

## Credit Risk, Market Risk, Operational Risk and Liquidity Risk on Profitability of Banks in Indonesia

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### Abstract

*This study examines the effect of credit risk, market risk, operational risk, and liquidity risk on profitability of banks listed on the Indonesia Stock Exchange in 2010-2014. The method used is descriptive and verification methods, with a sample of 30 banks and using multiple regression analysis. The results showed that credit risk does not partially affect profitability. Market risk, operational risk, and liquidity risk partially have positive effect on profitability. It simultaneously shows that credit risk, market risk, operational risk and liquidity risk have effect on the profitability of banks amounted to 67.1%. Improvement of Non-Performing Loan, Net Interest Margin, Operating Expenses to Operating Income Ratio, and Loan to Deposit Ratio will increase the Profitability.*

*Keyword: credit risk, market risk, operational risk, liquidity risk, profitability*

### INTRODUCTION

Bank is a sector strictly regulated by authorized institution, because it involves many parties, namely collecting funds from the public and distribute to the public in the form of credit. Bankrupt banks will lead to disruption of payment systems, mobilization of funds, distrust of people, and disruption of investment activities. Bank as a profit-oriented service company, should be able to maintain its financial performance, especially the level of profitability, i.e. the ability of the company to make profit in relation to total sales of assets or equity (Sartono, 2008:122). The bank's ability to generate profits is an important thing because basically interested parties, such as investors and creditors measure the bank's success based on the visible ability of the management performance in generating profits.

Return on Assets (ROA) measures the bank's ability to make an overall profit. The use of ROA as a proxy for profitability of the bank is in accordance with Bank Indonesia Circular Letter No. 6/23/DPNP May 31, 2004. The profitability of banks is assessed to be under pressure during the period of 2014 through 2015 and is expected to continue in 2016, as the impact of fierce and complex competition, and the rapidly changing business environment (Figure 1). The uncertainty in global financial markets that occurred during the first half of 2015 also influence the development of domestic financial markets, such as the slow growth

on economic and credit, weakness on exchange rate, yield increase on Government Securities (*SBN/ Surat Berharga Negara*), rise on international commodity prices, as well as the realization of fiscal that had yet go according to the plan.

The decline in banking performance was also followed by increased risk, namely the possibility of potentially negative events will occur and may cause adverse effects or inoptimal achievement of the goals and objectives of the company. Based on Bank Indonesia Regulation Number 11/25/PBI/2009, there were some risks in banking, such as credit risk, market risk, operational risk, liquidity risk, strategic risk, reputation risk, legal risk and compliance risk. This study discusses the risks affecting profitability, such as credit risk, market risk, operational risk, and liquidity risk (Darmawi, 2011: 16-18 in Attar, 2014; Meilania, 2014: 23; Hanafi: 2012).

Credit Risk (Bank Indonesia Regulation Number 11/25/PBI/ 2009) is a risk due to failure of the debtor and/or other parties to meet obligations to banks, measured by the ratio of Non-Performing Loan (NPL). Data for the second half of 2013 - 2015 is shown in Figure 2. The NPL increased due to (1) investment credit came from sub-sector coal exports and the trade in machinery and spare parts, (2) work on capital loans mainly from the trade sector of the fuel and the food retail trade, (3) consumer credit coming from mortgage types 11 to 70.

Market risk (Bank Indonesia Regulation Number 11/25/PBI/2009) is a risk on balance sheet and off-balance sheet/administrative account including derivative transactions, due to overall changes in market conditions, including the risk of changes in option prices. According to the Financial Services Authority (FSA), market risk component can be divided into three, namely price risk, foreign exchange risk and interest rate risk. Market risk can be proxied by the difference in total interest expense of funding for a total cost of interest on loans which is Net Interest Margin (NIM) (Mawardi, 2005). Based on Figure 3, bank lending rates declined, due to lower interest rates on deposits that cause the costs of intermediation become more affordable.

Operational risks (Bank Indonesia Regulation Number 11/25 /PBI/2009) is a risk due to insufficient and/or failed internal processes, human error, system failure, and/or the presence of external events affecting the operations of bank. Operational risk is different from other types of risk, because it is not directly related to the effort to produce a yield (return). To reflect the operational risk, we use OEOI ratio (Operating Expenses to Operating Income). Figure 4 shows the ratio OEOI increase across BUKU s, due to the rising cost of Allowance for Impairment Losses (CKPN/ Cadangan Kerugian Penurunan Nilai) in an effort to mitigate credit risk and interest cost of third-party funds.

Liquidity risk (Bank Indonesia Regulation Number 11/25/PBI/2009) is a risk due to the inability of bank to meet its maturing obligations of the funding sources of cash flow and/or liquid assets of high quality that can be pledged without disrupting the activities and financial condition of the bank. Loan to Deposit Ratio (LDR) is an indicator used for liquidity risk. Figure 5 shows a decline in liquidity in June 2015 which meant an increase in liquidity risk as it was reflected in banks' decreased liquidity buffer. The decrease of the buffer was marked by a decrease in the minimum of required primary and secondary clearing account (giro) compared to the previous semester and the same period the previous year. The decline occurred in both industrialized and per BUKU group.

Research on the effect of credit risk (proxied by Net-performing loans/NPL) to profitability (proxied by Return On Assets / ROA) conducted by Attar (2014), Kusuma (2013), Goddess (2014), Nawaz, et. al. (2012), and Mawardi (2005) showed that credit risk negatively affected profitability. The research of Smith (2013) and Ponttie (2007) showed that credit risk had a positive effect on profitability.

Research on the effect of market risk proxied by Net Interest Margin (NIM) on profitability proxied by Return on Assets (ROA) conducted by Mawardi (2005), Margaretha (2013), Widyastuti and Mandagie (2010), as well as Ponttie (2007) showed that credit risk had a positive effect on profitability. While the research

results by Rindhatmono (2005) showed that market risk negatively affected profitability.

Research on the effect of operational risk proxied by Operating Expenses to Operating Income (OEOI) ratio to profitability proxied by ROA conducted by Ponttie (2007) found results that operational risk had a positive effect on profitability while research by Attar (2014), Kusuma (2013), and Eka (2013), Sudiyatno and Fatmawati (2013) showed that market risk had a negative effect on ROA.

Research on the effect of liquidity risk proxied by the Loan to Deposit Ratio (LDR) to profitability proxied by ROA conducted by Attar (2014), Kusuma (2013), Smith (2013), Khoirul (2013), indicated that liquidity risk had a positive effect on profitability while research by Goddess (2014), Widyastuti and Mandagie (2010), and Ponttie (2007) showed that the liquidity risk had a negative effect on profitability.

Based on the slow growth in the domestic and global economy in the first half of 2015, and the conflicting results of previous studies, the research must be done to provide a more adequate and relevant data to current conditions.

The problems of this study are (1) What the condition of credit risk (NPL), market risk (NIM), operational risks (OEOI), liquidity risk (LDR), and profitability of banks listed on the Indonesia Stock Exchange Period 2010-2014 are, (2) How much the effect of credit risk, market risk, operational risk, liquidity risk simultaneously and partially on profitability of banks listed on the Indonesia Stock Exchange Period 2010-2014 is.

## METHOD

Research results by Attar (2014), Mawardi (2005), Kusuma (2013) showed that the application of credit risk management had a negative effect on profitability. Research results by Mawardi (2005), Widyastuti and Mandagie in Margaretha (2013) showed that market risk had a positive effect on profitability.

Research results by Mawardi (2005), Ponttie (2007), Kusuma (2013), Sudiyatno and Fatmawati (2013), showed that operational risk had a negative effect on profitability. Research results by Kusuma (2013), Margaretha (2013), and Attar (2014) showed that liquidity risk had a positive effect on profitability, while Sudiyatno and Fatmawati (2013) showed that liquidity risk had no effect on profitability.

The effect of credit risk, market risk, operational risk and liquidity risk on profitability of banks according to Attar (2014: 17) and Mawardi (2005: 58) was that the simultaneous application of risk management (credit, liquidity and operational) affected profitability. Research paradigm can be described in Figure 6. The hypothesis showed that there are simultaneously and partially significant credit risk, market risk, liquidity risk, operational risk on profitability.

The method used is descriptive and verification with the bank analysis unit listed in Indonesia Stock Exchange 2010-2014. Sampling technique used is purposive method of 30 companies with secondary data. Operationalization of research variables and indicators can be seen in Table 1.

## RESULT

Credit risk is the risk faced by banks for distributing the funds in the form of loans. Credit risk in 2010 to 2014 (Figure 7) appears to be fluctuative (3.22% - 3.27%) and under the maximum limit set by the central bank at 5% which means that banks successfully manage credit risk and are able to minimize the risk of bad credit. Credit risk is due to the business process, i.e. the bank is not ready to extend credit to MSMEs (Micro, Small and Medium Enterprises) as well as an increase in interest rates, and the slowing economic growth and the weakening of rupiah.

Lowest credit risk condition due to banks mostly give credit to the productive sectors as well done selectively so that the value of NPL is lower than credit growth. In, 2013 the condition of economic began to impact on credit growth but the condition of the banking risk remained low.

Market risk in 2010 to 2014 (Figure 8) tends to be stable. Market risk was highest in 2014 amounted to 3.27%, due to the political situation in Indonesia, which executed the 2014 general election and the presidential election, the weakening of foreign currencies against rupiah, as well as the increase of BI rate in the range of 1% - 5%. Market risk on the lowest occurred in 2011 amounted to 3.22%, due to the weakening of rupiah against foreign currencies and interest rate hikes. Rupiah stability can be measured by the value of rupiah against the goods at local and abroad. The stability of rupiah against the goods in the country has been reflected in the level of credit risk, while the stability of rupiah overseas has been reflected in the exchange rate against the currency of another country.

Operational risk is a risk that due to non-functioning of internal processes, human error, system failure, or external problems affecting the operations of the bank. The development of operational risk was proxied by OEOI in 2010 to 2014 tend to be fluctuative (Figure 9). Operational risk was highest in 2014 amounted to 63.81%, due to the bank upgrading the technology infrastructure in the banking financial system, which in the first half to test the information system 3 times, including carrying out operational activities of the BI-RTGS (Bank Indonesia-Real Time Gross Settlement), BI-SSSS (Bank Indonesia-Scriptless Securities Settlement System) and SKNBI by using information technology infrastructure at the location of Disaster Recovery Center (DRC) of Bank Indonesia.

Operational risk was at the lowest occurred in

2013 amounted to 63.61% influenced by the activity of intermediation collector and disbursement of funds both in terms of volume and interest rates. Operational risk is under the maximum limit set by Bank Indonesia at 94%, indicating that the bank has been managing the operational risk well, able to perform efficiency on operational costs.

Liquidity risk proxied by LDR is a risk due to the withdrawal of substantial funds by customers outside the bank calculations so it can lead to liquidity problems (Darmawi, 2011:17). The development of liquidity risk is fluctuating but from 2011 to 2014 has increased (Figure 10). Liquidity risk was highest in the year 2014 by 95% due to an increase in the expansion of government finances, which had an impact on improving the economy. This reflected the ability of banks to meet obligations in anticipation of a potential withdrawal of third party funds. Liquidity risk at the lowest occurred in 2011 amounted to 82%, because the conditions banks are still dependent on the collector of public funds, the share of third-party funds as a source of bank's funds fell.

The average liquidity risk is at a value of 90% which means that the bank is able to maintain its liquidity (pursuant to BI liquidity conditions by 78% - 100%). The main objective of liquidity risk management is to maintain the trust (Jenkinson, 2008). In modern financial markets, banks must manage their liquidity through money market operations that offer a variety of investment options available but still consider liquidity (Akhtar, 2014).

Profitability according Dendawijaya (2009:118) is the company's ability to generate profits for a certain period. Development of profitability in 2010 to 2014 in Figure 11 appears to fluctuate.

The lowest profitability was in 2010 amounted to 1.31%, while the highest was in 2012 amounted to 1.55%, with an average of 1.46%. Profitability increased from 2010 to 2012, then declined in 2012 to 2014. The increase in profitability was supported by growth in lending, banking efficiency performance increase, and the average growth of total banking assets. According to *Kajian Stabilitas Keuangan* (2014), a slowdown global economic and uncertainty over the European crisis resolution have the potential to increase the risk on banking sector. Meanwhile, the performance of the banking sector remains positive, as reflected in the pretty high capital and stable profitability supported by a decline in allowance for asset cost and the widening of Net Interest Margin of bank.

The decline in profitability in 2013 due to the percentage growth of the banking industry profit is less than the average growth percentage of total banking assets, then the increasing of operating costs is higher compared to operating income, the decreased efficiency of banks because of the increase in overhead cost components.

Classical assumption test results show that the normal distribution of data, multicollinearity does not occur, the absence of heteroscedasticity, and no auto correlation. The results of multiple regression analysis (Table 2) can be formed into equation:

$$Y = 319.158 - 0.308 \text{ Credit Risk} + 0.118 \text{ Market Risk} + 0.067 \text{ Operational Risk} + 0.247 \text{ Liquidity Risk}$$

Simultaneous hypothesis testing results (Table 3) show that credit risk, market risk, operational risk, liquidity risk have a significant effect on profitability. The amount of influence is 67.1%. The remaining 32.9% is due to other variables such as legal risk, strategic risk, reputation risk, compliance risk and capital (Table 4). The results of this study are relevant to the research results by Attar (2014: 17) and Mawardi (2005: 58) that stated the efficiency of operations, credit risk, market risk and capital together affect the bank's financial performance.

Partial hypothesis test results show credit risk negatively affect insignificant profitability. This result is contrary to research by Kusuma (2013) and Mawardi (2005) that showed that credit risk has a negative effect on the performance of commercial banks.

Partial hypothesis test results show that market risk has a positive effect on profitability. This indicates that an increase in interest rates in the banking system can increase profits for banks listed in the Indonesia Stock Exchange. One of the bank's revenue is derived from the difference between interest loans extended to customers. NIM demonstrated the ability of bank management to manage productive assets to generate greater net interest income. It will increase interest income on productive assets managed by the bank, therefore the greater the NIM indicates the more effective banks in the placement of assets in the form of credit, so that ROA increases.

The results are consistent with research by Widyastuti and Mandagi (2010), Margareta (2013) and Mawardi (2005) which stated that the quality of management seen from the ability to generate profits showed that high income derived from net interest profit of NIM led to the bank's management to reduce the risk of failure. According to Ponttie's opinion (2007), NIM is influenced by changes in interest rates and productive asset quality. Higher net interest income will result in increased earnings before taxes so that ROA is greatly increased.

Partial hypothesis test results show that operational risk has a positive and significant effect on profitability. The partial hypothesis test results show that liquidity risk has a positive and significant effect on profitability. This study is in line with the results of the research by Mawardi (2005), Pontti (2007), Kusuma (2013), Sudiyanto and Fatmawati (2013) which stated that when LDR increased, it means total outstanding loans increased, the revenue and profitability also increases.

Liquidity management is important for the survival

of the banking business. Liquidity will affect the level of trust of customers and shareholders. If the liquidity position indicated by LDR is too low, the investor will assume the bank does not have favorable prospects in the future therefore it became the loss of confidence to invest. Conversely, if the LDR is too high above the maximum provisions, banks will have difficulty in meeting their obligations.

## CONCLUSION

The average credit risk in the banks listed on the Indonesia Stock Exchange period 2010-2014 was amounted to 1.89%. The average market risk was amounted to 3.24%. The average operational risk was amounted to 63.66%. The average liquidity risk was amounted to 90%. The average profitability was amounted to 1.46%.

Simultaneously, credit risk, market risk, operational risk and liquidity risk have an effect on the profitability of banks amounted to 67.1%. Partially, credit risk does not affect the profitability. Market risk, operational risk, liquidity risk have a positive effect on the profitability of banks listed on the Indonesia Stock Exchange in 2010-2014.

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## APPENDIX

Table 1. Variable Operationalization

Variable	Operationalization Definition	Indicator	Scale
Profitability	Profitability is the ability of a company to generate profits for a certain period. Dendawijaya (2009:118)	$ROA = \frac{\text{Income Before Tax}}{\text{Total Asset}} \times 100\%$ Dendawijaya (2009:118)	Ratio
Operational Risk	Credit risk is giving credit to customers. Healthy crediting implicates on the smooth repayment of credit by customer for the loan principal or interest expense. The lack of smooth payment of loan principal and interest directly can degrade the performance of the bank. Darmawi (2011:16)	$NPL = \frac{\text{The Amount of Non performing loans}}{\text{Total Credit/Loan}}$ Darmawi (2011:125)	Ratio
Credit Risk	Market risk a the risk on the balance sheet and administrative accounts including derivative transactions, due to overall changes in market conditions, including the risk of changes in option prices. Market risks include, among others, interest rate risk, exchange rate risk, commodity risk and equity risk. (PBI 2009)	$NIM = \frac{\text{Net Interest Income}}{\text{Average Productive Assets}}$ (Bank Indonesia)	Ratio
Market Risk	Banks also face risks in its operations include a scarcity of funds, cost control and mismanagement. Darmawi (2011:17)	$OEOI = \frac{\text{Total Operation Expende}}{\text{Total Operation Income}}$ (Darmawi 2011:20)	Ratio
Liquidity Risk	This risk is due to the withdrawal of substantial funds by customers outside the bank calculations, which can lead to liquidity problems. Darmawi (2011:17)	$LDR = \frac{\text{Total Credit/Loan}}{\text{Total Third - Party Funds}}$ (Darmawi 2011:20)	Ratio

Table 2. Value Multiple Regression

Model		Unstandardized Coefficients		Standardized Coefficients	t	sig.
		B	Std. Error	Beta		
1	(Constant)	319.158	31.779		10.043	.000
	Credir Risk	-.308	.018	.082	.452	.065
	Market Risk	.118	.087	-1.842	2.358	.019
	Operational Risk	.067	.047	.259	1.426	.017
	Liquidity Risk	.247	.144	2.356	1.719	.010

Source : Data processed

Table 3. Simultaneous Hypothesis Testing (F Test) ANOVA<sup>b</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	21.140	4	4.228	15.408	.000a
	Residual	57.859	145	.782		
	Total	79.000	149			

a. Predictors: (Constant), NPM, NIM, OEOI, LDR

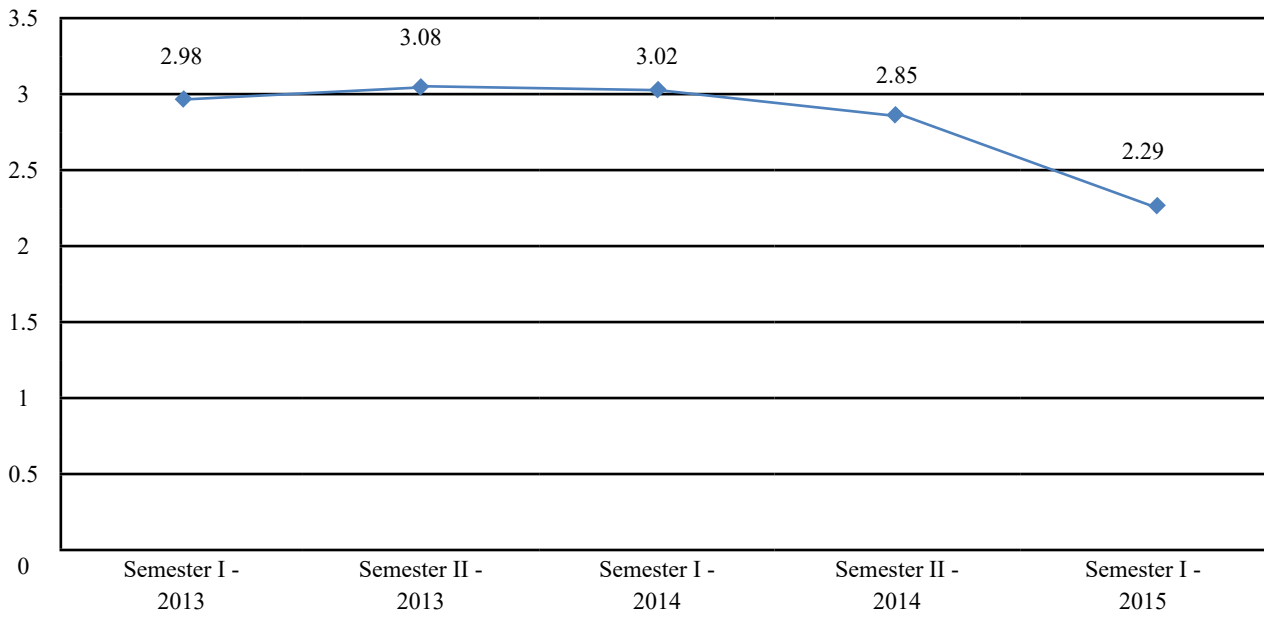
b. Dependent Variable: ROA

Table 4. Coefficient of Determination Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.819 <sup>a</sup>	.671	.602	4.95171	2.160

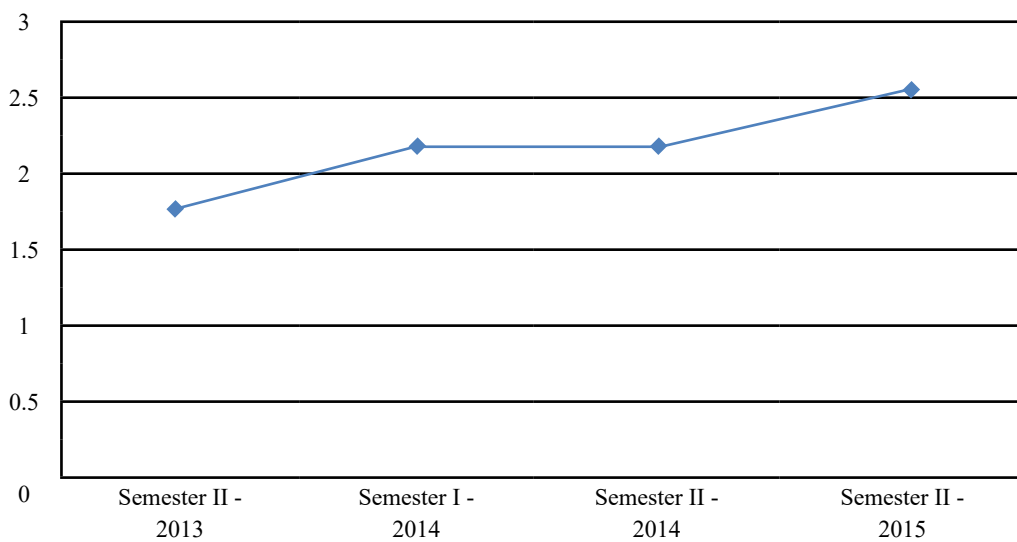
a. Predictors: (Constant), NPM,NIM,OEOI,LDR

b. Dependent Variable: ROA



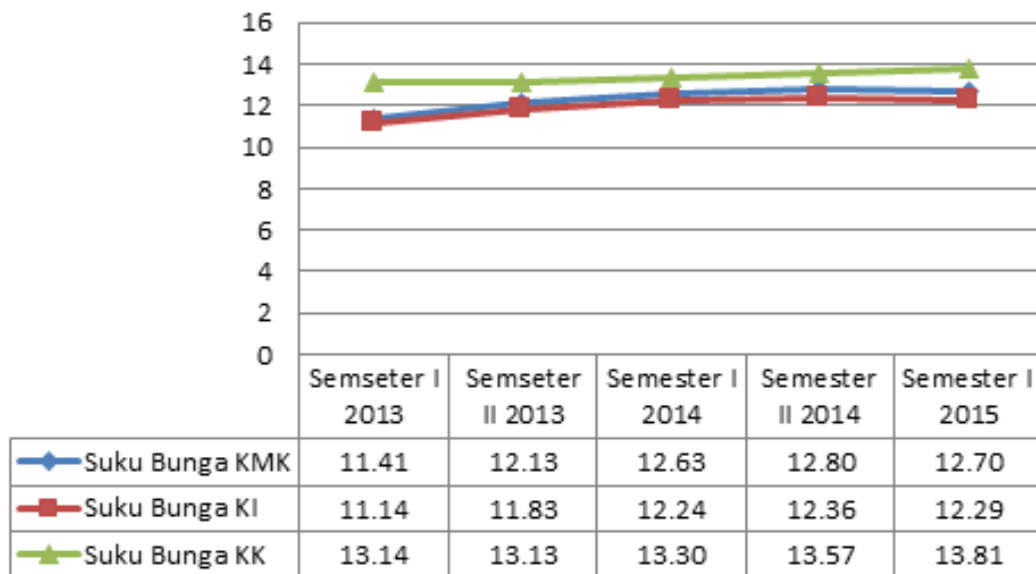
Source: www.bi.go.id

Figure 1. ROA of Bank per semester (%)



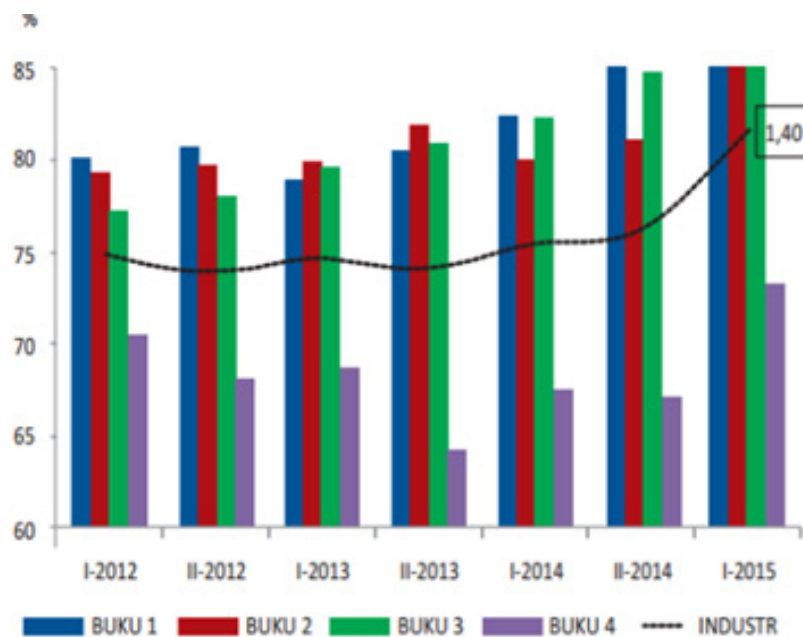
Source: www.bi.go.id

Figure 2. NPL Ratio of Bank (%)



Source : Bank Indonesia

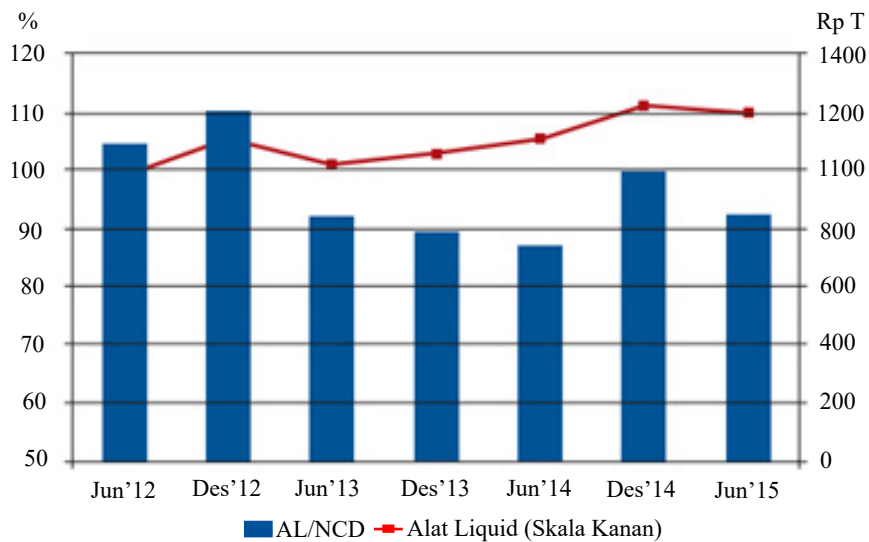
Figure 3. Credit Interest Rate



Source: www.bi.go.id

Figure 4. OEOI Ratio Per BUKU (%)





AL = Kas + Penempatan Pada BI + Excess Reserve GWM  
 NCD = 30% Giro + 30% Tabungan + 10% Deposito

Source : Bank Indonesia

Figure 5. Liquid Assets of Bank

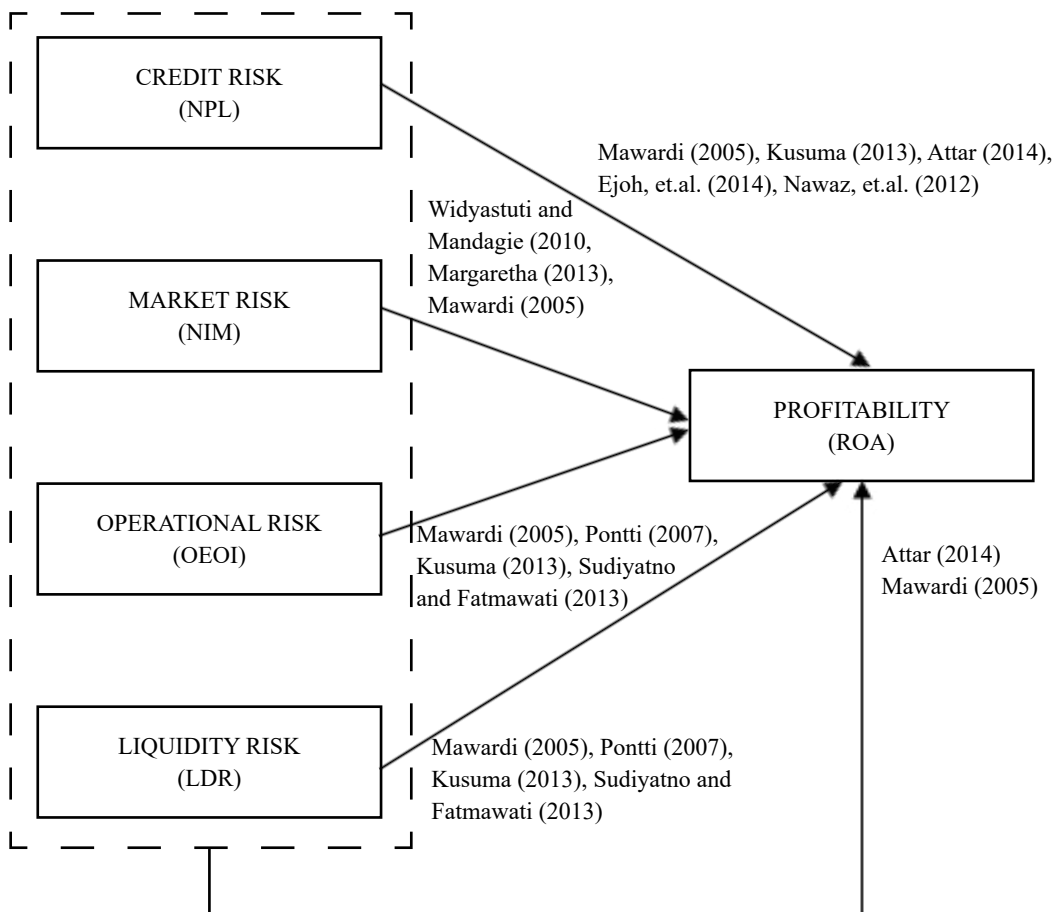
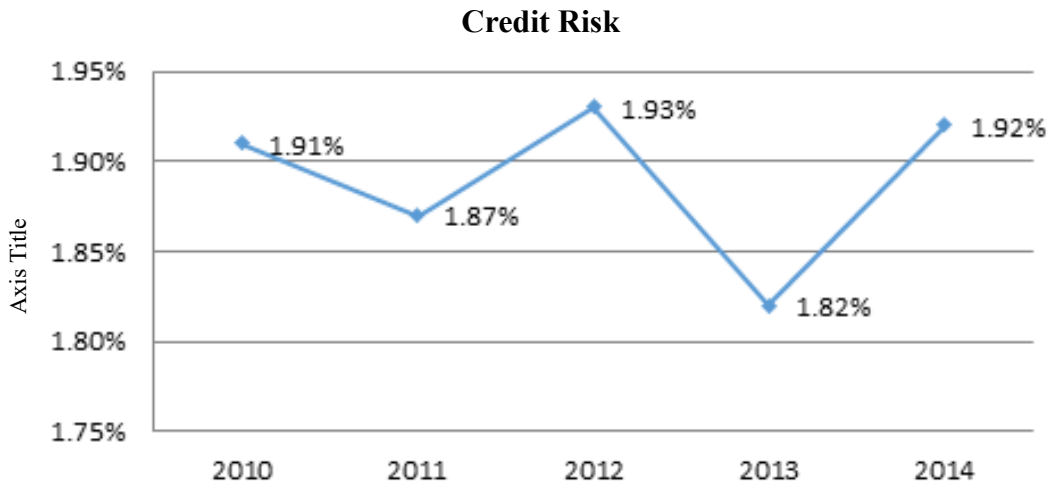


Figure 6. Research Paradigm



Source : Data processed

Figure 7. Graphic of Credit Risk Period 2010-2014



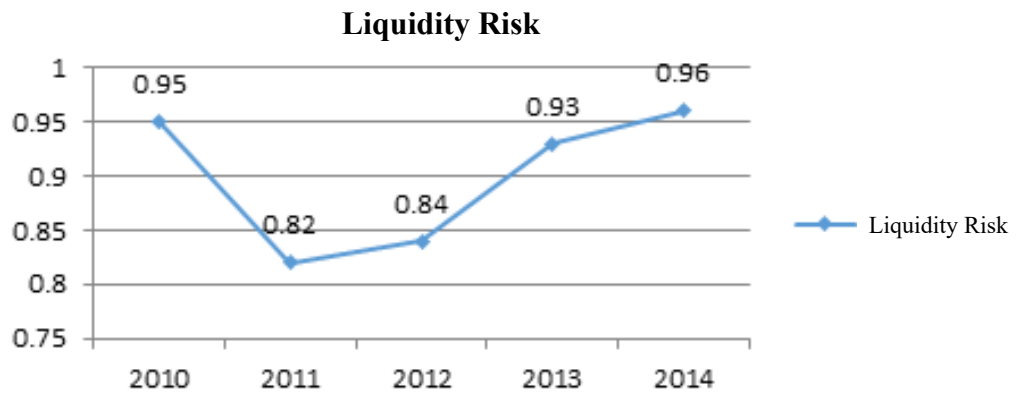
Source : Data processed

Figure 8. Graphic of Market Risk Period 2010-2014



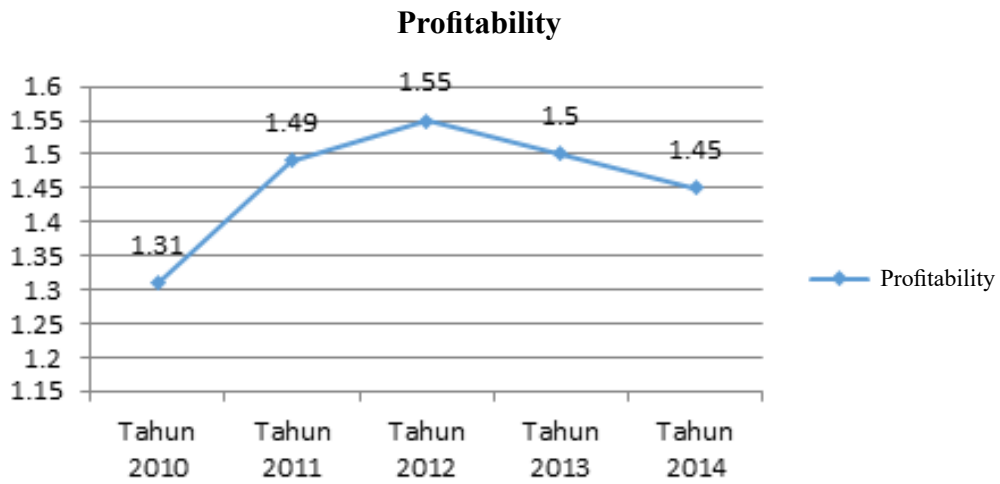
Source : Data processed

Figure 9. Graphic of Operational Risk Period 2010-2014



Source : Data processed

Figure 10. Graphic of Liquidity Risk Period 2010-2014



Source : Data processed

Figure 11 Graphic of Profitability Period 2010-2014