

DETERMINANTS OF CAPITAL ADEQUACY RATIO (CAR) IN 19
COMMERCIAL BANKS
(CASE STUDY : PERIOD 2008 – 2013)

Nuviyanti and Achmad Herlanto Anggono
School of Business and Management
Institut Teknologi Bandung, Indonesia
Nuviyanti@sbm-itb.ac.id

Abstract- Bank Indonesia issued some considerations for commercial banks in order to create healthy banking system and have ability to compete with worldwide should be preparing Minimum Capital Adequacy Ratio that meets with the international standards. Capital Adequacy ratio means amount of capital to ensure that banks can handle risk exposures. Implementing the Minimum Capital Adequacy Ratio must be adjusted to risk profile for absorb the potential losses on risk exposure as well as to fulfilling the minimum capital requirement. The objective of this research is to determinants of capital adequacy ratio based on risk based bank rating 19 commercial bank in Indonesia. The research involved the use of Multiple Regression Linier based on Ordinary Least Square estimation technique to determine the affect of the independent variables - Good Corporate Governance measured by operating expense to operating income ratio and net interest margin, Risk Profile measured by non performing loan ratio and loan to deposit ratio, Earning measured by return on asset ratio and return on equity – Secondary data were obtained from condensed financial statement conventional bank quarterly that derived from Bank Indonesia covering 2008 to 2013. Using significant level of 5%. The result analysis obtained from coefficient correlation (r^2), T test and F test. The research found that operating expense to operating income ratio, loan to deposit ratio, return on equity ratio have negative significant affect with capital adequacy ratio in the other hand non performing loan ratio and return on asset ratio have positive influence with capital adequacy ratio. While variables that most affecting with dependent variable is return on asset ratio that has coefficient value of 2.546153.

Keywords : Capital Adequacy Ratio, Risk Based Bank Rating, Commercial Bank in Indonesia.

Introduction

Banking is corporate entity, conducting its business activities by some procedures in realization of such a business activities which collecting funds from any party called depositors in the forms of deposits and channeling into the any party called borrowers in forms of credit or other forms. This activities can generate the profits if the bank pays interest for depositors then borrowers pay interest to bank. Each of bank maintain every important part and develop in each elements in banks in order to banks continue to exist and sustainable in that country. The Basle Committee on Banking supervision (BCBS) have authority to strengthen regulation and improve the quality of banking supervision worldwide (Bank for International Settlement). The committee publish Basle Capital Accord, it decide to define minimum capital adequacy ratio in the amount of 8% of risk weighted assets is standardize international banks. Moreover Indonesia adopts these regulations from the Committee and applied in Indonesia banks. Implementing the Minimum Capital Adequacy Ratio must be adjusted to risk profile for absorb the potential losses on risk exposure as well as to fulfilling the minimum capital requirement. Bank Indonesia as monetary authorities has issued

some considerations for commercial banks in order to create healthy banking system and have ability to compete with worldwide should be preparing Minimum Capital Adequacy Ratio that meets with the international standards. Capital Adequacy means amount of capital are reserved by the bank against risky assets in order to ensure that banks can handle risk exposures. In the detail of Minimum Capital Adequacy Ratio that applying are total capitals to risk weighted assets. There are consist of three risk in risk weighted assets credit risk means certain risks caused the failure debtor in fulfilling obligation of bank, Operational risk means certain risks caused inability of internal process, human error, failure system or other events that affect the operational activities in bank, and then market risk means certain risks caused overall changes of market condition for example interest rate and foreign exchange (BI, No.14/18/PBI/2012).

Figure 1 below shows that capital adequacy ratio for period March 2008 until December 2013 . The graph shows fluctuating conditions and has wide range of capital adequacy ratio when it compared with minimum capital adequacy ratio standard.

