Effect of Loan to Deposit Ratio (LDR), Non Performing Loan (NPL), Net Interet Margin (NIM) On Return on Assets (ROA) with ATM as Moderation Variables

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Abstract: Banking plays an important role in the economic development of a country, where banks provide benefits to the mechanism of available sources of funds effectively and efficiently. In addition, banks provide financial services to all levels of society, so that the soundness of banks must be considered so that the economy is better. Therefore, it is very important to assess the performance of a financial institution. The purpose of the assessment is to determine the state of health of a bank. Where the soundness of a bank is seen from the performance of the bank that is assessed in terms of profitability, and the level of profitability is assessed through Return on Assets (ROA). Innovations made by banks on the basis of information technology have an extraordinary impact on efficiency and effectiveness. One of them is the existence of electronic banking products such as ATMs. This study aims to examine the effect of the Loan Deposit Ratio (LDR), Non-Performing Loan (NPL) and Net Interest Margin (NIM) on Return on Assets (ROA), as well as ATM as a moderating variable on the effect of Loan Deposit Ratio, Non-Performing Loans, and Net Interest Margin against Return on Assets. In Banks listed on the Indonesia Stock Exchange, from 2010 to 2017. Sampling using Purposive Sampling. The analysis technique used is multiple linear regression with SPSS 24. Research shows that Loan Deposit Ratio, Non-Performing Loans, and Net Interest Margin are able to explain Return on Assets. Research results show that (1) Loan Deposit Ratio has a significant negative effect on Return on Assets; (2) Non-Performing Loans have a significant negative effect on Return on Assets; (3) Net Interest Margin has a significant positive effect on Return on Assets; and (4) ATMs do not moderate the influence of Loan Deposit Ratio, Non-Performing Loans, and Net Interest Margin on Return on Assets.
Keywords: Loan to Deposit Ratio, Non Performing Loan, Net Interest Margin, Return on Asset.

INTRODUCTION

In order for the organization or company to be more competitive, it is necessary to have completed planning in identifying the use of available resources [1]. The Bank is a business entity that collects funds from third parties in the form of deposits that will later be distributed to the public in the form of credit to improve the standard of living of the community. According to its function, the bank consists of two types, namely commercial banks and people's credit banks.

Financial Performance is a measure of how much a company can create profits, especially companies in the financial industry such as banking [2]. It is very important to assess the performance of a financial institution. The purpose of the assessment is to find out the health condition of a bank which is done using a measuring instrument. A healthy bank is measured in rentability which continues to increase. Besides that, it also relates to the efficiency and ability of a bank to carry out operations, it is expected that with the efficient use of costs, it is expected that the profits obtained by the bank will increase.

Based on the Bank Indonesia Regulation Number: 13/1 / PBI / 2011 concerning the Assessment of the Health of Commercial Banks, banks are required to always maintain and improve the soundness of banks. The soundness of a bank can be seen from the bank's performance which is assessed through the achieved profitability, where profitability is measured through Return on Assets (ROA).

Therefore, banks are required to obtain profitability in carrying out every operational activity. Probability is the company's ability to manage liquidity, assets using operating profit obtained. Market analysis often uses Return on Assets (ROA) to see the company's success in carrying out its operations. ROA is the company's ability to generate profits on assets used [3]. The greater the ROA shows better performance, because the level of profitability increases, of course the impact will be enjoyed by shareholders [4].

This research takes banking taken from Bank Financial Statements of 10 Banks that have the biggest assets per March 2018, according to the table below:

Data as of March 2018 (in Trillion)

Name of Bank	∑ ASSET (Trillion)
BRI	1.064,73
MANDIRI	945,62
BCA	745,04
BNI	648,57
BTN	258,74
CIMB NIAGA	255,69
MAYBANK BII	160,88
DANAMON	153,79
PERMATA	152,25
BUKOPIN	102,73
Source: Bank Financial Report	

This research is a quantitative research, which was conducted on 10 banks in Indonesia, where the data were changed for 8 years of observation from 2010 to 2017.

Banking innovation on the basis of information technology in the banking industry has a tremendous impact on efficiency and effectiveness. One of them is the existence of electronic banking products such as ATMs, Credit Cards, has encouraged banking services to become increasingly widespread, both in terms of time and geographical reach, which has resulted in a significant increase in the volume and value of financial transactions in the banking world.

Based on data at Bank Indonesia, electronic transactions carried out using cards (both credit cards, debit cards, ATMs, ATM + debit cards) in Indonesia, the period January to August 2008, 980,400,000 transactions with a nominal value of Rp. 1,463 Trillion, with 51,350,000 cards in circulation, issued by 118 organizers (53 ATM card issuers, 20 credit card issuers, 38 ATM + Debit card issuers, and 7 prepaid card issuers).

This research was conducted because of the inconsistency of the results of other researchers. Literature *et al*., [5] in his research shows that LDR has a significant positive effect on the company's financial performance, case studies on rural credit institutions in Melaya sub-district.

Setiawan [6] and Almazari [7] showed that LDR had a significant positive effect on ROA. On the contrary, Irawan [8] demonstrated that LDR had a significant negative effect on ROA. Yudha *et al*., [9] showed that LDR had no significant effect on ROA in domestic banks, while it had a negative and significant effect on ROA in foreign banks. A study by Menicucci and Guido Paolucci [10] indicated that loans had no significant effect on ROA and ROE. On the contrary, Kosmidou [11] indicated that loans in European banks had a negative effect on profitability. Sufian and Habibullah [12] showed a positive relationship between liquidity and profitability.

Rotinsulu *et al*., [13] showed that non-performing loan, loan-to-deposit ratio and net foreign exchange position had a significant effect on return on assets. Puteh [4] demonstrated that NPL had a significant positive effect on ROA. On the contrary, Hutagalung *et al*., [14] indicated that NPL had a significant negative effect on ROA. Yudha *et al*., [9] showed that NPL had a significant negative effect on ROA, both in domestic and foreign banks. Quite the opposite, Sastra *et al*., [15] showed that NPL had no significant effect on profitability. Similarly, Pinasti and Mustokawati [16] indicated that NPL had no significant effect on profitability.

A study conducted by Setiawan [6] showed that net interest margin had a significant effect on return on assets. Yudha *et al*., [15] demonstrated that net interest margin had a significant positive effect on return on assets in domestic banks; however, it had a significant negative effect on return on assets in foreign banks. Eng [17] indicated that net interest margin had a significant effect on return on assets. In contrast, Dian [19] showed that net interest margin had no significant effect on return on assets.

Based on the above previous studies, the hypotheses of the present study are:

H_1 = Loan-to-deposit ratio (LDR) has an effect on return on assets (ROA)

H_2 = Non-performing loan (NPL) has an effect on return on assets (ROA)

H_3 = Net interest margin (NIM) has an effect on return on assets (ROA)

H_4 = Automatic teller machines (ATMs) moderate the effect of loan-to-deposit ratio (LDR), non-performing loan (NPL) and Net interest margin (NIM) on return on assets (ROA)

LITERATURE REVIEW
Definition of Return on Assets (ROA)

Profitability ratios to measure the effectiveness of a bank in obtaining profits, while also being used to measure financial health. Based on the regulations of Bank Indonesia, profitability is one of the main elements in assessing the soundness of a bank and one of the indicators usually used to measure bank profits is Return on Assets (ROA).

Where ROA shows the ability of a company to generate profits on assets used [3]. ROA is a measure of the company's profitability in generating profits. Where ROA can be calculated by the formula:

$$ROA = \frac{Earning\ before\ tax}{Average\ Total\ Assets} \times 100\%$$

Definition of Loan to Deposit Ratio (LDR)

The LDR ratio is a financial ratio that relates to the liquidity aspect. Where the LDR ratio explains the extent to which existing deposits are used in lending, or LDR illustrates the bank's ability to repay withdrawals made by depositors by relying on loans provided as a source of liquidity. LDR can be used to see how far credit is given to credit customers, can offset the bank's obligation to immediately meet the demands of depositors who want to withdraw money that has been used by banks to provide credit.

