57	Bank Mega Syariah	2	5,763.6	3.2428	0.3243%	0.4864%	0.6486%	0.8107%	0.9729%	18.7	11.5	162.1
58	Standard Chartered Bank	3	32,284.6	3.2496	0.3250%	0.4874%	0.6499%	0.8124%	0.9749%	104.9	64.6	162.5
59	Bank Sahabat Sampoerna	2	9,685.2	3.2996	0.3300%	0.4949%	0.6599%	0.8249%	0.9899%	32.0	19.4	165.0
60	Bank Permata	3	123,013.8	3.3493	0.3349%	0.5024%	0.6699%	0.8373%	1.0048%	412.0	246.0	167.5
61	Bank Artha Graha Internasional	2	20,045.5	3.4027	0.3403%	0.5104%	0.6805%	0.8507%	1.0208%	68.2	40.1	170.1
62	Bank Resona Perdana	2	11,584.2	3.4498	0.3450%	0.5175%	0.6900%	0.8625%	1.0349%	40.0	23.2	172.5
63	Bank Victoria International	2	21,722.1	3.4866	0.3487%	0.5230%	0.6973%	0.8716%	1.0460%	75.7	43.4	174.3
64	Bank UOB Indonesia	3	81,544.5	3.5052	0.3505%	0.5258%	0.7010%	0.8763%	1.0516%	285.8	163.1	175.3
65	Bank Harda Internasional	1	1,970.2	3.5091	0.3509%	0.5264%	0.7018%	0.8773%	1.0527%	6.9	3.9	175.5



66	Bank Tabungan Negara	3	225,400.5	3.5904	0.3590%	0.5386%	0.7181%	0.8976%	1.0771%	809.3	450.8	179.5
67	Bank Windu Kentjana - CCBI	2	12,861.8	3.5930	0.3593%	0.5390%	0.7186%	0.8983%	1.0779%	46.2	25.7	179.7
68	Bank Bukopin	3	75,746.2	3.9691	0.3969%	0.5954%	0.7938%	0.9923%	1.1907%	300.6	151.5	198.5
69	Bank Yudha Bhakti	1	4,066.5	3.9742	0.3974%	0.5961%	0.7948%	0.9936%	1.1923%	16.2	8.1	198.7
70	Bank Mayapada International <sup>*/</sup>	3	75,959.7	4.0248	0.4025%	0.6037%	0.8050%	1.0062%	1.2074%	305.7	151.9	201.2
71	Bank ICBC Indonesia <sup>*/</sup>	3	28,163.0	4.0830	0.4083%	0.6124%	0.8166%	1.0207%	1.2249%	115.0	56.3	204.1
72	Bank Muamalat Indonesia <sup>*/</sup>	2	44,547.3	4.1372	0.4137%	0.6206%	0.8274%	1.0343%	1.2412%	184.3	89.1	206.9
73	Bank Kesejahteraan Ekonomi.	1	3,311.6	4.1430	0.4143%	0.6215%	0.8286%	1.0358%	1.2429%	13.7	6.6	207.2
74	Bank MNC Internasional	2	8,431.3	4.1679	0.4168%	0.6252%	0.8336%	1.0420%	1.2504%	35.1	16.9	208.4
75	Rabo Bank Internasional Indonesia <sup>*/</sup>	2	303.9	4.3493	0.4349%	0.6524%	0.8699%	1.0873%	1.3048%	1.3	0.6	217.5
<b>TOTAL PREMIUM</b>										<b>14,075.9</b>	<b>10,932.2</b>	

Notes: \*/ DPK = dana pihak ketiga (third-party funds); Data until September 2019.

Source: Authors' calculation.