

How to Reduce MSME Non – Performing Loans in Emerging Countries? A Study with Analytical Hierarchy Process

Aristo Purboadji¹; Dedi Budiman Hakin²; Hermanto Siregar³; Roy Sembel⁴

¹School of Business IPB University, Indonesia.

¹aristo78@icloud.com

²School of Business IPB University, Indonesia.

²dedihakim@gmail.com

³School of Business IPB University, Indonesia.

³hermansiregar@yahoo.com

⁴IPMI International Business School, Indonesia.

⁴rsembel@yahoo.com

Abstract

This study aims to examine how to reduce MSME Non Performing Loans, especially in developing countries by using the Analytical Hierarchy Process (AHP). The sample of this research is Bank DKI (11 clusters) in DKI Jakarta Province. The data used are quarterly with the period January 2014 – December 2018. There are two methods used, namely regression test to determine the factors; and an Analytical Hierarchical Process (AHP) was used to develop the strategy. The results of this study indicate that the Non-Performing Loans (NPL) of MSMEs can best be reduced by restructuring and intensive collection. Restructuring can be done by rescheduling and reconditioning where both can be done separately or simultaneously. Restructuring can be effective if followed by intensive collection by means of periodic billing with a short time frame so that customers know the seriousness of the matter, to convert a problematic loan back to good status.

Key-words: Analytical Hierarchy Process, Non – Performing Loans, MSMEs, Regional Development Bank

1. Introduction

The Micro, Small and Medium Enterprises (MSME) sector for banks is considered a less profitable sector because it has high Non-Performing Loans (NPL); and NPLs are seen as “financial polluters” because they have adverse economic consequences for banks (Barseghyan, 2010; Zeng,

2012). Meanwhile, in developing countries, the background of the economy is mostly contributed by the MSME sector. For example in Indonesia, the MSME sector contributes 61 percent to the national economy (Ministry of Cooperatives, Small and Medium Enterprises, 2018). The government as administrator encourages banks to provide credit to MSMEs, but banks are still in a dilemma in providing credit to MSMEs because they have high NPLs.

This phenomenon often occurs in local government-owned banks such as Regional Development Banks (BPD) because they have a dual role, namely social goals (helping MSMEs) and business goals (remaining profitable) (Umanto et al, 2016). Therefore, it is necessary to find a way how the NPL of SMEs, especially in developing countries, can be reduced. Many researches on how to reduce the NPL of MSMEs have been carried out, especially by knowing the determinants, such as Makri et al (2014); Ghosh (2015); Umar and Sun (2018); Radivojevid and Jovovic (2017). However, the results of the research carried out were not optimal because these factors did not have a priority scale. One of the most popular methods used in determining priorities and formulating strategies is the Analytical Hierarchy Process (AHP) method introduced by Thomas Saaty (1980). AHP's ability to solve multi-criteria problems is based on a comparison of the preferences of each element, AHP can be a comprehensive strategy development model (Purboadji et al, 2021).

The use of AHP as an instrument in formulating strategies in banking is still very minimal, for example only by Hadi (2018) to reduce Non-Performing Financing (NPF); and Purboadji et al (2021) to increase MSME credit growth. Therefore, it is crucial to discuss how to reduce the NPL of MSMEs in developing countries using the Analytical Hierarchy Process (AHP). The novelty of this research is to provide a way for banks to carry out their social and business functions more effectively and maximally.

2. Literature Review

The Regional Development Bank (BPD) was established to develop and mobilize regional development and as a source of regional income. This condition is a reality because the majority share ownership is held by the provincial government. Sunarsip (2011) says that BPD has a status quo because there's almost no difference with other type of commercial bank. This is a dilemma for BPD in facing a dual role whether it is social oriented or business oriented (Umanto et al, 2016). The real case that occurs is the high number of Non-Performing Loans in the MSME sector. BPD in each bank has its own definition related to the characteristics and amount of credit (ceiling) that will be provided, for example, Bank DKI (BPD in DKI Jakarta) provides a micro business ceiling ranging

from Rp. 25 million – Rp. 500 million, small businesses ranging from Rp. 500 million – Rp. 1 billion, and the ceiling for medium-sized businesses ranging from Rp. 1 billion – Rp. 10 billion. Of course, in the calculation of lending to MSMEs, there are two views, namely socially impactful or economically profitable (Purboadji et al, 2021).

According to Hadi (2018); and Purboadji et al, (2021) granting credit to MSMEs can benefit both socially and business wise. The strategy is not only to know the factors that affect the NPL, but these factors must be synthesized using AHP into the implementation of the strategy. Hadi (2018) and Purboadji et al (2021) in synthesizing AHP not only use factors, but also actors. These factors and actors are used as criteria to get the maximum implementation strategy. Hadi (2018) uses the Return on Asset (ROA) factor, Net Operating Margin (NOM), Financing Growth, Financing Deposit Ratip (FDR), Non-Performing Financing Handling, Bank Soundness Level, Benchmark Interest Rate, Inflation, Exchange Rate, Economic Growth. The use of the Hadi's factors (2018) is different from Purboadji et al (2021) because it uses different types of bank for the research's subject, one is Islamic bank and the other conventional bank. Purboadji et al (2021) used Return on Assets (ROA), Capital Adequacy Ratio (CAR), Non-Performing Assets (NPA), Ratio of Operating Costs to Operating Income (BOPO), Loan to Deposit Ratio (LDR), Net Interest Margin (NIM), Good Corporate Governance (GCG), Credit Growth, Benchmark Interest Rate, Inflation, Exchange Rate, and Gross Domestic Product (GDP). Actors involved in the strategy carried out by banks include Commissioners, Directors, Branch Work Units, Customers, and Authorities/Regulators (Hadi, 2018; Purboadji et al, 2021). While the implementation of strategy consists of intensive collection, restructuring, selling collateral, cooperation with law enforcement agencies, and cooperation with asset management companies (Hadi, 2018).

The process in carrying out the Analytical Hierarchy Process (AHP) in this study follows Hummel et al (2014) with 3 main stages, namely problem structuring, then evaluation, and ending with a choice. Problem structuring consists of 2 processes, namely (i) define the decision problem and goals; (ii) identify and structure decision criteria and alternatives. The evaluation stage consists of (iii) Judge the relative value of the alternatives on each decision criteria, (iv) Judge the relative importance of the decision criteria (v) Group aggregation of judgments, (vi) Inconsistency analysis of judgments. Meanwhile, the choice stage consists of (vii) Calculation of the weights of the criteria and priorities of the alternatives, (viii) Conducting sensitivity analyses.

3. Research Methods

3.1. Research Sample

The sample of this research is Bank DKI data of MSMEs' Non-Performing Loans (NPL) especially in the DKI Jakarta area including KC Balai Kota, KC Juanda, KC Kebayoran Baru, KC Matraman, KC Otista, KC Permata Hijau, KC Pintu Besar Selatan, KC Tanjung Priok, KC Walikota Jakarta Barat, KC Walikota Jakarta Selatan dan KC Walikota Jakarta Timur. Research period from January 2014 – December 2018 or 20 quarters.

3.2. Research Stage

This study consists of two stages, namely conducting a regression test to determine the factors that influence the Non-Performing Loans (NPL) of MSMEs; and continued with the Analytical Hierarchy Process (AHP).

First, in performing the regression test the variables used consist of Return on Assets (ROA), Capital Adequacy Ratio (CAR), Non Performing Assets (NPA), Ratio of Operating Costs to Operating Income (BOPO), Loan to Deposit Ratio (LDR), Net Interest Margin (NIM), Good Corporate Governance (GCG), Credit Growth, Benchmark Interest Rate, Inflation, Exchange Rate, and Gross Domestic Product (GDP). These variables are then regressed using Eviews 10 with the following regression model:

$$NPL_{i,t} = \alpha + \beta_1 ROA_{i,t} + \beta_2 CAR_{i,t} + \beta_3 NPA_{i,t} + \beta_4 BOPO_{i,t} + \beta_5 LDR_{i,t} + \beta_6 NIM_{i,t} + \beta_7 GCG_{i,t} + \beta_8 CRG_{i,t} + \beta_9 BIRATE_t + \beta_{10} INF_t + \beta_{11} KURS + \beta_{12} GDP_t + \varepsilon_{i,t}$$

Where:

- $NPL_{i,t}$: Non –Performing Loan Sector SMEs i at time t
- $ROA_{i,t}$: Return on Asset Bank DKI at time t
- $CAR_{i,t}$: Capital Adequacy Ratio Bank DKI at time t
- $NPA_{i,t}$: Non Performing Asset Bank DKI at time t
- $BOPO_{i,t}$: Ratio of operating expenses to operating income at time t
- $LDR_{i,t}$: Loan to Deposit Ratio Bank DKI at time t

$NIM_{i,t}$: Net Interest Margin Bank DKI at time t
$GCG_{i,t}$: Good Corporate Governance pada at time t
$CRG_{i,t}$: Credit Growth Bank DKI at time t
$BIRATE_t$: Benchmark Interest Rate at time t proxied by BI 7 day's repo
INF_t	: Inflation at time t
$KURS_t$: Exchange rate at time t
GDP_t	: Economic Growth at time t
α	: Constant
$\beta_1 \beta_1 - \beta_8 \beta_8$: Coefisient
$\varepsilon_{i,t}$: Component errors

Second, the factors that are significant in the regression results will be used in the Analytical Hierarchy Process (AHP). The AHP structure in this study consists of 4 levels including the level of objectives, factors, actors, and strategies. The goal level is “How to Reduce the Non-Performing Loans (NPL) of MSMEs”. Factors that are chosen are factors that have a significant effect on the regression results. Meanwhile, the actor level consists of Commissioners, Directors, Branch Work Units, Customers, and Authorities/Regulators; and at the implementation level the strategy consists of intensive collection, restructuring, selling collateral, cooperation with law enforcement agencies, and cooperation with asset management companies. The evaluation stage is carried out by asking for the assessment of experts and each stakeholder of Bank DKI consists of eight person including Authorities/regulators (2 in total), Academics (2), MSME Businessmen (3), and Local Governments (2). The results of the expert assessments were processed using Expert Choice 11.

4. Result and Discussion

4.1. Descriptive Data

Descriptive data is used to provide an overview of data information from the variables used in determining the factors that influence the Non-Performing Loans of UMKM at Bank DKI. The descriptive data in Table 1 below consists of the mean, median, maximum, minimum, and standard deviation.

Table 1 - Descriptive Statistics of Quarterly Data on Non-Performing Loans for MSME Bank DKI Bank DKI Period January 2014 – December 2018

DESKRIPTIF	MEAN	MEDIAN	MAK	MIN	Std. Dev
NPL	0,1686	0,1537	0,5777	0,0193	0,1136
ROA	0,0409	0,0396	0,1223	-0,0660	0,0297
CAR	0,2443	0,2767	0,3047	0,1421	0,0546
NPA	0,0301	0,0270	0,0544	0,0122	0,0133
BOPO	0,7913	0,7808	0,9299	0,6403	0,0661
LDR	0,8098	0,8127	0,9520	0,6186	0,0938
NIM	0,0639	0,0652	0,0784	0,0499	0,0081
GCG	2,4000	2,0000	3,0000	2,0000	0,4899
CRG	0,0325	0,0180	1,5287	-0,7084	0,2591
BIRATE	0,0611	0,0625	0,0750	0,0425	0,0130
INFLASI	0,0464	0,0398	0,0776	0,0288	0,0164
KURS	0,0077	0,0134	0,0993	-0,0644	0,0405
GDP	0,0501	0,0502	0,0527	0,0466	0,0015

Source: Secondary data reprocessed Researchers, 2021.

Table 1 shows the descriptive statistics of the data used in conducting the regression analysis. Bank DKI's Non-Performing Loans (NPL) in that period had an average of 16 percent and resulted in an average ROA of 4 percent. Quarterly credit growth has an average of 3.2 percent. This shows that there is a large gap between the mean of Non-Performing Loans and Credit Growth. Inflation is averaged at the rate of 4.6 percent, meanwhile, economic conditions in Indonesia tend to stagnate (GDP), which can be seen from the minimum and maximum values whose range is not too far from 5 percent.