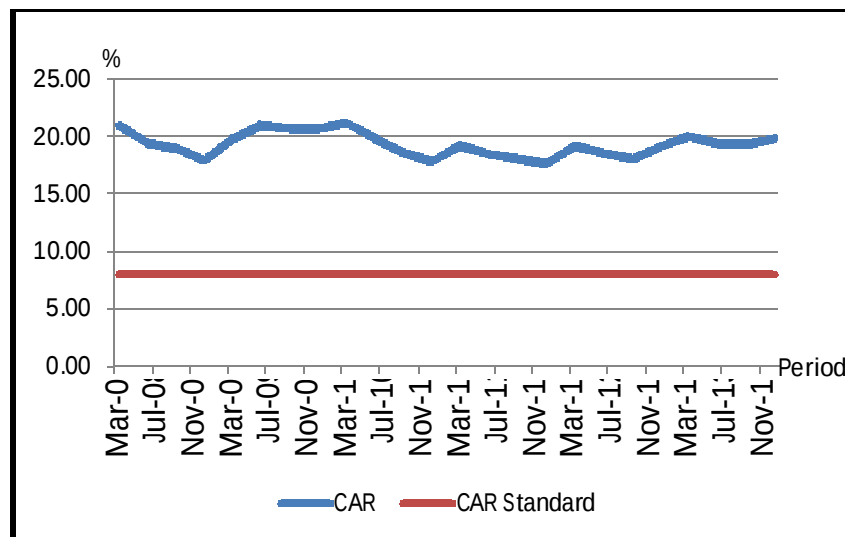


Figure 11 Capital Adequacy Ratio 19 Commercial Banks

Source: Bank Indonesia, Calculated data Capital Adequacy Ratio 19 Banks in Indonesia period 2008 to 2013. In accordance with the graph above, therefore the author will be check the condition of 19 banks in Indonesia has to determinants variables which affect toward capital adequacy ratio. The evaluation of capital adequacy ratio help bank to maintain the condition.

Literature Review

The new concept from Bank Indonesia Regulation is Risk Based Bank Rating (RBBR) means a process of assessment using risk profile, good corporate governance practices, earnings and capital. However, Bank Indonesia conducts assessment on individual banks and consolidated basis. The adoption of a new rating system (RBBR) is expected to improve banking supervision and enables bank supervisor to detect bank problems in early stage and take appropriate and timely supervisory action (Bank Indonesia, 2011). There are several components of risk based bank rating as follows :

1. Risk Profile - analysis is some procedures to risks assesment and risks. The Risk Profile measured by Non Performing Loans (NPL) and Loan to Deposit (LDR).

Non Performing Loan

Non Performing Loan ratio to measuring bank risk that related to credit risk, risk index and also some defaulted of risk. The previous study Ahmad et al (2008) , De Bondt dan Prast (2000) found that non performing loan has positive significant with capital adequacy ratio.

$$NPL = \frac{\text{Non Performing Loan}}{\text{Total Loan}}$$

Loan to Deposit

Loan to Deposit as proxy for risk profile. Loan to deposit determine distributing of credit and also fund collecting from third party funds. Related with previous research, Kasmir (2008) high value of loan to deposit ratio can be increase of bank profitability and affect to capital also capital adequacy ratio. Meanwhile Kleff & Weber (2003), decrease third of party fund consists of deposit, giro and saving will affect increase the cost to absorb risk so reduced profitability and also capital after that also may reduce capital adequacy ratio. The authors conclude loan to deposit has positive affect toward capital adequacy ratio.

$$LDR = \frac{\text{Credit}}{\text{Third Party Fund}}$$

2. Good Corporate Governance- Good Corporate Governance (GCG) analysis is the procedure of bank assesment bank management by applying the application of transparency, accountability, responsibility, and fairness principles (BI, No.8/14/PBI/2008). The Good Corporate Governance measured by Operating Expense to Operating Income (BOPO) and Net Interest Margin (NIM).

Operating Expense to Operating Income

Operating expense to operating income to measure the efficiency of bank uses their cost and income. Higher level BOPO indicated inefficiently use the operational list meanwhile the capital adequacy ratio also decreases.

$$BOPO = \frac{\text{Operating Expense}}{\text{Operating Income}}$$

Net Interest Margin

Net interest margin is ratio to determine bank ability to generate the net interest margin. The previous study related with capital adequacy ratio, Cebenoyan et al. (1999) found net interest margin positive affect toward capital adequacy ratio. The higher level of net interest margin also will increase capital adequacy ratio.

$$NIM = \frac{\text{Net interest income}}{\text{Average earning asset}}$$

3. Earnings - Earnings are portion of profit company procedures during some period. Earnings assessments are using several factors which are earnings performance, source of earnings, sustainability of earnings, earnings management. Earnings measured by Return on Asset (ROA) and Return on Equity (ROE).

