The Relationship Between Debt Securities Issuance and Operational Performance: An Empirical Study of Banks in Indonesia

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Abstract

This study aims to find out what determinants have the most influence in improving bank operational performance, including profit efficiency policies or debt securities issuance. Profit efficiency policy is proxied by net interest margin, which describes the input and output of the bank's production activities as an intermediary institution. Profit efficiency contributes more influence than issuing debt securities. The issuance of bonds is a proxy for bank policy in issuing debt securities. Researchers investigated some views stating that issuing debt is risky since it will negatively affect bank operational performance. This research differs from previous studies in that it used a non-linear test to find the optimal value indicating that additional debt securities issuance can improve bank operational performance. Based on ownership, the samples were separated into two categories, government-owned banks and private banks. The policy of issuing debt securities to private banks shows an inverted U-shape, whereas government-owned banks are U-shaped. This research uses a perceptual map to visualize the implementation of profit efficiency policies and of debt securities issuance in sample banks. This diagram technique will contribute to our understanding of how to implement managerial policies for profit efficiency and issuance debt securities in banks.

Keywords: Bank Performance, Bond, Debt Issuance, Efficiency Profit, Net Interest Margin

JEL Classification Code: E43, G10, G21, G32

1. Introduction

A company's capital structure consists of assets, liabilities, and equity (Allen et al., 2015). The focus of studies on capital structure is to investigate the debt-to-equity ratio. The leverage ratio is located on the right side of the company's balance sheet. Leverage is the company's ability to use assets as a source of funds that possesses a fixed burden to achieve the goal, i.e., maximizing the company owner's wealth (Whiting & Gilkison, 2000). The company will issue any policy to reducing leverage when there is an increase in the cost of debt and vice versa (D'Mello et al., 2018). Past

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profitability is a determinant of the leverage ratio and supports the pecking order theory of capital structure (Krishnan & Moyer, 1996).

The level of capital certainly affects bank operational costs. Banks must provide other alternative sources of funds to channel the credit (Berger & DeYoung, 1997). The capital ratio describes the financial health of a bank. This ratio affects profit efficiency (Niţoi & Spulbar, 2015). Debt provides a positive signal to the market. Funding costs are reduced by minimizing asymmetric information signals between companies and investors (Leland & Pyle, 1977). The pecking order theory states that a firm's funding follows a hierarchy. First, it comes from their own capital and if there are still shortcomings, it is necessary to consider financing from debt.

Bank debt consists of debt to third parties (in the form of savings, current accounts, and time deposit accounts) and originates from interbank loans and bonds. However, to meet funding needs (such as providing loans, both short and long-term), banks are required to find other efficient funding alternatives. Efficient funding will occur if the company has an optimal capital structure (Mosko & Bozdo, 2016). Corporate bonds are a source for companies in the form of long-term debt instruments issued by the companies

to investors (bondholders) (Thukral et al., 2015). Bond is funding as long-term debt instruments issued by the corporations or companies to investors or fixed-income securities. Bonds offer a fixed cash flow (coupon) that is paid regularly as a return with a predetermined formula, as well as principal amount on maturity. As an intermediary institution, banks need funds to finance credit expansion and business development to repay maturity debt. The regression results show that the capital structure is inversely proportional to bank performance. The result implies that banks are too dependent on short-term debt and have not optimized their bond financing activities (Awunyo-Vitor & Badu, 2012).

Banks that issue bonds are an implication of refinancing the maturity structure of debt. Refinancing has an impact on improving bank performance (Xu, 2018). In addition, financial sector and financial services are the sectors, which mostly contribute to the issuance of corporate bonds in Indonesia. Banks face trade-offs in using high capital ratios to improve bank health and safety (Duasa et al., 2014). Issuance of debt securities (bonds) is preferred because it is considered a cheaper source of funds (than equity) (Pessarossi & Weill, 2013). The banking sector dominates the issuance of bonds on the capital market. It proves that the capital market acts as a means of finding alternative funding sources. Moreover, banks need alternative sources of funding to deal with various possible decreases in internal liquidity. Internal liquidity usually sources from third-party funds whose growth tends to decline amid potential increases in inflation and lower deposit rates. As an intermediary institution, banks need sufficient capital to increase credit expansion and comply with regulatory standards from Bank Indonesia. This system is more efficient since it is a direct act without using any financial intermediaries in promoting long-term economic growth (Berger & Sedunov, 2017).

