The Effect of Productive Asset Diversification on Discretionary Behavior on Allowance for Loan Losses

Ignatia Ryana Widyatini and Raymundo Patria Hayu Sasmita

***Abstract*—The first objective of this study is to determine whether the discretionary behavior is built by diversification or concentrated productive asset financing. Discretionary behavior reflects the value of additional losses to form Allowance for Loan Losses or ALL based on several management motivations. The formation of ALL aims to maintain the quality of productive assets and the health of banks. Discretionary behavior is estimated from the difference between the total ALL and the non-discretionary component presented through a portfolio of economic impairment. Specifically, the concentration of banking asset financing in this study is classified based on the type of loan. This study examines the effect of the concentration of asset financing on loan distribution toward discretionary behavior. This research was conducted in several commercial banks in Indonesia.**

***Index Terms*—Discretionary behavior, allowance for loan losses, productive assets.**

I. Introduction

This study examines the effect of the concentration of productive assets financing toward discretionary behavior on allowances or allowance for loan losses (DALL). Discretionary behavior reflects the value of additional allowance for impairment losses [1]. There are two types of financing for productive assets, namely traditional (on-balance-sheet) and non-traditional or off-balance-sheet (OBS) financing [2].

Productive assets are funds provided by the bank to reach revenue. Banking offers a series of banking products that generate two sources of income, namely interest income from loans or so-called on-balance-sheet assets and several non-interest incomes such as off-balance-sheet assets (OBS) services [3].

Traditional banking is the bank's role as an intermediary between depositors and borrowers [4]. Regulators require certain criteria for guarding the quality of assets provided through the value of allowances or so-called allowance for loan losses [5]. The formation of allowance for loan losses is useful for reducing losses due to credit contraction [6]. Thus, there is a possibility of banks using the allowance for loan losses as a means of revenue management due to a lack of harmonization in standards [7].

Allowance for loan losses has two components, discretionary and non-discretionary. Non-discretionary is estimated through possible loan losses such as non-performing loans dan net loan charge-offs [1]. Therefore, Discretionary behavior is obtained from the difference between the total allowance for loan losses (ALL) and the non-discretionary value [1].

Financing portfolios on more concentrated on-balance-sheet assets have a higher risk of insolvency, resulting in higher returns [3]. This study is an extension of [1] research regarding the allowance or ALL. The difference with the previous research is determining whether a concentrated or diversification financing strategy investigates discretionary behavior as earnings management. Meanwhile, the previous research compared earnings management between public and private banks using discretionary behavior provisions as a proxy.

This study makes new contributions to the two literature developments related to earnings management through the discretionary behavior on allowance for loan losses and the financing strategy of banking productive assets. In addition, research was conducted to provide empirical evidence regarding the concentration of financing exposure deposits from on-balance-sheet productive assets and their impact on management choices through discretionary accrual on allowance for loan losses.

II. Literature Review

A. Risk of Productive Assets Financing

The bank's financial statements provide three separate disclosures to estimate the risk of default, namely non-performing loans, allowances, and loan chargeoffs [1]. Non-performing loans include all loan portfolios that are past due for more than 90 days with interest or principal payments. Allowance reflects the level of future loan losses that can be estimated and is disclosed as an accrued expense. Meanwhile, loan chargeoffs measure all loans that are considered uncollectible during that period. Loan chargeoffs are the write-offs of productive assets reported separately in the footnotes of financial statements and can also come from the balance sheet and income statement data [1], [8], [9].

Financial institutions can manage productive asset financing portfolios to maintain credit quality through financing diversification or risk spread [3], [10]–[15]. Diversification of productive asset financing is differentiated by the type of use and economic sector [14]

B. Discretionary Behavior Motivation

According to [1], who adopted the earnings management model by Beaver and Engel, allowance for loan losses (ALL) is very logical to be assessed as a subject of discretionary behavior where the percentage of ALL on net assets is quite large. Generally Accepted Accounting Principles (GAAP) states that there is uncertainty around the estimated loan loss

Manuscript received July 12, 2021; revised November 12, 2021.

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doi: 10.18178/ijimt.2022.13.2.918

to determine the allowance amount. In addition, the Statement of Financial Accounting Standards No. 5 (SFAS No. 5), regarding accounting for contingent losses, requires that the recognition of the loss against the principal be made if it is probable and can be reasonably estimated. The two terms are considered not clearly defined, thus opening up opportunities for various interpretations and practices.