If the LDR value is too low, the level of bank liquidity will be higher so that it will cause losses to the bank. Whereas if the value of the LDR ratio is too high, the higher the credit given, which will cause the bank to experience liquidity difficulties. Based on the Bank Indonesia Regulation Number: 18/14 / PBI / 2016, the LDR ratio is set between 80% -92% to prevent a bank from experiencing liquidity losses or difficulties. Where the LDR formula is:

$$LDR = \frac{Total\ Credit\ granted}{Total\ Third\ Party\ Funds} \times 100\%$$

Definition of Non-Performing Loans (NPL)

NPL shows the bank's ability to manage non-performing loans provided by the Bank, where the NPL is a ratio used to measure the Bank's ability to overcome the risk of failure of credit repayments by the Debtor. NPL reflects credit risk, the smaller the NPL, the smaller the credit risk borne by the Bank. In providing credit, the Bank needs to analyze the ability of the debtor to repay its obligations. After the credit is granted, the bank is obliged to monitor the use of credit, as well as the ability and compliance of the debtor in fulfilling its obligations. Credit Risk is a risk faced by the Bank because it distributes funds in the form of loans to the community [20].

Based on Bank Indonesia Regulation Number: 17/11 / PBI / 2015 Concerning Amendment to Bank Indonesia Regulation Number: 15/15 / PBI / 2013, concerning Statutory Reserves for Commercial Banks both in Rupiah and Foreign Currency, which are determined for Commercial Banks Conventional ratio values NPL must not exceed 5%. If the value of the NPL ratio is higher then it can be said that the credit quality is worse, which will cause more credit problems. Where the NPL formula is:

$$NPL = \frac{Number\ of\ Troubled\ Credit}{Total\ Credit} \times 100\%$$

Definition of Net Interest Margin (NIM)

Net Interest Margin (NIM) is a ratio that shows the management ability of a bank in managing earning assets in order to obtain net interest income, or NIM is a description of emerging market risks, seen from interest rates.

Net Interest Margin calculation takes from the difference between the interest rate of funding (funding) and the loan interest rate given (lending) or in absolute form is the difference between the total interest cost of financing and the total interest cost of the loan [21].

Therefore, the amount of NIM will affect the Bank's profit and loss which ultimately affects the performance of the bank. Net interest income is derived from the difference between the interest earned from granting credit and the interest that must be paid to the depositor.

Based on Bank Indonesia Regulation Number: 10/15 / PBI / 2008, where the value of the Net Interest Margin is set at a minimum of 6%. The greater this ratio, will increase net interest income, thus causing profit in the Bank. Thus, if the NIM gets bigger, the greater the profitability. Where the NIM formula is:

$$NIM = \frac{\text{Net interest income}}{\text{Average Earning Assets}} \times 100\%$$

Definition of Automatic Teller Machines (ATMs)

ATMs are a banking service channel, which makes it easier for customers to make cash withdrawals, cash deposits, balance check, transfers, payments and purchases without having to be served by humans. An ATM consists of a CPU, monitor, keyboard and so forth. Today, most ATMs around the world use the Microsoft Windows operating system, especially Windows XP Professional or Windows XP Embedded. However, a small number of it remains running Windows OS versions, such as Windows NT, Windows CE, or Windows 2000. ATMs are among the applications of information and electronic transactions.

The present study used loan-to-deposit ratio (LDR), non-performing loan (NPL) and net interest margin (NIM) as the independent variables. The dependent variable is return on assets (ROA).

METHODS

This research is quantitative research. The population of this study are the 10 largest banks in Indonesia, namely: Bank Rakyat Indonesia (BRI), Bank Mandiri, Bank Central Asia (BCA), Bank Negara Indonesia (BNI), Bank Tabungan Negara (BTN), CIMB Niaga, Maybank BII, Danamon, Permata and Bukopin. Where all populations are taken as samples, the sample of this research is saturated. Financial report data is taken during 8 years of observation, from 2010 to 2017. This study used the purposive sampling method with the following sample selection criteria:

Number of banks listed in the ISX	15
Banks inconsistently issuing annual reports	5
Number of samples	10

Operational Definition of Variables

Dependent variables in this study are Return on Assets (ROA), while the independent variables in this study are Loan to Deposit Ratio (LDR), Non Performing Loans (NPL) and Operational Income Operating Costs (BOPO).