It is essential to note that factors causing bank bonds issuance are still debated in the literature (Astrauskaite & Paškevicius, 2014; Benzion et al., 2018; González, 2015; Jiang et al., 2001; Kaya & Wang, 2016; Martellini et al., 2018) and profit efficiency (Caporale et al., 2017; Doyran, 2013; Haque & Brown, 2017; Shawtari et al., 2019). This study differs from previous studies regarding efficiency, which were analyzed using Data Envelopment Analysis (DEA Method) (Dimitras et al., 2018; Othman et al., 2017; Thilakaweera et al., 2016; Vo et al., 2020).

The purpose of this study was to investigate the determinants that bring impacts on the improvement of bank operational performance. The novelty in this study is to use perceptual map to visualize the implications of debt issuance policy and profit efficiency on bank samples. The use of diagrammatic technique distinguishes this research from the previous studies.

The second objective was to investigate the two most effective policies, namely, the efficiency of earnings or

bond issuance. The researchers tested the statement saying that more debt issuance will harm company performance (Myers, 1977). Non-linear test was conducted to obtain the optimal determination of bond issuance value, which may cause a decrease in bank operational performance. Third, this study examined the effect of policies that have the most influence on bank operational performance. Furthermore, the data were separated into two categories, government-owned banks and private banks. The categorization or separation of the data was done to determine if there were any differences on the effect of implementing bond issuance policy.

This study is expected to contribute to provide an understanding that banks can implement profit efficiency and issue bonds policies to improve their operational performance. This study found the differences in the effect of bond issuance policies at government-owned banks and private banks. The influence of bond issuance policy setting on improving operational performance in private banks is in the form of an inverted U-shaped curve. In contrast, government-owned banks result in the form of a U-shape.

2. Literature Review

Bank asset is a resource, which functions to finance bank operational activities in distributing credit. Moreover, asset is a description of wealth that contains economic value, selling value, and exchange value. Operational performance is defined as the acts of implementing all company policies in a certain period (Djalilov & Piesse, 2016; Fama & French, 1998). In addition, bank's performance is one of the profitability indicators of bank activities as an intermediary institution. Meanwhile, ROA is a manifestation of the implementation of how banks use assets as a source of investment to generate profits (Abdul-Rahman et al., 2018; Terraza, 2015; Yasser et al., 2017). ROA is an implementation of how banks use their resource to made profits. Most of banking performance studies uses ROA as a measurement tool. ROA functions as an accounting-based indicator (Lo Duca et al., 2016; Saghi-Zedek, 2016). Moreover, ROA can be used to measure bank operational performance which functions to see the differences in assets that occur during the financial year (Bian & Deng, 2017; Kosmidou & Tanna, 2005; Lestari, Wahyudi, Muharam, & Ariyanto, 2020; Ozili & Uadiale, 2017). Based on the Profitability Factor Assessment Indicators listed in Appendix I of the Financial Services Authority Circular Letter Number 14/SEOJK.03/2017 (Local term: *Surat Edaran Otoritas Jasa Keuangan Nomor 14 / SEOJK.03 / 2017)* concerning Ranking of the Strength of Commercial Banks, Bank performance is measured by the size of bank's profitability.

To strengthen the structure of bank's funding and to increase loans, banks issue debt securities. Based on the

pecking order theory (Myers & Majluf, 1984), liability management is the process done by banks to obtain non-traditional sources of funds by seeking loans on the money market or issuing debt securities (in the form of stocks, bonds, commercial paper, etc.) on the capital market. Bank can be defined as an intermediary institution, which manages its liabilities to finance its operational needs (OJK, 2016). In some developing countries, they have begun to intensify the issuance of bonds as an alternative to bank credit and foreign currency debt as a source of funding (Arnold & Soederhuizen, 2018; Jermias & Yigit, 2019; Trinh et al., 2020).

The issuance of bonds is a proxy for bank policy in issuing debt securities. Bond issuance is the bullet loans in which the payments use the balloon payment mechanism. It is a long-term amortization funding where the issuer will pay several coupons each year, while on the due date or according to the agreement (Acharya et al., 2013). This payment arrangement type is beneficial for banks which expect large cash flows for their operational needs as intermediary institution (Mukherjee, 2012). Banks can prepare funding before the debt maturity date (refinancing) by applying bond issuance policy (Forte & Peña, 2011; Xu, 2018).

The advantage of issuing debt securities compared to bank loans is that companies can reduce interest costs because there is no difference in interest margins due to intermediary fees charged by banks (Lin et al., 2013). Secondly, bond loan is longer-term than a bank loan (Kwan & Carleton, 2010). Thus, it is more flexible for to build the desired capital structure (Ho & Wang, 2018). Third, there is no capital amortization while the company's cash flow burden is lower. The issuance of bonds has a fixed term and the equity vise-versa (Norden et al., 2016). The increase in bond financing in developing countries affects companies' dependence on bank financing. The fact shows that the decline in world interest rates causes companies to consider issuing bonds. This situation causes bank credit to be relatively more expensive which consequently cause a decrease in bank capital (Chang et al., 2017).

Furthermore, this study used the measurements Bonds to Long Term Debt (BLTD) from (Benzion et al., 2018). BLTD is equal the book value of companies' bonds to the book value of companies' long-term debt. The results showed that companies, which increase their long-term debt, tend to increase outstanding bond and vice versa. The finding of this study confirms the hypothesis stating that the higher the level of long-term debt is, the higher the level of bond issuance will be and vice versa. The source of bank funding with bonds can improve bank performance. In addition, alternative sources of bank funding with bonds can improve bank performance (Astrauskaite & Paškevicius, 2014). Corporate actions with resolutions need to be implemented based on expansion

strategy considerations. Banks must take strategic steps to move efficiently to take advantage of momentum and opportunities for growth and expansion of the company's business reach. These bonds financing is to maintain capital adequacy ratio (CAR). Moreover, bank operational funding by issuing bonds has increased due to a decrease in bond interest rates; thus, bank interest margins are higher. This affects the improvement of bank performance (Çelik & Demirtaş, 2015).

H1: *Debt securities issuance policy has a positive effect on bank operational performance.*

According to the Production Theory, bank liabilities can be stated as an input characteristic because they are considered as source of funds. Assets represent output characteristics because they use funds to generate most of the bank's direct income. Total assets, productive assets, total deposits, current accounts, number of savings and loan accounts, gross operating income can be used as an output measurement (Benston, 1972). Productive assets as a source of bank income are comparable to inventory in manufacturing companies (Mackara, 1975; Pesek, 1970). Referring to some previous studies, productive assets can be used as a measure of output in the form of credits, securities, investments, and other investments to earn income.

Bank liabilities have input characteristics because they function as a source of investment funds, and bank assets have output characteristics because they are used by the banks to earn a part of the direct income (Lindley & Sealey, 1977). Profit efficiency is an illustration of a practice in maximizing profit (Fitzpatrick & McQuinn, 2008). Net interest margin (NIM) functions as a proxy for profit efficiency (Hassan, 2006; Maudos et al., 2002). This study uses the input, output, and benefits of NIM banks (Berger & Humphrey, 1997; Maudos et al., 2002). NIM indicates the difference between the interest income earned and the interest paid by a bank or financial institution is relative to its interest-earning assets like cash. The higher the NIM is, the better the bank management's ability to manage its productive activities will be. NIM is commensurate with the process of financial intermediation while certain assets or liabilities are transformed into different assets or liabilities (Eric & Joseph, 2012). Where the output used is total earning assets. The NIM represented does not only come from credit but also from other fund placements which can generate interest income (Muljawan et al., 2014). NIM as a proxy for profit efficiency policy has a significant and positive effect on bank performance (Lestari, Wahyudi, Muharam, & Ariyanto, 2020).