4.2. Analysis Regression Result

The process of performing regression analysis consists of several stages to obtain the best model. First, we tested the selection of the best estimation method used by performing the Chow test, Hausman test, and the Breusch-Paga Lagrange Mulplier test. The results of the Chow and Hausman tests show that the best estimation method used is the Fixed Effect Model (FEM), so the Breusch-Paga Lagrange Mulplier test is not carried out. Second, we tested the classical assumption to avoid the data used being free from problems of normality, multicollinearity, autocorrelation, and heteroscedasticity. The normality test was carried out by referring to the central Limit Theorem, the multicollinearity test was carried out by testing the correlation between the dependent variables, the autocorrelation test was carried out by the DW - statistic test, and the heteroscedasticity test was carried out by the Glacier test. The results of the classical assumption test carried out show that the

data used is Best Linear Unbiased Estimator (BLUE), so that the regression test can be carried out. The results of the regression estimation test can be seen in Table 2 below:

Table 2 - Test Results of Regression Model Estimation of Factors Affecting Non-Performing Loans

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<i>Return on Asset</i>	-0.108856	0.207756	-0.523960	0.6009
Capital Adequacy Ratio	0.658503	0.432281	1.523320	0.1293
Non – Performing Asset	0.978308	1.044874	0.936293	0.3503
Ratio of operating exp to operating	0.112070	0.139535	0.803165	0.4228
Loan to Deposit Ratio	-0.202377	-0.112286	1.802330	0.0730
Net Interest Margin	0.114311	0.095038	1.202797	0.2305
Good Corporate Governance	0.003575	0.014209	0.251617	0.8016
Credit Growth	0.391692	0.179522	2.181857	0.0303
Benchmark Interest Rate	-3.453490	1.385666	-2.492297	0.0135
Inflasi	1.517510	0.847368	1.790852	0.0749
Kurs	-0.147126	0.170243	-0.864214	0.3885
Gros Domestic Product	2.025403	6.396441	0.316645	0.7518
C	23.86704	3337.099	0.007152	0.9943
Adjusted R-squared	0.637709			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	1.865265			

Source: Output of Eviews 11 reprocessed by Researchers, 2021

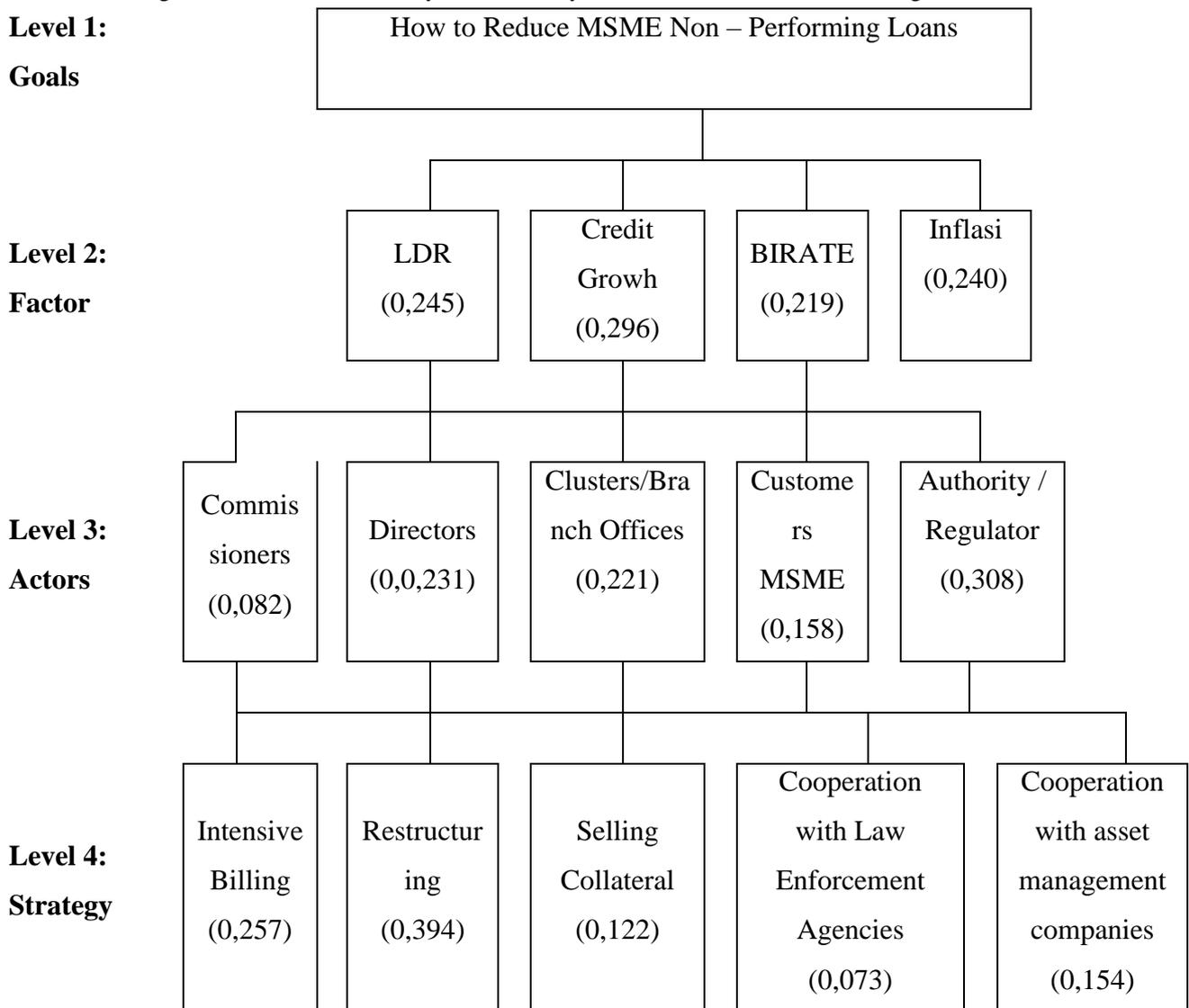
Based on Table 2, it can be seen that the Non-Performing Loans (NPL) of MSMEs are influenced by the Loan to Deposit Ratio (LDR), Credit Growth (CRG), Benchmark Interest Rate (BIRATE) factors, and Inflation. LDR has a negative effect on NPL because LDR makes the LDR ratio causing the NPL ratio to get smaller. In contrast to Makri et al, (2014); Louzis et al, (2010); Misra and Dhal, (2010) who say that loans disbursed in high amounts will have high non-performing loans as well. However, in this case, the LDR has a negative effect because it uses the loan calculation as a whole, not specific to the MSME sector. This is confirmed by the significant influence of the credit growth variable and has a positive coefficient value. Credit growth in banks is directly proportional to Non-Performing Loans (NPL) (Jabbouri and Naili, 2019). Meanwhile, the Benchmark Interest Rate variable has a negative effect on NPL. This finding is different from Hadi (2018), because the Benchmark Interest Rate is around 6 percent, while Bank DKI's MSME interest rate is on average around 17%. The results of the researchers' observations, although the Benchmark Interest Rate is increased (maximum 7.5 percent) or lowered (minimum 4.2 percent), MSME interest rates tend to stagnate. The high NPL in the MSME sector at Bank DKI was also exacerbated by inflation. According to Klein (2013), inflation will reduce people's real income, on the other hand

their income remains constant, thereby reducing the ability of debtors to pay their obligations, thereby causing an increase in NPL.

4.3. Analytical Hierarchy Process (AHP) Result

The results of the Analytical Hierarchy Process (AHP) from the assessments of the experts who were processed using Expert Choice 11 can be seen in Figure 1 below:

Figure 1 - Results of the Analytical Hierarchy Process to reduce Non-Performing Loans SMEs



Source: Expert Choice 11 output reprocessed by Researchers

The restructuring strategy is considered important because restructuring can provide space for banks to manage their cash flows and provide opportunities for debtors to organize their business in

order to fulfill their obligations to banks. This restructuring strategy program can take the form of an extension of the time period (rescheduling) or in the form of waivers or delays in the payment of principal loans to customers (reconditioning). The two alternatives can be done separately as well as can be done together. This restructuring strategy is the easiest and cheapest strategy for banks compared to other strategies. However, the most important thing that needs to be done is that the alternative selection must be in accordance with the ability and condition of the money that occurs to the customer. Accuracy in choosing alternatives can have an impact on strategies to reduce NPLs, so choosing accuracy in choosing alternatives requires careful analysis and evaluation support.

Such restructuring efforts can be carried out effectively and efficiently if supported by intensive collection efforts. The results of the justification of the experts show that intensive billing has a weight of 0.257. This intensive billing is a step in which the banking sector periodically with a short enough time difference so that customers know they are serious about returning problem loans to smooth. The intensive billing strategy itself can be carried out by direct visits to the customer/debtor's premises or by telephone communication. As for the intensive billing strategy, it is expected that officers can provide information to the leadership of Bank DKI. Alternative restructuring and intensive collections generally have a very high success rate in reducing NPL levels. However, if these efforts still cannot produce results, then the next strategy is to carry out the third strategy, namely Cooperation with asset management companies. However, cooperation with asset management companies takes a long time and costs a lot of money. Thus, what can be said as the main strategy is restructuring and both intensive collection strategies.

5. Conclusion

The results of this study show best strategies to reduce Non-Performing Loans of SMEs, especially in developing countries, namely restructuring and intensive billing. Restructuring can be done by rescheduling and reconditioning where both can be done separately or simultaneously. Restructuring can be effective if followed by intensive billing by means of periodic collection with a short time frame so that customers know the seriousness of returning loan quality, from problematic to normal status.

References

Barseghyan, L. (2010). Non-performing loans, prospective bailouts, and Japan's slowdown. *Journal of Monetary economics*, 57(7), 873-890.

- Ghosh, A. (2015). Banking-industry specific and regional economic determinants of non-performing loans: Evidence from US states. *Journal of financial stability*, 20, 93-104.
- Hadi, M. (2018). *Determinants of non-performing financing factors in Islamic commercial banks case study on sharia bank bri*. (Doctoral dissertation, Institut Pertanian Bogor).
- Hummel, J.M., Bridges, J.F., & IJerman, M.J. (2014). Group decision making with the analytic hierarchy process in benefit-risk assessment: a tutorial. *The Patient-Patient-Centered Outcomes Research*, 7(2), 129-140.
- Jabbouri, I., & Naili, M. (2019). Determinants of Nonperforming Loans in Emerging Markets: Evidence from the MENA Region. *Review of Pacific Basin Financial Markets and Policies*, 22(04), 1950026.
- Ministry of Cooperatives and Small and Medium Enterprises (KUMKM). 2018. *Data Development of Micro, Small, Medium Enterprises (MSMEs) in 2018 – 2019*. https://kemenkopukm.go.id/uploads/laporan/1617162002_SANDINGAN_DATA_UMKM_2018-2019.pdf
- Klein, N. (2013). *Non-performing loans in CESEE: Determinants and impact on macroeconomic performance*. International Monetary Fund.
- Louzis, D. P., Vouldis, A. T., & Metaxas, V. (2010). The determinants of non-performing mortgage, business and consumer loans in Greece: A dynamic panel data study. In *International Conference on Applied Economics–ICOAE*, 479-487.
- Makri, V., Tsagkanos, A., & Bellas, A. (2014). Determinants of non-performing loans: The case of Eurozone. *Panoeconomicus*, 61(2), 193-206
- Misra, B. M., & Dhal, S. (2010). Pro-cyclical management of banks' non-performing loans by the Indian public sector banks. *BIS Asian Research Papers*, 16, 1-23.
- Purboadji, A., Hakim, D.B., Siregar, H., and Sembel, R. (2021). Determinants of Non – Performing Loans for MSMEs Financing at Regional Development Banks in Indonesia (Case Study: Bank DKI Jakarta). *International Journal of Scientific & Engineering Research*, 12(2), 947 – 952.
- Purboadji, A., Hakim, D.B., Siregar, H., and Sembel, R. (2021). Strategies For Increasing MSME Credit Growth in Regional Development Banks in Emerging Countries: Analytical Hierarchy Process Approach. *International Journal of Management*, 12(7), 88- 98.
- Radivojevic, N., & Jovovic, J. (2017). Examining of determinants of non-performing loans. *Prague Economic Papers*, 26(3), 300-316.
- Saaty, T. (1980). The analytic hierarchy process (AHP) for decision making. In *Kobe, Japan*, 1-69.
- Umanto, U., Wijaya, C., & Atmoko, A.W. (2016). Corporate governance with the institutional theory approach on regional development banks in Indonesia. *BISNIS & BIROKRASI: Jurnal Ilmu Administrasi dan Organisasi* 22(2), 100-110.
- Umar, M., & Sun, G. (2018). Determinants of non-performing loans in Chinese banks. *Journal of Asia Business Studies*. 12(3), 273 – 289.
- Zeng, S., (2012). Bank non-performing loans (NPLs): a dynamic model and analysis in China. *Modern Economy*, 3(1), 100–110.