Discretionary behavior in determining allowances has four motivations. First, regulatory motivation, namely the desire to present financial reports, illustrates that the bank has a small risk with an adequate capital adequacy ratio. Second, financial report motivation, namely the motivation for financial reporting through explicit and implicit contract agreements, is stated in accounting numbers in certain ways to impact economic value. Third, tax motivation, namely the desire to minimize the present value of the payment tax. Fourth, signaling motivation, namely the desire to be seen as a strong bank and different from bad banks by taking additional capital costs [1], [8], [9].

Allowance for Loan Losses is carried out as a form of banking security and health [5], [7]. Adopting conservatism in accounting for loan losses aims to reduce losses when there is a credit contraction [6]. The discretionary component is obtained from the difference between the total allowances and the non-discretionary. Non-discretionary provides through non-performing loan assets, aggregate loans, and charge-offs because it is considered able to provides additional information about the economic impairment of the financing portfolios [1], [8].

C. Hypothesis Development

Various studies that have been conducted in the banking industry support Markowitz's portfolio theory that a portfolio diversification strategy can reduce the level of risk. For example, [12] found the benefits of diversification for bank health, especially in conditions of economic crisis. In addition, portfolio diversification has an impact on the spreading of risk to many sectors. The distribution of financing funds is classified according to the type of use and economic sector [14]. A well-diversified financing portfolio results in a lower risk of default [3], [10], [11], [13]–[15). In addition, financing transactions on OBS items that are more concentrated have a higher risk [3]

Discretionary behavior through allowances is considered intimate information and vision of managers regarding the estimated future risks and returns [1]. There is an opportunity for the ambiguity of the discretionary component where there is an opposite direction of motivation for discretionary behavior. For example, the motivation of financial statements explaining that banks with low capital to asset ratios will be motivated to reduce allowances. Contrary, for regulatory motivation, banks tend to increase the value of allowances [1], [8].

Several previous studies have shown a relationship between the alleged risk of financing with the allowance value or allowance for loan losses. Therefore, this study expands the literature on allowance for loan losses by examining whether the risk of a concentrated financing transaction affects management choices through a discretionary component of the ALL value.

So, the hypothesis is formulated as follows:

H1. diversified asset financing is associated with the discretionary behavior.

H2. diversified asset financing is associated with the non-discretionary component

H3. The association between diversified asset financing and discretionary behavior is stronger than the association between diversified asset financing and non-discretionary component

III. Research Method

A. Sample and Data Sources

The sample data of this research is the banking industry in Indonesia, a commercial bank in Indonesia. Data is taken from financial reports and notes on financial reports from 2016 to 2019. The criteria for selecting data are the availability of financial reports and notes of financial statements published completely.

B. Research Variabel

The Independent variable is the concentration of productive assets financing, especially loans. Sources of data for earning asset financing transactions are obtained from notes on financial statements. Financing transactions include various loan types.

Classification of whether the financing transaction is concentrated or diversified is obtained through the Hirschman Herfindahl Index (HHI) [16]. The HHI index ranges from zero to 1. The value of the HHI is close to 1, which means that the financing portfolio is increasingly concentrated. The concentration of financing transactions by economic sector.

HHI is calculated by the formula [16].

$$\boldsymbol{HHI} = \sum_{\boldsymbol{i=1}}^{\boldsymbol{n}} \boldsymbol{r^2}$$

Information :

HHI: *Hirschman Herfindahl Index* Diversification of financing transactions by economic sector

n: the number of groups being measured

i: the number of economic sectors

r: the amount of credit per sector divided by the total credit

The dependent variable is discretionary behavior in the allowance for impairment losses adopted in the Beaver and Engel formula in the research [1], where the calculation of discretionary behavior (DALL) requires estimation of the non-discretionary component (NALL). To simplify the formula for the total allowance for impairment losses, abbreviated as ALL. The first stage is to calculate ALL based on the NALL component obtained based on the possible loss of net charge-offs (CO), total loans (LOAN), non-performing loans (NPL), and changes in non-performing loans for the next 1 year.

$$NALL_{it} = \gamma_0 + \gamma_1\, CO_{it} + \gamma_2\, LOAN_{it} + \gamma_3\, NPL_{it} + \gamma_4\, \Delta NPL_{it+1} + u_{it} \quad (1)$$