H2: *Profit efficiency policies have a significant and positive effect on bank operational performance.*

3. Research Methods

The criteria of sample data used in this study were banks that have an outstanding bond value. The percentage of bank majority ownership was more than 5%. Moreover, they should publish their financial reports regularly from 2011 to 2018. Besides, *PT Kustodian Sentral Efek Indonesia* (English term: Indonesia Central Securities Depository) documented that only 24 from 40 banks had continuous outstanding bond values from 2011–2018. To map all these sample data, the researchers conducted a perceptual map analysis. Analysis of Perceptual Mapping is a visualization technique that to describe how banks implement the policies to issue bonds and/or profit efficiency. The purpose of the Perceptual Mapping was to find out the bank sample position against a group of banks implementing bond issuance policies in Indonesia.

Partial Least Squares is an approach to Structural Equation Models that allows researchers to analyze the relationships simultaneously (Chin, Wynne, 1999; Hair et al., 2014). In addition, path analysis requires that the relationship between variables is linear. It means that changes in any variable will cause changes in other variables linearly. The relationship between variables adds the scale of interval measurement. The recursive relationship is a one-way (non-reciprocal) causal relationship, and all residual variables are not correlated.

ROA is a measure of bank operational performance because it can detect differences in assets during the fiscal year (Bian & Deng, 2017; Kosmidou & Tanna, 2005; Ozili & Uadiale, 2017). On the other hand, bank's operational performance is a function of the bond issuance policy and profit efficiency policy. The first stage was to test the entire bank samples using the following model:

$$\text{ROA}_{\text{All}} = \beta Y_1 X_1 \text{BLTD}_{\text{All}} + \beta Y_1 X_2 \text{NIM}_{\text{All}} + e_2 \qquad (1)$$

The second stage was done by categorizing the samples based on the type of majority share ownership, and then they were tested using the following models:

$$\text{ROA}_{\text{Gov}} = \beta Y_1 X_1 \text{BLTD}_{\text{Gov}} + \beta Y_1 X_2 \text{NIM}_{\text{Gov}} + e_2 \qquad (2)$$

$$\text{ROA}_{\text{Pvt}} = \beta Y_1 X_1 \text{BLTD}_{\text{Pvt}} + \beta Y_1 X_2 \text{NIM}_{\text{Pvt}} + e_2 \qquad (3)$$

Furthermore, this analysis aimed to find differences in the characteristics of the implementation of both policies. Which policies, profit efficiency or bond issuances, have the biggest influence on improving operational performance in government-owned and private banks?

4. Results

Table 1 shows the standard deviation of all variables from the three types of samples describing a smaller value than the average value, which means all sample data have a small variation. Nevertheless, descriptive statistics only show information about data and do not provide any conclusions about the data. The data samples consisted of 24 banks, i.e., 13 private banks and 11 government-owned banks (4 state-owned banks, and 7 regional government-owned banks).

Figure 1 presents an overview of banks, which implement funding by issuing bonds and profit efficiency. Perceptual mapping of bank data used the average value of NIM and BLTD during the 2011–2018 observation periods. The first assumption of this figure is the more to the right the position is, the higher the bank applies for funding by issuing bonds. The second assumption is that the higher it is, the higher the bank will implement the profit efficiency policy.

