DOMESTIC AND FOREIGN BANK PROFITABILITY: PANEL EVIDENCE ON BANK-SPECIFIC AND MACROECONOMIC DETERMINANTS IN INDONESIA

UNDERGRADUATE THESIS

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DECLARATION OF THESIS ORIGINALITY

I the undersigned, Devi Anggun Octaviani, hereby state and declare that this thesis is true and accurate to be my own work specially written for partial requirement to complete Undergraduate Degree Program of Management and has not initially been presented in any other occasion.

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MOTTO AND DEDICATION

“It is hard to fail, but it is worse never to have tried to succeed.”

— Theodore Roosevelt

“Never lose hope.”

—Devi Anggun O.

This thesis I dedicate for:

My beloved parents and my family

And all those who love me sincerely

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ABSTRACT

This paper is conducted to compare the determinants of profitability of the domestic and foreign banks operating in Indonesia. The Random Effect Model is employed with balanced panel data on 27 commercial banks, using quarterly data for the period of 2010 to 2010. In order to find out the differences in the profitability determinants, the sample of banks is divided into two sub-samples based on share ownership (domestic and foreign).

The bank-specific determinants such as Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Non Performing Loan (NPL), Cost to Income Ratio (CIR), Loss Provision (LP) and also from macroeconomic determinants (NIM sensitivity to GDP, and NIM sensitivity to Inflation) employed simultaneous and individually toward Profitability which is proxied by Return on Asset (ROA). The results reveal that the profitability determinants of domestic banks are not much different from the determinant factors of foreign banks, namely Cost-to-Income Ratio and Loss Provision, meanwhile the other variables are not able to explain the variability of domestic and foreign banks' profitability. However, the Loss Provision variable indicates the different sign of significance, which means that there are differences in the behavior of banks in obtaining their income and managing their credit risk. In other side, the average intercept and explanatory power of the model of domestic banks is higher for than foreign bank, which shows that the profitability of domestic banks are better than foreign banks.

Keywords: *Domestic and Foreign Bank; Profitability, Bank Determinants, Random Effect Model*

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CHAPTER I

INTRODUCTION

1.1. Research Background

The banking industry in general has undergone some major changes in recent decades, as the innovations in technology as well as in the presence of various kinds of fluctuation caused by the crisis and globalization, so the banks need to continue creating opportunities for their development and also as a challenge for managers of banks to remain profitable in an increasing competitive environment. In addition, globalization and economic integration also makes the economic structure of countries become more liberal so will cause an increase in the volume of foreign investment (Kose, 2009). The existence of foreign capital in the economy, especially in the banking industry in a country often brings up the pros and cons, not least in Indonesia. Also, by joining ASEAN Economic Community (AEC) in 2015, foreigners' opportunities to enter the Indonesian market will be open wider and competition will be more intense.

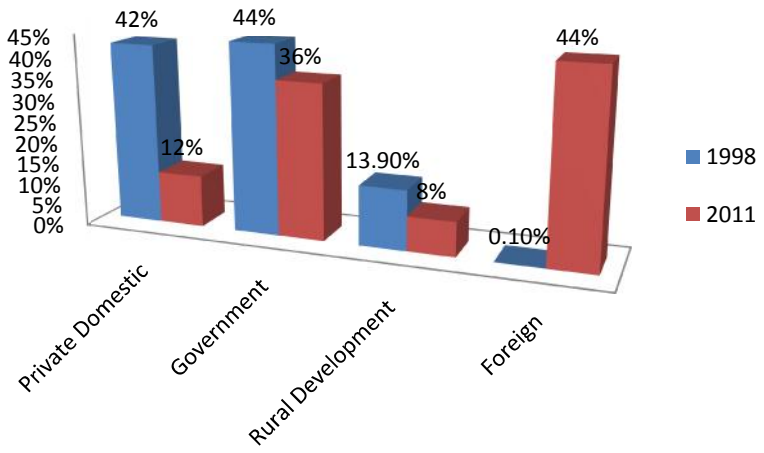
In Indonesia, foreign parties joining banking industry into several ways, which are operating as foreign branch offices (referred to the foreign bank subsidiary, either through a joint venture with a domestic bank (called Joint Venture bank), a merger or acquisition in the domestic banks that occurred in the post-crisis period in 1997 (divestiture program), or as representative office

(Hadad, 2004). Furthermore, commercial banks' shares also can be purchased by individuals or legal entities directly through the exchanges. Until 2013, shares can be owned by foreign individuals and legal entities set up to as much as 99% of the paid up capital of the bank. Meanwhile in terms of the ownership, if a person or an entity buy shares of the bank by 25% or more of the total paid-up capital, the ownership will switch on the person or legal entity. In other words, a bank can be said as foreign-owned or domestic-owned if there is at least 25% ownership of bank shares as noted in Article 1 paragraph (3) of Bank Indonesia Regulation (PBI) No. 14/24/PBI/2012. These regulations automatically open big opportunities of foreign party to join Indonesian banking industry.

Map of the national banking industry in the last decade has undergone a significant shift. After the financial crisis of 1998, there were more than 20 private banks were transferred to a foreign bank or foreign investors. As a consequence of various acquisitions of foreign banks on the national bank, then the control system assets by the national government and the private sector has declined. This shifting can be seen by the figure below.

Figure 1.1

Indonesian Banking Assets Based on Ownership in 1998 and 2011



Source: Bank Indonesia, 2011

The share of national bank assets owned local private investors continued to decline from 42 percent in 1998 to 12 percent in the share of state-owned assets in 2011 also had a significant reduction of 44 percent in 1998 to 36 percent in 2011 In contrast, the share of bank assets foreign-owned private sector increased significantly from nearly zero percent to 21 percent, when totaled with foreign bank branches and joint venture banks, the share of total assets of foreign banks in Indonesia has already reached 44 percent in 2011 (Anggraini, 2013).Furthermore, the existence of Indonesian banking industry is quite interesting to observe as can be seen in the table below.

Table 1.1

Market Share of Total Assets and Total Deposits of Banks (%) in 2011

Bank Group as Defined by BI	Total Assets		Total Deposits	
	Based on Licence Status	Based on Share Ownership	Based on Licence Status	Based on Share Ownership
Government Bank	36,36	36,36	37,32	37,32
National Private Bank	43,01	11,44	45,18	12,6
RuralDevelopment Bank	8,32	8,32	8,45	8,45
Foreign and Joint Venture Bank	12,31	43,88	9,06	41,63

Source: Infobank (2012)

The table shows that foreign dominance in national banking increasing powerfully in gaining nationwide market share. It is seen from the share of foreign and joint venture banks' asset based on licence status reach 12.31%, and based on share ownership, 43.88% of assets in commercial bank hold by foreign investor, which means that nearly half of the share of assets controlled by foreign parties. While the share of third-party funding (DPK) of foreign banks and joint venture banks reached 9.06%, where 41.63% of total deposits held by foreigners.

As mentioned before, rules and regulation of a country also play a significant role in allowing and working of foreign party. The allowances of foreign investment in Indonesia, as described in Government Regulation (PP) No. 29 of 1999 about the Purchase of Shares of Commercial Bank which stated that foreign ownership of national banks is allowed up to 99 percent, will lead to increasingly fierce competition among Indonesian banks so can affect the profitability of the less competitive banks. Competition can be seen through the

ranks with 10 commercial banks assets in Indonesia in 2012, where it is known that 5 of the 10 banks have been acquired by foreign parties.

Table 1.2

Bank Rating Based on Total Assets and Their Ownership in 2012

Name of Bank	Total Assets (IDR Billion)	Share of Commercial Banks to Total Assets (%)	Ownership
Bank Mandiri	480.558	13,25	Government 60%
BRI	417.634	11,51	Government 56.75%
Bank Central Asia	393.374	10,84	Private Domestic 48.91%
BNI	273.284	7,53	Government 60%
Bank CIMB Niaga	169.572	4,67	Malaysia 96.92%
Bank Danamon Indonesia	125.012	3,45	Singapore 67,4%
Pan Indonesia Bank	121.445	3,35	Australia 38.82%
Bank Permata	106.905	2,95	England 44.5%
BII	93.054	2,56	Malaysia 97,5%
BTN	83.829	2,31	Government 60,14%
Total	2.264.666	62,42	

Source: Indonesian Banking Statistic (SPI) 2012 and Financial Statement of each bank (processed)

The background of the opportunity of foreign participation in Indonesian banking is related to the necessity for more capital and expected to stimulate the growth of domestic banks and the national economy. As Claessens et al. (2001) explained, supported by Demirgüç-Kunt and Huizinga (2001), the reason for allowing foreign ownership is, first, foreign party provide the channel through which capital inflows finance domestic activities. It will stimulate the domestic economy, at least one that experiences a shortage of available funding from domestic, so efficiency and quality of domestic financial markets will improved

by providing better services, resources and technology. Also, the increased competition among banks will improve the performance of banks and provide financial services at a lower average cost. Finally, the experience of foreign party in their home country may lead to better regulation and supervision in the foreign markets where they do business.

But in the other hand, there remains negative sides that need to be anticipated, especially in times of crisis. According to Hadad (2004), the increasing chances of contagion in the event of a crisis in the origin country of foreign banks/funds, can make those banks become a place to escape the role of capital (capital flight), and besides that foreign funds could be more temporary and only looking for short-term profit. This arguments is supported by Claessens, Demirgüç-Kunt, and Huizinga (2001), and Demirgüç-Kunt, Levin, and Min (1998) who said that there will be much higher of negative consequences of capital outflows during bad times than on the positive consequences of capital inflows during good times.

The entry of foreign banks and investors are not fully bring benefits to the Indonesian economy. The dominance of foreign capital in the banking industry could potentially counter-productive to the national economy, especially many of the foreign capital that the controlling shareholder. Ownership of shares in Indonesia are generally concentrated can encourage controlling shareholders to expropriate, the use of control rights to maximize personal welfare by redistributing wealth from others. Concentration can occur through dividend shareholders, shareholders' rights to elect the board of directors, and other

corporate policies. Without the strong law enforcement and corporate governance, the rights of minority shareholders can be neglected. It can also be contrary to the interests of the national economy. Pros and cons of foreign domination which bring the question, whether the banks with foreign domination or in other words foreign banks (foreign-owned bank) have a difference in performance compared to a bank with non-foreign dominant, what determinants it and how it differ from domestic (owned) bank in the same market.

The performance of a bank is usually indicated by profitability. Profitability can be defined as the ability of banks to earn revenue and profit in a given period by using labor, capital and asset (Seiford in Rindathmono 2005 and Supraba, 2011). Bank profitability has always been latent issues of particular interest for academics, economists, and policy makers. Knowledges and informations about factors affecting profitability of financial sector, are not only important for the bank managers, but also to stakeholders such as central banks, governments, other banks and other related parties, in order to formulate future policies that bank profitability can be maintained and even increased (Sufian, 2011). With increased liberalization and competition in the global financial system, the understanding of what is the driving factor of profitability of banks is becoming increasingly vital. Profitability measurement used in this study is the Return on Assets (ROA), where the higher the ROA, show better financial performance, due to the greater rate of return. It also means that if the ROA increases, the profitability of the company will be increased so that there will be an increase in profitability enjoyed by shareholders (Husnan, 1998). Dendawijaya (2003) stated that in determining

the health of banks, Bank Indonesia is more concerned with valuation of Return on Assets (ROA) and does not include elements Return on Equity (ROE), this is because Bank Indonesia prefers the value of profitability of a bank as measured by assets with funds mostly from the public deposits. ROA reflects the management's ability to utilize the banks' financial and real investment resources to generate profits. Therefore, in this study ROA is used as a measure of banking performance.

Studies on the banks' performance have been done by many researcher both in Indonesia either in other countries. The literatures also found that the profitability of banks triggered by various factors, both internal (bank-specific determinant) and external (macroeconomic determinant) factors. Internal factors are those that effect a banks management and policy decisions. External determinants usually reflect factors that do not relate to bank management practices. Furthermore, for domestic-owned and foreign-owned bank (later on called domestic and foreign bank), depending on which effects dominate will vary by bank, foreign banks may perform better or worse compared to domestic banks. The different structure and characteristics from foreign banks and domestic banks, as well as the different influences of external factors on both banks is an interesting thing to observe. However, the results of those research showed less optimal results and less consistent among the studies and other research.

There are several common internal explanatory (bank-Specific) variables. As it is generally agreed that the main factor contributing to bank profitability is a higher quality management of resources, a closer examination of these variables is

appropriate. These main variables include capital requirement, liquidity risk, credit risk, operational efficiency, and market risk.

Capital Adequacy Ratio (CAR) is employed to detect the effect of capital requirements on banks' profitability. This ratio shows the ability of bank capital in order to accommodate the possibility of business development and risk of loss resulting from the operations of the bank. The results of the study on the effect of the Capital Adequacy Ratio (CAR) on profitability showed different results. The conventional risk-return hypothesis stated that high capital leads to low profits since banks with a high capital ratio are risk-averse, they ignore potential (risky) investment opportunities and, as a result, investors demand a lower return on their capital in exchange for lower risk. This is in line to the results of research conducted by Dietrich et al. (2009), Jha and Hui (2012), and Muda (2013) which showed that the Capital Adequacy Ratio (CAR) negatively affect profitability. However, Kosmidou and Kyriaki (2007) argues that, although capital is expensive in terms of expected return, highly capitalized banks face lower cost of bankruptcy (Berger, 1995), lower need for external funding especially in emerging economies where external borrowing is difficult. Thus well capitalized banks should be profitable than lowly capitalized banks. Research conducted by Sufian (2011) and Azzam and Siddiqui (2012) showed that the Capital Adequacy Ratio (CAR) has a positive effect on bank profitability (private sector and foreign sector). Meanwhile Anggraini (2013) found that CAR has a positive and significant on ROA of domestic bank, but it has negative relation with foreign bank. However Dietrich and Wanzenried (2011) find no correlation between

capital adequacy and bank profitability because the coefficient is always negative but never statistically significant in low-income country neither before nor during the crisis which is supported by Abiola and Olausi's (2014) research result.

Liquidity risk reflects the possible inability of bank to meet its obligations which can eventually lead to bank failure. The liquidity of bank often proxied with Loan to Deposit Ratio (LDR). In order to reduce the insolvency problems, bank will holds higher amount of liquid assets (lower LDR) which can be easily converted to cash (more liquid banks were found to have more cash on hand to finance their day-to-day operations). However, liquid assets usually have lower rates of return. Therefore, higher liquidity (lower LDR) would imply lower profitability. In other words, since the loan to deposit ratio is actually an inverse proxy for the liquidity, the higher the ratio, the higher is the bank profitability (Curak et al, 2011). This research was conducted by Anggraini (2013) on her research for domestic bank, but showing no significance influence on ROA of foreign bank. Kosmidou and Kyriaki (2007) found that this ratio is statistically significant and positively related to the profitability of domestic bank, but showing negative relation for foreign bank. In other side, Muda (2013) found it to be an insignificant determinant to profitability, which indicates that liquidity is not significant factors that contributes towards banks profitability.

Credit risk is one of the risks that arise due to the complexity of the banking activity and influence from environment situation such as the financial crisis that showed by the emergence of non-performing loan (NPL). This risk is accepted by

the bank as one of the bank's business risk that appear when debtor cannot payback their loans granted by the bank, which means that the higher this ratio, the more worse credit quality banks that caused the greater number of non-performing loans and cause profit decline, meanwhile the declining ratio of NPL had reflected a better quality of their assets. The negative relationship indicates that banks with a high level of credit risk shows lower level of profitability (Roman and Tomuleasa, 2012). These results conflict with studies of Abiola and Olausi (2014) and conducted by Bilal (2013) who found that NPL has significant positive effect on profitability. The positive effect of credit risk on bank profitability could be explained by the fact that higher credit risk should improve bank incomes since loans are the most risky and hence, the highest-yielding type of assets.

Proper management of costs shows how efficient a firm is running, that is by minimizing costs and increasing profits. Meanwhile, the main activity of banks in principle is to act as an intermediary, that is collecting and distributing public funds, so the bank's operating costs and revenues are dominated by interest expense and interest income (Dendawijaya, 2003). Cost to Income Ratio (CIR) is used to measure the level of efficiency and the bank's ability to conduct its operations. Anggraini (2013) by her research in Indonesian banking, showing that there are negative relation on ROA of both domestic and foreign banks. Pasiouras and Kosmidou (2007) find a negative and highly significant relationship between the two, which appears to be most significant determinant of profitability for foreign bank, showing that increase in these expenses reduces the profit of banks.

This result stands on line with the empirical results of Dietrich and Wanzenried (2011) in Switzerland in that the less costs you endure, the more efficient your bank is and thus more profitable. Meanwhile, Azzam and Siddiqui (2012) conducted by Curak et al (2012) found that ROA is not influenced in any sectors.

Loss provision (LP) is the allowance/provision established when the carrying value after impairment of financial assets is less than the initial carrying value. In example, if in a bank, there is objective evidence that the credit of the debtor suffered impairment (decrease), then the bank should establish a fund or reserve on these loans. Theory suggests that an increased exposure to credit risk is associated with decreased bank profitability. The high number of LP indicates that a financial asset is impaired, it means increasing in credit risk, so that must be reserved in order not to incur losses for the bank in the form of NPLs. Anggraini (2013) found that LP has a negative significant relation with ROA of domestic bank but showing no relation with ROA of foreign bank. The insignificant relation of LP with ROA also found in Dietrich and Wanzenried (2010) when analyzing Swiss Banking before the crisis, but after crisis, LP tend to increased and negatively affect profitability. This negative relation also found by Chantapoong (2003).

Meanwhile, external (macroeconomic) factors which are taken into consideration are inflation rate (INF) and Gross Domestic Product (GDP). The effect of macroeconomic changes can be seen through changes in the interest rate on the bank. Interest rate are important variable for macroeconomist to understand because they link the economy of the present and the future through their effects

on saving and investment, or in other words, the supply and demand for loanable funds determine the interest rate (Mankiw, 2014). In addition, Irwing Fisher (1867-1947) has linked inflation (macroeconomic factor) with interest rate which is called the Fisher Effect theory. The definition of Fisher effect is the one-for-one adjustment of the nominal interest rate to the expected inflation. That means, if there is a 1 percent increase in inflation, will contribute to increase 1 percent in the bank nominal interest rate.A nominal interest rate is a payment of bank on a loan. As illustration, when there is a rise in inflation, people tend to be reluctant to put their funds in the bank. Therefore, banks competing in raising interest rates to attract them to save and invest their funds to those banks. An increase in interest rates would fatten Net Interest Margins at those banks ifthe rates they charge borrowers rise more quickly than their own cost of funding.

On the other hand, in observing the determinant factors, there are two possibilities, that is observations on the magnitude and sensitivity of these factors to the factors which they influenced. In this case, the concern of this research is about the different responses or behaviors of banks in dealing with macroeconomic shocks, sothe observation of macroeconomic factors leads to its sensitivity (β). As mentioned before, macroeconomic changes can be seen through changes in the interest rate, that will lead to the change of Net Interest Margin (NIM).So, in this research, NIM sensitivity on GDP and inflation are used for proxies of macroeconomic variable. Beside the reason mentioned before, this sensitivity variables are used as data variabilities, because when using only research data of GDP and inflation, those data become the same and do not vary

on each bank (the macroeconomic variables are same for every banks in a year). NIM sensitivity is proxied with macroeconomic variables according to Financial Note and RAPBN 2014, due to partial sensitivity analysis used to see the difference effect of macro variableassumption, with assuming other variables unchanged (ceteris paribus). With these reasons, the amount of the interest rate sensitivity of a bank which then proxied by NIM has a different effect on each bank.

In addition, the relation between macroeconomic factor to banks profitability is explained as follows. GDP reflects the conditions of the economy in the way that a growing economy will provide growing demand for banking services and lower risk as opposed to shrinking economy. Increased gross domestic income has a positive effect on consumers because it can increase the earnings and savings patterns of the banking company (Anggraini, 2013). In other side, bank earns profit from the difference between the interest it charges on the loans and that bank pays on the deposit. According to Roman and Tomuleasa (2012), if GDP growth is high, the loan request increases and thus the banks can obtain bigger income by generating their earning assets. On the contrary, if the GDP growth slows, the banks are confronted with an increased credit risk (NPL), increasing provisions (LP) and subsequently the profitability is reduced. Dietrich and Wanzenried (2011), and Muda (2013) also found a positive correlation between real GDP growth and bank profitability. However, Roman and Tomuleasa (2012) found that GDP has an opposite sign (negative) on bank profitability. Azam and Siddiqui (2012) on their research found that the

macroeconomic variable GDP has affected the profitability of foreign banks, but the private sector banks have no influenced from GDP growth in host market. Meanwhile Kosmidou and Kyriaki (2007) found a negative association between GDP with foreign bank ROA, but positive association with domestic bank ROA.

Inflation rate (INF) is defined as a sustained general rise in prices in an economy whereby a high inflation rates is associated with higher costs as well as higher income. As suggestion by Perry (1992) as cited by Pasiouras and Kosmidou (2007), the effects of inflation on the profitability of a bank depend on whether the inflation is anticipated or unanticipated. In the anticipated case, the interest rate are adjusted accordingly, thereby causing revenues to increase faster than costs and to subsequently positively effect bank profitability. On the other hand, in the unanticipated case, banks may be slow in adjusting their interest rates, resulting increasing of banks' costs that is faster than bank revenues and consequently having a negative effect on bank profitability. Uncertainty about future inflation may cause problems in planning and in negotiation of loans which may lead to market losses or great profitability according to the implemented monetary policy. Pasiuras and Kosmidou (2007) found that inflation is positively related to domestic bank but bring negatively relation to foreign bank. These mixed results could be attributed to different levels of knowledge of country macroeconomic conditions and expectations concerning inflation rate between domestic and foreign banks. Meanwhile Muda (2013) found that inflation rate has a negative and statistically effect on profitability of domestic and foreign banks, which also found by Anggraini (2013) in Indonesian banking case.

1.2. Problem Formulation

Foreign dominance in national banking increasing powerfully in gaining nationwide market share. The foreign banks did not only bring in more capital to the economy but they also bring along the expertise and culture that add up to the competitiveness in the industry. Competition can be seen through the ranks with 10 commercial banks assets in Indonesia in 2012, where it is known that 5 of the 10 banks have been acquired by foreign parties. The allowances of foreign investment in Indonesia, as described in Government Regulation No. 29 of 1999 about the Purchase of Shares of Commercial Bank which stated that foreign ownership of national banks is allowed up to 99 percent, will lead to increasingly fierce competition among Indonesian banks so can affect the profitability of the less competitive banks.

Bank profitability has always been latent issues of particular interest for academics, economists, and policy makers. With increased liberalization and competition in the global financial system, the understanding of what is the driving factor of profitability of banks is becoming increasingly vital. Studies on profitability are an important tool towards evaluating bank operations, improving performance and determining management plan to help in increasing the chance for the banks to survive in competitive markets. Hence, an analysis of profitability determinants particularly the differences between domestic and foreign banking institutions is essential in order to further understand the effect on the competitiveness.

This study carried out after the discovery of a difference in the results, so it is necessary to research further because:

1. Existence of a research gap is the result of different research between researchers with one another so that further research needs to be done.
2. Despite the fact that there is abundant literature on banking profitability in several individual countries there are only a few studies available using recent data for the Indonesian banking sector. Furthermore, limited studies have examined the profitability of banks in Indonesia by comparing the performance of domestic banks and foreign banks and identifying the differences in the determinants of profitability between domestic and foreign banks in Indonesia in bank-specific determinant and macroeconomic determinant (espescially by concerning on bank sensitivity).

Table 1.3
Research Gap

Independent Variable	Positive Relation With Profitability	Negative Relation With Profitability	No Relation With Profitability
Capital Adequacy Ratio (CAR)	Pasiouras and Kosmidou (2007), Azzam and Siddiqui (2012), Anggraini (for domestic bank, 2013)	Anggraini (for foreign bank, 2013), Muda et al (2013)	Dietrich and Wanzenried (2011), Bilal (2011), Abiola and Olausi (2014)
Loan to Deposite Ratio (LDR)	Curak et al. (2011), Pasiouras and Kosmidou (for foreign bank, 2007)	Pasiouras and Kosmidou (for domestic bank, 2007)	Muda et al (2013)
Non Performing Loan (NPL)	Abiola and Olausi (2014)	Roman and Tomuleasa (2012), Bilal (2011)	
Cost to Income (CIR)		Pasiouras and Kosmidou (2007), Dietrich and Wanzenried (2014), Roman and Tomuleasa (2012)	Azzam and Siddiqui (2012), Curak et al (2011)
Loss Provision (LP)	Anggraini (for domestic bank, 2013)	Chantapong (2003), Dietrich and Wanzenried (2014), Anggraini (for foreign bank, 2013)	
Gross Domestic Product (GDP)	Pasiouras and Kosmidou (for domestic bank, 2007), Muda (2013)	Pasiouras and Kosmidou (for foreign bank, 2007), Roman and Tomuleasa (2012)	Muda et al (2013), Azzam and Siddiqui (2012)
Inflation Rate (INF)	Pasiouras and Kosmidou (for domestic bank, 2007), Roman and Tomuleasa (2012)	Pasiouras and Kosmidou (for foreign bank, 2007), Muda et al (2013)	

Source: Various Literatures

Pros and cons of foreign domination which also bring the questions, whether the banks with foreign domination or in other words foreign banks (foreign-owned bank) have a difference in performance compared to a bank with non-foreign dominant, what determinants it and how it differ from domestic (owned) bank in the same market. For more detail, based on the research problems, research questions can be presented as follows:

1. What are bank-specific and macroeconomic determinants affecting the profitability of domestic banks and foreign banks in Indonesia for period Q1 2011-Q4 2013?

   Bank-Specific Factors:

   a. How Capital Adequacy Ratio (CAR) affect profitability (ROA) of domestic banks and foreign banks in Indonesia?
   b. How Loan to Deposit Ratio (LDR) affect profitability (ROA) of domestic banks and foreign banks in Indonesia?
   c. How Non Performing Loan (NPL) affect profitability (ROA) of domestic banks and foreign banks in Indonesia?
   d. How Cost to Income Ratio (CIR) affect profitability (ROA) of domestic banks and foreign banks in Indonesia?

   Macroeconomic Factors:

   a. How NIM Sensitivity to Gross Domestic Product (GDP) affect profitability (ROA) of domestic banks and foreign banks in Indonesia?

b. How NIM Sensitivity to Inflation Rate (INF) affect profitability (ROA) of domestic banks and foreign banks in Indonesia?

Which variables can explain more to profitability of each group of banks?

2. Which of the two kinds of banks is able to better deal with the variables and perform more?

1.3. Research Objective and Utility

The objective of this research are:

1. To analyze how bank-specific and macroeconomic determinants affect the profitability of domestic banks and foreign banks in Indonesia and to identify the differences in the determinants of profitability between domestic and foreign banks in Indonesia for period of Q1 2010-Q4 2013.
2. To compare the performance of domestic banks and foreign banks in Indonesia to show which bank performs better than other.

The study is expected to provide information and input to several interested parties, among others:

1. Researchers and academics

   The results of this study is one of a useful reference for subsequent banking research to increase knowledge about the problems that occurred in the banking world as well as an input for science, in particular knowledge of the determinants of banks' profitability both foreign and domestic bank.

2. Banks

   Help evaluate the results of the company's performance with respect to the aspects that affect the profitability as well as the readiness of banks in a

competitive business then to formulate policies for the future so that profitability can be maintained or even continue to increase and also can survive and compete among their competitors as the developing globalization.

3. Those investors and the public

   The results of this study are expected to be considered in decision-making and guide investment in a company, as well as provide information about the condition of the national banking system, so that we can know the performance of banks in Indonesia, so it can be used as a reference for making decisions.

1.4. Research Systematication

This study is divided into 5 sections with systematic writing, which is described as follows:

Chapter I Introduction

This chapter is a chapter that provides a brief overview of the content of the study, which contains the research, problem formulation, research objective and research systematic writing.

Chapter II Literature Review

This chapter is the basis of the analysis that will outline and basic theory of the research, so in this chapter will describe theoretical basis, empirical evidence, framework of theory, hypotesis conceptual.

Chapter III Research Methods

This chapter contains the research methodology, a section describing the research variables and operational definitions, how basic research, methods used, sample data sources, data gathering, and data analysis method.

Chapter IV Results and Discussion

This chapter is the core of this thesis, as stated in this chapter a description of the object of research, data analysis and discussion of the results of the analysis based on the theory to answer the issues raised.

Chapter V Conclusion

Based on the explanation of the results of the data analysis in Chapter IV above, the conclusion will be formulated which is a proof of the hypothesis that there is in Chapter II. In addition, also be expressed limitations of the research conducted, and suggestions are expected to be useful for relevant agencies.

CHAPTER II

LITERATURE REVIEW

2.1. Theoretical Basic

2.1.1. Theory of Trade-Off Between Liquidity and Profitability

Generally, the objectives of the bank is divided into two, long-term objectives and short-term objetives. The long term objective is to obtain a bank management profits of the bank's activities to enhance corporate value and managed with the aim of generating wealth for their sharedolders. Meanwhile the short-term objective related to the liquidity of banks, namely the ability of the bank's management to provide sufficient funds to be able to run the operational activities and meet its obligations (Rivai, et al, 2013).

The success of bank depends on the ability to gather deposits at a lower rate then invest at a higher rate. Bank earns profit from the difference between the interest it charges on the loans and that bank pays on the deposit. In order to earn a higher profit, bank must invest its funds in long-term assets. But, bank managed funds mostly from the public which they have to repay on demand, so when bank has to pay his obligation on demand, bank must have either cash or liquid assets which can be quickly converted into cash. In other words, to avoid liquidity risk happens, banks must maintain its liquidity position by increasing cash reserves. This resulted in some idle funds. As a

result, the level of profitability to decline. Therefore, banks should implement a policy on the management of liquidity on its own funds, to avoid excess or shortage of funds, since both affect not advantageous for the bank.

2.1.2. Bank Profitability Theory

Profitability can be defined as the ability of banks to earn revenue and profit in a given period by using labor, capital and asset (Seiford in Rindathmono 2005 and Supraba, 2011). Profitability is very important for a bank because the bank funds are majority from third-party funding, which will be able to increase the profitability of their own capital, because the extra profit that is greater than the additional interest expense. Profitability measurement used in this study is the Return on Assets (ROA), where the higher the ROA, show better financial performance, due to the greater rate of return. It also means that if the ROA increases, the profitability of the company will be increased so that there will be an increase in profitability enjoyed by shareholders (Husnan, 1998).

Dendawijaya (2003) stated that in determining the health of banks, Bank Indonesia is more concerned with valuation of Return on Assets (ROA) and does not include elements Return on Equity (ROE), this is because Bank Indonesia prefers the value of profitability of a bank as measured by assets with funds mostly from the public deposits. ROA reflects the management's ability to utilize the banks' financial and real investment resources to generate profits. ROA is a better proxy for bank profitability as opposed of ROE because ROE disregards financial leverage (Flamini et al, 2009). Also in the

study of Ommeren (2011) and Schipper (2013) mention that ROE is an useful tool in the measurement of profitability during prosperity, but be weak measure during periods of high volatility, such as in a crisis. Therefore, in this study ROA is used as a measure of banking performance. According to Horne and Wachowicz (2005), ROA is used to measure the overall effectiveness in generating profits through asset available (which is given that profit is obtained from interest income (service-based income) and non-interest income (fee-based income)). So, the formula to get the value of ROA is as follows.

$$\textbf{ROA} = \frac{Profit\ Before\ Tax}{Average\ Total\ Asset} \text{ x } 100\%$$

2.1.3. Bank Profitability Indicators

Literatures found that the profitability of banks triggered by various factors, both internal and external factors (Dietrich and Wanzried, 2011;Muda et al 2013; Azam and Siddiqui, 2012; Pasiouras and Kosmidou, 2007; etc). To study the relationship between foreign ownership and bank performance, bank performance indicators must first be selected. The popular bank performance indicators are categorized as follows:

2.1.3.1. Bank-Specific Determinants

There are several common internal explanatory (bank-specific) variables. As it is generally agreed that the main factor contributing to bank profitability is a higher quality management of resources, a closer examination of these variables is appropriate. These main variables include

capital requirement, liquidity risk, credit risk, operational operational efficiency, and market risk.

2.1.3.1.1. Capital Adequacy Ratio (CAR)

Capital Adequacy Ratio (CAR) is a ratio that shows how much the entire risky bank assets (loans, investments, securities, bills of other banks) financed from the bank's own capital funds, in addition from obtaining funds from sources outside banks, such as public funds, loans, and others. CAR in other words, is the ratio of performance of banks to measure the capital adequacy owned banks to support risky assets (Dendawijaya, 2005).

The Expected Bankruptcy Cost hypothesis states that more capitalized banks will be better off because they face lower costs of funding, and because a higher ratio allows banks to absorb any shocks that they may experience. Additionally, having a higher ratio allows banks to borrow less to support any given level of assets (Berger, 1995 as cited by Osborne et al. 2011). Gavila et. al. (2009) conducted and added, although capital is expensive in terms of expected return, highly capitalized banks face lower cost of bankruptcy, lower need for external funding especially in emerging economies where external borrowing is difficult. Thus well capitalized banks should be profitable than lowly capitalized banks. If the expected bankruptcy cost hypothesis is indeed correct, then holding of liquid assts shoul exhibit a positive relationship with bank profit.

However, at the same time, holding liquid assets imposes an opportunity the risk-return trade-off however states that a higher capital to asset ratio will result in lower profitability because the more risk-averse banks could potentially be ignoring profitable opportunities (Schipper, 2013). Dietrich and Wanzenried (2014) in line with that theory and stated that high capital leads to low profits since banks with a high capital ratio are risk-averse, they ignore potential (risky) investment opportunities and, as a result, investors demand a lower return on their capital in exchange for lower risk.

According to Bank Indonesia Circular Letter dated March 31, 2010 No.12/11/DPNP, CAR is calsulated as follows:

$$CAR = \frac{Capital}{Risk\ Weighted\ Assets}$$

Capital for the head office bank in Indonesia consists of:

a. Core capital (tier 1);
b. Supplementary capital (tier 2);
c. Additional supplementary capital (tier 3).

Risk Weighted Assets (RWA) consists of:

a. RWA for credit risk;
b. RWA for operational risk;
c. RWA for market risk.

As stipulated in Bank Indonesia Regulation No. 14/18/PBI/2012 on the minimum capital requirement as the regulation for applying Basel Accord, banks are required to provide the minimum capital based on their

risk profile, which will allow them not only to absorb potential losses arising from credit risk, market risk, and operational risk, but also other risks such as liquidity risk and other material risk. The minimum capital required according to risk profile is as follows:

a. 8% of RWA for banks with rank-1 risk profile;

b. 9% to less than 10% of RWA for banks with rank-2 risk profile;

c. 10% to less than 11% of RWA for banks with rank-3 risk profile;

d. 11% to 14% of RWA for bank with rank-4 or rank-5 risk profile.

Risk profile rank is determined by Bank Indonesia decree on health levels of banks. Each bank shall calculate RWA for credit risk and RWA for operational risk. RWA for market risk shall be calculated only by banks that meet certain criteria as stipulated in Article 25 Regulation No. 10/15/PBI/2008. The risk weighting is prescribed by the Bank International Settlements. For example, cash and government securities are said to have zero risk, whereas mortgages have a risk weight of 0.5. Multiplying the assets by their risk weights gives the total risk-weighted assets, which is then used to determine the capital adequacy.

2.1.3.1.2. Loan to Deposit Ratio

Liquidity risk reflects the possible inability of bank to meet its obligations which can eventually lead to bank failure. Liquidity risk management is a fairly complex problem in the operations of banks, it is because the bank managed funds mostly from the public, that are short term and can be withdrawn at any time. The liquidity of bank often proxied with

Loan to Deposit Ratio (LDR). This ratio can be interpreted as the extent to how the provision of credit to customers of bank can offset the bank's obligation to immediately meet the demands of depositors who want to withdraw the money that has been used by banks to extend credit (Dendawijaya 2005). Loan to Deposit Ratio also defined as bank's ability to repay the withdrawal of funds by depositors to rely on loans as a source of liquidity, or in other words, to explain about how far to extend credit to customers to offset the bank's obligation to immediately meet the demands of depositors who want to withdraw funds that have been disbursed by the bank in the form of loans (Rival, et al, 2013). The higher this ratio, gives an indication of the low ability of the bank's liquidity.

As mentioned before, there is always conflict occur when talikng about liquidity and profitability. In order to reduce the insolvency problems, bank will holds higher amount of liquid assets (lower LDR) which can be easily converted to cash. However, liquid assets usually have lower rates of return. Therefore, higher liquidity (lower LDR) would imply lower profitability (Curak et.al., 2011). In other words, if banks can channel all funds raised will indeed benefit, but it is associated risks if at any time the owner or user to withdraw cash funds of funds can not repay the funds borrowed. Conversely, if the bank does not distribute the funds in the form of loans, the bank will also be exposed to risk due to the loss of the opportunity to make a profit. Importance of both banks manage liquidity primarily intended to minimize the risk that may occur. Liquidity

management is the ability of banks to provide enough funds to fulfill their obligations, in order to minimize liquidity risk due to lack of funds (Rivai, et al., 2013). Banks need to manage their funds in a planned and precisely because of the effects of excess and shortage of funds are not profitable for the bank.

According to Bank Indonesia Circular Letter dated March 31, 2010 No.12/11/DPNP, Loan to Deposit Ratio (LDR) can be measured as follows:

$$LDR = \frac{Credit}{Third\ Party\ Funding} \text{ x } 100\%$$

Credit is total credit to third party (not including third party bank). Third Party Funds consist of demand deposit, savings deposit and time deposits (not including interbank).

In Indonesia, the LDR level is set at the level of 78% -100%. For banks that have LDR outside that range will be a disincentive to the following conditions (Banking Supervisor Report, 2011):

- For banks that have LDR is lower than the lower limit of the LDR targets imposed disincentives in the form of additional deposits reserve requirement (GWM) by 0.1 from rupiah DPK for every 1% LDR shortfall.
- For banks that have LDR higher than the upper limit of the LDR targets and have a CAR below 14% reserve requirement imposed additional (GWM) disincentive in the form of deposits at 0.2 from rupiah DPK for every 1% LDR excess.

- For banks that have LDR higher than the upper limit of the target LDR but has a CAR of 14% or more are not subject to additional statutory reserves.

In this case, foreign banks have a sufficient number of high LDR. This is because foreign banks seeking difficulties for third parties funding as well as the difficulties in the establishment of branch offices, is also due to the depreciation of the currency. In this regard, Bank Indonesia does not charge a penalty because the CAR of the banks at far above the 14% level. If the level of Capital Adequacy Ratio below 14%, subject to a penalty in the form of additional statutory reserves (GWM) amounted to 0.1% of deposits multiplied by the ratio of its shortcomings for LDR below 78% and an additional reserve requirement of 0.2% of deposits multiplied by the ratio of the excess to the high LDR values.

2.1.3.1.3. Non Performing Loan (NPL)

Credit risk is one of the risks that arise due to the complexity of the banking activity and influence from environment situation such as the financial crisis that showed by the emergence of non-performing loan (NPL). The extent of the credit risk depends on the quality of assets held by an individual bank as result of credit provision and bank deposit investation to different portfolio. Thus, nonperforming loan ratios are the one of proxies for asset quality. This risk is accepted by the bank as one of the bank's business risk that appear when debtor cannot payback their loans granted by the bank, with significant exposure levels, the inability of the debtor to pay a

small portion can deliver on its obligations insolvent. Which means that the higher this ratio, the more worse credit quality banks that caused the greater number of non-performing loans and cause profit decline, meanwhile the declining ratio of NPL had reflected a better quality of their assets. Roman and Tomuleasa, (2012) also conduct that ratio of nonperforming loans to total loans (NPL) is a variable proxy for credit risk and, at the same time, one of the most representative indicators that measure the quality of the bank assets and implicitly the soundness of the credit portfolio. A higher level of the ratio of nonperforming loans to total loans and implicitly a deterioration of the credit portfolio quality has a negative effect upon bank profitability. NPL ratio measured as follows:

$$NPL = \frac{(Substandard, Doubtful\ and\ Loss\ Credit)}{Total\ Credits} \text{ x } 100\%$$

2.1.3.1.4. Cost to Income Ratio

Proper management of costs shows how efficient a firm is running by minimizing costs and increasing profits. Meanwhile, the main activity of banks in principle is to act as an intermediary, that is collecting and distributing public funds, so the bank's operating costs and revenues are dominated by interest expense and interest income (Dendawijaya, 2003). Cost to Income Ratio (CIR) is used to measure the level of efficiency and the bank's ability to conduct its operations. The smaller the bank's CIR shows more efficiency in carrying out its business activities. According to Circular No. 15/7/DPNP about regulation of opening of commercial banks

based network core capital issued March 8, 2013, one of the requirements and permissibility to bank to open a branch, noted that benchmark CIR for commercial banks business groups (BUKU) I maximum of 85%. BUKU II range of 78%-80%, meanwhile BUKU III is 70-75% and BUKU IV is about 65%-60%. BUKU (*Bank Umum Kelompok Usaha*) is BI grouping based bank's core capital. If the ratio exceeds above those level, the bank can be categorized inefficient in carrying out its operations. In Indonesia, CIR is called *Biaya Operasional per Pendapatan Operasional* (BOPO). CIR is measured as follows:

$$CIR = \frac{Operation\ Cost}{Operation\ Income}$$

Operating costs are costs incurred by the bank in order to run the main business activity (interest costs, labor costs, marketing costs and other operating costs). Operating income is the main income of the bank that the interest income earned from the placement of funds in the form of credit and other operating income.

2.1.3.1.5. Loss Provision (LP)

Productive assets is a major source of income from banking activities consisting of loans, investment in securities, investment bank to another and inclusion. Expected bank earnings greater than investment in productive assets, so the opportunity to earn increased profits. Profit will give a positive assessment for investors who invest in banking stocks.

Funds collected by the bank will be a burden if unused. Therefore, banks should allocate funds in productive assets. Investment of

bank funds in productive assets must be carried out based on the precautionary principle. Bank management must maintain the quality of its productive assets to keep it in good condition and non-impaired economy. The economic value of the loan portfolio and funding may rise or fall due to a change in the credit quality as if something wrong with the good faith (willingness to pay) and the ability of borrowers to repay their loans and their credit. Assessment of the quality seen from the ratio of productive assets Allowance for impairment (Loss Provision/CKPN).

Allowance for impairment (CKPN) hereinafter referred as loss provision (LP), is the allowance/provision established when the carrying value after impairment of financial assets is less than the initial carrying value (BI Regulation (PBI) No. 14/15/PBI/2012). In other words, Loss provision is a provision that has been calculated from the amount of impairment loss on financial assets evaluated individually or collectively. Allowance for losses is important to do so that the bank's financial statements reflect the actual situation (representation faithfullness). In the allowance for impairment (LP/CKPN), formation or fund-sinking assessed from the results of the debtor credit evaluation conducted by the bank. If in a bank, there is objective evidence that the credit of the debtor suffered impairment (decrease), then the bank should establish a fund or reserve on these loans. Evaluation of the debtor's credit different from each bank causes each bank has its own policy in shaping the provision.

The determination of the loss provision is the requirement for banks to have historical data on loss experience of any type of bank credit, at least 3 years. Banks are required to have objective data evidence on the amount of a loan loss rate of each customer. Objective data evidence is disadvantage events to the credit owned by bank based on data from observations on events of concern to the bank that affect the debtor's ability to pay in the future. In the event of impairment, the carrying amount after impairment credit less than the carrying value then it should set up an initial allowance for impairment (loss provision) to cover losses due to the impairment. However, the bank's policy should not deviate from some of the criteria contained in the PAPI (Indonesian Banking Accounting Guidelines) that is PSAK (*Pernyataan Standar Akuntansi Keuangan*) 50 and 55.

The measurement provisions of reserves (LP) according to the allowance for impairment based (CKPN) on the PAPI is divided into:

1. Individual
    a. Discounted Cash Flow: The estimated future cash flows (principal+interest payments) are discounted at the interest rate
    b. Fair Value of Collateral: Taking account of the value of the cash flows to the security or collateral in the future
    c. Observable Market Price: Determined from the market price of the loan
2. Collective
    a. From a cash flow calculation contractual creditors in the future

b. From the calculation of historical loss rate of credit debtors after deducting the return credit.

Seen from the formation of allowance for impairment provisions (LP) can be said that the more earning assets the greater risk faced by banks or in other words the quality of earning assets deteriorated so reserve that must be established is also getting bigger. Greater reserves will lower the profitability of banks.

2.1.3.2. Macroeconomic Determinants

In other hand, external factors which are taken into consideration are inflation rate (INF), Gross Domestic Product (GDP).The effect of macroeconomic changes can be seen through changes in the interest rate on the bank. Interest rate are important variable for macroeconomist to understand because they link the economy of the present and the future through their effects on saving and investment, or in other words, the supply and demand for loanable funds determine the interest rate (Mankiw, 2008).

On the other hand, in observing the determinant factors, there are two possibilities, that is observations on the magnitude and sensitivity of these factors to the factors which they influenced. In this case, the concern of this research is about the different responses or behaviors of banks in dealing with macroeconomic shocks, so the observation of macroeconomic factors leads to its sensitivity (β). As mentioned before, macroeconomic changes can be seen through changes in the interest rate, that will lead to the change of

Net Interest Margin (NIM).So, in this research, NIM sensitivity on GDP and inflation are used for proxies of macroeconomic variable.

2.1.3.2.1. Net Interest Margin (NIM)

NIM ratio reflect the market risk arising from changes in market conditions, where it can be detrimental to the bank. Net Interest Margin indicates as how the banks effectively spread their funds to generate income from their earning assets. In achieving the maximum profit, there is always a risk that is worth, the higher profit the greater risk faced by the bank which is strongly influenced by the interest rate. Based on Bank Indonesia, one of proxy of market risk is interest rate, which is measured from the difference between the interest rate financing (funding) with an interest rate of loans (lending) or in the form of absolute is the difference between the total interest costs of funding the total cost of a loan where in banking terms is called the Net Interest Margin (NIM) (Siamat, 2002).

Pursuant to Circular Letter No.6/23/DPNP dated May 31, 2004, NIM is measured as follows:

$$NIM = \frac{Net\ Interest\ Income}{Average\ Earning\ Assets} \text{x}100\%$$

Net interest income derived from interest income earned from interest income minus interest expense of source of funds provided. Productive assets are assets that counts which produce interest as placements with other banks, securities, investments, and loans.

According to the predefined rules by Bank Indonesia, the magnitude NIM achieved by a bank must be greater than 6%.

2.1.3.2.2. NIM Sensitivity on Gross Domestic Product

GDP measures the national output of an economy. It reflects the conditions of the economy in the way that a growing economy will provide growing demand for banking services and lower risk as opposed to shrinking economy. Madura (2007) using economic growth with GDP as the measuring tool, as a picture of a country's economic activity within a certain time frame. The activity includes all activities of economic units. When economic growth is high then the individual's income is relatively high, so it tends to be an increase in spending on goods and services, this is an effect on the increase in the demand for goods and services. Then it results in improved corporate earnings as providers of goods and services and vice versa.

Specifically, Dietrich and Wanzenried (2011), Athanasoglou et al. (2008), and Kunt and Huizinga (1999), postulate and show that real GDP growth is a good proxy for the business cycle because its up and downswings influence the demand for borrowing. Downswings in particular will have a negative effect on bank profits because banks will expect less of their debtors to repay them in tougher times and thus be more exposed to credit risk.

As mentioned before, macroeconomic changes can be chanelled through changes in the interest rate, that will lead to the change

Net Interest Margin (NIM). This means that changes in the bank's NIM is caused by changes in GDP assuming ceteris paribus. Increase (decrease) this is explained by the sensitivity analysis (or in economic theory often called elasticity). Referring to Hadinoto (2008) who wrote about the theory of the interest rate sensitivity of bank deposits or in other words, the change (increase) in deposits that are influenced by interest rates, with the following formula:

$$Elasticity\ (Sensitivity) = \frac{\%\ \Delta Q}{\%\Delta r} = \frac{\frac{(Q_1 - Q_0)}{Q_0}}{\frac{(r_1 - r_0)}{r_0}} = \frac{\Delta Q}{\Delta r} x \frac{r_0}{Q_0}$$

Where:

Q = amount of deposits

r = interest rate

The formula above is then adjusted to the variables used in this study that is the change in the bank's NIM affected by GDP (or in other words NIM sensitivity to the GDP), so it becomes:

$$SENSI\_GDP = \frac{\%\Delta NIM}{\%\Delta GDP} = \frac{\frac{(NIM_t - NIM_{t-1})}{NIM_{t-1}}}{\frac{(GDP_t - GDP_{t-1})}{GDP_{t-1}}} = \frac{\Delta NIM}{\Delta GDP} x \frac{GDP_{t-1}}{NIM_{t-1}}$$

2.1.3.2.3. Inflation Rate

The effects of inflation can be substantial and undermines the stability of the financial system and the ability of the regulator to control the solvency of financial intermediaries. Revell (1979) as cited in Staikouras and Wood (2003) noted that an important indirect influence

on commercial banks lies in the effect of inflation on their customers and the consequent changes in the demand for different kinds of financial services. As suggestion by Perry (1992) as cited by Pasiouras and Kosmidou (2007), the effects of inflation on the profitability of a bank depend on whether the inflation is anticipated or unanticipated. In the anticipated case, the interest rate are adjusted accordingly, thereby causing revenues to increase faster than costs and to subsequently positively effect bank profitability. In addition, Irwing Fisher (1867-1947) has linked inflation (macroeconomic factor) with interest rate which is called the Fisher Effect theory. The definition of Fisher effect is the one-for-one adjustment of the nominal interest rate to the expected inflation. That means, if there is a 1 percent increase in inflation, will contribute to increase 1 percent in the bank nominal interest rate. A nominal interest rate is a payment of bank on a loan. As illustration, when there is a rise in inflation, people tend to be reluctant to put their funds in the bank. Therefore, banks competing in raising interest rates to attract them to save and invest their funds to those banks. An increase in interest rates would fatten Net Interest Margins at those banks where the rates they charge borrowers rise more quickly than their own cost of funding.

On the other hand, in the unanticipated case, banks may be slow in adjusting their interest rates, resulting increasing of banks' costs that is faster than bank revenues and consequently having a negative

effect on bank profitability. Unexpected rises of inflation cause cash flow difficulties for borrowers which can lead to premature termination of loan arrangements and precipitate loan losses. Uncertainty about future inflation may cause problems in planning and in negotiation of loans which may lead to market losses or great profitability according to the implemented monetary policy.

Meanwhile the formula of NIM sensitivity to Inflation is as follows:

$$SENSI\_INF = \frac{\%\Delta NIM}{\%\Delta INF} = \frac{\frac{(NIM_t - NIM_{t-1})}{NIM_{t-1}}}{\frac{(INF_t - INF_{t-1})}{INF_{t-1}}} = \frac{\Delta NIM}{\Delta INF} x \frac{INF_{t-1}}{NIM_{t-1}}$$

2.1.4. Indonesian Banking System

The definition of a bank according to Banking Act (UU) No. 10 of 1998 is a business entity which collects funds from the public in the form of savings and channel them to the public in the form of credit or other forms in order to improve the living standard of the people. It means that financial institution (bank) that is in charge of the institution to raise funds directly from the public in the form of deposits, for example demand deposits, savings or time deposits received from savers or surplus units. Surplus units can be corporations, governments and households who have excess net income for consumption needs, and distribute it to the deficit units, i.e. those who need funds. Discussion of the banking system in the UU No. 10 of 1998 include:

a. Principles, Functions and Objectives of Banking

b. The Types of Businesses and Banks

c. Lisence Procedures for Establishing A Bank and Ownership of Banks.

These elements are a single entity in the banking system where each element is associated. Start from banking background purposes, the forms of banking institutions, as well as how to set up bank ownership arrangements.

2.1.4.1. Principle, Functions and Objectives of Banking

The principle of banking has significance as the philosophical basis of banking activities. Besides, banking principles is the basis for the establishment of various banking laws. The purpose of the banking principle is to create a sound banking system. The banking principle extracted from the philosophical values of the people of Indonesia, they are (Usman, 2003):

a. Economic Democracy Principle

In Article 2 of UU on banking said that "Indonesian Banking in the conduct of its business based on economic democracy by using the precautionary (prudential) principle". From the article it can be concluded that the banking business is directed to implement the principles contained in the economic democracy based on Pancasila and the 1945 Constitution. In the era of modern banking and the development of economic globalization, the principle of democracy in Indonesia experienced economic challenge. Where economic globalization "force" an open state broadest economic sector boundaries (including the banking system). Today, the ownership of major banks in Indonesia began to be acquired by foreign investors. The investor thus bringing democratic values which tend to be pro-

liberalism economic entry into the Indonesian banking system. In order to create a favorable investment climate, the rule of law ought to provide legal certainty. It should be observed whether the rule of law in the banking system in Indonesia to give a sense of justice and prosperity for the benefit of the Indonesian people.

b. Fiduciary Principle

Based on Article 29 ayat (4) UU No 10 of 1998, the principle of trust (fiduciary) is a principle which states that the bank's business is based on the relationship of trust between banks and their customers. Bank works primarily with funds from the people who saved their funds with the principle of trust. So that each bank should continue to maintain the level of health while maintaining and retaining public trust. Parameter confidence level of society can be measured from the institution's readiness to meet the demand of its customers in the bank to withdraw cash whenever the customer wants, or according to customer agreements with banking institutions. When the customer confidence can not be maintained by a bank institution, it will create a rush to the condition that the funds deposited in the bank. The crisis that occurred in various parts of the world have an effect on the level of customer confidence in storing their money in the bank. Fight-to-quality-action of domestic and foreign investors from assets deemed risky to safer assets for example to other banks that are considered to have a higher quality banks in domestic and abroad, can caused banks

experiencing liquidity problems and lead to increased cost of funds so that the bank can not meet its obligations to the Third Fund Party (DPK) (Sudarsono, 2009). This is evidenced by the presence of additional demand banking liquidity by investing Rp 5 trillion to the three state banks, namely BRI, BNI and Bank Mandiri as a result of the drought of liquidity of the global financial crisis (Report on Banking Supervision, 2011).

c. Confidential Principle

The principle of bank confidential is under Article 40 through Article 47 A of UU No. 10 of 1998. According to Article 40, banks are required to keep secret about customers and their savings information. However, the obligation to keep such provision does not apply in a particular law case. Confidentiality is for the benefit of each bank, because the bank requires a belief that society saves their money in the bank. Society will only entrust their money to a bank or utilize the services of the bank if it can guarantee that no misuse of knowledge about the savings banks.

d. Prudential Principle

The purpose of the prudential principle applied is that the bank is always in good health, liquid and solvent. With the implementation of the precautionary principle, expected levels of public confidence in banks remains high, so people are willing to and did not hesitate to save their money in the bank. Enforcement of prudential system not

only for keeping in touch with the bank's customers. But also at the macro level is to create a sound banking system and efficient. Which in turn helps the development of the national economic development of a country.

Regarding banking functions we can refer to Article 3 of the Banking Act (UU Perbankan) which is the bank function as collector and distributor of public funds. This provision reflected the function of banks as intermediaries parties with a surplus of funds shortage parties and lacks of funds. Understanding the function of banks is very closely related to the purpose of the banking institution itself. In Article 4 of the Banking Act says that "Indonesian Banking aims to implement national development in order to improve equity, economic growth and national stability towards improving the welfare of the people".

2.1.4.2. The Types of Businesses and Banks

Banking institutions in Indonesia are grouped into two types of banking institutions. It shows on in Article 5 of the Banking Act is type Commercial Banks and Rural Banks type.

a. Commercial Bank

Commercial bank is a bank conducting conventional business and / or based on sharia principles and provides services in payment traffic. In addition, commercial banks can specialize to carry out certain activities such as long-term financing activities, activities for the Growth of

cooperatives, the Growth of low-income entrepreneurs/small business owners, non-oil export Growth, and Growth of housing construction.

b. Rural Bank (BPR)

Rural Bank is a bank conducting business in a conventional or sharia in their actions do not provide services in payment traffic.

Meanwhile, bank also can be divided into their ownership licence status. Ownership seen from the certificate of incorporation and control of shares owned by the bank. Types of banks by ownership license is as follows (Siamat, 2005):

1. The Government-Owned Banks (Limited Bank)

   State-owned bank is a bank which certificate of incorporation or capital, owned by the government so that the overall profit of banks owned by the government. The banks that belong to the state-owned banks, among others:

   a. Bank Negara Indonesia (BNI)
   b. Bank Rakyat Indonesia (BRI)
   c. Bank Tabungan Negara (BTN)
   d. Bank Mandiri

2. Private Commercial Bank

   Domestic private-owned bank is a bank that is majority-owned by private national and established by private deed, as well as privately owned profit-sharing (WNI) and or incorporated in Indonesia. Subdivided into Foreign Exchange and Non-Exchange bank. According

to SPI Banking published by BI, untuil the end of 2013 the amount of foreign exchange private bank total of 36 banks, while the Non-Foreign Exchange private bank many as 30 banks.

3. Banks Regional Government (BPD)

   Ownership shares of local government-owned banks, as well as a good deed and capital gains owned by local governments. The number of BPD was 26 stable banks.

4. Foreign Banks

   Foreign banks are branches of overseas banks there either private foreign and foreign governments, obviously owned by a foreign party. The number of foreign banks in until 2013 consists of 10 banks.

5. Joint Venture Bank

   Joint venture bank is a proprietary blend of commercial bank co-founded by one or more commercial banks domiciled in Indonesia and was established by citizens (and/or Indonesian legal entity wholly owned by citizens), with one or more banks domiciled abroad. The number of Joint Venture banks fluctuated that is numbered 14 banks until 2013.

2.1.4.3. Lisence Procedures For Establishing a Bank and Ownership of Banks

Related to the requirement, in Article 16, Paragraph (1) and (2) of the Banking Act have set the permissions to run the business of banks. In addition business licensing banks must meet bank licensing procedures

contained in the Bank Indonesia Regulation (PBI) No. 2/27/PBI/2000 for Conventional Commercial Bank, PBI No. 6/24/PBI/2004 for commercial banks based on Islamic principles, as well as PBI No.6/22/PBI/2004 for Rural Banks. Besides arrangement of the licensing procedures for business/establishment of the bank, another thing to consider is the procedure for bank ownership. Ownership relating to the party as the owner of a bank including shareholding and also the requirements of the party/legal entity as the owner of the bank or the composition of the foreign party of a bank and its transition mechanisms and procedures. According to the Banking Act No. 7/1992 as amended by the Banking Act No.8/1998, there are no restrictions on the ownership of banks by foreigners, but still have to pay attention to the principle of partnership. In terms of opening branches of foreign banks are also regulated in the Act, namely that the foreign bank must have at least A rank and reputation from leading international rating agencies. In addition, foreign banks must also have a minimum of effort funds equivalent to Rp 3 trillion and must provide a statement from the country where the bank's headquarters.

Beside that, in the development of an increasingly open economy and growing rapidly at this time, required banking institutions that are healthy, strong and able to compete, so needed a good capital structure. It can be achieved if the banking institutions getting sufficient funds to run its activities. The Banking Act No. 10 of 1998 which is supported by Government Regulation (PP) No. 29 of 1999 about the Purchase of Shares

of Commercial Bank gives room for the banking institutions to obtain funding from public sources. Commercial banks' shares can be purchased by individuals or legal entities directly through the exchanges. For shares owned by foreign individuals and legal entities set up to as much as 99% of the paid up capital of the bank. It means that BI provides an opportunity for foreign investors and domestic investors to buy shares of banking institutions directly through the stock exchange. With the process of purchasing these shares, banks will be able to raise additional capital and other aspects related to the health of banks. BI also gives room for foreign citizens and foreign legal entities to participate and have a commercial bank in Indonesia. Futhermore, in terms of the ownership, if a person or an entity buy shares of the bank by 25% or more of the total paid-up capital, the ownership will switch on the person or legal entity. In other words, a bank can be said as foreign-owned or domestic-owned if there is at least 25% ownership of bank shares as noted in Article 1 paragraph (3) of Bank Indonesia Regulation (PBI) No. 14/24/PBI/2012.

2.2. Empirical Evidence

Pasiouras and Kosmidou (2007) analyzed profitability of a balanced pooled data of commercial banks which is splitted into foreign and domestic bank in 15 EU countries during period 1995-2001 by using Fixed Effect Model estimation. He found that capital ratio was positively related to ROA in both group banks, meanwhile difference effect found of cost to income ratio on profits between foreign bank and domestic banks could be the result of diseconomies of

operating or monitoring an institution from a distance. The different effect of GDP and inflation on ROA with opposite sign could be attributed to different levels of knowledge of country macroeconomic conditions and expectations concerning inflation rate between domestic and foreign banks. Additionally, domestic and foreign banks tend to serve different cus-tomer segments that may react differently under the same macroeconomic conditions.

Muda et al (2013) is conducted two research on Islamic Malaysian Banking, first research is conduct to identify the determinants of profitability of Islamic banks operating in Malaysia and examine the effect of the global financial crisis on the profitability of these banks, meanwhile second research is to compare the determinants of profitability of the domestic and foreign Islamic banks operating in Malaysia. Almost all same variables are used to both research. The different is located on the dependent variabel and by different analysis tools, where first research using ROA and Random Effect Model (REM) and the second research is using ROE and the Generalized Least Square (GLS). The first research shows that the empirical results indicate that overhead expenses ratio, loans ratio, deposits ratio, technical efficiency and bank size have a positive significant effect in determining banks' profitability. Meanwhile, the inflation rate has a negative significant effect in determining banks' profitability. The findings of study indicate that capital and reserves, liquidity ratio, banks' age, gross domestic product growth rate, Gross domestic product per capita and concentration ratio are not able to explain the variability of profitability of Islamic banks. The study also reveals that the profitability of Islamic banks is negatively affected by the global

financial crisis. Meanwhile on the second research, the Generalized Least Square (GLS) is employed with unbalanced panel data on seventeen Islamic banks, using quarterly data for the period of 2007 to 2010. In order to find out the differences in the profitability determinants, the sample of banks is divided into two sub-samples (domestic and foreign). The results reveal that domestic Islamic banks are more profitable than foreign Islamic banks. The results also show that the profitability determinants of domestic banks are different from those of foreign banks. The overhead expenses, loans, efficiency, gross domestic product growth (growth rate) and bank size have a significant effect in determining banks' profitability, in which case applicable to the domestic banks only. In turn, the gross domestic product per capita has a significant effect in determining banks' profitability of only the foreign banks. The study finds that, deposits, capital and reserves, inflation and banks' age have a significant effect in determining banks' profitability of both domestic and foreign banks. Meanwhile, liquidity and concentration are not able to explain the variability of domestic and foreign Islamic banks' profitability. The findings indicate that the profitability of domestic banks is affected by the global financial crisis while, the profitability of foreign banks is not affected.

Azzam and Siddiqui (2012) analyze and compare the profitability of domestic (Public & Private) and foreign banks operating in the Pakistan Banking market between 2004 and 2010 on quarterly basis. Total 36 Commercial Banks of Pakistani Industry have represented our sample. To control for the effect of bank ownership on performance, they split the sample into three categories: (1)

domestic banks with Government Control, (2) domestic banks with Private control, and (3) foreign banks. The results indicate that the comparison with private sector banks shown that most of the variables have influenced on Banks ROA except Cost Income Ratio and Provision to total loan as proxy of credit risk. Capital Adequacy is same among private sector and foreign sector banks that increasing their ROA but other factors are influencing only private banks ROA. The R-squared of the foreign sector banks are high as compare to private and public sector banks. The results are also shown by looking at the foreign ownership variables, that it still has no effect. in growth of GDP, the return from equity of foreign banks could be increase or decrease because they brought their equity in the market for investment from their parent country. But in case of private sector banks the result shows that there is no relationship exists between ROE/ROA of Private Sector and the macroeconomic factor of country. This may be evidence that although the foreign banks operate in the Pakistan market, they are less influenced by its macroeconomic conditions as compare to domestic banks because there major parts of investment portfolio are depended on abroad. The result also found that the Inflation affects foreign banks more than domestic ones.

Muhammad Bilal, et al (2013) study entitled Influence of the specific Bank and Macroeconomic Factors on Profotability of Commercial Banks: A Case Study of Pakistan. This study aims to identify the effect of bank-specific and macroeconomic factors on the profitability of commercial banks in the period 2007-2011 apkistan. Return on Assets (ROA) and Return on Equity (ROE) is used

as the dependent variable. For specific measure used Bank Deposits to Assets, Bank Size, Capital Ratio, Net Interest Margin, and Non-Performing Loans to Total Advances. Inflation, real gross domestic product and industrial production growth rate is a macroeconomic factor that is used in this research. Methods of data analysis used linear regression analysis. The results showed the size of banks, net interest margin, prodution industry growth rate has a significant positive relationship with ROA and ROE. Non-performing loans to total advances and inflation has a significant negative effect on ROA, while real gross domestic product are positively related to ROA. Capital ratio is significant positive effect on ROE.

Saovanee Chantapoong's (2003) research about comparative study of domestic and foreign bank performance in Thailandin terms of profitability and other characteristics after the East Asian financial crisis (1997). This paper provides a comprehensive study of the performance of domestic and foreign banks in Thailand in terms of pr ofitability and other characteristics after the 1997 financial crisis. The estimation used in this research are Generalized Least Square and Fixed Effect Models (FEM). Variable used are Non Interest Income/total assets, Loan Loss Reserve/total assets, overhead cost/total assets, Loan Ratio, foreign and domestic dummy (GLS) and crisis dummy (FEM). The results of this study indicate that foreign bank profitability is higher than the average profitability of the domestic banks. loan loss reserve over total assets has significant negative relationship to bank profitability. It seems likely that the deterioration of bank asset quality during cyclical downturns requires higher loan

loss provisions and reserves. Loan over total assets is negatively related to bank profitability in between regression methodology (GLS) whereas it has significantly positive relationship with bank profitability when applied fixed effects methodology. In this case results from fixed effects methodology seem to be useful for understanding the development of bank performance.

Table 2.1

Empirical Evidence

Researcher	Title	Research Variable	Analysis Method	Research Result
Muhamad Muda, Amir Shaharuddin, Abdelhakim Embaya (2013)	Comparative Analysis of Profitability Determinants of Domestic and Foreign Islamic Banks in Malaysia	Dependent: ROE Independent: ***Bank Specific*:*** OHTA, LOTA, DTA, CRTA, LATA, TE, LOGTA, LOGAGE, ***Macroeconomic:*** GDPGR GDPPC, CONC, INF, GFC	The Generalized Least Square	• OHTA, LOTA, TE, GDPGR and LOGTA have a significant effect in determining domestic banks only. • GDPPC has a significant effect in profitability of only the foreign banks. • DTA, CRTA, INF and LOGAGE have a significant effect in determining banks' profitability of both domestic and foreign banks. • LATA and CONC are insignificant to both banks. • Profitability of domestic banks is affected by the global financial crisis while, the profitability of foreign banks is not affected. • Domestic Islamic banks are more profitable than foreign Islamic banks.
Azam and Siddiqui (2012)	Domestic and Foreign Banks' Profitability: Difference and	Dependent: ROA, ROE Independent: ***Bank Specific*:*** CAR, LOAN,	Multiple Regression	• CAR is insignificant on profitability for public and private sector. • CIR shows negative

	Their Determinants	NIM, CIR, LIQ (liquid asset/total asset), ADV (total advance/total deposit) ***Macroeconomic:*** INF (inflation), GDP		effect to profitability public and sector banks and positive insignificant to private banks. • LIQ is not significant for any sectors profitability • NIM shows a positive and significant effect on ROE for foreign sector • GDP is not affected for foreign banks ROE but it has affected the foreign banks ROA • INF affect foreign banks more than domestic banks. • Domestic banks are more profitable than foreign bank.
Muhamad Muda, Amir Shaharuddin, Abdelhakim Embaya (2013)	Profitability Determinants and the Effect of Global Financial Crisis: A Panel Data Analysis of Malaysian Islamic Banks	Dependent: ROA Independent: ***Bank Specific*:*** OHTA, LOTA, DTA, CONC, CRTA, LATA, TE, LOGTA, LOGAGE ***Macroeconomic:*** INF, DDF, GDPPC, GDPGR, GFC	The Random Effect Model (Panel Data)	• OHTA, LOTA, DTA, TE and bank size have a positive significant effect in ROA • INF has a negative significant on ROA. • CRTA, LATA, LOGAGE, GDPGR, GDPPC, CONC are insignificant to ROA.
Muhammad Bilal et al (2011)	Influence of Bank specific and Macroeconomic Factors on	Dependent: ROA, ROE Independent:***Bank Specific*:*** Deposit To Assets, Bank	Ordinary Least Square (OLS)	• Bank Size, Net Interest Margin, Industry Production Growth Rate have positive significant

	Profitability of Commercial Bank: A Case Study of Pakistan	Size, Capital Ratio, Net Interest Margin, and Non-Performing Loan ***Macroeconomic:*** Loans To Total Advances, Inflation, Real Gross Domestic Product and Industry Production Growth Rate		toward ROA and ROE. Non-Performing Loan to Total Advances have a negative significant towards ROA; meanwhile Real Gross Domestic Product has a positive significant towards ROA.
Pasiouras Fotios and Kyriaki Kosmidou (2007)	Factors Influencing the Profitability of Domestic and Foreign Commercial Banks in The European Union	Dependent: ROAA Independent: ***Bank-Specific*:*** EQAS, CIR, LOFUND, Size ***Macroeconomic*** INF, GDPGR, CONC, ASSGDP, MACPASS, MACGDP	Fixed Effect Model (FEM)	• EQAS have positive significant effect on ROA of domestic and foreign bank. • CIR, size have negative significant effect on ROA • INF and GDP has positive relation to ROA of domestic bank and showing negative sign to foreign bank.
Saovanee Chantapong (2003)	Comparative Study of Domestic and Foreign Bank Performance in Thailand: The Regression Analysis	Dependent: ROA, NIM Independent: NII/ta, o/ta, LP, LR, dummy crisis (dc)*	Fixed Effect Model (FEM) and Generalized Least Squares (GLS)	• Non Interest Income, Loan are positive significant to ROA • Loan loss reserve, overhead ratio are significant negative to ROA • Foreign banks' profitability in Thailand is better than domestic bank.

Source: Various journals (reviewed)

**Note: Nomenclature of variables above explained in the appendix 6.*

2.3. Hypotesis Conceptual

2.3.1. The Effect of Bank-Specific Determinants toward Bank Profitability

Bank-specific determinants (internal factors) are those that affect a banks management and policy decisions. There are several common internal explanatory (bank-specific) variables. As it is generally agreed that the main factor contributing to bank profitability is a higher quality management of resources, a closer examination of these variables is appropriate. This research use Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Non Performing Loan (NPL), and Cost to Income Ratio (CIR).

2.3.1.1. The Effect of Capital Adequacy Ratio (CAR) towards ROA

The Bankruptcy hypothesis states that more capitalized banks will be better off because they face lower costs of funding, and because a higher ratio allows banks to absorb any shocks that they may experience. Additionally, having a higher ratio allows banks to borrow less and invest more to support their profitable investment. Gavila et. al. (2009) conducted, although capital is expensive in terms of expected return, highly capitalized banks face lower cost of bankruptcy, lower need for external funding especially in emerging economies where external borrowing is difficult. This hypothesis research conducted by Sufian (2011) and Azzam and Siddiqui (2012) showed that the Capital Adequacy Ratio (CAR) has a positive effect on bank profitability (private sector and foreign sector).

***H_1**: CAR has a positive and significant effect on profitability (ROA) of bank*

2.3.1.2. The Effect of Loan to Deposit Ratio (LDR) towards ROA

In order to reduce the insolvency problems, bank will holds higher amount of liquid assets (lower LDR) which can be easily converted to cash (more liquid banks were found to have more cash on hand to finance their day-to-day operations). However, liquid assets usually have lower rates of return. Therefore, higher liquidity (lower LDR) would imply lower profitability. In other words, since the loan to deposit ratio is actually an inverse proxy for the liquidity, the higher the ratio, the higher is the bank profitability (Curak et al, 2011).

H_2:*LDR has a positive and significant effect on profitability (ROA) of bank*

2.3.1.3. The Effect of Non Performing Loan (NPL) towards ROA

Credit risk is one of the risks that arise due to the complexity of the banking activity and influence from environment situation such as the financial crisis that showed by the emergence of non-performing loan (NPL). This risk is accepted by the bank as one of the bank's business risk that appear when debtor cannot payback their loans granted by the bank, which means that the higher this ratio, the more worse credit quality banks that caused the greater number of non-performing loans and cause profit decline, meanwhile the declining ratio of NPL had reflected a better quality of their assets (Jha and Hui, 2012). This result is conducted by Roman and Tomuleassa (2012) which stated that the negative relationship of NPL indicates that banks with a high level of credit risk shows lower level profitability.

H_3:*NPL has a negative and significant effect on profitability (ROA) of bank*

2.3.1.4. The Effect of Cost to Income Ratio (CIR) towards ROA

Cost to Income Ratio (CIR) is used to measure the level of efficiency and the bank's ability to conduct its operations. The smaller the bank's CIR shows more efficiency in carrying out its business activities. That is shows that the measure of operational efficiency is negatively and significantly related to bank profitability. This result stands on line with the empirical results of Dietrich and Wanzenried (2011) in Switzerland in that the less costs you endure, the more efficient your bank is and thus more profitable, that is also supported by Pasiouras and Kosmidou (2007) who stated that an increase in these ratio reduces the profits of banks.

H_4:*CIR has a negative and significant effect on profitability (ROA) of bank*

2.3.1.5. The Effect of Loss Provision (LP) towards ROA

The ratio of loss provisions is a measure of a bank's credit quality. The loss provisions are reported on a bank's income statement. The high number of LP indicates that a financial asset is impaired, so that must be reserved in order not to incur losses for the bank in the form of NPLs. Also, a higher ratio indicates a lower credit quality and therefore, a lower profitability. This is supported by the resarch of Chantapong (2003) and Dietrich and Wanzenried (2014). Thus, we expect a negative effect of the loss provisions on bank profitability.

H_5:*LP has a negative and significant effect on profitability of bank*

2.3.2. The Effect of Macroeconomic Determinants toward Bank Profitability

2.3.2.1. Effect of NIM Sensitivity on GDP towards ROA

NIM sensitivity on GDP used for proxies of macroeconomic variable as data variabilities, because when using only research data of GDP, those data become the same and do not vary on each bank, given the macroeconomic variables are variables the same for every cross section. Sensitivity is proxied with macroeconomic variables according to Financial Note and RAPBN 2014, due to partial sensitivity analysis used to see the difference effect of macro assumption variable, with assuming macroeconomic variables other assumptions unchanged (ceteris paribus). Effect of changes in the sensitivity of Net Interest Margin (NIM) to GDP reflects how the percentage change in Net Interest Margin (NIM) is affected (caused) by the percentage change in the level of GDP.

According to Roman and Tomuleasa (2012), if GDP growth is high, the loan request increases and thus the banks can obtain bigger interest margin. Increasing and decreasing in Gross Domestic Product is also affecting clients saving their money in banks, in other words has a positive effect on consumers because it can increase the earnings and savings patterns of the banking company (Anggraini, 2013). On the contrary, if the GDP growth slows, the banks are confronted with an increased credit risk, increasing provisions and subsequently the profitability is reduced. Furthermore, as cited by Garza (2010), Bernanke and Gentler (1990) suggest

that an increase in economic activity (showed by economic growth/GDP), increases the net worth of borrowers, thus, reducing the interest rate spread. With regards to the interest spread, the main method is by charging interest on the amounts of money the bank lends out to customers. The bank profits from the difference between the level of interest pays for deposits and other sources of funds, and the level of interest charges in its lending activities. The more interest income generated relative to the interest expense, the more profit the bank eventually makes (Lartey et al., 2013).

H_6:*NIM Sensitivity on GDP has a positive and significant effect on profitability (ROA) of bank*

2.3.2.2. Effect of NIM Sensitivity on Inflation towards ROA

Effect of sensitivity of Net Interest Margin (NIM) changes to the level of inflation reflects how much percentage of NIM change is affected (caused) by the percentage change of inflation. Inflation rate (INF) is defined as a sustained general rise in prices in an economy whereby a high inflation rates is associated with higher costs. But as suggestion by Perry (1992) as cited by Sufian (2011) and Pasiouras and Kosmidou (2007), the effects of inflation on the profitability of a bank depend on whether the inflation is anticipated or unanticipated. In the anticipated case, the interest rate are adjusted accordingly, thereby causing revenues to increase faster than costs and to subsequently positively effect bank profitability.

On the other hand, in the unanticipated case, banks may be slow in adjusting their interest rates, resulting increasing of banks' costs that is faster

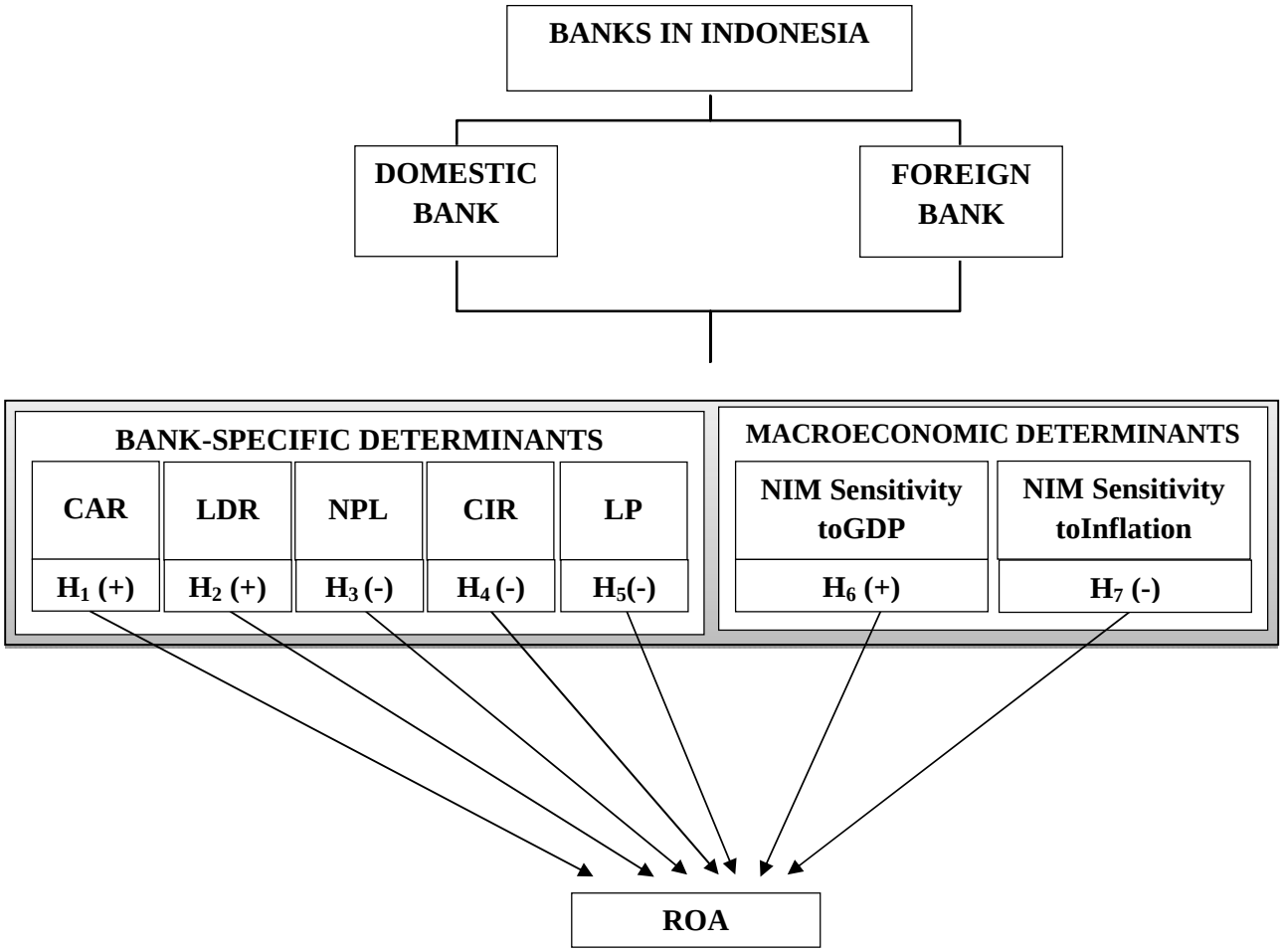
than bank revenues and consequently having a negative effect on bank net interest margin. But nowadays, when crisis can occur uncertainty condition, inflation rate is become more unanticipated. In other words, in anticipated case, when inflation rises, BI will anticipated it by increasing BI rate. In addition, Fisher (1867-1947) has linked inflation (macroeconomic factor) with interest rate which is called the Fisher Effect theory. The definition of Fisher effect is the one-for-one adjustment of the nominal interest rate to the expected inflation. This increase is responded by banks by raising interest rates of loan higher than interest rate of deposits. But this could have responded negatively, especially if banks change the amount of credit. This condition assessed will lead to slowing the rate of bank credit that may reduce net interest margin which then have an effect on bank profitability.

H_7:*Sensitivity NIM toINF has a negative and significant effect on profitability of bank*

2.4. Framework of Theory

Figure 2.1

Framework of Theory



Sources: Ali et al., (2011), Sufian (2011) and Azzam and Siddiqui (2012), Curak et al (2011), Jha and Hui (2012), Roman and Tomuleassa (2012, Anggraini (2013), Bernanke and Gentler (1990), Perry (1992), Pasiouras and Kosmidou (2007)

CHAPTER III

RESEARCH METHOD

3.1. Research Variables and Operational Definitions

3.1.1. Research Variables

Research variables used in this study consists of two types of variables: independent variables (X), and the dependent variable (Y). These variables are used to determine whether the factors that influence the performance (profitability) of domestic banks and foreign banks in Indonesia in the period Q1 2010-Q4 2013.

1. The independent variable (X) is the variable whose value affects the dependent variable. The independent variables in this study are:
   a. Capital Adequacy Ratio (CAR)
   b. Loan to Deposit Ratio (LDR)
   c. Non Performing Loans (NPL)
   d. Cost to Income Ratio (CIR)
   e. Loss Provision (LP)
   f. Net Interest Margin (NIM) Sensitivity to Gross Domestic Product (GDP)
   g. Net Interest Margin (NIM) Sensitivity to Inflation

2. The dependent variable (Y) is a variable whose value is affected or which become due to the presence of independent variebel. The variable in this study is profitability proxied by Return on Assets (ROA).

3.1.2. Operational Definitions

3.1.2.1. The Dependent Variable (Y)

3.1.2.1.1. Return on Asset (ROA)

Return on Assets ratio (ROA) is used to measure the ability of the company in its efforts to obtain the advantage of using assets owned. ROA is the ratio of profit before tax to average total assets. Under the provisions of the Bank of Indonesia, stated in Bank Indonesia Circular Letter No. 12/11/DPNP dated March 31, 2010, ROA mathematically formulated as follows:

$$ROA = \frac{Profit\ Before\ Tax}{Average\ of\ Total\ Assets} x100\%$$

3.1.2.2. The Independent Variables (X)

3.1.2.2.1. Capital Adequacy Ratio (CAR)

Capital Adequacy Ratio (CAR) is a ratio that shows how much the entire risky bank assets (loans, investments, securities, bills of other banks) financed from the bank's own capital funds, in addition from obtaining funds from sources outside banks, such as public funds, loans, and others (PBI, 2008). CAR has been adjusted to the provisions of Regulation No. 12/11/DPNP/2010 March 31, 2010 regarding the Capital Adequacy of Commercial Banks, as follows:

$$CAR = \frac{Capital}{Risk\ Weighted\ Assets} \text{ x } 100\%$$

3.1.2.2.2. Loan to Deposit Ratio (LDR)

Loan to Deposit Ratio defined as bank's ability to repay the withdrawal of funds by depositors to rely on loans as a source of liquidity, or in other words, to explain about how far to extend credit to customers to offset the bank's obligation to immediately meet the demands of depositors who want to withdraw funds that have been disbursed by the bank in the form of loans (Rival, et al, 2013).

Loan to Deposit Ratio (LDR) can be measured as follows:

$$LDR = \frac{Credit}{Third\ Party\ Funding} x100\%$$

3.1.2.2.3. Non Performing Loans (NPL)

Non-Performing Loan (NPL) is a ratio that arise due to the complexity of the banking activity and influence from environment situation which cause credit risk. This risk is accepted by the bank as one of the bank's business risk that appear when debtor cannot payback their loans granted by the bank, with significant exposure levels, the inability of the debtor to pay a small portion can deliver on its obligations insolvent. NPL ratio measured as follows:

$$NPL = \frac{(Substandard, Doubtful\ and\ Loss\ Credit)}{Total\ Credits} \text{ x } 100\%$$

3.1.2.2.4. Cost to Income Ratio (CIR)

Cost to Income Ratio (CIR) is used to measure the level of efficiency and the bank's ability to conduct its operations by managing operational expense toward its income expense. CIR is measured as follows:

$$CIR = \frac{Operation\ Expense}{Operation\ Income} \text{ x } 100\%$$

3.1.2.2.5. Loss Provision (LP)

Loss provision (LP), is the allowance/provision established when the carrying value after impairment of financial assets is less than the initial carrying value (BI Regulation (PBI) No. 14/15/PBI/2012). In other words, Loss Provision is a provision that has been calculated from the amount of impairment loss on financial assets evaluated individually or collectively. The calculation of LP is as follows:

$$LP = \frac{Allowance\ for\ Impairment\ of\ Financial\ Asset}{Total\ Productive\ Assets} x100\%$$

3.1.2.2.6. Net Interest Margin (NIM) Sensitivity to Gross Domestic Product (GDP)

NIM sensitivity on GDP used for proxies of macroeconomic variable as data variabilities, because when using only research data of GDP, those data become the same and do not vary on each bank, given the macroeconomic variables are variables the same for every cross section in a year. Effect of changes in the sensitivity of Net Interest Margin (NIM) to GDP reflects how the percentage change in Net Interest Margin (NIM) is

affected (caused) by the percentage change in the level of GDP. The calculation of this ratio is as follows:

$$SENSI_{GDP} = \frac{\%\Delta NIM}{\%\Delta GDP} = \frac{\Delta NIM}{\Delta GDP} x \frac{GDP_{t-1}}{NIM_{t-1}}$$

3.1.2.2.7. Net Interest Margin (NIM) Sensitivity to Inflation

Effect of sensitivity of Net Interest Margin (NIM) changes to the level of inflation reflects how much percentage of NIM change is affected (caused) by the percentage change of inflation.

$$SENSI_{INF} = \frac{\%\Delta NIM}{\%\Delta INF} = \frac{\Delta NIM}{\Delta INF} x \frac{INF_{t-1}}{NIM_{t-1}}$$

Based on the description above, can be summarized in the following table 3.1.

Table 3.1
Operational Definitions of Variables

No	Variables	Explanation	Calculation
1	Return on Assets (ROA)	Ratio of profit before tax to average total assets	$ROA = \frac{Profit\ Before\ Tax}{Average\ of\ Total\ Assets} x x100\%$
2	Capital Adequacy Ratio (CAR)	The ratio shows how much of the total assets of banks that contain risks (credit, investment, securities, bills of other banks) financed part of its own capital in addition to obtaining funds from sources outside the bank.	$CAR = \frac{Capital}{Risk\ Weighted\ Assets} \text{x } 100\%$
3	Loan to Deposit Ratio (LDR)	Comparison between credit provided by the bank with the third party managed funds deployed by the bank.	$LDR = \frac{Credit}{Third\ Party\ Funding} x1x100\%$
4	Non-Performing Loan (NPL)	The ratio of substandard, doubtful and loss credit to total credits distributed by bank	$NPL = \frac{(Substandard, Doubtful\ and\ Loss\ Credit)}{Total\ Credits} \text{x } 100\%$
5	Cost to Income Ratio (CIR)	Ratio of bank to conduct its operations by managing operational expense toward its income expense	$CIR = \frac{Operation\ Expense}{Operation\ Income} \text{x } 100\%$
6	Loss Provision (LP)	Provision established when the carrying value after impairment of financial assets is less than the initial carrying value	$= \frac{Allowance\ for\ Impairment\ of\ If\ Financial\ Asset}{Total\ Productive\ As:Assets} xx100\%$
7	NIM Sensitivity to GDP (SENSI_GDP)	The ratio of percentage change in Net Interest Margin (NIM) caused by the percentage change in Gross Domestic Product (GDP)	$SENSI\_GDP = \frac{\Delta NIM}{\Delta GDP} x \frac{GDP_{t-1}}{NIM_{t-1}}$
8	NIM Sensitivity to Inflation (SENSI_INF)	The ratio of percentage change in Net Interest Margin (NIM) caused by the percentage change in Inflation (INF)	$SENSI\_INF = \frac{\Delta NIM}{\Delta INF} x \frac{INF_{t-1}}{NIM_{t-1}}$

Source: Rivai et al (2013), Bank Indonesia Circular Letter No. 12/11/DPNP/2010

3.2. Population and Sample

The population used in this study is all commercial banks operating in Indonesia during the quarterly period 2010-2013 (all banks except for Rural Development Bank (BPD) and Islamic bank). Samples were taken by purposive sampling, the sampling method is based on the subjective judgment of researchers, where there are requirements that have to be made as the criteria that must be met by the sample to obtain a representative sample (Sugiyono, 2004). The reason for the limited use of this method of data access so that not all researchers can access the data bank. Sample selection criteria are as follows:

1. Commercial banks which registered in BI and still operating in the period of study (Q1 2010-Q4 2013).
2. Commercial banks which provide complete annual reports and quarterly finance ratio according to variables used in this study.
3. Commercial banks which have a clear ownership structure.

Rural Development bank is not taken into sample is due to its characteristic, which is owned by local governments, which generally only operate in a certain region. Meanwhile, islamic bank were exluded from the sample becuse it has different system and structure from conventional bank, so it needs different treatment.

As procedure for the determination of the sample is as follows.

Table 3.2

Sample Determination Procedures

No	Sample Criteria	Total
1	Commercial banks which registered in BI and still operating in the period of study (Q1 2010-Q4 2013).	131
2	Excluded Islamic Banks	-11
3	Excluded Rural Development Banks	-26
4	Excluded bank which not provide complete financial statements and quarterly finance ratio according to variables used in this study (Q1 2010-Q4 2013).	-77
Total banks include into sample		27
5	Split into subsample based on ownership (50% or more share owned by foreign include into foreign bank)	Domestic= 13 Foreign= 14

Source: Bank Indonesia, Published Financial Statement of each bank, processed (the sample explanation is attached on Appendix 1)

3.3. Data Resource

The data used in this study is secondary data in the form of panel data. Data of this type are readily available and widely spread in various sources. The secondary data in this study was in the form of financial ratios, which include Return on Asset (ROA), Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Non-Performing Loan (NPL), Cost to Income Ratio (CIR), Loss Provision (LP), NIM (Net Interst Margin) obtained from published financial statements quarterly period Q1 2010 to Q4 2013, which is issued by each bank from their website. While Gross Domestic Product (GDP) and inflation data obtained through the Central Bureau of Statistics through www.bps.go.id, which is then calculated through a formula that has been provided so that the NIM sensitivity values obtained to be the macroeonomic variables for each bank.

3.4. Data Gathering Method

The data collected in this study is secondary data so that data collection methods used by non participant observation. Data collection was done through literature by examining the literature books, journals, theses, thesis, and other sources related to the study to obtain a comprehensive theoretical foundation related to Indonesian Banks. In addition, data was also obtained by exploring the financial statements of each banks sample. The financial statements are explored, namely the balance sheet, income statement, asset quality, capital adequacy calculation, and calculation of financial ratios in the quarterly financial statements published by the respective Commercial Bank and the Bank Indonesia official website.

3.5. Analysis Method

This research used a quantitative analysis using panel data as secondary data, so the analysis is conducted panel data regression. Panel data regression is a regression technique where the data used is a combination of time series and cross section (Widarjono, 2013). According to Gujarati (2003) as cited by Ghozali (2013), panel data provide advantages over the standard approach of cross section and time series only, including:

1. Provide more informative data, more varied, the lower level of the collinearity among variables, higher degree of freedom, and more efficient.
2. Able to detect and measure the influence that the data can not be observed through the pure time series or pure cross section.

3. Panel data allows us to study the behavior of the model more complex and more heterogeneous. And many more advantages stated by the experts.

Panel data regression model incorporating elements of cross section and time series in the equation. When the unit cross section has the same number with the observation time series of data is called a balanced panel. When the number of observations differs between members of the panel it is called unbalanced panel. The data used in this study is a balanced panel of data.

Widarjono (2013) said that the estimation of the panel regression model depends on the assumptions made the intercept, slope coefficients and error term (Ɛ). Some assumptions that arise are as follows:

1. Intercept and the slope coefficient is fixed over time and individuals as well as differences in the intercept and slope explained by disturbance variables.
2. Slope is fixed, but the intercept is different between individuals.
3. Slope is fixed, but the intercept vary both between time and between individuals.
4. Intercept and slope to vary between individuals.
5. Different intercept and slope over time and between individuals.

Under the assumptions mentioned above, there are three methods commonly used to estimate the panel data regression model. The model is the Pooled Ordinary Least Squares (Common Effect Model), Least Squares Dummy Variable (Fixed Effect Model), and The Random Effect Model.

3.5.1. Estimation Model of Panel Data Regression

3.5.1.1. Common Effect Model (Pooled Ordinary Least Square)

Common effect is the simplest technique in estimating panel data regression model. In this method, a combination of time series data and cross section combined away without seeing the difference between the time and the individual, in other words the fixed coefficient between time and individual. In the approach is also called the pooled ordinary least squares, the behavioral data between the same company in different periods so that the dimensions of the individual and time are not considered (Widarjono, 2013). Common effect regression model in this study are as follows:

$$ROA_{it} = \beta_{1i} + \beta_2 CAR_{it} + \beta_3 LDR_{it} + \beta_4 NPL_{it} + \beta_5 CIR_{it} + \beta_6 LP_{it} + \beta_7 SENSI\_GDP_{it} + \beta_8 SENSI\_INF_{it} + u_{it} \quad (3.1)$$

Where:

β = slope coefficient

i = cross section unit (domestic and foreign banks)

t = period of time (Q1 2010 – Q4 2013)

3.5.1.2. Fixed Effect Model (Least Square Dummy Variables)

In common effect technique assumes that the intercept and the slope is the same across both time and company. However, that assumption is far from the actual reality. There will be differences between the characteristics of the company, for example, corporate culture, managerial style, intensive systems, and so on. The way to know the difference is to assume that the intercept is different between firms while the slope remains

the same between companies. Fixed effects regression model assumes the existence of differences in the intercept by adding the subscript i in the equation.

Fixed Effect models is a technique of estimating panel data using a dummy variable to capture the differences in the intercept. Fixed effect model is often referred to as the technique Least Squares Dummy Variables (LSDV). Fixed effect model with dummy variables technique in this study can be written as follows:

$$ROA_{it} = \alpha_1 + \alpha_2 D_{2i} + \alpha_3 D_{3i} + \cdots + \alpha_n D_{ni} + \beta_2 CAR_{2it} + \beta_3 LDR_{3it} + \beta_4 NPL_{4it} + \beta_5 CIR_{5it} + \beta_6 LP_{6it} + \beta_7 SENSI_{GDP\,7it} + \beta_8 SENSI_{INF\,8it} + u_{it} \quad (3.2)$$

In this study, there were 13 domestic banks and 14 foreign banks, so to make the bank dummy variables excluded one bank from each subsample to be regarded as a benchmark or reference category. So there will be 12 dummy variables from domestic banks and 13 dummy variables from foreign banks. Example Bank Rakyat Indonesia (from domestic bank) and Bank OCBC NISP (from foreign bank) excluded from sample to be taken as benchmark. So the explanation is as follows:

From domestic banks:

α_1 = intercept for BRI

α_2- α_n = differential intercept coefficient which show how much intercept value differs from intercept of BRI

D_{2i} = 1 for Bank Bumi Artha and 0 for another domestic bank

D_{3i} = 1 for Bank Central Asia, 0 for another domestic bank, etc until D_{12i}

Meanwhile from foreign bank:

α_1 = intercept for BNISP

α_2- α_n = differential intercept coefficient which show how much intercept value differs from intercept of BNISP

D_{2i} = 1 for Bank CIMB Niaga, 0 for another foreign banks

D_{3i} = 1 for Bank ICB Bumiputera, 0 for another foreign banks, etc until D_{13i}

3.5.1.3. Random Effect Model (Error Correction Model)

Dummy variables are used to represent ignorance about the actual model, but it can effect on the reduction of degrees of freedom (degree of freedom), which in turn reduces the efficiency parameters. So the problem is resolved by using a disturbance variable (error terms) or a technique known as random effect. The basic idea is to start with equation (3.1):

$$ROA_{it} = \beta_{1i} + \beta_2 CAR_{it} + \beta_3 LDR_{it} + \beta_4 NPL_{it} + \beta_5 CIR_{it} + \beta_6 LP_{it} + \beta_7 SENSI\_GDP_{it} + \beta_8 SENSI\_INF_{it} + u_{it} \quad (3.1)$$

Instead of treating β_{1i} as fixed, we assume that it is a random variable with mean value of β_1 (no subscript *i*). The intercept value for an individual bank can be expressed as:

$$\beta_{1i} = \beta_1 + \varepsilon_i \quad (3.3)$$

where ε_i is a random error term with a mean value of zero and a variance of σ_ε^2. Then substituting equation (3.9) and (3.10) to obtain equation:

$$ROA_{it} = \beta_1 + \beta_2 CAR_{it} + \beta_3 LDR_{it} + \beta_4 NPL_{it} + \beta_5 CIR_{it} + \beta_6 LP_{it} + \beta_7 SENSI\_GDP_{it} + \beta_8 SENSI\_INF_{it} + w_{it} \quad (3.4)$$

where:

$$w_{it} = \varepsilon_i + u_{it} \quad (3.5)$$

The composite error term w_{it} consists of two components: ε_i, which is the cross section or individual-Specific, error component, and u_{it}, which is the combined time series and cross-section error component, where error term w is homoscedastic. The usual assumptions made by REM are that the individual error components are not correlated with each other and are not autocorrelated accross both cross section and time series unit (Gujarati, 2009).

3.5.2. The Selection of Model Analysis Method

There are three tests that are used to determine the most appropriate technique for estimating the panel data regression (Widarjono, 2013). The first is manual F-statistical test or by Eviews8 program through Likelihood Ratio test (Redundant Fixed Effect Test), used to choose between Common Effect Model (Ordinary Least Square) or Fixed Effect Model (Least Square Dummy Variable). Second, the Lagrange Multiplier test (LM) is used to choose between Common Effect Model (OLS) or Random Effect Model (Error Component Model). Third, Hausman test was used to choose between the Fixed Effect Model or Random Effect Model.

3.5.2.1. Common Effect or Fixed Effect Model

F-statistic test is done to examine whether in panel data regression, Fixed Effect is better than panel data regression model without dummy variable (Common Effect) by looking for the value of Sum of Squared Residual (SSR). The equation of F-statistic test is as follows:

$$F = \frac{SSR_R - SSR_U / q}{SSR_U / (n-k)}$$

where:

SSR_R = Sum of squared residuals of common effect model estimation result

SSR_U = Sum of squared residuals fixed effect model estimation result

q = Number of common effect model (CEM) restriction

n = Number of observations

k = Number of parameters in the Fixed Effect Model (FEM)

F-statistic values compared with the F-statistic critical degrees of freedom (df) for the numerator and q as many as n - k for denumerator. If the F-statistic is greater than the F-critical, then used a Fixed Effect Model. If the F-statistic smaller F-critical, then the Common Effect Model was used.

Likelihood Ratio test is a test conducted by Eviews8 to simplify the selection between Common Effect Model and Fixed Effect Model. The hypothesis of this test is as follows:

H_0: Fixed Effect model is equal to Common Effect.

H_1: Fixed Effect model is better than Common Effect.

In other words, if the value of F is significant, it means that Fixed Effect model is better than Common Effect (Ghozali, 2013).

3.5.2.2. Fixed Effect (FEM) or Random Effect Model (REM)

Hausman test is used to examine which model fit the best among Fixed and Random Effect. This test is done by comparing chi-square (x^2) statistic with x^2-critical value on the degree of freedom (*df*) as many as the amount of independent variables (*k*) (Widarjono, 2013). Hypothesis used in Hausman test is:

H_0 : Random Effect Model

H_1 : Fixed Effect Model

If the value of chi-square (x^2)-statistic is bigger than x^2-critical, so the best model is Fixed Effect, and vice versa. The result estimation also can be seen from the significance of probability. If it shows significance probability, it means that Fixed Effect Model is chosen, and vice versa (Ghozali, 2013).

3.5.2.3. Common Effect (CEM) or Random Effect Model (REM)

This test is used to determine whether the random effect models better than the OLS method using Lagrange Multiplier test (LM). Significance test is based on the random effect of the residual value of the OLS method. Calculating the value of LM can be written as follows:

$$LM = \frac{nT}{2(T-1)}\left(\frac{\sum_{i=1}^{n}(T\bar{e}_{it})^2}{\sum_{i=1}^{n}\sum_{t=1}^{T}\hat{e}_{it}^2} - 1\right)^2$$

Where:

n = Number of individu

T = number of time period

$\hat{e}$ = residual of CEM.

LM test based on the chi-squares distribution with degree of freedom for the number of independent variables. If the value of the LM-statistic greater than the critical value of chi-squares, then the proper estimation for panel data regression model is the random effect method than OLS (common effect). So is the contrary if the value of the LM-statistic is smaller than the value of chi-squares as a critical value, then it can not be used estimates of random effect, but using OLS (common effect).

3.5.3. Normality Test

Normality test aims to test whether in the regression model, residual variable has a normal distribution. If this assumption is not met, then the statistical test results become invalid (Ghozali, 2013). Detection of normality to see the spread of the data (dots) on the diagonal axis of the graph through the normal graphs P - P plots. Basis for decision making is if the points (gradient between the observations and the cumulative probability of cumulative expectancy) are along the line, the residuals follow a normal distribution (Nachrowi and Usman, 2006).

To ensure normality test results obtained from the graph, then used the Kolmogorov-Smirnov test. The advantage of this test is because it does not lead to a difference in perception as to the normality test results with graphs. The basic concept of the Kolmogorov-Smirnov test was to compare the distribution

of the data to be tested with the standard normal distribution normality. Like the regular test, if the significance below 0.05 means that there are significant differences with the standard normal data, and if significance above 0.05 means that there is no significant difference with the standard normal data. In multivarians data normality test performed on the residual results.

3.5.4. Classical Assumption Test

3.5.4.1. Multicollinearity Test

Multicollinearity is an existence of a perfect or exact linear relationship among explanatory variables of a regression model (Gujarati, 2009). According to Ghozali (2013), multicollinearity test can be done by looking at the value of Varian Inflation Factor (VIF) and Tolerance. This value is calculated using the value of R-square (R^2) auxiliary regression. Auxiliary regression is a regression performed between one independent variable with other independent variables remaining. