Research Article

Implementation of Composite Index to Determine Risk Tend to Bank Default at Rural Bank

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Abstract: This study aims to identify risk tend to bank default using a composite index at rural banks in Indonesia. The method used in this study uses logit. The data used are primary and secondary. Primary data is used when weighting the composite index by respondents who are representatives of banking associations, bank authorities and directors. Secondary data obtained from Bank publication reports during period 2009 - 2018. The population used in this study is rural banks in East Java and sample selection based on purposive sampling. The results showed that NIM, NPL, OR and ROA have significant affect to risk of tend to bank default. Meanwhile, LDR have no significant affect to risk of tend to bank default. Rural bank must pay attention to the variables that are indicators of the risk tend to bank default.This study is useful for providing a different perspective in identifying bank default using a composite index that has never been conducted before.

Keywords: failure, composite index, Indonesia

1. Introduction

Banking has an important role in the economy of a country. The role of banks in fulfilling the needs of business players and individuals is vital as well as in making banks an intermediary institution. Banking has the main function as an intermediary, namely collecting funds from the public and channeling them effectively and efficiently to the real sector to drive the development and stability of a country's economy.Banks as intermediary institutions that in carrying out their business activities depend on funds and public trust. Therefore, banks need to maintain public trust by maintaining and maintaining a healthy level. Various efforts have been made by the authorities to maintain bank health through the establishment of criteria for bank soundness.

Even though there have been many regulations to maintain the health of banks, there are still failed banks, especially in Rural Banks. Data for the last ten years from 2008 to 2018, it appears that the existence or existence of Rural Banks has decreased. The role of rural banks for the economy in Indonesia is quite strategic. The government's focus on empowering Rural Banks to improve the local economy and the MSMEs community and absorb unemployment makes Rural Banks expected to be the main support for the local economy and MSMEs. Various studies on the issue of bank failure have been carried out with various parameters. The most popular are based on the criteria of CAR, NPL, Cash Ratio (CR) and most recently using the Off Balance Sheet (OBS). The study conducted by Puspitasari *et al.* (2020a) identified failures based on CAR criteria. The next study of Puspitasari *et al.* (2020b) identified failures based on OBS criteria that had not been carried out in previous studies with the Rural Banks analysis unit. This study aims to identify the risk of bank failure based on the composite index criteria, consisting of CAR, CR and OBS.

2. Literature Review

Default risk is a condition when a bank fails to fulfil its obligations and run its business. This has the potential for systemic risk. Of course, the banking industry must not be careless in addressing the risks that are and will be faced. Various studies were carried out to find solutions so that bank failures would not happen again. A bank is an institution that has an inherent risk in the financial system of a country, where the bank offers products that are used by all individual customers and companies related to money. This causes the impact of failure in the bank, either partially or completely, will have a national economic effect and result in a financial crisis and adversely affect the economy as a whole, not only on employees, shareholders and customers. Based on the research results of Altman (2000), there are four independent variables for failure indicators in the service company model including liquidity, profitability, productivity and solvency. A study conducted by Adnan and Taufik (2001) used the Altman (2000) model for service companies to analyse predictions of bankruptcy in Indonesia at conventional

commercial banks. The results of his research found that capital adequacy was an important factor in determining the potential for bank failure. This finding is reinforced by the results of research by Kyriazopoulos *et al.* (2014) on cooperative banks in Greece.

Research by Febrian and Herwany (2011) summarizes a failed bank as a bank that is declared undercapitalized by bank supervisors until mergers, consolidations, acquisitions and revocation of business licenses must be carried out by the authorities. The source of bank income is dominated by financing and in fact is the biggest source of risk. Therefore, banks are expected to care to identify, measure, monitor and control financing risks as well as determine sufficient capital to cover the risks faced.

This is in line with the results of research by Puspitasari *et al*. (2020a), Wheelock *et al*. (2019), Anwar *et al.* (2018), Raz (2017), Laeven *et al.* (2016), Haque and Shadid (2016), Boadi *et al.* (2016), Abdul Mongid (2015), and Fiordelisi and Mare (2013) which show that CAR has a significant and negative effect on bank failures. Other studies in line with the subject of conventional Rural Banks conducted in Indonesia include the findings of Puspitasari et al. (2020) and Buchdadi *et al.* (2018). However, these findings contradict the results of research by Rachmawati and Ningsih (2018) on the subject of Sharia Rural Banks which found that CAR does not have a significant effect on the risk of bank default.

Based on the explanation above, if a bank has assets that are less liquid, it will be in a state of distress. It will be difficult for the bank to sell its assets and face problems in fulfilling its liquidity obligations. The greater this ratio, the smaller the risk faced by the bank. Therefore, this variable contributes negatively to bank risk (Febrian and Herwany, 2011). The provisions of the POJK supervisory authority Number 19 / POJK.03 / 2017, the criteria for bank failure tendency or bank tend to default are seen from the cash ratio. Cash Ratio is a comparison between liquid assets and current debt as defined in the provisions of laws and regulations governing procedures for evaluating the soundness level of BPRs. When a bank experiences a high cash ratio, the liquidity risk will decrease (Wheelock et al., 2019). This finding is reinforced by the results of studies conducted by Haque and Shadid (2016), Bennet et al. (2014), Uhliq (2013), Filippaki and Mamatzakis (2009), Andersen (2008), and Wheelock and Wilson (2000). This contrasts with studies conducted by Giordana and Schumacher (2017), Dermine and Carvalho (2005) and Altunbas *et al. (*2000), where when there is over liquidity, a bank is faced with a weak profitability side so that it is at risk of default if it continues for a long term.

In their study Puspitasari *et al.* (2020b), Giordana and Schumacher (2017), Aktan *et al.* (2013), Perera *et al.* (2013), Haq and Heaney (2012), and Calmes and Theoret (2010) found that OBS affects bank health. This is because OBS can make financial reports appear to be performing. This is dangerous because management will tend to use OBS transactions as the window dressing to the financial statement. With the aim of management wanting to appear to be performing in the eyes of its stakeholders or other specific purposes. It is possible that the non-disclosure of an OBS transaction leads to financial shenanigans, which are actions taken with the aim of hiding or distorting the financial condition of a bank. This can cause banks not to carry out good corporate governance, namely providing information openly and informatively to stakeholders. Therefore, it is necessary to have a further study which presents the effect of all of the aforementioned factors as a whole into a composite index in determining the criteria for risk of tend to bank default with the attitudes of financial institutions in Indonesia.

Table 1. Definition of Proxy Variables

Dependent Variable	
DEFAULT	Dummy Dummy variable: equals one for a failed bank, zero otherwise.
Regressors	
NIM	A measure to distinguish between the interest income earned by the bank and the amount of interest paid to the lender.
NPL	The level of credit collectability provided by banks to third parties
OR	Comparison of operating expenses to operating income
LDR	The bank's ability to meet short-term obligations by dividing total credit against deposits
ROA	The bank's ability to generate profits or profits from the assets used

DEFAULT dependent variable, is the default dummy variable. The use of the financial ratio indicators above is based on previous empirical studies and presents management quality more realistically. This model seeks to

determine the condition of a bank through the use of financial data which is a powerful predictor (Kyriziapoulis *et al*., 2014). NIM is a bank ratio that reflects the risk arising from changing market conditions, which can cause losses to the bank (Hasibuan, 2006). NIM is a ratio that is closely related to the ability of banks to manage productive assets so that they can generate net interest. The greater this ratio, the higher the interest income on productive assets managed by the bank so that the condition of the problematic bank is getting smaller (Fiordelisi and Mare, 2013). Non-performing loans are the ability of bank management to manage non-performing loans provided by the bank.

The probability of default is closely related to credit risk (Giordana and Schumacker, 2017). This is in line with the results of research by Devi and Firmansyah (2018) and Chou and Buchdadi (2016), with the research subjects of Rural Banks. Efficiency operation is an operational cost which is a cost incurred by a bank in carrying out its main business activities. A high level of efficiency in minimizing costs and maximizing profits has a positive and statistically significant relationship with the probability of bank survival (Devi and Firmansyah, 2018; Fiordelisi and Mare, 2013). The LDR is included as a proxy for liquidity risk. Banks are required to be able to be able to maintain their liquidity to meet their short-term obligations (Hogan, 2015; Gosh, 2014; Fadare, 2011; Altunbas *et al.*, 2000; Chatterjee and Eyigungor, 2009; and Fukuda et al., 2008). ROA is a financial ratio to measure the bank's ability to generate profits (profits) as a whole. The greater the ROA of a bank, the greater the level of profit achieved by the bank and the better the position of the bank in terms of asset use, so the better the bank's financial performance. The ability of banks to gain profits has a significant negative effect on bank failures (Puspitasari *et al.*, 2020; Mayes and Stremmel, 2012; Fukuda *et al*., 2008; Lopez and Saurina, 2007).

3. Methodology

This type of research is verification research and the research method used is explanatory research. The object of research is the risk of the tendency of banks to fail in the banking industry in the financial system in Indonesia which is influenced by changes in the risks of financial institutions, financial markets, financial infrastructure and macroeconomics. Then an assessment is carried out by testing empirically the accuracy of risk tend to bank default and the validation of the logit model that was formed during the study period 2009 to 2018. In making a composite index, it is necessary to determine the weight of each variable using the Delphi technique to reach a consensus among experts. Respondents who are selected and involved in the Delphi Technique are kept from knowing each other in providing ideas and ideas. The process of selecting respondents in Deplhi Engineering is based on 2 (two) criteria, namely (i) interest and expertise in the field; and (2) may represent a certain group (field expertise) in this study consisting of banking associations, academics, banking practitioners and supervisory authorities. The respondent in this study was representation from banking associations, academics, banking practitioners and supervisory authorities, in which the total respondents were 30 respondents.

In summarizing and summarizing the varying opinions and frequent differences among respondents, statistical calculations such as mean, median, range, standard deviation or agreement with percentages are used. In this study using the mean statistical calculation. With the basic assumption that there is no absolute similarity among the respondents, the researcher clarifies both individually and in groups. Based on the composite index or a combination model between several variables (CAR, CR, OBS), the Bank included in the not tend to default criteria was coded 0 and Banks included in the criteria for tent to default were coded 1.

$$(\text{CAR, CR, OBS}) = \gamma_0+\gamma_1 NIM +\gamma_2 NPL +\gamma_3 BOPO +\gamma_4 LDR +\gamma_5 ROA +\varepsilon .$$

There are 5 hypotheses tested. H1 is that NIM affect risk of default bank. H2 is about NPL affect risk of default bank. H3 is about NPL affect risk of default bank. H4 is about BOPO affect risk of default bank. Then for H5 is about ROA affect risk of default bank as shown in figure 1.

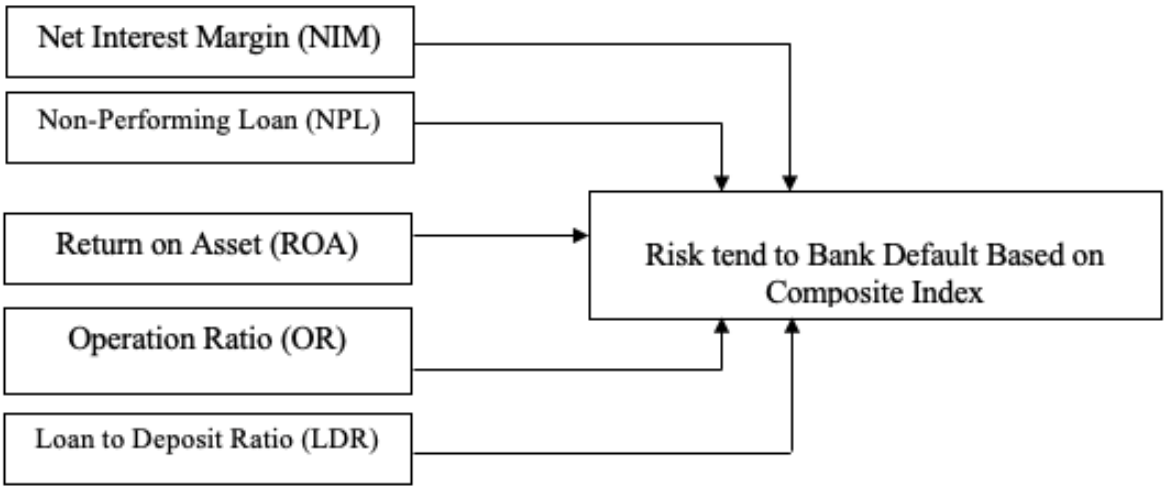

Figure 1. Framework

4. Result and Discussion

In summarizing and concluding the varied opinions and it was found that there were differences among the respondents, this study used the mean statistical calculation. With the basic assumption that there is no absolute similarity among the respondents, the researcher clarifies both individually and in groups. The results of the questionnaire statistical analysis using the mean show the weighted average value for each variable as follows:

Table 2. Mean Variable for Weighting

Capital Adequacy Ratio (CAR)	Cash Ratio (CR)	Off Balance Sheet (OBS)
43 %	32%	25%

Based on the results of the statistical analysis of the questionnaire in Table 2, the determination of code 0 for not tend to default and code 1 for tend to default is carried out by compiling a composite index formula by entering the threshold value of each variable as follows:

$Y = (0{,}43x\ CAR) + (0{,}32x\ CR) + (0{,}25x\ OBS)$.....(4.1)

$Y = (0{,}43x\ 8\%) + (0{,}32x\ 6\%) + (0{,}25x\ 1\%)$.....(4.2)

$Y = 3{,}44\% + 1{,}92\% + 0{,}25\%$.....(4.3)

$Y = 5{,}61\ \%$.....(4.4)

With the standard numbers obtained above, you can determine code 0 for not tend to default and code 1 for tend to default, where if Y> 5.61% then code 0 and if Y <5.61% then code 1. Table 3 shows the logit regression test results according to the composite index or a combination model between several variables or Composite Index (CAR, CR, OBS).

Table 3. Variable in The Equation

Variable	Expected Sign	Coefficient
NIM	(-) negative	-0.141529***
NPL	(+) positive	0.023762***
BOPO	(+) positive	0.005376***
LDR	(+) positive	0.000114
ROA	(-) negative	-0.063256***
C		2.010965
McFadden R^2		0.902

Variable	Expected Sign	Coefficient
AIC		0.221
SIC		0.212
% Correct		96.86
% Incorrect		3.14

***) Significant at the 1percent level.
**)Significant at the 5 percent level.
*) Significant at the 10 percent level.

The test results show that NIM, NPL, OR and ROA have an effect on the risk tendency to bank default. Meanwhile, LDR is proven to have no effect on the risk tendency to bank default. The results of this study reinforce the study conducted by Indrajati *et al.* (2020) and Puspitasari *et al.* (2020). This is because Rural Banks generally have an LDR ratio in accordance with the provisions of the authorities. However, this is not accompanied by good credit quality.

The results of the model are in accordance with several studies including the effect of NIM on the risk of tend to bank default, strengthening the research conducted by Fiordelisi and Mare (2013) which concluded that NIM is proven to have an effect on risk tendency to bank default. (Giordana and Schumacker, 2017) provide empirical justification that is a determining factor for the risk tendency to bank default. These findings illustrate the effect of poor credit quality which causes bank capital to shrink due to the allowance that must be provided. Findings by Devi and Firmansyah (2018) and Chou and Buchdadi (2016) concluded that credit distribution must be accompanied by good credit quality in order to generate income for banks.

Other similar research was conducted by Devi and Firmansyah, 2018; Fiordelisi and Mare, 2013 which concluded that efficiency affects the risk tendency to bank default. Inefficient banks are caused by high operating costs and high interest rates for Rural Banks. Puspitasari *et al.* (2020) adds that banks that are unable to manage their assets to generate returns will face a risk tendency to bank default. This finding strengthens the results of research conducted by Mayes and Stremmel, 2012; Fukuda *et al*., 2008; Lopez and Saurina, 2007.

5. Conclusion

This study shows that banks need to pay attention to efficiency, profitability, credit risk and potential market risks faced. The variables NIM, NPL, OR and ROA are proven to have a strong influence on risk tendency to bank default. This study is expected to provide a new perspective for the risk tendency to bank default, especially for rural banks. This study is useful for Rural Banks to pay attention to the inherent risks studied in this research and to optimize their role in improving the local economy and MSMEs. Future studies may use different methodologies, variables, data or proxies.

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