Table 1: Descriptive Statistic

Type of Sample	Variable	Number of Sample	Mean	Standard Deviation	Minimum	Maximum
All banks	BLTD	192	0.571	0.270	0.034	1.218
	NIM	192	0.064	0.024	0.015	0.130
	ROA	192	0.024	0.011	0.001	0.051
	BLTD	88	0.546	0.284	0.056	1.000
State-owned banks	NIM	88	0.074	0.017	0.043	0.112
	ROA	88	0.029	0.010	0.009	0.051
	BLTD	104	0.593	0.258	0.034	1.218
Private banks	NIM	104	0.055	0.015	0.015	0.130
	ROA	104	0.020	0.001	0.001	0.051

Note*:* NIM: Net Interest Margin; BLTD: Bonds to Long Term Debt; ROA: Return on Assets.

The perceptual mapping shows that regional (provincial) government-owned banks, i.e., *Bank Pembangunan Daerah* (BPD) Sumatra Utara, BPD SulutGo, BPD SulselBar, and BPD Nusa Tenggara Timur were categorized as banks with the highest rates in implementing profit efficiency policies. The average NIM of regional government-owned banks was 8.12% and is greater than the NIM for government-owned banks, which was around 7.4%. This may be due to the fact that lending channel in regional government-owned development banks is dominated by consumer credit. Thus, the increase in consumer lending has resulted in a relatively high NIM for BPDs. There are various risk factors determining the loan interest rate (Bank Indonesia Regulation No. 5/8/PBI/2003).

Figure 1: A Perceptual Map of the Study Results

BPD Sumatra Utara, BPD SulutGo, BPD SulselBar, and BPD Nusa Tenggara Timur also have the highest ratio in the implementation of bond issuance policies. The average BLTD of regional government-owned banks was 69.5%, and it was greater than the NIM of government-owned banks, approximately 54.6%. Operational costs are mostly greater. This occurs perhaps because debtors in Indonesia are dominated by small and medium enterprises.

The average BLTD of state-owned banks was 28.4%, lower than the BLTD of state-owned banks, which was around 69.5%. Bank Mandiri, Bank BTN, Bank BRI, and Bank BNI had a greater need for funds to support the government's economic stimulus program. Accordingly, the ratio of bond issuance to long-term debt is small. Meanwhile, state-owned banks must also maintain bank liquidity while their conditions were in decreasing deposits. The average NIM of state-owned banks was 6.25%, lower than the NIM of state-owned banks, which around 7.4%. This may be due to the fact that the number of requests for new loans tends to fall and is compounded by high credit, which affects bank operational performance.

Table 2 provides the results of the structural models. The adjusted R^2 for government banks was the largest, i.e., 0.463. R^2 adjustment of all sample banks was 0.445 and 0.363 for only private banks. The coefficient of determination is a statistical measurement that examines how differences in one variable can be explained by the difference in the second variable when predicting the outcome of a given event. R-squared (or R^2) assesses the strength of the linear relationship between BLTD and NIM and it is heavily relied on by researchers for conducting trend analysis using ROA dependent variable. The result of adjusted R^2 ROA for the three types of sample data was in the moderate category. The variance refers to independent variables of all sample banks, and the government-owned banks were between
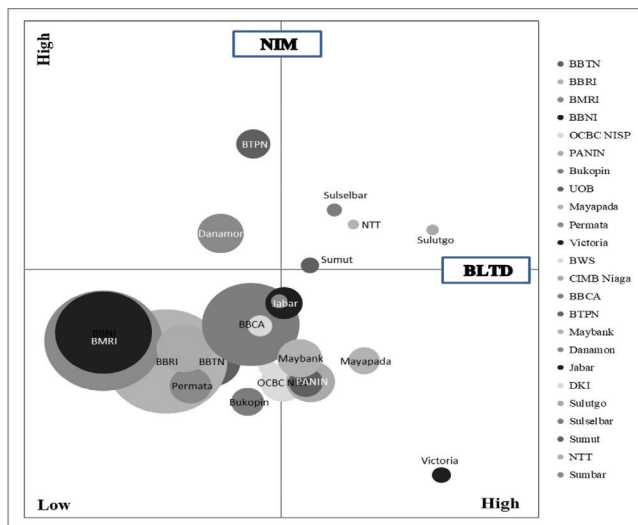
Table 2: Results of Structural Equation Models

Path analysis	All Banks		Government-Owned Banks		Private Banks	
	BLTD-ROA	**NIM-ROA**	**BLTD-ROA**	**NIM-ROA**	**BLTD-ROA**	**NIM-ROA**
Path coefficient	−0.170***	0.657***	−0.476***	0.828***	0.143**	0.632***
Adj. R^2	0.445		0.463		0.363	
Q^2	0.451		0.482		0.372	
Effect size	0.024	0.427	0.008	0.467	0.002	0.377
Std. Error	0.059	0.059	0.101	0.070	0.075	0.075
APC/ARS/AARS	0.414***/0.450***/0.445***		0.652***/0.475***/0.463***		0.387***/0.375***/0.363***	
AVIF/AFVIF/GoF	1.002/1.483/0.671		1.444/2.096/0.689		1.066/1.433/0.612	
SPR/RSCR/SSR/NLBCDR	1.000/1.000/1.000/1.000		1.000/1.000/1.000/1.000		0.500/0.995/0.500/0.500	

Note: ***, ** and *indicates significant at 1%, 5% and 10% level of significance based on *t*-statistics.

$0.45 \leq$ adjusted $R^2 \leq 0.70$. All the models have predictive validity causing the value of ROA q-square from all of the sample groups more than zero. The relationships between BLTD and ROA variables showed ≥ 0.02 effect size, which means all data have a small model category. Meanwhile, all the relationships between NIM and ROA variables had ≥ 0.35 effect size, which included in the large model category.

The Goodness of Fit (GoF) result showed that the ROA for these three types of samples was highly relevant (Table 2). The P-value of the Average Path coefficient (APC), Mean Square (ARS), and Adjustable-Square (AARS) were at the significant level, i.e., <1%. Both Average Block VIF (AVIF) and Average Full Co linearity VIF (AFVIF) values were <3.3 indicating that there was no multicollinearity problem between exogenous variables. Three sample groups resulted in >0.36 suitability value indicating that the suitability was in a large category. The values of all observed indexes, such as Symson's Paradox (SPR), R-Squared Contribution Ratio (RSCR), and Non-Linear Bivariate Causality Direction Ratio (NLBCDR), were above 0.70 and there was no causality problem in the model, except for private banks sample types. The Suppression Statistics Index (SSR) value was >0.70 and acceptable in ROA-based model.

The direct effect of BLTD on ROA in all bank samples and government-owned bank samples found in this study was significantly negative. This result confirms hypothesis 1 in the private banks with <5% significance level. Meanwhile, the government-owned banks and all banks data results were not in line with the first hypothesis. The test results of the direct effect of NIM on ROA for the three types of bank samples were positive with 1% significance level. These results support hypothesis 2.

5. Discussion

Based on the research problems of this study, profit efficiency policy is the most influential determinant in improving bank operational performance. Table 2 shows the test results of the three types of samples. The NIM coefficient has a positive value than that of BLTD. The managerial implication is that bank management should first establish a policy on profit efficiency. Furthermore, the next stage was to set up a bond issuance policy to improve their operational performance. When a bank applies a profit efficiency policy, it means the management has to increase its interest income. On the other hand, the increase in interest income as a proxy for profit efficiency is considered insignificant compared to cost efficiency (Maudos et al., 2002). Banks become less competitive if they apply too high loan interest rate. In addition, the rate of bank loan interest rate in Indonesia is still relatively high based on the data per September 2020 and the average prime lending rate (local term: *Suku Bunga Dalam Kredit*-SBDK) in Indonesia is 9.37%. Banks in other

ASEAN countries only charge a single-digit credit interest, around 5–6%. This possibly is due to the high cost of funds (CoF), operating expenses, investment risk, and profit margins to be taken. Banks in Indonesia have high operating costs because they have to open branches in all regions in Indonesia with the Geological Archipelago Condition with thousands coastal zone. Operating-costs become much bigger since the debtors in Indonesia are dominated by micro and small business actors, which consequently increase the investment risk.

Debt issuance has a significant negative effect on the firm/company value (Myers, 1977). The researchers in this study investigated the maximum allowable debt value. This research examined the optimal value of debt securities issuance that can improve bank operational performance. As seen in Figure 2, there are differences in the influence of BLTD variable on ROA in all three types of banks. This study states that bonds (debt securities) issuance was applied by all government-owned bank samples. It can be concluded that banks have a significantly negative effect on improving bank operational performance and this conclusion confirms previous studies (Lestari, Wahyudi, Muharam, & Utomo, 2020). The figure shows the results of non-linear test of the effect of BLTD on ROA in all types of bank samples data as a whole. This test aimed to investigate to what extent the policies of bond issuance affect the decline in bank operational performance.

The bond issuance policy will affect the improvement of operational performance of all bank samples. The ratio of bond issuance to long-term debt was more than or equal to 62%. Furthermore, it can be seen in the figure that the average of bond issuance in the whole bank samples is 57%. This condition can be illustrated in a declining curve position as in Figure 2. The bonds issuance on the type of bank-wide data complies with the theory stating that issuing debt will be risky
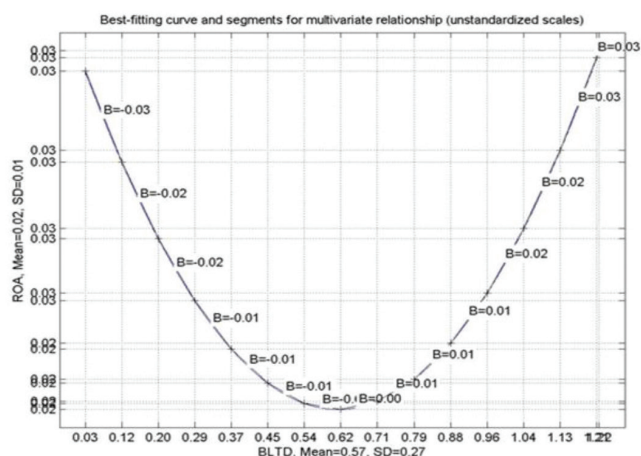
Figure 2: Non-linear Curve of BLTD Influence on ROA for All Bank Samples (Source: Output of Warpl.PLS6.0)
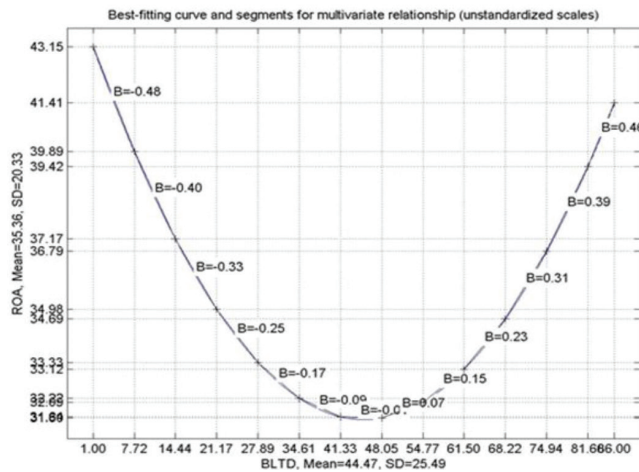
Figure 3: Non-linear Curve of BLTD Influence on ROA for Government-owned Banks (Source: Output of Warpl.PLS6.0)
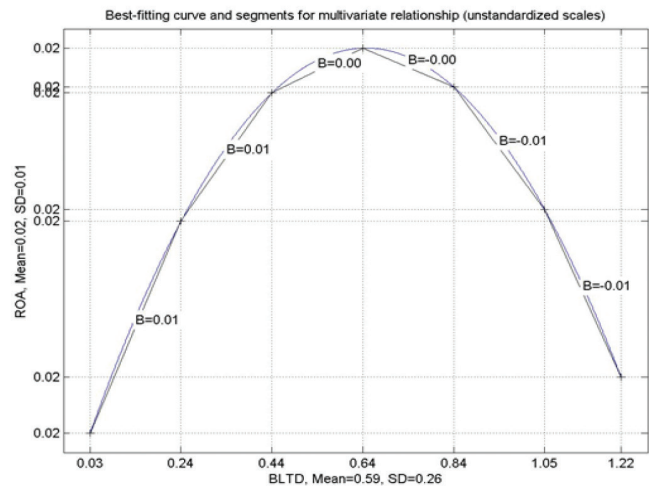

