THE DETERMINANTS OF CAPITAL BUFFERS' COMERCIAL BANKS IN INDONESIA (STUDY ON 16 BIGGEST COMERCIAL BANKS PERIOD 2004-2010)

BACHELOR THESIS

Submitted as a requirement
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Written by:

MOH. ROMIZUL FIKRI
NIM. C2A 008 101

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DIPONEGORO UNIVERSITY
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APPROVAL

Author	:	Moh. Romizul Fikri
Student ID Number	:	C2A 008 101
Faculty/Major	:	Economics/Management
Title	:	**THE DETERMINANTS OF CAPITAL BUFFERS' COMERCIAL BANKS IN INDONESIA (STUDY ON 16 BIGGEST COMERCIAL BANKS PERIOD 2004-2010).**
Paper Advisor	:	Erman Denny Arfianto, S.E., M.M.

Semarang, June 1st 2012

Paper Advisor

(Erman Denny Arfianto, S.E., M.M.)
NIP. 19761205 200312 1001

APPROVAL

Author	:	Moh. Romizul Fikri
Student ID Number	:	C2A 008 101
Faculty/Major	:	Economics/Management
Title	:	**THE DETERMINANTS OF CAPITAL BUFFERS' COMERCIAL BANKS IN INDONESIA (STUDY ON 16 BIGGEST COMERCIAL BANKS PERIOD 2004-2010).**

Has passed the examination on June 8th 2012.

Examiners:

1. Erman Denny Arfianto, S.E., M.M. (.....)
2. Drs. Prasetiono, M.Si (.....)
3. Dra. Irene Rini Demi Pangestu, ME (.....)

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Here in undersigned I am, Moh. Romizul Fikri, claim that Bachelor Thesis entitled: **The Determinants of Capital Buffers' Comercial Banks in Indonesia (Study on 16 Biggest Banks period 2004-2010)**, is my on writing. Hereby I declare in truth that this Bachelor Thesis is not contains half or entire written by others. In which I took by copy or imitate a set of sentences or symbols that shows other writer ideas, opinions, or thoughts that I admitted as my own, and there are no part of the entire sentences which is copied, imitated, or token from the other writers without giving confession towards the original writer.

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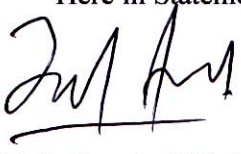

(Moh. Romizul Fikri)
NIM : C2A 008 101

MOTTO

عَنْ ابْنِ عُمَرْ رضي الله عَنْهُمَا قَالَ : أَخَذَ رَسُوْلُ اللهِ صلى الله عليه وسلم بِمَنْكِبَيَّ فَقَالَ : كُنْ فِي الدُّنْيَا كَأَنَّكَ غَرِيْبٌ أَوْ عَابِرُ سَبِيْلٍ . وَكَانَ ابْنُ عُمَرَ رَضِيَ اللهُ عَنْهُمَا يَقُوْلُ : إِذَا أَمْسَيْتَ فَلاَ تَنْتَظِرِ الصَّبَاحَ، وَإِذَا أَصْبَحْتَ فَلاَ تَنْتَظِرِ الْمَسَاءَ، وَخُذْ مِنْ صِحَّتِكَ لِمَرَضِكَ، وَمِنْ حَيَاتِكَ لِمَوْتِكَ .

[رواه البخاري]

Dari Ibnu Umar radhiallahuanhuma berkata : Rasulullah Shallallahu'alaihi wasallam memegang pundak kedua pundak saya seraya bersabda : Jadilah engkau di dunia seakan-akan orang asing atau pengembara ", Ibnu Umar berkata : Jika kamu berada di sore hari jangan tunggu pagi hari, dan jika kamu berada di pagi hari jangan tunggu sore hari, gunakanlah kesehatanmu untuk (persiapan saat) sakitmu dan kehidupanmu untuk kematianmu "

(Riwayat Bukhori)

"When life give you lemons, make lemonades – make the best of what we already have"

"Khairun Naasi Man Yanfau'hu Lin Naasi – The best people is who always giving benefit to the surrounding".

This thesis is granted special to :

- *My Family, my mom and dad. I love you so much, thanks for everything.*
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ABSTRACT

This study aims to analyze the determinants of capital buffer on 16 Biggest comercial banks in Indonesia. Research model based on Ayuso, et al. (2004), Tabak, et al. (2011), and Jokipii and Milne (2008). The model consists of 5 independent variables that are Return on Equity (ROE_{t-1}), Non Performing Loan (NPL), Increment of Capital Buffer (IncrBUFF), Loans to Total Assets (VLOAN), and Bank's Share Assets (BSA) and one dependent variable which is Capital Buffer (BUFF).

This study conducted for the period 2004-2010. The empirical result showed capital buffer is affected mainly by two variables: Non Performing Loand and Increment of Capital Buffer. NPL positive sign signaling that comercial banks adopt a conservative behavior and do not take risks. Return on Equity (ROE_{t-1}) affected negaively to capital buffer, it is signaling that comercial banks in Indonesia may have unlimited acces to external capital and/or prefer their financing from equity. Loans to Total Assets (VLOAN) have negative and significant on influencing capital buffer, it also signaling that comercial banks in Indonesia use "bacward-looking" strategy by reducing their capital buffer during the boom of credit activities. Bank's Share Assets (BSA) finding is supporting Too Big To Fail (TBTF) nature that suggest the large banks tend to maintain their capital buffer lower than small banks.

Keywords : Capital Buffer, ROE_{t-1}, NPL, Increment of Capital Buffer, Loans to Total Assets, bank's Share Assets.

ABSTRAK

Penelitian ini bertujuan untuk menguji faktor-faktor yang mempengaruhi cadangan modal (BUFF) pada 16 bank komersial terbesar di Indonesia. Penelitian ini berdasarkan pada penelitian sebelumnya yaitu Ayuso, dkk. (2004), Tabak, dkk. (2011), dan Jokipii dan Milne (2008). Model ini terdiri dari 5 variabel independen yaitu Return on Equity (ROE$_{t-1}$), Non Performing Loan (NPL) Increment of Capital Buffer (IncrBUFF), Loans to Total Assets (VLOAN), Banks' Share Assets (BSA) dan satu variabel dependen yaitu cadangan modal(BUFF).

Penelitian ini dilakukan untuk periode 2004-2010. Hasil empiris menunjukkan bahwa cadangan modal dipengaruhi terutama oleh dua variabel: Non Performing Loan dan Increment of capital Buffer. Pengaruh positif NPL menandakan bahwa bank di Indonesia mengadopsi perilaku konservatif dan cenderung tidak mengambil risiko. Return on Equity (ROE$_{t-1}$) berpengaruh negatif dengan cadangan modal, hal ini menandakan bahwa bank-bank di Indonesia memiliki akses tak terbatas pada modal eksternal dan / atau lebih memilih pembiayaan dari ekuitas. VLOAN juga berpengaruh negatif dan tidak signifikan pada cadangan modal, hal ini menandakan bahwa bank di Indonesia menggunakan strategi "backward looking" dengan mengurangi cadangan modal selama periode booming dalam pendistribusian kredit. Penemuan terhadap Banks' Share Assets setuju dengan teori "Too Big To Fail" (TBTF) yang menyatakan bahwa bank besar cenderung menjaga capital buffernya lebih rendah daripada pada bank kecil.

Kata Kunci : Capital Buffer, ROE$_{t-1}$, NPL, Increment of Capital Buffer, Loans to Total Assets, Bank's Share Assets

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Writing this final assignment has given me a lot of learning. It was really challenging and fun, also seasoned with stressful experiences sometimes. It helps me to explore a wider horizon of behavioral science, which I enjoy the most. I am also indebted for the presence, support, advices, and love of many people. Therefore, I would like to thank:

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Despite of my best effort and hard work, I realized that this assignment is still have a lot of lack. Hopefully there will be critics and suggestions to make this assignment particularly and my skill generally better.

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Moh. Romizul Fikri

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CHAPTER I

INTRODUCTION

1.1 Research Background

A financial service is industry that experienced the most rapid change and growth in many countries. Indonesia, with total population of approximately 240 million people and an average population aged 28 years, becoming a potential land for market penetration of banking. Moreover, the level of market penetration is still low by the number of people who have bank accounts only 40 million to 50 million peoples. In the last 20 years, the banking sector is always growing and still dominated by 82% of the assets of all financial sector assets, such as insurance, multi finance, pension funds, and securities companies (Info Bank Outlook, 2011).

Functions of the bank as an agent of trust is not only necessary for individuals and society as a whole, but also plays a role in facilitating economics growth and development of the country. In addition, the bank also helps to facilitate the transaction, production and consumption through its function as an agency of payment system (Rivai, Veithzal, et al., 2007). In order to be well functioned, banks must have sufficient capital, good asset quality, good management and operated on the principle of prudence, and also making a profit.

As a vital institution in the economy, it is necessary to control a healthy and stability by the banking regulator.

Commercial banks are the most heavily regulated financial institutions in Indonesia. This largely reflects the critically important role bank play in the payment system and in providing credit to individuals and business. The large number of failed banks during crisis in 1998 force Bank Indonesia as a reserve bank in Indonesia to redesign its regulatory framework encompassing and deposit insurance. Fundamentally, there are five reasons for bank regulation. First, to ensure the safety and soundness of bank and financial instrument. Second, to provide an efficient and competitive financial system. Third, to provide monetary stability. Fourth, to maintain the integrity of the nation's payment system. Fifth, to protect consumers from abuses by credit granting institutions (Rose, 2002).

Precious lessons from the crisis of 1998 was indicated that the national banking industry still weak on regulation because it did not has a solid banking infrastructure, so it would be not easy to overcome internal and external shocks that come suddenly. The weakness of banking's regulation becomes challenges that still must be resolved in order to encourage economic growth at the expected level and keep the soundness and stability (Rivai, Veithzal, et al., 2007).

To enhance the soundness and stability of the financial system, regulators of banks impose the restricted regulation on the capital requirement, several instrument have been adopted for the regulation of banking institutions, the most prominent taking the form of the capital requirement regulation. As imposed by

the 1988 Basel Capital Accord and its subsequent amendments, the regulation requires that banks hold a minimum amount of capital equal to eight percent (8%) of risk weighted assets. This ratio is known as the capital adequacy ratio (CAR).

Indonesia adopted the rule was originally intended to overcome the effects of banking competition post financial deregulation in the 1990s. However, banks commercial at the time tends to break the rules minimum of capital requirement and respond to competitive pressures by extending credit to risky projects, where most of the bad debt can be found at non-tradable sectors such as real estate, property and construction. Although the capital reserves that continue to erode due to bad loans that are too large, the banks remain in operation until the end of the financial crisis can not be avoided (Creed, 1999).

An update version of capital accord, Basel II, already implemented in Indonesia with the objective of bringing bank capital requirement more in line with actual risk. In early 2004, Bank Indonesia strengthens bank capital regulation. The regulation known as the Indonesian Banking Architecture (API). API requires minimum capital of Rp 3 Trillion for establish a new bank. While banks has been established, there are obliged to meet minimum capital of Rp 100 Billions until the end of 2010. To strengthen the API, Bank Indonesia implement new consolidation rules in June 2005, which commercial banks are required to have capital Rp 8 billions until the end of 2007 (Infobanknews, 2006). Strengthening regulations on capital bank is nothing but it is the Bank Indonesia's effort in preparation for BASEL II.

The lattes version of capital accord called BASEL III will be implemented in Indonesia in 2018, The World Bank explains Basel III is the latest global standards for the regulation of capital adequacy and liquidity. Basel III regulations are made to respond to the global financial crisis, which revealed various shortcomings in the regulation of global finance. In the financial sector, Basel III is not only touches on prudential regulations (relating to the precautionary principle) micro scale, but also on macro scale, because it can maintain the stability of the financial system. Basel III will introduces additional capital buffers, a mandatory capital conservation buffer of 2.5% and a discretionary countercyclical buffer, which allows national regulators to require up to another 2.5% of capital during periods of high credit growth. The measures proposed Basel III also aims to reduce financial sector conditions are pro-cyclical (pro-cyclicality) and reduce systemic risks, including by addressing the problem of liquidity.

Incorporated banks in Indonesia generally maintain a capital adequacy ratio (CAR) well above the regulatory requirement. For example, the average CAR of licensed commercial banks were 18,8 per cent in the 2010, against an average required minimum of just 8 per cent, that means banks has 10,8 per cent for their capital buffer (Bank Indonesia). This phenomenon is also common in other economies. It raises the question of what factors determine the actual amount of capital held by banks can affect the level of bank capital.

The excess of Capital Adequacy Ratio so called as Capital Buffer gets a great deal of attention in the economic literature considering that banks serve a pivotal role in the economy. However, the level of minimum CAR set by the regulator may not fully capture banks' risks. There could also be risks that do not concern the regulator, but affect banks' capital holding decisions, including financial distress caused by a loss of branches value. Such as, banks' views on the appropriate level of capital may differ from the minimum level set by the regulator.

Table 1.1

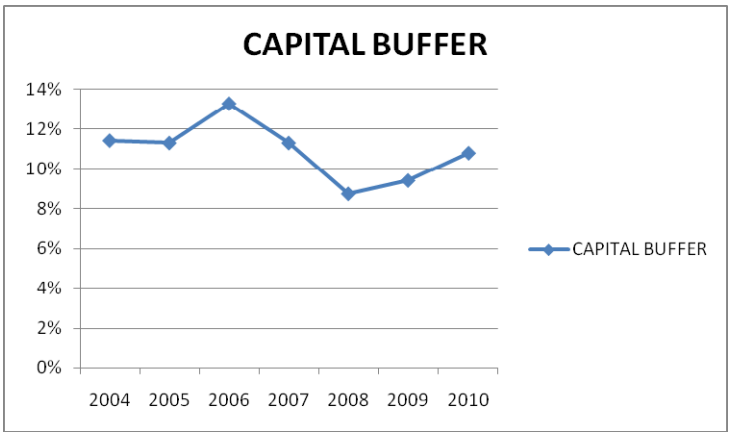
Capital Buffer Ratios Banking in Indonesia (%)

Ratios	CAR	Minimum CAR	Capital Buffer
2004	19,42	8	11,42
2005	19,3	8	11,3
2006	21,27	8	13,27
2007	19,3	8	11,3
2008	16,76	8	8,76
2009	17,42	8	9,42
2010	18,80	8	10,80

Source: Bank Indonesia (compiled)

Figure 1.1

Level of Capital Buffer Ratio Banking in Indonesia (%)



Source: Bank Indonesia (compiled)

Function of capital buffer in the banking industry is strickly needed to anticipate an increase of future losses and to anticipate when capital is rare and expensive in downturn period. Mishkin (2007) argued that banks also hold excess capital or capital buffer are made based on three most common reasons. First, bank capital aids to prevent bank failure. A bank maintains it's capital to reduce the chance of become insolvent. Banks will prefer to have a sufficient capital to act as cushion to absorb the losses. Second, the amount of capital affects returns for the equity holders of the bank. The higher the bank capital, the lower the return that the owners of the banks. There is a trade off between the safety and the returns to equity holders, so the bank managers had to set an optimal level of bank capital. Third, a minimum amount of bank capital is required by the regulators.

In chart above shown that commercial banks in Indonesia always generally maintains a capital adequacy ratio (CAR) well above the regulatory requirement

(more than 8%). The highest level of capital buffer happened in 2006, this discussion become more interesting because the lowest level of Capital buffer occured in 2008, but afterward, level of Capital Buffer was always increase. The average CAR from 2004-2010 touched 18,89% against BASEL III only required 13% of minimum CAR. Too much CAR value is not good for banking industry, since it's excess capital can be used for runing the business of banking and maximizing of it's profit.

Table 1.2

Financial Ratios (BUFF, CAR, and NPL)

Comercial banks in Indonesia 2004-2010 (%)

Ratios	2004	2005	2006	2007	2008	2009	2010
BUFF	11,42	11,30	13,27	11,30	8,76	10,42	10,80
CAR	19,42	19,3	21,27	19,3	16,76	17,42	18,80
NPL	4,50	14,75	10,70	6,50	3,74	3,46	2,80

Source: Bureau of Bank Indonesia (compiled)

From chart above, the ratio of capital buffer called BUFF showed a fluctuation from 2004 to 2010. Ratio of BUFF in 2004 amounted 11,42% and in 2005 was 11,30%, in the other hand, BUFF ratio decreased during year 2004 to 2005. In 2006 to 2007, BUFF also decreased from 13,27% to 11,30%. But BUFF ratio increased during 2008 until 2010. In 2008 was 8,76%, in 2009 was amounted to 10,42 and in 2010 was 10,80%. It is interesting to note that the buffer

capital showed increasing level during 2008 to 2010, because in those years global recession occured.

In term of NPL data, there are some data gap that is not relevant with theory, it was happened during year 2005 to 2010 except year of 2007. When Non performing loan (NPL) has showed the decline, but BUFF showed the uptrend. Furfine (2000) and Estrella (2004) found a significant positive coefficient would indicate that higher risk leads to higher capital buffers. The theory predicts this coefficient should be positive since higher risks increase the probability of meeting regulatory capital constraints and facing the related costs such as market discipline and supervisory intervention. Non-Performing Loans (NPL) from year to year has always experienced a trend decline during 2005-2010, beginning in 2005 was 14,75% to 10,7% in 2006, in the year 2007 NPL amounting to 6,5%, in 2008 decreased to 3,74%, during 2009 to 2010 NPL was decreasing too from 3,46%, to 2,8%. This indicates that the ratio of non performing loans getting less and be able to overcome.

The purpose of this research is to assess the determinants of bank capital buffer's comercial bank in Indonesia. The methodology is roughly similar to the one used by a literature on the determinants of capital buffers. This allows for a direct comparison of the results with theirs, especially those of Ayuso et al. (2004) based on Spanish banks. Other empirical studies include Jokipii and Milne (2006) for the Finland, Lindquist (2003) for Norway, Kleff and Weber (2005) for Germany, Prasetyantoko and Soedarmono (2010) for Indonesia, and the lates research was conducting by Benjamin M. Tabak et all (2011) in Brazil.

Basically there are three different types of costs associated to bank capital to the model capital buffers, based on Ayuso et al. (2004), Lindquist (2004), Stolz and Wedow, (2009), Brown and Davis (2008), Fonseca and Gonzalez (2009), Nier and Baumman (2006), Jokipii and Milne (2008), and Tabak et al. (2011), wich there are including cost of holding capital, cost of financial bankcruptcy or financial distress, and adjustment costs.

Some researchees on the determinants of capital buffers have been conducted, including Ayuso et al. (2002), Jokipii and Milne (2008), and Prasetyantoko & Soedarmono (2008) uses ROE as a proxy of capital holding cost, the result was showing a negative influence between ROE and Capital Buffer. De Bont and Prast (1999) find That ROE is only negative in countries with large stock markets, suggesting that the argument of "opportunity cost of capital" hold only in countries were shareholder value is Important and access to external finance relatively cheap. It is contrary to the findings of Nier (2006), D'Avack & Levasseur (2007) found a positive correlation between ROE and capital buffer, it indicates that there is a role of shareholders in disciplining market. Shareholders tend to increase the capital buffer to keep the market value (Park and Peristiani, 2007).

The bank's risk profile or cost bankcruptcy also determines capital buffer, since it is related to the likelihood of costs of failure. Jokipii and Milne (2008), Fonseca and Gonzalez (2009) use the non-performing loan ratio to total loans (NPL) to proxy the banks risk and the result has found a positive correlation between NPL and capital buffers. While Alfon et al. (2005) found a negative

correlation Between NPL and capital buffer, a negative coefficient would however indicate "moral hazard" behavior, where banks assume higher risks with lower buffers, it could also indicate more sophisticated risk management systems, allowing banks to hold lower buffers for the same amount of risk (Alfon et al., 2005).

Capital adjustment also has important effect on determining capital buffers, since banks may face adjustment costs in moving toward optimal their capital ratios. Ayuso et al. (2002) and Esterella (2004) using lag of capital buffer ($BUFF_{t-1}$) to proxy this cost, the result was showing positive significant on influencing capital buffer. But this research try to change lag of capital buffer variable into increment of capital buffer variable, since this capital buffer decission not only determined by adjusting capital buffer at the previous period (t-1), but also determined by capital buffer at the current period (t). So we expect the delta of capital buffer will affect positevely, as same as lag of capital buffer.

In this research also add some other determinats to find a real determinants that can effect to capital buffer's comercial banks in Indonesia, there are two other determinats that also included in this research such as Bank's Loans To Total Assets and Bank’s Share Assets. Loans To Total Assets is considered in the analysis, it is expected to positively related to capital buffer because the higher amount of distributed loans, the more risky a bank may be to higher defaults. Bank's Share Assets also considered as independent variables, therefore in this study need to asses strategy to decrease capital buffer that could be used for

banking with high share assets. It also will prove Too Big To Fail consensus that states large banks tend to decrease their capital buffer.

It is important to highlight that most of the comercial banks in Indonesia hold capital above the required minimum ratio. But unfortunately, study on capital buffer in Indonesia is still difficult to found. The discussion about capital buffer banks have not been touched yet in academic and policy level. This study wanted to analyze more about the determinants of capital buffer comercial banks in Indonesia, since that bank's CAR in Indonesia has reached a level of average 18,89% during the period 2004-2010, when the minimum capital regulations only required banks to have CAR equal to 8% and a new BASEL III only required CAR to 13%.

Thus, based on research gap and theory gap as explained above, there is a need to asess **"The Determinants of Capital Buffers' Comercial Banks in Indonesia" (Study on 16 Biggest Comercial Banks in Indonesia).** Built upon those reasons, this research tries to analyze what is determinants of capital buffer in Indonesia which is influenced by some variables such as Return on Equity, Non Performing Loan, Increment of Capital Buffer, Loans To Total Assets, and Bank Share Assets.

1.2 Problem Statement and Research Questions

The research question will be built based on research gap. We can see from previous research as mentioned above in research background that show the gap between one researcher to other researchers. Such the other previous research conducted by Jokipii and Milne (2008) analyze the cyclical behaviour of European bank capital buffer's bank of Finland. The research uses ROE as one of determinants of capital buffer and the result for this variable is negative. As noted by Jokipii and Milne (2008), ROE may well exceed the remuneration demanded by shareholders and to this extent is a measure of revenue rather than cost. A high level of earnings substitutes for capital as a buffer against unexpected shocks. Thus, as raising capital through the capital markets is costly, retained earnings are frequently used to increase capital buffers. So the expected sign for ROE may be negative (Jokipii and Milne, 2008; Stolz and Wedow, 2005), but it also may be positive (Nier and Baumman, 2006).

The other research gap also found in Fonseca and Gonzalez (2009) research. They use the non-performing loan ratio to total loans (NPL) to proxy the bank risk, the results found a positive relationship between capital buffers and risk that proxy by non performing loan. But Alfon et al. (2005) and Miguel Boucinha (2008) found a negative correlation Between NPL and capital buffer.

Increment of Capital Buffer (ΔBUFF) variable also will be analyzed although Ayuso et al. (2002) and Esterella (2004) using lag of capital buffer variable to proxy cost of capital adjustment, the results was showing a positive

and significant on influencing capital buffer. Study on incremental capital buffer try to add some other finding research on determining capital buffer, especially it still haven't touch yet in Indonesia, so the author will include this variable also in this research.

The other variable also has important on determining capital buffer since Prasetyantoko and Soedarmono (2008) also analyze Bank's Share Assets (BSA) and Loans to Total Assets (VLOAN) on influencing capital buffer comercial banks in Indonesia. But the research only conducted in 4 years during the period of 2004 – 2007, so to prove the real of those two varibales in influencing capital buffer, this research will analyze those variables with longer period time during 2004-2010.

Built upon those problem, research questions which will be studied in this research are listed as follows:

1. Does Return on Equity (ROE_{t-1}) influence Capital buffer banking in indonesia during 2004-2010?
2. Does Non Performing Loans (NPL) influence Capital Buffer banking in Indonesia during 2004-2010?
3. Does Increment of Capital Buffer ($\Delta BUFF$) influence Capital Buffer banking in Indonesia during 2004-2010?
4. Does Loans to Total Assets (VLOAN) influence Capital Buffer banking in indonesia during 2004-2010?

5. Does Bank's Share Assets (BSA) influence Capital Buffer banking in Indonesia during 2004-2010?

1.3 Objective and Research Benefit

1.3.1 Research Objective:

The objectives of this study are:

1. To analyze the influence of Equity (ROE_{t-1}) on Capital buffer banking in indonesia from 2004-2010.
2. To analyze the influence of Non Performing Loans (NPL) on Capital Buffer banking in Indonesia from 2004-2010.
3. To analyze the influence of Increment of Capital Buffer ($\Delta BUFF$) on Capital Buffer banking in indonesia from 2004-2010.
4. To analyze the influence of Loans to Total Assets (VLOAN) on Capital Buffer banking in indonesia from 2004-2010.
5. To analyze the influence of Bank's Share Assets (BSA) on Capital Buffer banking in Indonesia from 2004-2010.

1.3.2. Research Benefits

The benefits this research are:

1. Benefit for Civitas Academica

   The results of this study are expected to contribute knowledge about the determinants of capital buffer's comercial banks in Indonesia.

Result of this research also hopefully can add empirical research repository about science discipline of finance management management, especially concerning about capital buffer.

2. Benefit for Bankers

   This research is expected to be able to analyze the future financial condition, so it could be a reference materials for banking industry to strategize about the future of banking regarding BASEL III will be implemented in 2018.

3. Benefit for Readers

   For all readers, this study is expected to increase the knowledge and information who want to study about the problem of capital buffers comercial banking in Indonesia. As well as reference material to make a comparative study in the future regarding study on capital buffer still rare to find in Indonesia.

1.4 Thesis Outline

Outline of the bachelor thesis is describe as follows:

CHAPTER I: INTRODUCTION

Chapter I provide the research backround about determinants of capital buffer, problem discussion, research questions, research purpose, and research benefits.

CHAPTER II: LITERATUR REVIEW

Chapter II contains underlying theories and reviews of the previous study that has a closer relationship to the subject of this study. It also contains theoritical framework of the study and hypothesis.

CHAPTER III: RESEARCH METODOLOGY

Chapter III explains the research method. This chapter also includes a definision and operational measurement of the variables, population and sampling frame, data type and data source. This chapter also describe analysis method used in the research.

CHAPTER IV: RESULT AND ANALYSIS

Chapter IV presents research object, data analysis, and discussion of the research hypothesis.

CHAPTER V: CONCLUSIONS

Chapter V provide the conclusions and implication drawn from the research. I includes the limitation of the study and suggestions.

CHAPTER II

LITERATURE REVIEW

2.1 Theoretical Backround

2.1.1 Bank's Capital

The capital accounts of a comercial bank play several vital role in supporting its daily operations and ensuring its long run viability. Rose (2002) propose there are five functions of bank capital, first, capital provides a cushion against the risk of failure by absorbing financial and operating losses until management can address the bank's problem and restore the institution's profitability. Second, capital provides the funds needed to get the bank chartered, organized, and operating before deposits come flowing in. Third, capital promotes public confidence in bank and reassures its creditor of the bank's financial srength, capital also must be strong enough reassure borrowers thet bank will be able to meet their credit needs even if the economy turns down. Fourth, capital provides fund for organization's growth and the development of new services, program, and facilities. Fifth, capital serves a regulator of bank's growth, helping to ensure that individual bank's growth is held to a pace that is suistainable in the long run.

Both of the regulatory authorities and the financial markets require that bank capital increases roughly in line with the growth of loans and other risky bank assets. Thus, the cushion to absorb losses is supposed to increase along with a banking institution's growing risk expossure. A bank that expands its loans and

deposits too fast will start receiving signals from the market and regulatory community that its growth must be slowed or additional capital must be required.

So, capital regulation by the bank regulatory agencies has become an increasingly important tool to limit how much risk exposure banks can accept. In this role capital not only tends to promote public confidence in banks and the banking system but also serves to protect the government's deposit insurance system from serious losses.

2.1.2 Bank Regulation

Bank regulations are a form of government regulation which subject banks to certain requirements, restrictions and guidelines. This regulatory structure creates transparency between banking institutions and the individuals and corporations with whom they conduct business, among other things. Given the interconnectedness of the banking industry and the reliance that the national and global economy hold on banks, it is important for regulatory agencies to maintain control over the standardized practices of these institutions.

Rose (2002) propose the principal reasons banks are subject to bank's regulation. First, to protect the safety of the public's saving, it is related to minimum requirements, requirements are imposed on banks in order to promote the objectives of the regulator. Often, these requirements are closely tied to the level of risk exposure for a certain sector of the bank. The most important minimum requirement in banking regulation is maintaining minimum capital ratios. Second, to control the supply of money and credit in order to achieve a

nation's broad economic goals, such as high economic's growth, low inflation, and high employment. Third, to ensure equal opportunity and fairness in the public's access to credit and other vital financial services. Fourth, to promote public confidence in the financial system, so that savings flow smootly into productive investment, and payments for goods and services are made speedily and efficiently. Fifth, to avoid concentrations of financial power in the hands of a few individuals and institutions. Sixth, to provide the government with credit, tax revenues, and other services. Seventh, to helps sectors of the economy that have special credit needs, such as housing, small business, and agriculture.

The capital regulation by the bank regulatory agencies has become one of the key instruments of modern banking regulation with aim to provide both a capital buffer during adverse economic conditions, as well as a mechanism aimed at preventing excessive risk ex ante (Rochet, 1992). And this regulations becomes an increasingly important tool to the safety of the public's saving, to the public's confidence in the financial system and to the limit on how much risk exposure banks can accept. In this role capital also serves protect the government's deposit insurance system from serious losses.

The capital regulation by the bank regulatory called as capital requirement sets a framework on how banks must handle their capital in relation to their assets. Globally, Basel Committee on Banking Supervision influences each country's capital requirements. In 1988, the Committee decided to introduce a capital measurement system commonly referred to as the Basel Capital Accords. The latest capital adequacy framework is commonly known as Basel III, This updated

framework is intended to be more risk sensitive than the original one, but is also a lot more complex. The capital regulation rules those recomended by the BASEL Accord are minimum to be implemented by banks globally in across country with the aim to ensure a sound and stable financial environment.

2.1.3. The BASEL Agreement on International Capital Standards

2.1.2.1 BASEL I

In 1987 the Federal Reserve Board, representing by 12 countries such as United States, Belgium, Canada, France, Germany, Italy, Japan, The Netherlands, Sweden, Switzerland, the United Kingdom, and Luxemborg) announced preliminary agreement on new capital standard, often referred to as the Basel Agreement or Basel I that would be uniformly applied to all banking institutions in their respective juridictions. Formally approved in July 1988, those new requirements are designed to encourage leading banks to strengthen their capital positions, reduce inequality in the regulatory rules of different nations, and consider the risk to bank of the off balance sheet commitments that they have made in recent years.

Basel I, primarily focused on credit risk. Assets of banks were classified and grouped in five categories according to credit risk, carrying risk weights of zero (for example home country sovereign debt), ten, twenty, fifty, and up to one hundred percent (this category has, as an example, most corporate debt). Banks with international presence are required to hold capital equal to 8 % of the risk-weighted assets. This version has helped to strengthen the soundness and stability

of international banking system as a result of the higher capital ratios that it required.

2.1.2.3 BASEL II

Basel II initially published on June 2004, aims to create an international standard for banking regulators to bring the framework more in line with modern banking by becoming more risk sensitive and representative of current risk management practise. This version intended to control how much capital banks need to put aside to guard against the types of financial and operational risks banks (and the whole economy) face.

Basel II was created to build on a solid foundation of prudent capital regulation, supervision, and market discipline, and to enhance further risk management and financial stability. As such, the Committee encourages each national supervisor to consider carefully the benefits of the new framework in the context of its own domestic banking system and in developing a timetable and approach to implementation. Given resource and other constraints, these plans may extend beyond the Committee's implementation dates. That said, supervisors should consider implementing key elements of the supervisory review and market discipline components of the new framework even if the Basel II minimum capital requirements are not fully implemented by the implementation date. National supervisors should also ensure that banks that implement Basel II are subject to prudent capital regulation and sound accounting and provisioning policies.

Advocates of Basel II believed that such an international standard could help protect the international financial system from the types of problems that might arise should a major bank or a series of banks collapse. In theory, Basel II attempted to accomplish this by setting up risk and capital management requirements designed to ensure that a bank has adequate capital for the risk the bank exposes itself to through its lending and investment practices (BIS, 2012). Generally speaking, these rules mean that the greater risk to which the bank is exposed, the greater the amount of capital the bank needs to hold to safeguard its solvency and overall economic stability.

2.1.2.3. BASEL III

Forum Basel Committee on Banking Supervision in Switzerland has decided that the world have to improve standards of banking regulation following the crisis 2008. With the due date of January 1, 2013, the whole world should implement certain standards for sound banking. Bank Indonesia will adapt some of the rules related to it, Indonesia compared to other countries, it has actually been quite strong. That's since the capital structure of banks in Indonesia is still strong with an average capital adequacy ratio (CAR) 17% (Gayatri, 2012).

Basel III is intended to be applied consistently around the world so as to reduce the risk that financial institutions will move their operations to jurisdictions with more lenient regulatory regimes. However, it is by no means clear that Basel III will be implemented uniformly around the world. The timing of implementation will not be identical, and banks with operations in multiple

countries may be compelled to comply with the tightest national timeline to which they are subject. Even when fully implemented, the finer details of national capital adequacy regimes are likely to differ and, again, international banks may find themselves compelled to comply with the rules of the host country with the most stringent national capital adequacy requirements.

Basel III's new requirement for countercyclical capital buffers may also be difficult for banks with international operations. Basel III requires that individual countries consider whether to increase their national capital requirements when there is an unsafe build-up of credit. If a bank has operations in more than one country, the countercyclical buffer that it is required to maintain will be a weighted average of all of the countercyclical buffers in force in countries in which it has credit exposure.

Generally speaking, Indonesia is ready for implementing BASEL III because banks in Indonesia has more components of tier one, however, the tightening of the Basel capital rules will still affect Indonesia. Capitalization rules will be tightened. The final rule requires the Basel minimum capital of 13% CAR by the composition of at least 6% tier one, 2% tier two, capital conservation buffer of 2.5% , and another 2.5% of capital during periods of high credit growth.

2.1.4 Theories Related to Capital Buffer

The theories related to capital buffer study that author have decided for this research are as follows: Pecking Order Theory and To Big Too Fail Consensus. Research on capital buffer has close conection to capital structure, so the underlying theories used are based on capital structure theory too and capital buffer is one of bank's behavior in their capital structure.

2.1.4.1 The Pecking Order Theory

In the theory of firm's capital structure and financing decisions, the pecking order theory was first suggested by Donaldson in (1961) and it was modified by Stewart C. Myers and Nicolas Majluf in (1984). It states that companies prioritize their sources of financing (from internal financing to equity) according to the principle of least effort, preferring to raise equity as a financing means of last resort. Hence, internal funds are used first, and when that is depleted, debt is issued, and when it is not sensible to issue any more debt, equity is issued.

Pecking order theory starts with asymmetric information as managers know more about their companies prospects, risks and value than outside investors. Asymmetric information affects the choice between internal and external financing and between the issue of debt or equity. Stewart C. Myers and Nicolas Majluf in (1984) stated that equity is more costly compare to other bank liabilities because of information asymmetries. Equity may also be disadvantaged because interest payments on debt are deducted from earnings before tax. Excess

capital is hence expected to be negatively associated with equity cost. Therefore, previous studies have considered the return on equity (ROE) as a proxy variable for the direct cost of remunerating excess capital. Thus, this research expect a negative relationship between ROE and excess capital (capital buffer).

Banks may face adjustment costs in moving toward their optimal capital ratios. These costs arise both when the bank is raising new external capital and when it is shedding external capital (Estrella, 2004). Equity also is a form of capital for which monitoring costs are high, and the bank has an informational advantage over public investors as to the value of its own equity, which would increase the cost of the desired adjustment (Myers and Majluf, 1984). Accordingly, the issuance of equity could be seen by the potential buyers as a negative signal with regard to the banks' value. An important cost of shedding equity comes from pressure from regulators, supervisors and market participants to maintain clearly sound levels of capital (Estrella, 2004).

An excess, or a deficiency of capital can arise as a result of the difficulties in capital adjustment. However, the consequence of falling short of capital is probably more serious, so banks are more likely to be "over-capitalised" than "under-capitalised". In addition to the assumption of asymmetric information, changing capital level can be give a bad signal, thus making the bank reluctant to react quickly when capital shocks occur (Myers and Majluf, 1984).

Ayuso et al. (2002) and Estrella (2004) found Lag of Capial Buffer ($BUFF_{t-1}$) coefficient may be interpreted as a measure of adjustment costs in capital buffers and its sign is positive. This research not using lag of capital buffer

as a proxy of capital adjustment, but it will use increment of capital buffer, this variable expected its sign to be positive as same as lag of capital buffer.

2.1.4.2 Too Big To Fail Consensus

A clear predictions about capital buffer obviously is related to the size of the bank. a consensus has been reached, where large banks tend to have lower capital buffer than small banks, due to the nature of the Too Big To Fail (Kane 2000; Mishkin 2006). In addition to Too Big To Fail, large bank is easily to get their financing from capital market and it has a comparative advantage to address the problem information to improve monitoring efforts to encourage them to strike a balance between cost supervision and the cost of equity. In turn, banks will reduce the cost of equity by way of lower capital reserves.

2.1.5 Capital Buffer

Bank's capital buffer (BUFF) is defined as the difference between the CAR ratio (ratio the adequacy of bank capital) to the regulatory capital minimum of 8%. Despite the safety and soundness benefits of capital regulation, requiring banks to hold increased levels of capital that does have costs and can be argued to be a binding constraint on bank behaviour.

Bank's capital buffers can view as a cushion, to absorb unexpected shock, if the financial distress costs from low capital and the costs of accessing new capital are high (Wong,et al. 2005). In addition, low capitalization banks are also easy to lose market confidence and reputation. Therefore, Furfine (2001) mentions

that banks may hold capital buffers as insurance to avoid cost about market discipline and supervisory intervention if they approach or fall below the regulatory minimum capital ratio.

Other reasons to have capital buffers, Berger et al. (1995) considers that market forces lead banks to keep capital buffers, even when capital is relatively costly, as bank capital commits the bank to monitor and without deposit insurance that allows the bank to raise deposits more cheaply. Jokipii and Milne (2008) argue that in the event of a substantial increase in loan demand, banks with relatively little capital may lose market share to those that are well capitalized.

Mishkin (2006) argued that banks also hold capital are made based on three most common reasons. First, bank capital aids to prevent bank failure. A bank maintains bank capital to reduce the chance of become insolvent. Banks will prefer to have a sufficient capital to act as cushion to absorb the losses. Second, the amount of capital affects returns for the equity holders of the bank. The higher the bank capital, the lower the return that the owners of the banks. There is a trade off between the safety and the returns to equity holders, so the bank managers had to set an optimal level of bank capital. Third, a minimum amount of bank capital is required by the regulators.

Basically there are three different types of costs associated to bank capital to the model of capital buffers, based on Ayuso et al. (2004), Lindquist (2004), Stolz and Wedow, (2009), Brown and Davis (2008), Fonseca and Gonzalez (2009), Nier and Baumman (2006), Jokipii and Milne (2008), and Tabak et al.

(2011), including of holding capital, cost of financial bankcruptcy or financial distress, and adjustment costs.

Ayuso et al. (2002), Jokipii and Milne (2008), and Prasetyantoko & Soedarmono (2010) uses ROE as a proxy of capital holding cost, the result was proving Return on Equity (ROE) has a negative on influencing capital buffer. It was different to the findings of Bauman Nier (2006), D'Avack & Levasseur (2007) that found a positive correlation between ROE and capital buffer, it indicates there is a role of shareholders in disciplining market. Shareholders growing niche to increase of of the capital buffer to keep the market value (Park and Peristiani, 2007), this is in line with the forward looking theory by the Palia and Porter (2004), in which capital ratios used by banks to maintain their market power.

Cost of bankcruptcy also determines capital buffers, Jokipii and Milne (2008), Fonseca and Gonzalez (2009) used non-performing loan ratio to total loans (NPL) to proxy the banks risk and the result has found a positive correlation between NPL and capital buffers. While Alfon et al. (2005) found a negative correlation Between NPL and capital buffers. This is in line with the argument by Mishkin (2007) which states that the banks will prefer to have a sufficient capital to act as a cushion to absorb the losses.

Capital adjustment has important effect on determining capital buffers, since banks may face adjustment costs in moving toward optimal their capital ratios. Ayuso et al. (2002) using lag of capital buffers to proxy this cost, the result was showing a significant positive on influencing capital buffer. As mentioned in

the theory, this research will use increment of capital buffer to proxy capital adjustment.

There are two types of behavior of banks in managing their capital. First, banks that are backward-looking will reduce the capital buffer during the boom to extend credit activities. As a result, they fail to think of capital buffers in the closing credit risk, and thus, they are forced to increase capital reserves during periods of recession (Borio et al., 2001). Second, banks that are forward-looking would anticipate economic recession in the future by improving capital buffer during periods of economic boom.

Ayuso et al (2004) provide an empirical evidence on the behavior of banks in Spain that are backward-looking to show that bank capital is procyclical. Jokipii and Milne (2008) found similar results in which the capital reserves in European banks are procyclical during the period 1997 to 2004.

In contrast, several studies have shown that the ratio of capital may be countercyclical. This is because the banks that are forward-looking would anticipate economic recession using the period of economic boom not only to increase their profits, but also to increase the capital reserves avoiding greater losses in the event of an economic recession (Borio et al, 2001). Berger and Udell (2004) argues that the ratio of capital being countercyclical, due to develop bank balance sheets during a period of economic boom. Finally, in this research also add some other determinants to find a real determinants that can effect to capital buffer's comercial banks in Indonesia, there are two other determinats that also included in this research such as the Loans to Total Assets (VLOAN) and Bank's Share

Assets (BSA). VLOAN is considered in the analysis, it uses to determine wheather the higher loan's growth will effects in reducing capacity to raise bank's capital reserve or not. BSA also considered as independent variables, therefore in this study need to prove whether the bank with a substantial market power is relatively easier to get a profit so as to encourage banks to increase of capital reserves from the profit.

2.1.6 The Determinants of Capital Buffer

As mentioned above, this research following Ayuso et al. (2004), Jokipii and Milne (2008), and Tabak (2011), there are three different types of bank capital-related costs to model capital buffers: cost of holding capital, cost of financial distress, and adjustment costs.

2.1.6.1 Cost of Holding Capital

Holding capital implies direct costs of remunerating the excess of capital, that is the opportunity cost of the capital (Ayuso, et al., 2002). Therefore, banks' incentives to hold capital buffers depend on the cost of capital compared to the cost of deposits (Fonseca and Gonzalez, 2009). Theoritical analysis (see Myers and Majluf, 1984; Campbell, 1979) has argued that in the context of information asymetries, equity is a more costly alternative to other bank liabilities. In this research, include the banks return on equity (ROE) in order to capture direct costs of remunerating excess capital. this measures reveals how much profit company earned in comparison to the total amount of shareholder equity found on the balance sheet.

2.1.6.1.1 Return on Equity (ROE_{t-1})

When the return on equity is high, it is costly to hold excess capital. In this case, a profit-maximising bank may maintain a lower capital buffer when the opportunity cost of capital is high. Several previous researches, Ayuso et al.(2002) and Jokipii & Milne (2008) found negative correlation between Capital Buffer and the return on equity, it was suggested that banks would reduce capital holding when the cost of capital is high.

Ayuso et al. (2004), Jokipii and Milne (2008) use each institutions' return on equity (ROE) to proxy cost of holding capital. As noted by Jokipii and Milne (2008), ROE may well exceed the remuneration demanded by shareholders and to this extent is a measure of revenue rather than cost. A high level of earnings substitutes for capital as a buffer against unexpected shocks. Thus, as raising capital through the capital markets is costly, retained earnings are frequently used to increase capital buffers.

2.1.6.2. Cost of Financial Distress

Holding higher level of capital can ensuring banks to reduces the probability of bankruptcy and therefore so called the costs of failure, which include the loss of charter value, reputational loss and legal costs of the bankruptcy process (Tabak, 2011). As mentioned by Milne and Whalley (2001), higher levels of capital therefore reduce the risk of non-compliance and the subsequent costs of failure which are directly proportional to absolute value of the negative net worth of the failing bank.

Related to these costs are those associated with the existence of compulsory capital requirements. Higher capital levels also reduce the probability of not complying with those requirements, thus minimising the consequent costs. As a matter of fact, before regulatory limits are reached, supervisory authorities usually place some restrictions on the activity of the bank. The risk profile of the bank determines it's capital buffer.

Since a bank's probability of failure is reliant on its risk profile, proxy for the cost of failure adopting from various measures of risk. As Ayuso et al. (2004) measured, in this research consider the ratio of non-performing loans. If banks set their capital corresponding to the true riskiness of their assets portfolios, then would expect the relationship between capital buffers and the ratio of non-performing loans to be positive.

2.1.6.2.1 Non Performing Loans (NPL)

Based on Ayuso et al. (2004), Jokipii and Milne (2008), Fonseca and Gonzalez (2009), they use the non-performing loan ratio to total loans (NPL) to proxy the bank risk. Bank's risk is one of the bank's business risks, those happened because of failed or no payback of loans by borrowers to the banks. Therefore, the ability of credit management is really needed by the bank for managing their credit problem (Sinungan, 2000). In this research use non-performing loans (NPL) to proxy these risks (credit risk), this ratio indicates the ability of bank management in managing problem loans.

According to regulation of Bank Indonesia (BI No. 3/30DPNP on december,14 2001), Non Performing Loan (NPL) measured from the nonperforming loan divided to total loans. The higher Non performing Loan level would increase costs, so it causes the potential bank to get losses. In accordance with the regulations stipulated by Bank Indonesia, a good amount of Non Performing Loans (NPL) is below 5%.

2.1.6.3 Adjustment Costs

Banks may face adjustment costs in moving toward their optimal capital ratios. An excess, or a deficiency, of capital can arise as a result of the difficulties in capital adjustment. However, the consequence of falling short of capital is probably more serious, so banks are more likely to be "over-capitalised" than "under-capitalised". In other words, a part of the observed capital buffer may be held for precautionary purposes, due partly to frictions in adjusting capital level.(Wong, et al., 2005).

2.1.6.3.1 Increment of Capital Buffer (ΔBUFF*)*

Increment of Capital Buffer (ΔBUFF*)* is proxy of adjustment cost, it represents the delta of excess capital over regulatory requirements in the period t (now) minus excess capital over regulatory requirement in the period t-1 (one year before). In order to illustrate the cost of capital adjustment, this study added from Ayuso et al. (2004) and Estrella (2004) model that used lag of capital buffer to proxy adjustment cost.

2.1.7 The Other Determinants of Capital Buffer

2.1.7.1 Loans to Total Assets (VLOAN)

Distributing loans to the borrowers is the main business of banks and the main source of income for banks but it is contains the greatest risk as well. Loans to Total Assets will impact on bank earnings growth. VLOAN sustained by increasing of consumption today. In accordance with theory, the increased of consumption will also increase the loans.

Total Loans to Total Assets ratio (VLOAN) is considered in the analysis because it is important ratio for banks. VLOAN expected to relate positively to capital buffer because the higher capital that is distributed to its credits, the riskier bank will face because of high credit distribution.

2.1.7.2 Bank's Share Assets

Bank's Share Assets (BSA) also considered as independent variables. Prasetyantoko and Soedarmono (2008) defined bank's share assets defined as the ratio of total bank assets of the total banking system assets.

2.2 Previous Researchees

Researches on Determinanats of Capital Buffer have been done by some of the researchers, are as follows:

1. Prasetyantoko and Soedarmono (2010)

   These research examine whether capital buffer banking in Indonesia can be affected by the factors such as financial ratios, business cycles, regulatory, and institutional. The data used in this study is a monthly balance sheet and financial statements of the 99 commercial banks in Indonesia during the period 2004 - 2007.

   From the analysis based on the bank by asset size, indicated that for small banks, capital buffer was positively related to the cost of equity, non-interest income, control of corruption, and government intervention. While the capital buffer will go down if the size of assets, ex-post credit risk, financing from the financial markets, credit growth, economic growth, and the rule of law increases.

   For large banks, capital buffer will be increased if the ex-post credit risk, the cost of equity, retained earnings, market forces, economic growth and control of corruption were improved. Meanwhile, the only financing from financial markets and government interventions that can reduce the capital reserves of banks.

   In addition to focus on these factors, this study shows that capital reserves in the banking Indonesia are procyclical. Those results would be different if the analysis was done by groups of banks according to size and the involvement of market discipline (market

discipline). In a large bank and the listed banks, the banks' capital buffer capital is countercyclical. In other words, these banks tend to raise the reserve optimistic in the current capital (economic booms), and down in a recession.

Thus, the policy consolidation of small banks and the strengthening of market discipline (market discipline) is required to support implementation of Basel II, particularly in addressing the procyclical effects of minimum regulatory capital.

2. Juan Ayuso et all (2002)

This research analyse the relationship between the Spanish business cycle and the capital buffers held by Spanish commercial and savings banks from 1986 to 2000 using panel data.Variables in this research are lag of capital buffer (BUF_{t-1}), Return On Equity (ROE), Non Performing Loan (NPL), BIG, SMA, and GDP growth as dependent variables, BIG and SMA are included to detect the differences in the capital buffer according to the size of each institution. In particular, BIG (SMA) is a dummy variable that taking value 1 for banks in the highest (lowest) decile and capital Buffer (BUFF) as a independent variable.

This research findings are fairly robust and quite unequivocal. After controlling for other potential determinants of the surplus capital, this research found a robustly significant negative relationship between the business cycle and capital buffers. The result was

showing that ROE has positive correlation and NPL has a negative correlation. The signs of the dummy variables BIG and SMA are, respectively, consistent with the too big to fail hypothesis and the relatively greater difficulties for small banks to draw on capital markets.

3. Francesco d'Avack and Sandrine Levasseur (2007)

This research anylize the determinants of capital buffers in CEECs (Central and Eastern European Countries), using a dynamic panel-analysis based on country-level data for CEECs. The research try to use lag of Capial Buffer ($BUFF_{t-1}$), Return On Equity (ROE), Non Performing Loan (NPL), and Business cycle (GDP growth) as independent variables, and Capital Buffer (BUFF) as dependent variable.

The results was showing a positive significant adjustment costs lag of Capial Buffer ($BUFF_{t-1}$) in determining capital buffer, Return on Equity (ROE) also has a positive effect in influencing capital buffer. But Non Performing Loan (NPL), and GDP's growth has significant negative relationship to capital Buffer.

The main results are as follows. First, there are large and significant adjustment costs in raising capital. Second, banks behave pro-cyclically, depleting their buffers in upturns to benefit from unanticipated investment opportunities. Third, there is a significant negative relationship between current levels of non-performing loans

(NPL) and capital buffers, suggesting that banks in CEECs are risk-takers. Banking sectors with large past NPL however tend to have larger buffers. Finally, the access to external capital may appear still somewhat limited, with banks relying on internally generated funds to raise buffers.

4. Miguel Boucinha (2008)

Miguel Bouchinha try to analyze the determinants of Portuguese banks' capital buffers. The dataset used for estimation covers 17 Portuguese banks from 1994 to 2004. This research use Non Performing loan (NPLi,t), variance of profits (VPROV), Bank's Size (Size), output gap to potential output (YGAP), Bank's merger (Merger), the weight of volatile income financial assets in banks' total assets (STK), the change in the Lisbon Stock Exchange general index (PSIG) as independent variables, and lag of capital buffer ($BUFF_{t-1}$) as dependent variable.

The results were showing that Non Performing Loan (NPLi,t), Variance of Profits (VPROV), Bank's Size (Size), output gap to potential output (YGAP), Bank's Merger (Merger) has negative significant effect to BUFFi,t. The weight of volatile income financial assets in banks' total assets(STK), General stock market index (PSIG) has positive significant effect to BUFFi,t. Merger has no effect to BUFFi,t.

The main findings are that the capital buffer is positively influenced by several broad risk measures, suggesting that the introduction of the more sensitive regulation in Basel II might not affect Portuguese banks' capital ratios as much as one could expect. Provisions and high and stable profitability are found to be substitutes for capital buffers, whereas larger banks seem to hold less excess capital. A negative business cycle effect is also found, and several other hypotheses are tested.

5. Terhi Jokipii and Alistair Milne (2006)

This research analyze the cyclical behaviour of European bank capital buffer's bank of Finland, it using an unbalanced panel of commercial, savings and co-operative banks for the years 1997 to 2004, specifically control for potential determinants of capital buffer in order to analyze the sign and the magnitude of the eefect that business cycle has on capital buffer fluctuations.

The results highlight a distinct difference that appears to exit between banks operative in the recently accessed member states (RAM) and 25 banks those of the European Union 25 (EU25), and euro area 15 (EA15).

The evidence indicated the capital buffers of the RAM banks appear to have a significant positive relationship with the cycle, while for those in the EU15 and the EA and the combined EU25 the relationship is significantly negative. The research also distinguish

between type and size of banks, and find comercial and saving banks as well as large banks move counter cyclically. The other finding was showing that saving banks and smaller banks drive the negative effect or move pro cyclically for the EU25, EU15, and EA samples.

6. Benjamin M. Tabak et all (2011)

This research analyze about bank capital buffers, lending growth and economic eycle and it is using empirical evidence for Banks in Brazil. The research used an unbalanced quarterly panel data of 134 banks, from 2000 to 2010. Return On Equity (ROE), Non Performing Loans (NPL), Bank's Size (SIZE), Economic cycle (GAP_{t-1}) used as dependend variables and capital buffer used as independent variable.

The results were proving a negative significant Return On Equity, Non Performing Loan, Size, and output gap (economic cycle) on influencing capital buffers. It means that banks in Brazil move pro-cyclically behavior since economic cycle has negative effect to capital buffer, in other word banks in Brazil try to increase their capital buffer while economics condition is downturn.

Tabel 2.1
Summary of Previous Researches

Researchers	Title	Variables	Analysist Method	Results
Agustinus Prasetyantoko, Wahyoe Soedarmono (2010)	*Determinanats Of Capital Buffer Banking in Indonesia*	*Dependent Variables* : Capital Buffer (BUFF) Independent variables: Size (Ln Total Assets), Loan Loss Provision (LLP), Ex-ante risk (LNSDROA), return On Equity (ROE), Return on Assets (ROA), Non Interest Income (NNI), Financing from financial Mareket (MD), bank's Monopoly Power (MPOW), Loan's growth to Total Assets (VLOAN), GDp growth (GDPG), Indonesia banking Architecture (IBA), Single Presence Policy (SPP), Rule of law (LAW), corruption Index (CORRUPT), governance effectiveness (GOV)	Multiple Linear Regression	From the analysis based on the bank by asset size, indicated that for small banks, capital buffer was positively related to the cost of equity, non-interest income, control of corruption, and government intervention. While the capital buffer will go down if the size of assets, ex-post credit risk, financing from the financial markets, credit growth, economic growth, and the rule of law increases. For large banks, capital buffer will be increased if the ex-post credit risk, the cost of equity, retained earnings, market

				forces, economic growth and improved control of corruption. Meanwhile, the only financing from financial markets and government interventions that can reduce the capital reserves of banks.
Ayuso et all (2002)	The relationship between the Spanish Business Cycle and The Capital Buffers Held by Spanish Commercial and Savings Banks	*Dependent variable*: BUFF Independent variables: BUFFt-1, Return On Equity (ROE), Non Performing Loan (NPL), BIG, SMA, and GDP. BIG and SMA are included to detect differences in the buffer according to the size of each institution. In particular, BIG (SMA) is a dummy variable.	Multiple Linear Regression	This research found a robustly significant negative relationship between the business cycle and capital buffers. The result was showing that ROE has positive correlation and NPL has a negative correlation. The signs of the dummy variables BIG and SMA are, respectively, consistent with the too big to fail hypothesis and the relatively greater difficulties for

				small banks to draw on capital markets.
Francesco d'Avack and Sandrine Levasseur (2007)	The Determinants of Capital Buffers in CEECs (Central and Eastern European Countries)	*Dependent variable*: BUFF Independent variables: BUFFt-1, Return On Equity, Non Performing Loan, and Growth of GDP	Multiple Linear Regression	The results was showing a positive significant adjustment costs (BUFFt-1) in determining capital buffer, Return on Equity (ROE) also has a positive effect in influencing capital buffer. But Non Performing Loan (NPL), and GDP's growth has significant negative relationship to capital Buffer. It was indicating as follows. First, there are large and significant adjustment costs in raising capital. Second, banks behave pro-cyclically, depleting their buffers in upturns to benefit from unanticipated investment opportunities. Third, there is a significant

				negative relationship between current levels of non-performing loans (NPLs) and capital buffers, suggesting that banks in CEECs are risk-takers. Banking sectors with large past NPLs however tend to have larger buffers. Finally, the access to external capital may appear still somewhat limited, with banks relying on internally generated funds to raise buffers.
Miguel Boucinha (2008)	The Determinants Of Portuguese Banks' Capital Buffers	*Dependent variable*: BUFFi,t Independent variables: Non Performing loan (NPLi,t), variance of profits (VPROV), Bank's Size (Size), output gap to potential output (YGAP), Bank's merger (Merger), the weight of volatile income financial assets in banks' total assets (STK), the change in the Lisbon Stock Exchange general index	Multiple Linear Regression	The results were showing that non Performing Loan (NPL1i,t), Variance of Profits (VPROV), Bank's Size (Size), output gap to potential output (YGAP), and Bank's Merger (Merger) has negative significant effect to BUFFi,t. The weight of

		(PSIG)		volatile income financial assets in banks' total assets(STK), General stock market index (PSIG) has positive significant effect to BUFFi,t. Merger has no effect to BUFFi,t. The main findings are that the capital buffer is positively influenced by several broad risk measures, suggesting that the introduction of the more sensitive regulation in Basel II might not affect Portuguese banks' capital ratios as much as one could expect. Provisions and high and stable profitability are found to be substitutes for capital buffers, whereas larger banks seem to hold less excess capital. A negative business cycle

				effect is also found, and several other hypotheses are tested.
Terhi Jokipii and Alistair Milne (2006)	The Cyclical Behaviour of European Bank Capital Buffers	*Dependent variable*: Capital Ratio - National Regulatory Minimum Reserve (BUFF) Independent variables: return on equity ROE), risk ratio of non-performing loans to total loans (NPL), loan-loss provisions over total asset (RISK2), log of total assets (size), post-tax profit over total assets (profit), annual loan growth (Δloan), loans over total assets (net loans), gdp domestic and sub-sample GDP growth (GDP), and HP filtered real GDP series (output gap)	Multiple Linear Regression	The evidence indicated the capital buffers of the RAM banks appear to have a significant positive relationship with the cycle, while for those in the EU15 and the EA and the combined EU25 the relationship is significantly negative. The research also distinguish between type and size of banks, and find comercial and saving banks as well as large banks move counter cyclically. The other finding was showing that saving banks and smaller banks drive the negative effect or move pro cyclically for the EU25, EU15, and EA samples.

Benjamin M. Tabak et all (2011)	Bank Capital Buffers, Lending Growth and Economic Cycle: Empirical Evidence For Brazil	*Dependent variable*: BUFF Independent variables: Return On Equity (ROE), Non Performing Loans (NPL), bank's Size (SIZE), Economic cycle (GAPt-1)	Multiple Linear Regression	The results were showing a negative significant correlation of Return On Equity, Non Performing Loan, Size, output gap (economic cycle) on determining capital buffers. It means that banks in Brazil move pro-cyclically behavior since economic cycle has negative effect to capital buffer, in other word banks in Brazil try to increase their capital buffer while economics condition is downturn.

2.3 Research's Model and Hypotesis

This study aims to determines the factors that affect the capital buffer of comercial banks in Indonesia. The author formulates the problem to be discussed as well as limit the scope so that this discussion can more be focused. This study also choose research model as well as the appropriate analytical methods to be used in order to achieve the objectives of this study. Then, the author will collect

the necessary data and process these data with the model of research, analysis and statistical methods that have been determined. In the end, the author will draw conclusions from the results of analysis.

The data required in this study consisted of the factors influenced to affect the capital buffer of comercial banks in Indonesia as well as financial data bank which was considered to describe the bank's financial performance. The factors that affect the capital buffer are including cost of holding capital that proxy by Return on Equity (ROE_{t-1}), cost of bankcruptcy which proxy by credit risk or non performing loan (NPL), cost of capital adjustment which proxy by Increment of Capital Buffer ($\Delta BUFF$), and other determinants such as Loans to Total Assets (VLOAN), and Bank's Share Assets (BSA).

2.3.1. The Influence of Cost of Holding Capital proxy by Return on Equity (ROE_{t-1}) toward Capital Buffer Banking in Indonesia

Based on Alfon et al. (2004), Ayuso et al. (2004), and Jokipii and Milne (2008), they use return on equity (ROE) as a proxy for the cost of holding capital or cost of financing. They use this proxy because when banks holding capital, it will implie direct costs of remunerating the excess of capital. The cost of equity is used to proxy cost of capital because it’s more challenging to calculate as equity does not pay a set return to its investors. One of the determinant of Cost of equity is the expected Total Share Return (TSR) when investing in the company, is measured by looking at the past ROE of the company over the period t-1.The past of ROE might prove to be a very poor indicator of the future, this is the reason

why a through analysis of the company's future projects should be undertaken, and would probably yield better predictions than a mere extrapolation of past numbers.

The finding show a negative relation between ROE and capital buffer. De Bondt and Prast (1999) also find that ROE is only negative and significant in countries with large stock markets (the United States, the United Kingdom and the Netherlands) suggesting that the argument of "opportunity cost of capital" holds only in countries were shareholder value is important and access to external finance relatively cheap. As noted by Jokipii and Milne (2008), ROE may well exceed the remuneration demanded by shareholders and to this extent is a measure of revenue rather than cost. A high level of earnings substitutes for capital as a buffer against unexpected shocks. Thus, as raising capital through the capital markets is costly, retained earnings are frequently used to increase capital buffers. So the expected sign for ROE may be negative (Jokipii and Milne, 2008), but it also may be positive (Nier and Baumman, 2006).

Moreover, when there are information asymmetries, a significant proportion of fluctuations in bank earnings is kept as retained earnings, and increases in earnings will spark increases in capital ratio, so we can expect a positive relation between ROE and capital. Consistent with this argument, Berger (1995), Nier and Baumann (2006), and Francesco d'Avack and Sandrine Levasseur (2007) find a positive relation between ROE and cost of capital. The opposing arguments and mixed empirical evidence lead us to include ROE as a control variable.

H1 : Return on Equity (ROE_{t-1}) is more likely to give negative influence on Capital Buffer

2.3.2 The Effect of Bankruptcy Costs or Financial Distress Proxy by Non Performing Loan (NPL) toward Capital Buffer Banking in Indonesia

The risk profile of each institution is proxied by NPL, which measures the non performing loans ratio (ratio of non performing loans to total loans). This is an ex post measurement of the risks assumed by the institution and, therefore, the theory predicts this coefficient should be positive since higher risks increase the probability of meeting regulatory capital constraints and facing the related costs such as market discipline and supervisory intervention (Furfine, 2000; Estrella, 2004). Riskier banks should therefore raise capital. A negative coefficient however would indicate "moral hazard" behaviour, where banks assume higher risks with lower buffers. It could also indicate more sophisticated risk management systems, allowing banks to hold lower buffers for the same amount of risk (Alfón et al., 2005).

H2 : Non Performing Loan (NPL) is more likely to give positive influence on Capital Buffer

2.3.2. The Effect of Adjustment Cost proxy by Increment of Capital Buffer (ΔBUFF)toward Capital Buffer Banking in Indonesia

As argued by Ayuso et al. (2002) and Estrella (2004), lag of Capital Buffer (BUFFt-1) coefficient may be interpreted as a measure of adjustment costs in capital buffers. The lagged endogenous is introduced to reflect the presence of adjustment costs in attaining the desired level of capital for banks and its expected sign is thus positive. Since the capital buffer decissions not only determined by adjusting capital buffer in the period before (t-1), but also determinded by capital buffer in this perode (t), so the right variable for capital adjustment is increment of capital buffer by seeing decreasing or increasing of the turning point.

H3 : Increment of Capital Buffer (ΔBUFF) is more likely to give positive influence on Capital Buffer

2.3.3. The Effect of Other Determinants (Loans to Total Assets, and Bank's Share Assets) toward Capital Buffer Banking in Indonesia

The loans' to total assets ratio (VLOAN) are also considered in the analysis. VLOAN expected to relate positively to Capital Buffer (BUFF). Eventhough Prasetyantoko and Soedarmono (2010) showed the negative impact of VLOAN toward Capital Buffer (BUFF), this suggests that the more bank distribute their credit, the smaller level of capital buffer being reserved. But this research agree with positive corelation between Loans to Total Assets and Capital Buffer, it's come from the logic of bank risk. Simple logic that we can imply is

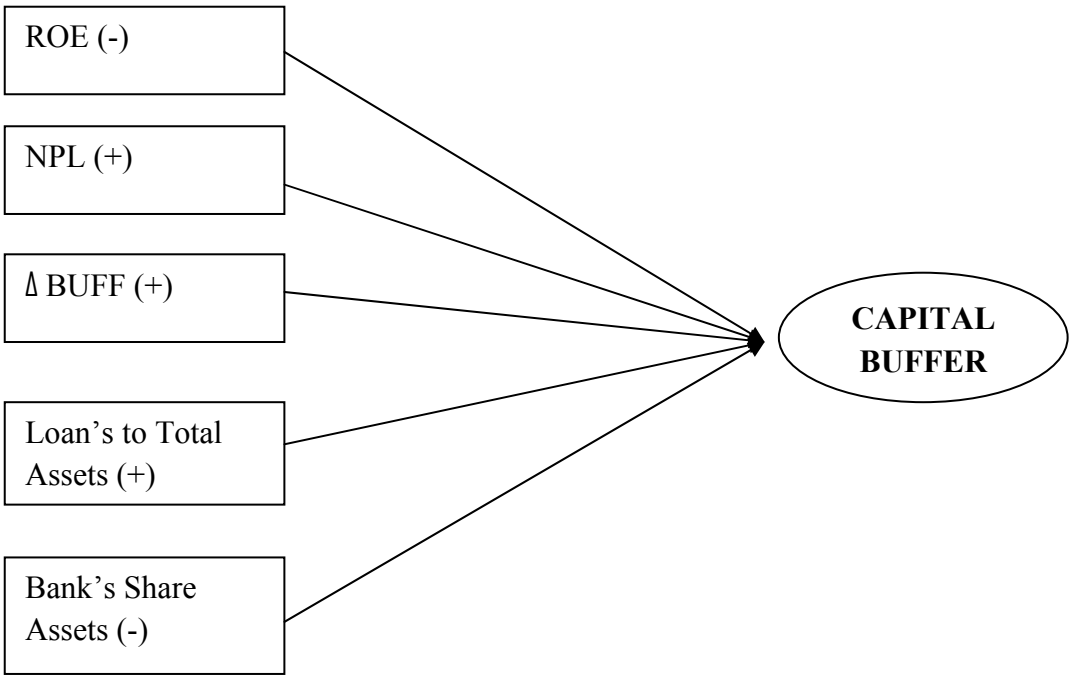
the higher Loans to Total Assets value, the riskier banks will face, since banks investing their business more in credit.

This research also agree with Too Big To Fail consesus that states large bank prefer to maintain low capital buffer. Large bank can be seen from Bank's Share Assets value, which banks with high share assets mean they have big total assets, or in the other word, it can be included to category of large bank. Very clear prediction has been reached, where large banks tend to have lower capital ratios than small banks, due to the nature of the Too Big To Fail (TBTF) (Mishkin 2006). Large banks has a comparative advantage to address the problem information to improve monitoring efforts encourage them to strike the cost of equity. In turn, banks will reduce the cost of equity by way of lower capital reserves.

H4 : Loans to Total Assets (VLOAN) is more likely to give positive influence on Capital Buffer

H5 : Banks Share Assets (BSA) is more likely to give negative influence on Capital Buffer.

Some of the variables described above can serve as a model of this study as follows:



2.3.4. Research Hypotesis

Based on previous research and conceptual framework above, then the hypothesis is developed as follows:

H1 : Return on Equity (ROE_{t-1}) is more likely to give negative influence on Capital Buffer

H2 : Non Performing Loan (NPL) is more likely to give positive influence on Capital Buffer

H3 : Increment of Capital Buffer (ΔBUFF*)* is more likely to give positive influence on Capital Buffer

H4 : Loans to Total Assets (VLOAN) is more likely to give positive influence on Capital Buffer

H5 : Banks Share Assets (BSA) is more likely to give negative influence on Capital Buffer

CHAPTER III

RESEARCH METHODS

3.1 Research Variables

Research variable is an attribute that has a particular variant to be learned and to be drawn the conclusions from it. This study used two types of variables, these are input variables and output variables. Input variable is a independent variable, or in this case is the factors that affect the input to the banks' capital buffer. And the output variable is the capital buffer itself.

Input and output variables used in this study was based on the literature review and in accordance with the established hypothesis. Research variables used in this research are:

a. Independent variables consist of:
    1. Return on Equity (ROE_{t-1})
    2. Non Performing Loan (NPL)
    3. Increment of Capital Buffer ($\Delta BUFF$)
    4. Loans to Total Assets (VLOAN)
    5. Bank's Share Assets (BSA)
b. Dependent variable used in this research is Capital Buffer (BUFF)

3.1.1. Independent Variables

The following are operational definitions of each variable:

1. Return on Equity

Riyadi (2004) defined Return on Equity as the ratio of income after tax divided to core capital. Rivai, et al. (2007), Return on Equity is an indicator that it's important for shareholders and potential investors to measure the ability of banks to earn net income in dividends. The increase in this ratio means an increase in net income from earnings and will affect the probability associated with dividend payments (especially for banks that have been going public).

Return on equity (ROE) measures the rate of return on the ownership interest (shareholders' equity) of the common stock owners. It measures a firm's efficiency at generating profits from every unit of shareholders' equity (also known as net assets or assets minus liabilities). ROE shows how well a company uses investment funds to generate earnings growth. Level of ROE between 15% and 20% are considered desirable.

Formula:

$$ROE_{t-1} = \frac{\text{Income After Tax}_{t-1}}{\text{Shareholder Equity}_{t-1}} \quad \text{.....(1)}$$

2. Non Performing Loans (NPL)

Non-performing loans (NPL) is the level of risk faced by banks. NPL is the number of troubled loans and may not be billed. The more greater value of Non Performing loan the more worse bank's performance (Mohammed, 2005).

Bank Indonesia regulation stated limit of NPL (Non Performing Loan) on the Bank is 5%. According to IMF, A loan is nonperforming when payments of interest and principal are past due by 90 days or more, or at least 90 days of interest payments have been capitalized, refinanced or delayed by agreement, or payments are less than 90 days overdue, but there are other good reasons to doubt that payments will be made in full.

By Bank regulatory definition, non-performing loans consist of other real estate owned which is that taken by foreclosure or a deed in lieu of foreclosure, loans that are 90 days or more past due and still accruing interest, and loans which have been placed on nonaccrual (i.e., loans for which interest is no longer accrued and posted to the income statement). non-performing loans (NPL) is the ratio of total nonperforming loans to total loans. This ratio is defined as follows (SE BI 6/73/INTERN DPNP No date December 24, 2004):

$$NPL = \frac{\text{Total non Performing Loan}}{\text{Total Loans}} \quad \text{.....(2)}$$

3. The Increment of Capital Buffer (ΔBUFF*)*

The adjusting capital proxy by the increment of capital buffer (ΔBUFF) is likely to decrease in capital buffers or has negative corelation toward capital buffer. ΔBUFF also has simillarity with lag of capital buffer, it is measured as the excess of capital over regulatory requirements in the period now (t) minus capital over regulatory in the periode one year before (t-1).

$$\Delta BUFF = BUFF_t - BUFF_{t-1} \quad \text{..... (3)}$$

4. Loans to Total Assets (VLOAN)

The Loans to Total Assets ratio measures the total loans outstanding as a percentage of total assets. The higher this ratio indicates a bank is loaned up and its liquidity is low. The higher the ratio, the more risky a bank may be to higher defaults. This figure is determined as follows:

$$\text{Loans to Total Assets} = \frac{\text{Total Loans}}{\text{Total Assets}} \quad \text{.....(4)}$$

5. Bank's Share Assets

Banks with substantial market power relatively maintain their low capital buffer. There are several reasons to expect a negative relationship between the banks' monopoly power and its capital level. The main reasons is according to Too Big To Fail hypothesis, advantages in the access to capital (Berger and Udell, 2004), and if there are economies of scale in screening and monitoring borrowers, then large banks may substitute excess of capital with these activities (Jokipii and Milne, 2008). Bank's Share Assets defined as the ratio of total bank assets to the total banking system assets.

$$\text{BSA} = \frac{\text{Total Bank Assets}}{\text{Total Banking System Assets}} \quad \text{.....(5)}$$

3.1.2. Dependent Variable

Banks' capital capital buffer (BUFF) is defined as the difference between the CAR ratio (ratio the adequacy of bank capital) to the regulatory capital minimum of 8%. From Qfinance Dictionary, capital buffer is the amount of

capital a financial institution needs to hold above minimum requirements, calculated on an assessment of forecast risk.

BUFF = CAR ratio – Minimum Regulatory Requirement (8%) .....(6)

Table 3.1

Operational Definition

Variable	Definition	Formula	Scale
Return on Equity (ROE_{t-1})	The ratio of income after tax period $_{t-1}$ divided to equity capital period $_{t-1}$.	$\frac{\text{Income After Tax}_{t-1}}{\text{Shareholder Equity}_{t-1}}$	In precentage (%)
Non Performing Loan (NPL)	The ratio of total nonperforming loans to total loans	$\frac{\text{Total NPL}}{\text{Total Loans}}$	In precentage (%)
The Increment of Capital Buffer ($\Delta BUFF$)	Capital Buffer on the period now (t) minus capital buffer on the period before ($_{t-1}$)	BUFFt – BUFFt-1	In precentage (%)
Loans to Total Assets (VLOAN)	Ratio measures the total loans outstanding as a percentage of total assets	$\frac{\text{Total Loans}}{\text{Total Assets}}$	In precentage (%)
Bank's Share Assets (BSA)	The ratio of total bank assets of the total banking system assets.	$\frac{\text{Total Bank Assets}}{\text{Total Banking System Assets}}$	Precentage (%)

Capital Buffer (BUFF)	The difference between the CAR ratio (ratio the adequacy of bank capital) to the regulatory capital minimum of 8%	CAR ratio – Minimum Regulatory Requirement (8%)	In precentage (%)

3.2 Population dan Sample

The data used in this study is secondary data from longitudinal data or a group of individual data includes data 16 biggest banks in the market share of Third Party Funds (TPF) are:

a. Have a total value of deposits of at least 12 trillion in 2004 and at least 16 trillion in 2010.

b. Object of study in Indonesia examined the banking industry during years 2004-2010. The reason the use of these data as research data for the 16 largest commercial banks are controlled more than 75 percent share of total market share of existing commercial banks, so that samples can be considered to represent the banking industry as well. The reason the time period was chosen as the study time period start from 2004 was due Indonesian Banking Architecture (API) program start being implemented in that year, and in this research border until year of 2010 because of recent data that researchers can get is 2010.

The data used is a data of performance bank indicators that include the total assets, total deposits and total loans contained in the balance sheet and

financial ratios of banks that were subjected to experiments. Data obtained from the financial statement's commercial bank publications of Bank Indonesia and some of the data obtained from the website address of the bank concerned. As well as other information that is relevant to the issues to be investigated. Banks that were subjected to experiments can be seen in the table below.

Table 3.2 List of Banks (Research Objects)

Bank Persero	**BUSN Devisa**	**Bank Asing**
Bank Mandiri	Bank Central Asia	CITIBANK
Bank Rakyat Indonesia	Bank Danamon	HSBC
Bank Negara Indonesia	Bank Internasional Indonesia	
Bank Tabungan Negara	Bank Permata	
	Bank CIMB Niaga	
	PAN Indonesia Bank	
	Bank Mega	
	Bank OCBC NISP	
	Bank UOB Buana	
	Bank Bukopin	

Source: Bank Indonesia

3.3 Types and Source Data

Type of data used in this study is the type of secondary data, the research data obtained indirectly. Secondary data is data which has been collected by data compiler (institute) and published to public and data user. The availability of secondary data would make this study easier and quicker. Company resource or

archive, government publication, industry analysis offered by the media, website, the internet are incude in secondary data (Sekaran, 2000). In this research, secondary data obrtained by collecting data from books, magazines article, journal, and also website related to which has been selected, such as annual reports published from the period January 2004 untill December 2010.

3.4 Data Collection Method

1. Indirect Observation

Performed by opening the website and downloading of the object under study, so as to obtain the financial statements, an overview of the bank and its development. The sites used were:

a. www.bi.go.id

b. www.infobank.co.id

c. www.idx.com

2. Literature Study

Literature Study was done by collecting information from books, journals, magazines, and internet which has correlation with research.

3.5. Data Analysis

This research will use quantitative analytical methods. Quantitative analysis utilizing analyzer having the character of quantitative. Analyzer having the character of quantitative is analyzer using models, like mathematics model,

statistical model, and econometrics. The result presented in the form of number then explained and interpreted in a description.

Quantitative analysis that will be used in his research include test classical asumption test and multiple linear regression analysis.

3.5.1. Classical Assumptions tests

Testing of the classic assumptions made to ensure that autocorrelation, multicollinearity, and heterocedasticity normally distributed (Ghozali, 2001). Assumptions of classical test consists of:

a) Normality test

The purpose of normality test is to whether in a regression model, dependent variable, independent variables or both are having normal distribution or near come to normal (Ghozali,2009). Normality detection is done by seeing normal chart of probability plot. The decission making base is as follows:

i) If data disseminates around the diagonal line and follows the direction of diagonal line, then the regression model fulfills normality assumption.

ii) If data disseminates far from the diagonal line and does not follows the direction of diagonal line, then the regression model does not fulfills normality assumption.

b) Heteroscedasticity Test

This test aims to see the spread of data. This test can be done by looking at the chart plot between the predicted value of the variable independent (ZPRED) with residualnya (SRESID). If the graph is not a regular pattern teredapat then identified there is no heteroscedasticity.

c) Multicollinearity Test

The purpose of multicollinearity test is to examine whether or not a regression model contains correlation between independent variables. if it happened, the correlation problem will be recognized as multicollinearity problem. A good regression model should not contain any multicollinearity problem (Ghozali, 2009). Indocator of a regression model which are from multicollinearity are VIF (variance inflation factor) value less than 10, or Tolerance value less than 1.

d) Autocorrelation Test

This test was used to test the assumptions of classical regression relating in the presence of autocorrelation. This test uses the model Durbin - Watson (DW test). If the DW is located between the upper limit or upper bound (du) and (4 - du) meaning it has met the assumptions of classical regression or mean there is no autocorrelation.

3.5.2 Multiple Linear Regression Analysis

In this study using the method of multiple linear regression analysis (Multiple linear regression method). Multiple regression analysis is used to determine the closeness of the relationship between capital buffer (dependent variable) with the factors that influence it (the variable independent). The equation model of regression which will be tested areas follows:

Capital Buffer (BUFF) = a + b1x1+ b2x2+b3x3 + b4x4 + b5x5 + E

Where,

a = constant

b1 – b6 = regression coefficient of each variable

X1 =Return on Equity (ROE_{t-1})

X2 = Non Performing Loan (NPL)

X3 = Increment of Capital Buffer (ΔBUFF*)*

X4 = Loans to Total Assets (VLOAN)

X5 = Bank's Share Assets (BSA)

E = error term (confounding variables) or residual

3.5.3. Hypothesis Test

a. T test

The purpose of this test is to determine whether each independent variable affects the variables significantly dependent. Tests performed by t-test, comparing the count with a t-table. This test performed with the following requirements:

- If t-table < t calculated < t-table, then H0 is accepted independent variables had no effect on the variable dependent
- If the t calculaed > t-table or t calculated > t-table, then H0 denied the means of independent variables affect significant effect on the dependent variable. Testing can also be done through observation of the t significance level α used (this study

using α level of 5%). The analysis is based on comparison between the value of significance with a significance value of t 0.05, where the terms are as follows:

- If the significance of t < 0.05 then H0 is rejected, which means independent variables significantly influence the dependent variable
- If the significance of t > 0.05 H0 accepted then the variable no independent effect on the dependent variable.

b. F Test

This test aims to determine whether the variables simultaneously or independently together significantly affect the dependent variable. This test using the F test, by comparig result of the F calculated to F table. The test is performed with the following requirements:

- If F calculated < F table, then H0 is accepted variables simultaneous independent no effect of the dependent variable
- If F calculated > F table, then H0 rejected the variables simultaneous independent effect on the dependent variable.

Testing can also be done through observation of the F significance level α used (this study using α level of 5%). The analysis is based on comparison between the significance of F with a significance value 0.05, where the terms are as follows:

- If the significance of F < 0.05, H0 is rejected, which means independent variables simultaneously influence of the dependent variable
- If the significance of F > 0.05, H0 is accepted variables simultaneous independent no effect of the dependent variable.

3.5.4. Testing the accuracy of the estimated model (Goodness of Fit Test)

The purpose of this testing is to test the level of closeness or relationship between the dependent variable with independent variables that could seen from the large value of the coefficient of determination (Adjusted R-Square). If the Adjusted R-Square value closer to 1, then the level closeness or relationship also higher. (Ghozali, 2001).