Because of the definition, $ALL_{it} = NALL_{it} + DALL_{it}$,

$$ALL_{it} = \gamma_0 + \gamma_1 CO_{it} + \gamma_2 LOAN_{it} + \gamma_3 NPL_{it} + \gamma_4 \Delta NPL_{it+1} + z_{it} \quad (2)$$

where

$$z_{it} = DALL_{it} + u_{it} \quad (3)$$

Since NALL cannot be observed directly, it is estimated through the ALL regression (equation 1). The residual in equation 2, namely z_{it} , is taken to estimate DALL. As an extension of the residual value of (equation 1), u_{it} is non-zero, the estimate will measure DALL with error, although the coefficients on eq 1 and 2 can be estimated without error. The model assumes no discretionary component in equation 1; this assumption is to simplify the analysis, even though no variable is completely devoid of discretionary behavior. The nature of the discretionary behavior is multiperiod, ALL_{it} reflects the impact of the discretionary behavior in the period before year t.

C. Analysis Method

The main question of this research is whether concentrated financing is related to discretionary behavior through the allowance for loan losses. The concentration of transactions is based on economic values, especially financing of productive assets on the balance sheet. Then the basic equation of research is:

$$DALL_{it} = \alpha_0 + \beta_1 HHI_{it} + \beta_2 NPL_{it} + \beta_3 CO_{it} + \varepsilon_{it}$$
$$NALL_{it} = \alpha_0 + \beta_1 HHI_{it} + \beta_2 NPL_{it} + \beta_3 CO_{it} + \varepsilon_{it}$$

where:
DALL = discretionary behavior
NALL = non-discretionary component
HHI = Diversified asset financing
NPL = non-performing loan
CO = net charge-offs

IV. Results

A. Descriptive Statistics

Table I illustrates the descriptive statistics on diversified asset financing (HHI), non-performing loan (NPL), net charge-offs (CO), and discretionary behavior (DALL), non-discretionary component (NALL) as the dependent variable. All data obtained from published annual banking financial reports and data Financial services authority statistics from 2016 to 2019. Asset financing diversification is obtained through the distribution of loans based on types consisting of investment, working capital, consumption, employees, and other loans.

TABLE I: Descriptive Statistics

Variable	Obs	Mean	Standard Deviation	Min	Max
DALL	104	5.207.943	9.592.043	12.671	44.833.953
NALL	104	9.095.077	17.203.819	20.453	74.822.245
HHI	104	0,4798	0,1714	0,2810	0,9723
NPL	104	3.115.662	5.570.568	2.356	24.565.306
CO	104	2.455.137	3.944.490	0	17.006.364

B. Diversified Asset Financing (HHI), Discretionary Behavior (DALL), and Non- Discretionary Component (NALL)

Discretionary behavior (DALL) is obtained through the difference between the allowance for loan losses (ALL) and the non-discretionary component (NALL). The NALL calculation in equation 1 is generated through ALL regression with several constituent components such as CO, LOAN, NPL, and ΔNPL in equation 2 [1]. Then the DALL value is absolute to observe how the DALL value is related to the management justification, which is the choice of management in determining the allowances (Tran et al., 2019). On the other hand, non-performing loans (NPL) and net charge-offs (CO) are used as control variables because these variables estimate the risk of default to determine the allowance for loan losses [1]. NPL illustrates the risk factor of credit quality, while CO is a net loan charge-offs as a recovery of bank conditions from NPLs that are too high to improve banking conditions.

H1 states that diversified asset financing is associated with discretionary behavior. Table II explains that the p-value is 0.0027. Meanwhile, the H2 test results, which state that diversified asset financing is associated with the non-discretionary component, show the regression results with a p-value of 0.0002. Based on the p-value, it can be stated that diversified asset financing (HHI) is associated with both discretionary behavior and non-discretionary components. Furthermore, the coefficient of HHI concerning DALL is -135756.5, which means that HHI is negatively related to the discretionary component. In contrast, the coefficient of HHI in NALL is 23638445, which indicates that HHI is positively related to non-discretionary components. Thus, H1 is supported, as well as H2 is supported.

H3 relates to comparing the relationship between HHI and DALL and the relationship between HHI and NALL. The complete test results can be seen in Table II, at the R-squared value. R-squared is a number that ranges from 0 to 1, which indicates the number of combinations of independent variables jointly affecting the value of the variable. The higher value, the better model will be produced by the regression equation. Furthermore, Table II shows that R-squared over DALL (0.98) is higher than R-squared over NALL (0.38%). Thus, H3 states a stronger relationship between HHI and DALL than the association between HHI and NALL, which is supported.

