The Factors Influence Credit Risk in Japan Banking Sector Specific for Kyoto Bank

Mohammad Azmi, Nur Syafikah Atirah

universiti utara malaysia

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Nur Syafikah Atirah Binti Mohammad Azmi

Universiti Utara Malaysia

nur_syafikah_atirah@sefb.uum.edu.my

Abstract

This research paper is to the performance of credit risk in japan bank specific for Bank of Kyoto. The measurement is based on bank specific factor and macroeconomics factor. However, the finding result would determine whether both of factors is correlated significant or uninfluenced.

Keywords: *bank specific factor, macroeconomic factor, credit risk.*

OBJECTIVE

1) To study the factor influence Credit Risk performance.
2) To determine relationship between bank specific factor and macroeconomic.
3) To find out the most significant correlated the Credit Risk performance.

1.0 INTRODUCTION

Credit risk is very important to financial institutions. Especially in the present time where cash is not only limited to paper but the value of currencies and commodities is of invisibility like crypto currencies. Furthermore, it can be understood that credit risk is a potential opportunity for the borrower to fail to pay the loan to the financial institution at a predetermined timeframe. The study will be specific to Japan's bank yards on the financial performance of financial institutions and how to manage credit risk. Bank of Kyoto, Ltd. is a Japanese bank based in Kyoto. The Bank operates primarily in the Kansai region with over 165 branches in Kyoto, Osaka, Shiga, and Nara, Hyogo, Aichi and Tokyo regions. Business transactions are based on banking services such as deposits, loans, commodities trading, securities investments, and foreign and domestic exchange services. Furthermore, other business operations include real estate operations and leasing,

commercial support services, manpower transmissions, credit guarantee services, credit card services, economic outlook and consulting services. The bank was established on October 1, 1941, so it has been noted that the bank has a total of 3,428 employees. Kyoto Bank has been listed on the Tokyo Stock Exchange and market capitalization.

2.0 LITERATURE REVIEW

The aim of this paper are based on the past research like articles, journal and etc. that related to the factor that influence credit risk. Selection of individual loans, or borrowers, risk assessment techniques play a key role in managing and minimizing credit risk. It only occurs after the determination of the risks represented by each individual borrower and by individual credit services that can begin managing the loan portfolio as overall. Assessment of the credit risk of the borrower based on the study and qualitative and quantitative indicators of economic conditions borrower (Korobova, 2010). According to Kurawa & Garba (2014), credit risk is a chance of a loss on loan that effect from borrower that not payback the loans. Heffernan (2015) says there are many bank occur a bankruptcy that causes by a big ratio of credit risk. So, credit risk analysis is very significant. In past studies, Castro (2012) say that there are many external and internal factors that affect credit risk in banking sector. Example for external factor are changes in exchange rate, increasing in Gross Domestic Product, rate of employment, inflation rate, and change in economic regulation as well the changes in political structure. The internal factor that influence credit risk are character of a borrower, bank's financial position and etc. Based on Goyal (2010) credit risk, market risk, operational risk, interest rate risk, liquidity risk and exchange risk are the types of risks that the banking sector will face. (Heffernan, 1996) Liquidity risk is the inability to finance the day-to-day operations of the bank. Based on the statement Demerjian, P. R. (2007). The five types commonly used financial ratio covenants is Minimum Coverage, Maximum Debt to Cash Flow, Minimum Net Worth, Maximum Leverage, and Minimum Current. Each one has a relationship with the credit risk of the borrower. Of the three using one step of operation performance. Coverage and debts to their respective cash flows are calculated based on income from earnings statement, while net value captures equity holders. Operation presentations are important credit risk element. Debt payment is made out of a strong cash flow. Evidence shows

that Earnings are a good forecast for future cash flows. According to Tam, K. Y. (1992). The high percentage of commercial bank failures, has led to the economic crisis in recent years. As such, it is advisable that financial institutions be desirable to explore new predictive techniques to ensure that early warnings are taken to avoid harmful consequences.

3.0 METHODOLOGY

3.1 Introduction

Methodology is a analytically techniques to solve the research objective or research problem (Kohtari, 2004). The methodology has included several contents such as historical data, publication research, surveys and interviews. Research methodology is broader that has sub of research methods. In this paper, the study of a relationship between the banking credit risk and its determinants Kyoto Bank in Japan is a main idea by using few method.

3.2 Population / sampling technique

The population that has chosen in this study is banking sector in Japan and the sample that selected from the population is a Kyoto Bank. The historical data that used in this study is from the annual report that available in bank's which are from year 2013- 2017. The independent variable which comprise firm specific factors and dependent variable comprise the macroeconomic factors was determine by the collected data.

3.3 Statistical technique

This study is selected banking industry which is Kyoto Bank in Japan. It will used collected historical data from Mizuho Financial Group website in the annual report from the years 2013-2017. The bank specific factors which are liquidity, profitability, operational and credit risk in this study is determine from Mizuho Bank balance sheet and also income statement. While Gross Domestic Product (GDP), economic growth, domestic demand, investment, inflation rate, money, unemployment rate and exchange rate are the macroeconomics determinants that collected from the past economy data for past five years.

The Ordinary Least Square (OLS) method were used to estimate the statistical finding of linear such as descriptive statistics, correlation and regression. Correlation analysis is used to see the percentage of relationship that influence credit risk by the internal and external factor. While regression analysis is used to see the suitable independent variable that indicate to dependent variable. The data analyze using Statistical Package for Social Sciences (SPSS) based on the collected data. There are two independent variable and one dependent variable in this study.

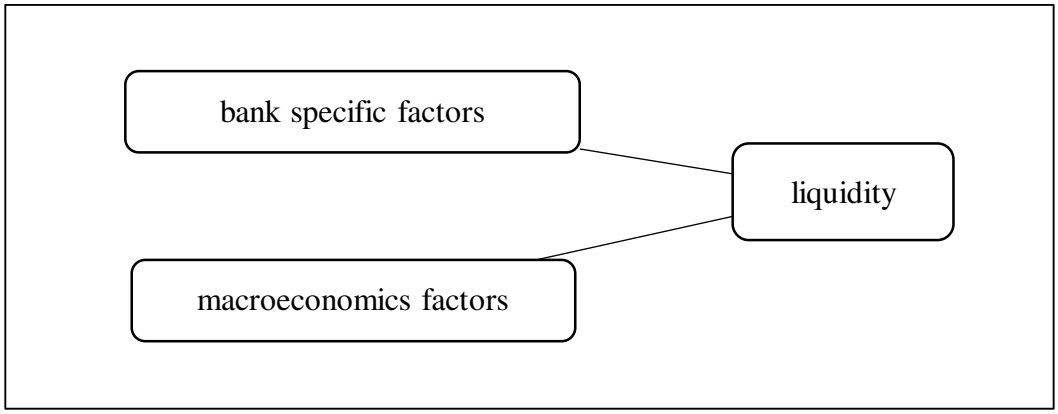


Figure 1 Research Framework of independent and dependent variables.

Multivariate regression analysis was used in this study to find out the determinant of dependent independent variable. It will show the impact of those variable. The multivariate regressions formula are explained by the regression equation as follow of each model:

$LR = \beta_0 + \beta_1 DR + \beta_2 ROA + \beta_3 ORA + \varepsilon$ …….. Equation 1

$LR = \beta_0 + \beta_1 INFLA + \beta_2 UNEMP + \beta_3 ER + \beta_4 GDP + \varepsilon$ ……. Equation 2

$LR = \beta_0 + \beta_1 DR + \beta_2 ROA + \beta_3 ORA + \beta_4 INFLA + \beta_5 UNEMP + \beta_6 ER + \beta_7 GDP + \varepsilon$ …… Equation 3

Table 1

Measurement of variables

No.	Variables	Notation	Measurement
1	*Debt Ratio*	DR	*total liability / total asset*
2	*Asset Turnover ratio*	*ATO*	*Total loan / total assets*
3	*debt equity ratio*	*DER*	*Total liability /*
4	*Return on equity*	*ROE*	*Net income / shareholder equity*
5	*Liquidity ratio*	*LR*	*Total asset / total liability*
6	*Net profit margin*	*NP*	*Net income / loan*
7	*Operating Return on Asset*	*ORA*	*Operating income / total asset*
8	*Return on Asset*	*ROA*	*Net income / total asset*
9	*Operating ratio*	*OMR*	*Operating income / total loan*
10	*Net interest margin*	*NIM*	*Net interest income / average earning assets*
11	*Non performing financial ratio*	*NPFR*	

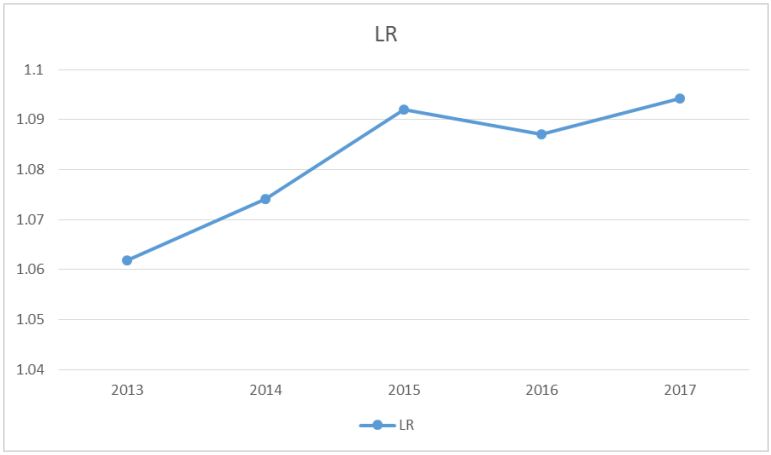
Measurement of variables

Variables	Notation	Measurement
Liquidity ratio	LR	Total asset / Total liability
Debt Ratio	DR	total liability / total asset
Asset Turnover ratio	ATO	Total loan / total assets
debt equity ratio	DER	Total liability /
Return on equity	ROE	Net income / shareholder equity
Liquidity ratio	LR	Total asset / total liability
Net profit margin	NP	Net income / loan
Operating Return on Asset	ORA	Operating income / total asset
Return on Asset	ROA	Net income / total asset
Operating ratio	OMR	Operating income / total loan
Net interest margin	NIM	Net interest income / average earning assets
Non-performing loan ratio	NPFR	Non-performing loan / Total loan
Population	PA	5 years Population
Gross Domestic Product	GDP	5 years GDP
Economic Growth	EG	5 years Economic growth
Investment	INVES	5 years Investment
Inflation rate	IR	5 years Inflation rate
Exchange rate	EXCHA	5 years Exchange rate
Unemployment rate	UR	5 years Unemployment rate
Money	M	5 years Money
Domestic Demand	DD	

4.0 FINDINGS RESULTS

4.1 Trend analysis

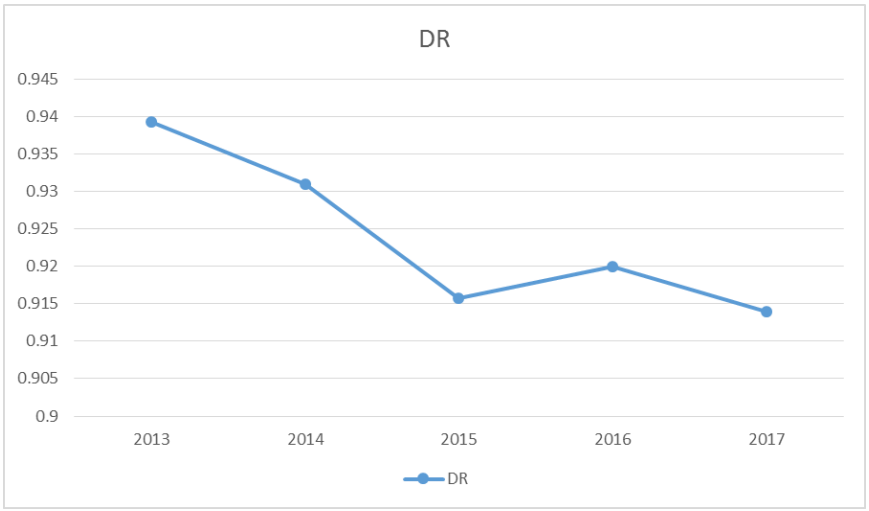
4.1.1 Liquidity ratio



Graph 1 Trend of liquidity ratio.

The graph 1 is show the liquidity ratio performance by Kyoto bank from 2013 to 2017. From 2013 to 2015 is rose but decline at 2016 and rise again in 2017. . Liquidity is the company capability to settle the short term obligation. The more liquidity is better for company. The above graph show that 2015 has the best liquidity than others year. And the lowest liquidity is in 2013. Kyoto liquidity ratio show a better trend over a year. The more liquid asset Kyoto have, the better for the company meet their short term obligation.

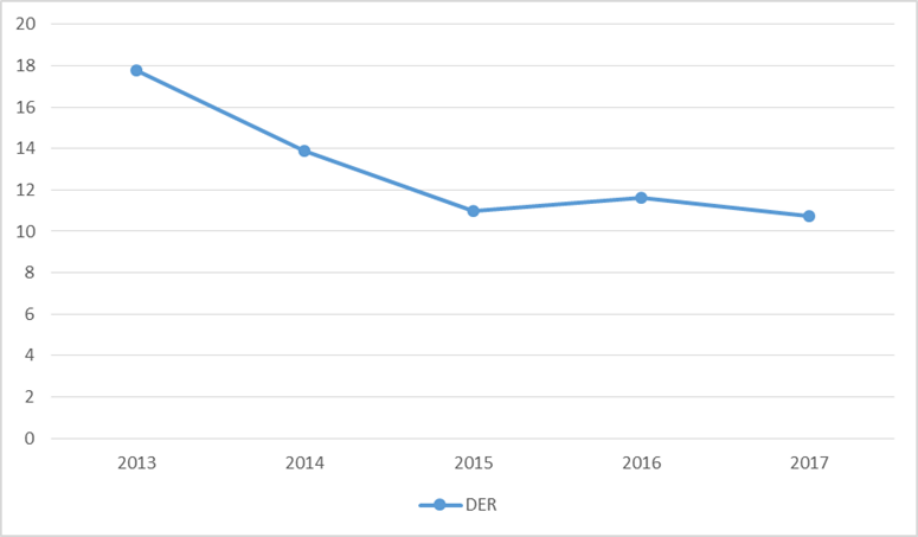
4.1.2 Leverage risk



Graph 2 Trend of debt ratio

Based on graph 3, it shows that the trend of debt ratio. Debt ratio is measure the amount of debt that company obligates. Financial leverage is important to sustain the company. The higher the leverage, the more probability of financial risk. The ratio for 2013 is 0.9393 and it continuous decrease to 0.9139 for 2017 but increase again in 2016. However, the debt ratio of Kyoto getting lower from year to year

4.1.4 Debt Equity Ratio



Graph 2 Trend of debt ratio

According to graph 2, Debt equity ratio from 2013 to 2017 is declined. It means Bank of Kyoto from make a regulation for the number of risk that would like to accept.

4.2 Descriptive analysis

Table 2

Descriptive statistics

Variable	Mean	Std. Deviation	Mean	Std. Deviation	Std. Deviat
	Model 1	Model 2			
LR	1.081	.013598			
DR	.9239	.010833			
ATO	.54486	.016146			
DER	13.00350	2.947623			
ROE	.03208	.004688			
ROA	.19502	.093130			
OJ	19443.80000	2300.872378			
ORA	.13954	.029516			
OMR	1.23056	1.291499			
NIM	.47702	.076034			
NPFR	2.37800	.758597			
P				.000000	
GDP		127000000.00000		2113.035376	
EG		38075.00000		.6245	
DD		1.300		.8385	
INVES		1.040		1.4516	
IR		2.680		1.0803	
M		.920		.4159	
UR		3.660		.4604	
		3.380			

4.3 Correlation

4.3.1 Correlation of Model 1

Table 3

Correlation of Model 1(bank specific factors)

		LR	DR	ATO	DER	ROE	ROA	NP	ORA	OMR	NIM	NPFR
Pearson Correlation	LR	1.000										
	DR	-.999*	1.000									
	ATO	.306	-.312	1.000								
	DER	.985** *	.976**	-.284	1.000							
	ROE	.775	.763	-.158	.779	1.00						
	ROA	.835	-.811	.147	-.913	-.600	1.000					
	NP	.726	.738	.372	-.694	-.130	.639	1.000				
	ORA	-.329	.294	.543	.449	.360	-.692	-.068	1.000			
	OMR	.082	-.056	-.833	-.170	-.201	.381	-.157	-.915	1.000		
	NIM	-.101	.099	-.346	.075	.620	.160	.478	-.273	.296	1.000	
	NPFR	-.935	.937	-.618	.912	.730	-.723	-.698	.060	.242	.265	1.000

* Correlation is significant at 0.10

** Correlation significant at 0.05

*** Correlation significant at 0.001

Based on the table 3, debt ratio and debt equity ratio has most significant to the liquidity with p value < 0.0001 in different movement. Debt equity ratio has positively correlated with r= 985. While, the debt ratio has strong negatively correlated with r= -.999. Besides, the asset turnover, Return on equity, return on asset, net profit, Operating ratio, Net interest margin and none

performing financial ratio is not significant to liquidity. But, asset turnover, return on asset, Return on Asset, net profit, and Operating ratio has positively correlated with r=.306, r=.835, r=.775, r=.726, r=.082. While return on equity, net interest margin, and non-performing loan are negatively correlated.

4.3.2 Correlation of Model 2

Table 4

Correlation of Model 2 (macroeconomic factors)

		LR	P	GDP	EG	DD	INVES	IR	M	UR
Pearson Correlation	L	1.000								
	P	.	1.000							
	GDP	-.624	.	1.000						
	EG	-.079	.	.097	1.000					
	DD	-.537	.	.280	.874	1.000				
	INVES	-.847	.	.506	.472	.814	1.000			
	IR	-.250	.	-.115	-.737	-.440	.096	1.000		
	M	-.650	.	.935	.356	.515	.566	-.382	1.000	
	UR	-.898	.	.230	.078	.534	.744	.282	.334	1.000

* Correlation is significant at 0.10

** Correlation significant at 0.05

*** Correlation significant at 0.01

Table 4 shows that not have significant to the liquidity ratio with macroeconomic factor.

4.4 Model summary

Table 5

Model summary and of bank specific factors and macroeconomic factor

	Model 1		Model 2		Model 3	
Model	R Square	Adjusted R Square	R Square	Adjusted R Square	R Square	Adjusted R Square
1	.998	.997				
2	1.000	1.000				
			.806	.741		
1					9.998	.997
2					1.000	1.000

Dependent Variable: LR

a. Predictors: (Model 1and 2), DR,
b. Predictors: (Model 1 and 3), DR, DER
c. Predictors(Model 2), UR

Based on the result in Model Summary, the adjusted R square for model 1 and model 2 are.997 and 1.000. This clarified that the 99.7 % variations of debt ratio explained by the variations in the liquidity of Kyoto bank. The unemployment rate has the R square of -.898. This explained that 89.9 % variations of unemployment rate explained by the variation of liquidity and the 10.5 % was unexplained.

4.5 Anova

Table 7

Anova of Model 1, 2 and 3

	Model 1	Model 2	Model 3
Model	Sig	Sig	Sig
1	.000		
2	.000		
		.039	
1			0.000
2			0.000

Dependent Variable: LR

a. Predictors: (Model 1 and 3), DR
b. Predictors: (Model 1 and 3), DR, DER
c. Predictors: (Model 2), UR

Based on the result in Model Summary and Macroeconomic factors table, the UR has the R square of -.898. This explained that 89.9% variations of unemployment explained by liquidity and the 10.5% was unexplained. The debt ratio and debt equity ratio has more significant to liquidity with p=0.000 which is p <0.10. Moreover, UR has more significant to liquidity with p= 0.039 which is p <0.10.

4.6 Coefficients

Table 9

Regression coefficient of Model 1,2 and 3

	Model 1 and 3				Model 2			
variable	B	Beta	t	Sig.	B	Beta	t	Sig.
DR	-1.254	-.999	-35.502	.000				
DER	-.001	.000	-8.047	.015				
UR					-.027	-.898	-3.529	.039

Based on table 9, there is three variable that explained the coefficient of regression. Two variable were explained Model 1 and one variable for Model 2. Debt ratio has more significant because the p value =0.000 with p value <0.001. Besides, the beta for debt ratio is -.999 and t value=-35.502. It show that the most negative influence between liquidity and debt ratio. Every 1%t increase in liquidity will decrease in debt ratio for 99.9. %. A high debt will cause the cash flows having an interruption and lead to increase in credit risk. However, debt equity ratio shows that it is significant than debt ratio which p= -.001 is p <0.001 and the beta is 0.000 and has positive influence to liquidity. It clarify that 1% increasing in Debt equity ratio will also rise the liquidity by 1%. Based in Model 2, the unemployment rate is moderate significant to the liquidity with p=0.039 which is p < 0.05 and it has negative influence to the liquidity. When economic increase in unemployment rate, it consequence to decrease in cash and lead to decreased in liquidity.

5.0 DISCUSSION AND RECOMMENDATION

From the coefficient table, the factors influence Credit Risk performance is Debt Ratio, Debt Equity Ratio and Unemployment rate is significant influence the liquidity ratio. Increased in Liquidity ratio means during inflation, the money value received is losses, loss the change for saving in taxes exclusion and increased in interest rate. However debt of ratio increase is showing a good ways for company getting advantages for reduce the interest tax. But the Risk manager of this bank should planning and make decision for the number of Debt ratio to accepted because it will causes to bankruptcy if not much care on that. According to annual report 2018, Bank of

Kyoto, as of May 2018 appears A for both of credit rating agency which is (S&P) and (R&I). This sign is good for the investor who is interested to issuing the investment with Bank of Kyoto.

6.0 CONCLUSION

In nutshell, that has relationship between debt ratio and equity ratio with liquidity ratio. Every 1%t increase in liquidity will decrease in debt ratio for 99.9. %. A high debt will cause the cash flows having an interruption and lead to increase in credit risk. It clarify that 1% increasing in Debt equity ratio will also rise the liquidity by 1% for Kyoto Bank performance.

7.0 REFERENCES

Goyal, K. A. "Risk Management in Indian Banks: Some Emerging Issues", *International Journal of Environment Research*, 1(1), (2010): 102-109.

Heffernan, S. 1996, Modern Banking in Theory and Practice, John Wiley&Sons, U.S.A.

Barth, M., D. Cram, and K. Nelson. 2001. Accruals and the prediction of future cash flows. *The Accounting Review* 76(1): 27-58.

Dechow, P., S. Kothari, and R. Watts. 1998. The relation between earnings and cash flows. *Journal of Accounting and Economics* 25: 133-168.

Demerjian, P. R. (2007). Financial ratios and credit risk: The selection of financial ratio covenants in debt contracts.

TAM, K. Y. (1992). Managerial applications of neural networks: the case of bank failure predictions. *Management Science*, *38*, 926-947.

"Bank of Kyoto Ltd/The". www.bloomberg.com. Bloomberg. Retrieved 10 November 2015.

"Bank of Kyoto". www.relbanks.com. Banks around the World. Retrieved 10 November 2015.

"Profile: Bank of Kyoto Ltd (8369.T)". www.reuters.com. Reuters. Retrieved 10 November 2015.

"Annual Report". www.kyotobank.co.jp. Bank of Kyoto. Retrieved 5 December 2017.

Korobova G.G., 2010, Banking.