Return on Asset

Return on Asset is how the company be effectively to generate earning with its available assets. Return on Asset is earning available for common stockholders divided to total assets. It means the bank with higher value of ROA, also get higher profitability. Related with previous study, Gropp and Heider (2007) found that more profitable banks tend to have more capital relative to assets.

$$ROA = \frac{\text{Earnings available for common stockholders}}{\text{Total Assets}}$$

Return on Equity

Return on Equity measure the earning from stockholder's investment in the company. Return on Equity are earning available to total equity, generally bank using ROE as the alternative cost of capital.

$$ROE = \frac{\text{Earnings available for common stockholders}}{\text{Total Equity}}$$

4. Capital - Capital is wealth in form of financial. Capital measured by Capital Adequacy Ratio (CAR). Capital Adequacy Ratio

Capital Adequacy Ratio is the indicator of capital adequacy to absorb any risk and cover any losses. The capital adequacy ratio level also determined by ability the banks generate profit and then the assets allocation fund accordance with risk level. The standard of capital adequacy ratio is 8%. Capital adequacy ratio as defined by tier one capital and tier two capital to risk weighted asset.

$$ROE = \frac{\text{Earnings available for common stockholders}}{\text{Total Equity}}$$

Methodology

Research Methodology is the specific system who the researcher used to and implemented in the research project. There are some steps that will explain on flowchart below to do the research project:



Figure 1.2 Research Methodology

Problem Identification - The background of the research problem and also started goals and objective of this research.

Literature Review - The theoretical foundations from several literatures regarding the subject are reviewed in the research.

Data Collection - The data gathering process that related with the research topic.

Data Analysis - The results of this research includes tables and graphs to strengthen findings of the research.

Conclusion - The summary of the research from beginning to end in order to solving of problem identification.

Data Collection and Analysis

The research attempts to determine the specific variables effect of capital adequacy commercial banks in Indonesia. The author determines variables for the research based on new regulation concerning commercial bank rating through Bank Indonesia Regulation (PBI) number 13/1/PBI/2011. The author used secondary data that taken by Bank Indonesia publication report. The data quarterly started from March to December. The number of banks which became the research samples is 19 commercial banks period 2008 to 2013. The 19 Banks in Indonesia include BUKU 3 and BUKU 4 that have core capital at least 5 trillion – 30 trillion rupiah. There are sample of bank in Indonesia that the author use in the research project:

Table 1 1 Samples of 19 Bank in Indonesia

No.	Name of Commercial Bank		
1	Bank Mandiri	11	Bank Niaga
2	Bank BRI	12	Bank Mega
3	Bank BNI	13	Bank Bukopin
4	Bank BTN	14	Bank BJB
5	Bank BCA	15	Bank DBS Indonesia
6	Bank Danamon	16	Bank Mizuho Indonesia
7	Bank Panin	17	Bank Sumitomo
8	Bank Permata	18	Bank Citibank
9	Bank BII	19	Bank of Tokyo Mitsubishi
10	Bank OCBC NISP		

The research study using Multiple Liniear Regression based on Panel data to explain the influence between one dependent and more explanatory variable. The authors explains the explanatory variable in order to determine variables of affect toward capital adequacy ratio Good Corporate Governance measured by operating expense to operating income ratio and net interest margin, Risk Profile measured by non performing loan ratio and loan to deposit ratio, Earning measured by return on asset ratio and return on equity), Earnings measured by (ROA and ROE)}. Meanwhile the chosen variables as proxy based on Risk Based Bank Rating.Their selection criteria of variables expected with capital adequacy ratio based on previous research in other country. Therefore, the regression model formulated below :

Descriptive Statistic

Table 1 2 Descriptive Statistic Summary

	BOPO	CAR	LDR	NPL	NIM	ROA	ROE
Mean	90.30910	19.34612	115.5522	2.529276	5.306557	2.556557	17.98838
Median	78.04500	16.50500	85.41500	2.365000	5.305000	2.445000	17.16500
Maximum	6300.000	75.04000	9100.000	10.84000	10.77000	6.390000	43.83000
Minimum	5.820000	10.80000	45.83000	0.210000	0.630000	-0.240000	-2.390000
Std. Dev.	291.7459	8.925944	423.6515	1.596938	1.885377	1.072871	8.471047
Skewness	21.21529	2.697644	20.98581	1.799029	0.382936	0.747848	0.369527
Kurtosis	452.0671	11.40187	445.5258	8.894555	3.315119	3.818104	2.806914
Jarque-Bera	3865771.	1894.310	3754224.	906.1442	13.03132	55.22159	11.08617