TABLE II: Association between HHI, DALL, ALL

Result of Regression Model *Fixed Effect*

	DALL			NALL		
	Coefficient	Std. dev.	p-value	Coefficient	Std. dev.	p-value
HHI	-135756,5	43686,79	0,0027	23638445	6102187	0,0002
NPA	0,272458	0,035357	0,0000	-0,463973	1,148347	0,6873
CO	-0,028674	0,039642	0,4717	-5,023445	2,219346	0,0265
Observations		104		Observations		104
R-squared		0,985826		R-squared		0,382954
Adjusted R-squared		0,980535		Adjusted R-squared		0,15259
Prob(F-statistic)		0,00000		Prob(F-statistic)		0,042834

The overall results show that the distribution strategy in

asset financing (HHI) is significantly related to discretionary behavior (DALL) and non-discretionary component (NALL), which are the two main components in forming allowances for loan losses. The distribution of asset financing is said to be diversified or concentrated based on the value of the HHI with a range of 0-1. The closer to value 1, the more concentrated the distribution of asset financing [16].

HHI is negatively related to discretionary behavior. The negative relationship between HHI and discretionary behavior shows that the more concentrated the distribution of asset financing is, the lower the discretionary value through the management choices in determining the allowance for loan losses. Concentrated asset financing has the potential in increasing the level of banking risk due to the risk from credit extension is concentrated in one sector [3], [10], [11], [13]–[15]. The potential for greater risk due to credit concentration makes management reduce justification so that the allowance for loan losses is determined based on the NALL component.

The consistent explanation is shown in the positive relationship between HHI and non-discretionary components. The more concentrated asset financing is, the higher the non-discretionary component in making allowance for loan losses. This makes perfect sense, given the concentration of asset financing in one sector, which causes greater banking risk [14]. Increased risk due to the concentration of financing assets causes the greater NALL in forming allowances. Moreover, NALL is determined from several variables that can estimate the risk of default [1].

In addition, the results showed that the relationship between HHI and DALL was stronger compared to the relationship between HHI and NALL. This means that asset financing strategy has a stronger influence on management choices by presenting justification in determining the allowance for loan losses. In other words, the more diversified asset financing is, the greater the potential for management to carry out earnings management through discretionary behavior in allowance for loan losses which will affect the condition of banking financial statements.

V. Conclusions

A. Conclusions

This study examines the differences in the strength of the association between asset financing strategies with discretionary behavior and non-discretionary components in determining the allowance for loan losses. The results of this study indicate, first, the relationship between asset financing strategy and discretionary behavior is negative. Second, the relationship between asset financing strategy and non-discretionary component is positive.

These results show that when the asset financing strategy is concentrated or not well-diversified, it will cause management unmotivated to carry out earnings management. In other words, the concentrated asset financing has a greater potential risk so that the allowance for loan losses is more determined by a non-discretionary component. However, if asset financing is well-diversified, management will be motivated to carry out earnings management using the discretionary component in the allowance. Finally, this study found a stronger relationship between asset financing strategy and discretionary behavior than non-discretionary components. This finding reaffirms the choice of management as earnings management through discretionary behavior in the allowance for loan losses.

B. Limitations

There are several limitations of this study; first, whether it is diversified or concentrated, the measurement of asset financing strategy is limited to the distribution of types of loan financing because it is considered to dominate banking assets. However, apart from the asset financing strategy, management policies are also influenced by other things. For instance, the maximum credit financing limit and the approval of credit structuring have potential risks contributing to the total allowance. Second, management's decision regarding the allowance is also based on policies determined by regulations upon market conditions at that period. So that a comparing test regarding the possibility of earnings management before and after a recession due to the Covid-19 pandemic is interesting to develop.

Conflict of Interest

There was no conflict of interest between the authors.

Author Contributions

Ignatia Ryana Widyatini (Ignatia) and Raymundo Patria Hayu Sasmita (Raymundo) constructed the research idea during the proposal stage. Ignatia designed the conceptual and theoretical framework which was related to her main map interest research. Raymundo conducted the data collection as well as the data tabulation. All authors discussed the results and contributed to the final manuscript.

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