Figure 4: Non-linear Curve of BLTD Influence on ROA for Private Banks (Source: Output of Warpl.PLS6.0)

and inversely proportional to company performance (Myers, 1977). The results of this study suggest that bank will improve their operational performance by increasing their bond issuance more than 62% toward their total long-term debt.

The next stage tested whether there was a difference effect of debt security policy on bank operational performance. To achieve this goal, the researchers categorized the samples into two based on majority shares ownership, i.e., government-owned banks and private banks. Figure 3 shows the non-linear test results of BLTD effect towards ROA on government-owned banks data. The finding indicates the average ratio of bond issuance policies in government-owned banks data samples was 44.47%. This condition can be illustrated in a declining curve position. The analysis results of this study suggest that the issuance of bonds will affect the improvement of the banks' operational performance bank when the ratio of bond issuance to long-term debt is more than or equal to 48.05%. This finding in line with the study result that state ownership structure has a U-shaped relationship with the performance (Vo et al., 2020).

Figure 4 shows the results of non-linear test to the effect of BLTD toward ROA on private bank data types. The finding of this study indicates that the curve was different to Myres' theory, 1977. In addition, the results of non-linear test show that an increase in bond issuance leads to an increase in private bank's operational performance. The average ratio of bond issuance policies in private banks sample was 59%, thus, it can be categorized as an increasing curve position. When the bond issuance ratio compared to the amount of long-term debt exceeds 64%, it will cause a decrease in the bank's operational performance. This finding confirms the opinion stating that company performance will increase along with debt increase (Scott, 1977).

6. Conclusion

The findings of the research showed that more debt issuance harm company performance. To obtain the optimal value determination of bond issuance that causes a decrease in bank operational performance using the non-linear test. Furthermore, we separated the data into government-owned banks and private banks to determine the different effects of the bond issuance policy implementation. The policy of issuing debt securities to private banks shows an inverted U-shape, while government-owned banks resulted in U-shaped curve.

Perceptual mapping of bank data used the average value of NIM and BLTD during the 2011–2018 observation periods to visualize the samples into industries. The first assumption of this figure was the more right the bank position in the line, the higher the possibility for banks to apply funding by issuing bonds. The second assumption was that the higher it is, the higher the bank will implement the profit efficiency policy. BPD Sumatra Utara, BPD SulutGo, BPD SulselBar, and BPD Nusa Tenggara Timur showed the highest NIM and BLTD. Meanwhile, Bank BNI, Bank BRI, Bank Mandiri, Bank BTN (state-owned bank) and private-banks showed a lower implementation of both policies.

The limitation in this study was that the data used the consolidated annual financial statements of commercial banks. Thus, it did not consider separation based on business groups or types, the bank as the parent and the subsidiary corporation. This study only used bond issuance as a measure of debt securities funding. The researchers did not use other debt securities such as *Sukuk* (sharia-based bonds) and medium-term notes (MTN). The future research is

recommended to use the Generalized Method of Moments (GMM), which is considered as an adjustment dynamic to produce more consistent estimators.

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