Probability	0.000000	0.000000	0.000000	0.000000	0.001480	0.000000	0.003914
Sum	41180.95	8821.830	52691.82	1153.350	2419.790	1165.790	8202.700
Sum Sq. Dev.	38727636	36250.98	81663684	1160.346	1617.364	523.7285	32650.18
Observations	456	456	456	456	456	456	456

As shown in table above, the capital adequacy ratio has mean value of 19.3% with minimum value of 10.8% and has maximum value of 75.04%. It means that 19 commercial banks in Indonesia has already maintain their capital adequacy ratio. Meanwhile the operating revenue to operating expense has mean value 90.3% and minumum of 5.8%. It indicates their uses operating effectively. Then, loan to deposit ratio has mean value 115.5% and has minimum of 45.83%. It means their slow growth to distributing of credit. While, net interest margin has mean value of 5.2% and maximum of 10.7%, the 19 commecils bank's ability to generate net interest margin in middle level. Non performing loan has mean value of 2.5%, which is under the standard requirement. In the other hand, return on asset and return on equity have mean value of 2.5% and 17.9% and maximum of 6.3% and 43.8%. Both of them indicates slow growth in earnings.

Classical assumption test

Heteroscendasticity Test

The authors decide to use General Least Square and Actual, Fitted, Residual Graphs test are conducted to detect heteroscedasticity. The General Least Square Weighted tests seeing from sum square resid in weighted statistics value of 5793.100 compare to sum square resid unweighted statistic of 6083.471. In order to no heteroscendasticity in regression model so dealing with white heteroscendasticity approach.

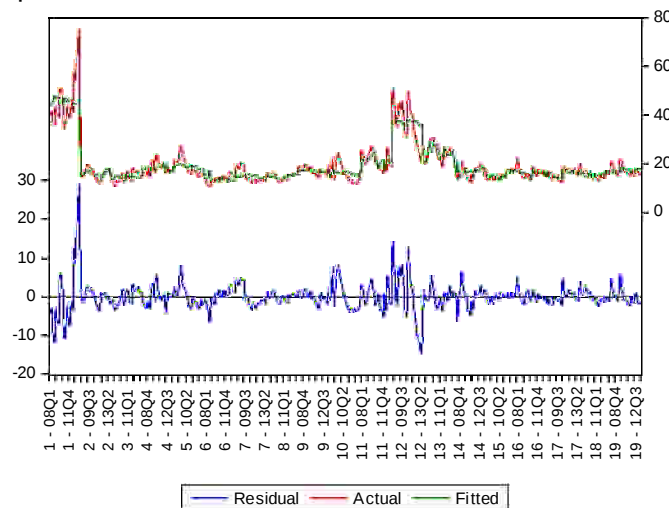
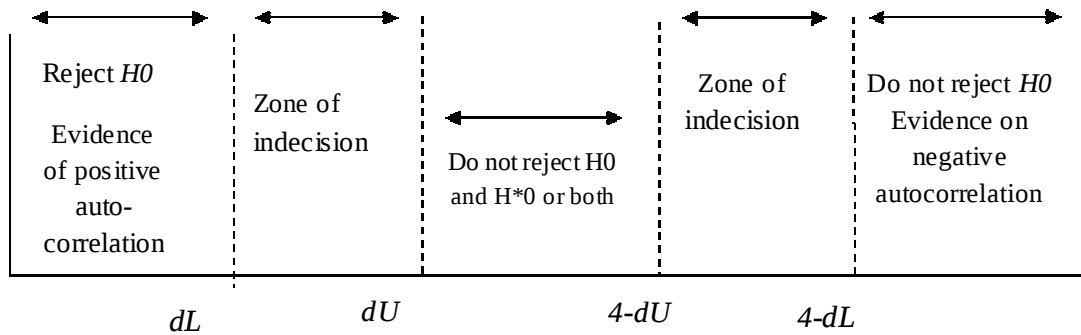


Figure 13 Actual, Fitted, Residual Graphs

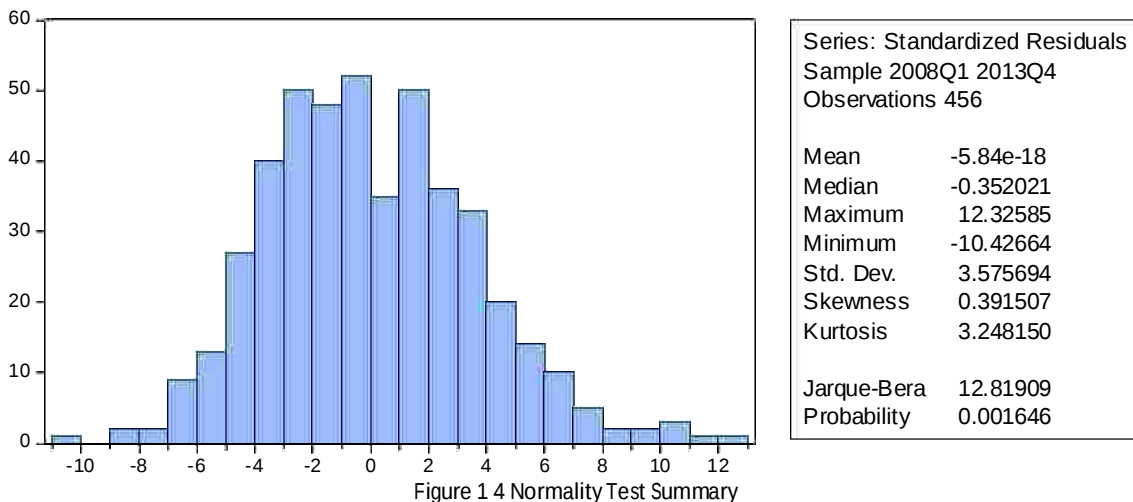
As shown in figure above there is no heteroscedasticity because the line pattern of this graph no repeated so that the residual is constant.

Autocorrelation



The value from Durbin Watson statistic is 0.934706. This value compared with Durbin Watson table with $\alpha = 5\%$, total sample (n) = 114 and independent variables (k) = 6 are $dL = 1.5855$ and $dU = 1.8065$, $4-dU = 2.1935$ and $4-dL = 2.4145$ therefore reject H_0 or positive autocorrelation but the autocorrelation problem be able to dealing with Newey–West standard errors which extension theory from white heteroscedasticity. The Newey – West method can use for large number of sample in observation and there can be obtain in eviews tools. Because of Fixed Effect method, therefore could be free from the autocorrelation problem.

Normality Test



Beside the graphs present p-value is 0.01646, it compare with significant level 0.05. The conclusion is p-value is quite low so the author sees it from probability of Jarque-Bera. Meanwhile the value from Jarque- Bera is 12.81909 compared with chi-square using $\alpha = 0.05$ then k = independent variable is 6 independent variables, df or $n*k$ -(number of variable)= 449, the value is 499,4013. The result is Jarque- Bera value lower than chi square table, it means accept H_0 that the normally distributed.

Multicollinearity Test

Table 1 3 Pair Wise Correlation Table

	ROA	ROE	NPL	NIM	LDR	BOPO	CAR
ROA	1.000000	0.641804	-0.042273	0.324262	-0.006477	0.018550	0.199129
ROE	0.641804	1.000000	0.014069	0.575385	-0.143459	0.029132	-0.391317
NPL	-0.042273	0.014069	1.000000	0.241639	-0.029357	-0.020006	-0.193928
NIM	0.324262	0.575385	0.241639	1.000000	0.035083	-0.000447	-0.472205
LDR	-0.006477	-0.143459	-0.029357	0.035083	1.000000	-0.004268	0.043128
BOPO	0.018550	0.029132	-0.020006	-0.000447	-0.004268	1.000000	-0.026862
CAR	0.199129	-0.391317	-0.193928	-0.472205	0.043128	-0.026862	1.000000

The authors using Pair- Wise Correlation Matrix to determine the multicollinearity test. This research conclude no multicollinearity in regression model because there is no value more than 0.80

Regression Model

Table 1 4 Haustman Test result using Random Effect

Correlated Random Effects - Hausman Test
Equation: RANDOM
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	23.583741	6	0.0006

Accordance with Haustman test, the result shows that p-value is 0.0003 smaller than significant level in 0.05. It has been conclude the regression model is using Fixed Effect method. To evaluating of output the regression model by coefficient of determination or R-value on the table, T- test and F- test.

Regression Analysis using Six Independent Variables

Estimation Equation :

$$CAR = \beta_0 + \beta_1(BOPO) + \beta_2(NIM) + \beta_3(NPL) + \beta_4(LDR) + \beta_5(ROA) + \beta_6(ROE) + \epsilon$$

Substituted Coefficients :

$$CAR = 19.3477598437 - 0.000193508482141BOPO - 0.342229435831NIM + 0.344936558004NPL - 0.000504863939718LDR + 2.52705460808ROA - 0.302571303345ROE + e$$

Table 1 5 Regression Analysis using Six Independent Variables

Dependent Variable: CAR
Method: Panel EGLS (Cross-section weights)
Date: 09/04/14 Time: 13:21
Sample: 2008Q1 2013Q4
Periods included: 24
Cross-sections included: 19
Total panel (balanced) observations: 456
Linear estimation after one-step weighting matrix
White cross-section standard errors & covariance (d.f. corrected)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.34776	1.017694	19.01138	0.0000
BOPO	-0.000194	5.61E-05	-3.446461	0.0006
NIM	-0.342229	0.183973	-1.860215	0.0635
NPL	0.344937	0.102311	3.371443	0.0008
LDR	-0.000505	0.000128	-3.949117	0.0001
ROA	2.527055	0.235916	10.71165	0.0000
ROE	-0.302571	0.035704	-8.474378	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.723945	Mean dependent var	31.50977	
Adjusted R-squared	0.708573	S.D. dependent var	12.34488	
S.E. of regression	3.673900	Sum squared resid	5817.442	
F-statistic	47.09519	Durbin-Watson stat	0.934706	
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.831904	Mean dependent var	19.34612	
Sum squared resid	6093.633	Durbin-Watson stat	0.730211	

Coefficient of Determination

According to the regression estimation table above, the value of coefficient of determination () is 0.723945 or 72.39% of dependent variable can be explained by six independent variables then 27.61% explained by other variables.

F test

The value of F statistic from regression table above is 46.49526 then compare with F table for a = 0.05, df1 or (k-1) = 6, df2 (n-k) =449 is 2,118767. Because F statistic is higher than F table it means accept H1, all independent variables has significant affect towards dependent variable.

T test

In t- test, the author will analyze the affect of each independent variable as individually with dependent variable. The t- test should be compare p-value with significant level to prove the hypothesis. The significant level is 0.05 and compare with p-value six independent variables then the result are Net Interest Margin have negative and no significant influence toward Capital Adequacy Ratio, Operating Expense to Operating Income, Loan to Deposit, and Return on Equity has negative and significant affect towards with Capital Adequacy Ratio, Net Performing Loan and Return on Asset has positive influence towards Capital Adequacy Ratio.

Regression Analysis Using Five Independent Variables

After removing net interest margin, the regression analysis consists of five independent variables and one dependent variable shows as below :

Estimation Equation :

$$CAR = \beta_0 + \beta_1(BOPO) + \beta_2(NPL) + \beta_4(LDR) + \beta_5(ROA) + \beta_6(ROE) + \epsilon$$

Substituted Coefficients :

$$\text{CAR} = 17.9104492546 - 0.000218479395942\text{BOPO} + 0.276296895775\text{NPL} - 0.000534501353966\text{LDR} + 2.54615279442\text{ROA} - 0.316373915034\text{ROE} + e$$

Table 1 6 Regression Analysis using Five Variables

Method: Panel EGLS (Cross-section weights)				
Date: 09/04/14 Time: 13:28				
Sample: 2008Q1 2013Q4				
Periods included: 24				
Cross-sections included: 19				
Total panel (balanced) observations: 456				
Linear estimation after one-step weighting matrix				
White cross-section standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.91045	0.615129	29.11659	0.0000
BOPO	-0.000218	5.70E-05	-3.833949	0.0001
NPL	0.276297	0.110802	2.493607	0.0130
LDR	-0.000535	0.000119	-4.483812	0.0000
ROA	2.546153	0.233818	10.88947	0.0000
ROE	-0.316374	0.031317	-10.10240	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.719936	Mean dependent var	31.80784	
Adjusted R-squared	0.705025	S.D. dependent var	12.73361	
S.E. of regression	3.716455	Sum squared resid	5966.801	
F-statistic	48.28272	Durbin-Watson stat	0.931142	
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.832835	Mean dependent var	19.34612	
Sum squared resid	6059.913	Durbin-Watson stat	0.730736	

Coefficient of Determination

According to the regression estimation table above, the value of coefficient of determination (R^2) 0.719936 or 71.99% of dependent variable can be explained by six independent variables then 28.01% explained by other variables.