Dependent Variables

a. Return on Assets (ROA)

Return on Assets (ROA) is a ratio used to measure a bank's net income using total assets.

Independent Variable

a. Loan to Deposit Ratio (LDR)

Loan to Deposit Ratio (LDR) is a ratio that describes the ability of a bank to repay the withdrawal of funds by depositors obtained from lending as a source of liquidity.

b. Non Performing Loan (NPL)

Non-Performing Loans (NPLs) are the ratios used in measuring the ability of a Bank to overcome the risk of failure to repay credit

c. Net Interest Margin (NIM)

Net Interest Margin (NIM) adalah rasio yang menjelaskan kemampuan manajemen suatu bank terhadap pengelolaan aktiva produktif yang dimiliki untuk memperoleh pendapatan bunga bersih.

Intervening Variables
Automatic Teller Machine (ATM)
Automatic Teller Machine (ATM) is a banking service channel that is expected by bank customers to conduct cash withdrawals, cash deposits, balance checks, transfers, payments and purchases easily, where the transaction process is carried out without having to be served by humans.

The Feasibility Test Model
Goodness of Fit **Test (F Test)**
The F-test is used to test the feasibility of the model of research, with the aim to find out whether the research model is good or not.

A Classic Assumption Test
Normality tests are used to test the normalcy of a data, by using a test of normality, autocorrelation, multicollinearity and test.

The Coefficient Of Determination (R2)
The coefficient of Determination (R2) is used to find out the extent to which the dependent variable models in describing him. The value of R2 which demonstrates the ability of small independent variable in explaining the dependent variable, is very limited [22].

The Test Of Hypothesis
Testing the LDR, NPL, NIM and against the Return on Asset (ROA), as well as the impact of ATM as the moderate variable influence on LDR, NPL, NIM and against the Return on Asset (ROA). Analytical techniques used multiple linear regression to wear, with a significant level of 5%. The form of a linear equation is:

$ROA = a_1 + b_1LDR + b_2NPL + b_3NIM + e$ ………… Equation 1

$Abs\_res = a_2 + b_4ATM + e$ ……………………… Equation 2

Where,
  a = Konstanta
  LDR = *Loan to Deposit Ratio*
  NPL = *Non Performing Loan*
  NIM = *Net Interest Margin*
  ROA = *Return on Asset*
  ATM = Dampak ATM
  e = *error*

RESULTS
The Feasibility Test Model
The test results of F over ROA, indicating significant value of 0.000, so it can be said that this research model deserves to be continued.

A Classic Assumption Test
Data Normality Test
The Normality test of the data performed wearing a P-P Plot, indicate that the data is spread around the diagonal line, and deployment following the direction of the diagonal lines. The data is distributed normally, so that means the research meet the assumption of normality.

Autocorrelation Test
The results Test table wear autocorrelation Durbin-Watson below:

Table-2:

Summary Model				
Model	R	R Square	Adjusted R Square	Durbin-Watson
1	0,770[a]	0,593	0,577	0,923
a. Predictors (Constant) : LDR, NIM, NPL				
b. Dependent Variabel : ROA				

Source: The data processed by the researcher

From table-2 known that Durbin Watson test results show the value of this result, 0.923 does not occur, because the autocorrelation 0.923 < 1.35, inconclusive research on the autocorrelation is not happening.

Multicollinearity Test

Multicollinearity test against ROA, it appears that the value of Toll > 0.10 and VIF < 10 shows not the case study on the multicollinearity.

Hyphotesis Test

Following are the results of hypothesis testing:

Tabel-3:

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig
1	(Constant)	0,032	0,008		3,953	0,000
	LDR	-0,018	0,008	-0,162	-2,183	0,032
	NPL	-0,533	0,081	-0,501	-6,567	0,000
	NIM	0,373	0,064	0,438	5,787	0,000
a. Dependent Variable: ROA						

Information obtained from table-3 regarding the multiple regression equation between the independent variable (LPR, and NPL, NIM) of the dependent variable (ROA) is:

$$ROA = 0,032 - 0,018\ LDR - 0,533\ NPL + 0,373\ NIM + e$$

The value of the variable significance of LDR, NPL and NIM is less than 0.005, so variable LDR, NPL, NIM and effect on ROA

Variabel Moderasi

As for ATM processing results as variable moderation, can be seen from the table below:

Table-4:

Coefficients[a]						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig
1	(Constant)	-0,895	0,681		-1,314	0,193
	ROA	36,082	23,497	0,171	1,536	0,129
a. Dependent Variable: abs_res						

From table-4, the regresion equation is

$$Abs\_res = -0,895 + 36,082\ ROA$$

ATM is known as moderation variable in the value of its parameter is negative and the table t test is significant. From table-4 above, it appears that the values of the parameters B and positive values of t test was not significant. Therefore, the ATM is not moderating variables that influence of LDR, NPL, NIM and against ROA.

Coefficient of Determination

From sports SPSS indicates that the adjusted R square of 0.577, meaning the percentage of the influence of the independent variable (LDR, NPL, and NIM) against ROA is of 57.7%, rest of 42.3% are affected by other variables that are not included in the model This research.

DISCUSSION
The influence of the Loan to Deposit Ratio (LDR) towards Return On Asset (ROA)

Based on table-3 shows that the level of significance LDR 0.032 means significantly influential to the direction of LDR negatively to ROA registration-0.018. These data indicate that any increase in LDR 1% will cause the ROA dropped by 1.8%. Thus H1 stating that influence on LDR ROA received.

The results of this research in accordance with previous research done by Eng [17] shows that significant negative effect LDR toward profitability, which diproksi by ROA. Whereas Yudha *et al*., [9] in her research indicates that significant negative effect against the LDR ROA on foreign banks, domestic banks however LDR has no effect against ROA.

Influence of Non Performing Loan (NPL) against the Return On Asset (ROA)

Based on table-3 it appears that the NPL level of significance means 0.000 LDR significant influential to the direction of negatively to ROA of 0.533. These results indicate any increase in NPL amounting to 1% will cause the ROA down by 53.3%. Thus H2 stating that the NPL affects ROA received.

The research is in line with research Yudha *et al*., [9] which showed that the NPL negative effect significantly to ROA, both on domestic banks and Foreign banks. The research was also supported by Hutagalung *et al*., [14], which showed that the NPL negative effect significantly to ROA.

The influence of Net Interest Margin (NIM) against the Return On Equity (ROA)

From table-3 shows the NIM has the level of significance of 0.000 means significant influential NIM positive direction towards ROA of 0.373. These data indicate that any rise in NIM 1% will cause the ROA rose by 37.3%. Thus the H3 stating that the NIM to ROA received.

The present study is consistent with those of Setiawan [6] and Eng [17] demonstrating that NIM had a significant effect on ROA. Yudha *et al*., [9] showed that NIM had a significant positive effect on ROA in domestic banks, but it had a significant negative effect in foreign banks.

ATMs moderate the effects of LDR, NPL, and NIM on ROA

Table-3 shows that B is positive not significant; thus, ATMs are not a moderating variable. ATMs do not boost the effects of LDR, NPM and NIM on ROA. Thus, H_4 stating that ATMs moderate the effects of LDR, NPM, and NIM on ROA is rejected. ATMs are a means to enhance marketing. Also, it can be considered as a promotional tool, rather than increasing revenues. The authors only used data of the number of ATMs, rather than using the revenues generated through ATMs. Thus, ATMs did not moderate the effects of LDR, NPM and NIM on ROA.

CONCLUSION

The foregoing analysis shows that LDR, NPL and NIM have an effect on ROA with a significance level of less than 0.05. Furthermore, ATMs do not moderate the effects of LDR, NPL and NIM on ROA since it represents a promotional tool, rather than increasing revenues directly.

Results of the correlation coefficient test showed an adjusted *R*-squared of 0.577 for ROA. This indicates that LDR, NPL and NIM have effects on ROA of 57.7 %, while the remaining 42.3% are affected by other variables not included in the study, such as CAR, OER, non-interest income, net foreign exchange position and other variables of financial ratios.

The present study has several limitations in terms of the data available and banks' inconsistent reporting. Future studies are recommended to include macro-economic factors, such as interest rates and inflation, since external factors also have an effect on a company's profitability.

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