F test

The value of F statistic from regression table above is 48.28272 then compare with F table for $\alpha = 0.05$, df_1 or $(k-1) = 6$, df_2 $(n-k) = 449$ is 2,118767. Because F statistic is higher than F table it means accept H_1 , all independent variables has significant affect towards dependent variable.

T test

In t- test, the author will analyze the affect of each independent variable as individually with dependent variable. The t- test should be compare p-value with significant level to prove the hypothesis. The significant level is 0.05 and compare with p-value six independent variables toward Capital Adequacy Ratio, Operating Expense to Operating Income, Loan to Deposit and Return on Equity has negative and significant affect towards with Capital Adequacy Ratio, Net Performing Loan and Return on Asset has positive influence towards Capital Adequacy Ratio

Table 1 7 Summary of hypothesis testing

Bank Ratio	Predicted Sign	Result	Significant level
NPL	+	+	5%
LDR	+	-	5%
BOPO	-	-	5%
ROA	+	+	5%
ROE	+	-	5%

Conclusion and Recommendation

Conclusion

This research aim to examined whether risk based bank rating components have affect toward capital adequacy ratio in 19 commercial banks in Indonesia. The author focuses on good corporate governance, risk profile, and earnings as components of risk based bank rating. Two variables namely Operating Expense to operating expense to operating income ratio and net interest margin ratio are proxy for good corporate governance, but it shows different significant. In the other hand operating expense to operating income has negative significant to capital adequacy ratio. Each increase of one percent of operating expense to operating income ratio meanwhile has decreased capital adequacy ratio amount 0.000218.

In this research, Non Performing Loan and Loan to Deposit were enter for ratio which represent of risk profile in risk based bank rating components. Both of them have significant influence with capital adequacy meanwhile the correlation coefficient positive for non performing loan ratio and negative for loan to deposit ratio. Each increase of one percent non performing loan ratiothen will be increase in parallel with capital adequacy ratio amount 0.276297. Otherwise, if loan to deposit ratio one percent increase meanwhile decrease capital adequacy ratio amount 0.000535.

The next two variables as proxy for earnings are Return on Equity and Return on Asset. Two variables are significant influence with capital adequacy ratio, but different coefficient. Return on asset is positive whereas return on equity is negative. Each increase of one percent of return on asset ratio will increase of capital adequacy ratio amount 2.546153, whereas in return on asset increase of one percent, capital addequacy ratio decrease amount 0.316374.

Thus, to maintain a capital adequacy ratio an appropriate with standards, the commercial bank need to pay attention and regularly monitored their capital adequacy. The current research has been carried out and there are numerous components involved in determining affect toward capital adequacy ratio like good corporate govomance, risk profile and eaming.

Recommendation

There some recommendation for any party that can be given in below:

- For 19 Commercial Bank,

The author suggests, the banks should maintain capital adequacy ratio. Capital adequacy ratio is one of indicator for bank condition. If the bank can maintain the capital adequacy ratio accordance

with standard it will get some benefit as follows, first trusted by any party especially shareholders and depositors, create of fair competition in the global financial markets, create the healthy bank condition, be able to support of any conditions like a bankrupt and can sustain until period of time, be able to absorb some risk.

- For Investors

The author suggest for investors who will invest the money, it must be noticed and observed the financial ratio of the bank, such as capital adequacy ratio in order to minimize the higher risk and maximizing of return from investment.

- For Further research

The author recommend to the next research of number of variables can be added in order to increase the significant model and also period of time can be extended so can be the best result for the further research. Then, for the next, could be widen of content such as comparison of CAMELS versus Risk Based Bank Rating affected toward Capital Adequacy Ratio Bank in Indonesia and also could be determine the variables affect towards whole the bank in Indonesia.

Reference

- Abdalla, K., & Fakhri, S. (2013). Determinants of Capital Adequacy in Commercial Banks of Jordan an Empirical Study. *International Journal of Academic Research in Economics and Management Sciences* , Vol 2 No.4.
- Abusharba, M. T., Triyuwono, I., Ismail, M., & Rahman, F. A. (2013). Determinants of Capital Adequacy Ratio (CAR) in Islamic Commercial Banks. *Global Review of Accounting and Finance* , 159-170.
- Ahmat, R., Ariff, M., & Skully, M. (2009). The determinants of capital adequacy ratio in developing economy . *Asian Pacific Finance* , 255-272.
- Bank Indonesia . (2011 - 2013). *Banking Regulation*. Indonesia: Bank Indonesia web site <http://www.bi.go.id/en/peraturan/perbankan/>.
- Bank Indonesia . (2008-2013). *Condensed Financial Statement Conventional Bank*. Indonesia: Bank Indonesia Web site <http://www.bi.go.id/en/publikasi/laporan-keuangan/bank/umum-konvensional/>.
- Bank Indonesia . (2013). *Kelembagaan Perizinan, Kepemilikan dan Kegiatan Usaha* . Jakarta : Bank Indonesia.
- Bank Indonesia. (2011). *Bank Indonesia Regulation*. Retrieved from Risk Based Bank Rating : <http://www.bi.go.id/id/peraturan/perbankan/>
- Bank Indonesia. (2004). *Indonesian Banking Architecture*. Jakarta: Bank Indonesia web site <http://www.bi.go.id/en/perbankan/arsitektur/Contents>.
- Basel Committee on Banking Supervision. (2011). *International regulatory framework for banks (Basel III)*. Bank for International Settlement <http://www.bis.org>.
- Bokhari, I. H., Ali, S. M., & Sultan, K. (2012). Determinants of Capital Adequacy Ratio in Banking Sector: An Empirical Analysis from Pakistan. *Academy of Contemporary Research Journal* , 1-9.
- Büyüksalvarcı, A., & Abdioglu, H. (2011). Determinants of capital adequacy ratio in Turkish Banks: A panel data analysis. *African Journal of Business Management* , Vol 5 (27).
- De Bondt, D., & Prast, H. M. (t.thn.). Bank capital ratios in the 1990s: Cross-country evidence. *BNL The Quarterly Review* , 212, 72–97.
- Ediez, T., Michael, I., & Perraudin, W. (t.thn.). The impact of capital adequacy standards on UK bank. *Economic Policy Review* , 4, 15–22.
- Ezike, J. E., & Oke. (2013). Capital Adequacy standards, Basle Accord and Bank Performance: The Negeria Experience. *Asian Economic and Financial Review* , 146-159.
- Gitman, L. J., & Zutter, C. J. (2012). Principles of Managerial Finance. Dalam L. J. Gitman, & C. J. Zutter, *Principles of Managerial Finance* (hal. 81-82). United State: Pearson Education.
- Gropp, R., & Heider, F. (t.thn.). What can corporate finance say about banks' capital structures? <http://www.wiwi.uni-frankfurt.de/schwerpunkte/finance/master/brown/177.pdf>.
- Gujarati. (2004). *Basic Econometrics*. New York: McGraw- Hill.

- Jacques, K., & Nigro, P. (t.thn.). Risk-based capital, portfolio risk, and bank capital: A simultaneous equations. *Journal of Economics and Business* , 49,533–547.
- Kasmir. (2011). *Dasar - dasar Perbankan*. Jakarta: Rajawali Pers.
- Kleff, V., & Weber, M. (2003). How do banks determinants capital?Emperical Evidence from Germany .*ZEW Disc* , 03-66.
- Lembaga Pengembangan Perbankan Indonesia. (n.d.). *Risk Based Bank Rating*. Retrieved July 2014, from Lembaga Pengembangan Perbankan Indonesia: <http://www.lppi.or.id>
- Matthews, K. (1996). Capital adequacy ratios for banks. *Reserve Bank Bulletin* , hal. Vol 2 No. 59.
- Praktikum Pelatihan Ekonometrika Bank Indonesia* . Bank Indonesia .
- Q Finance. (2014, July 20). Internal Capital Adequacy Assessment Process. *Understanding the Internal Capital Adequacy Assessment Process* .
- Rime, B. (2001). Capital requirements and bank behaviour: Empirical evidence for Switzerland. *Journal of Banking and Finance* , 25, 789–805.
- Sahajwala, R., & den Bergh, P. V. (2000). Supervisory Risk Assesment and Early Warning Systems. 4.
- Setianingrum, D. (2011). Pengaruh Resiko, Kualitas Manajemen, Ukuran dan Likuiditas Bank terhadap Capital Adequacy Ratio Bank-Bank yang Terdaftar di Bursa Efek Indonesia. *Jurnal Akutansi dan Keuangan* , 47-56.
- Widyastuti, R. S., & Armanto, B. (2013, April). Banking Industry Competition in Indonesia . *Bulletin of Monetary, Economics and Banking*.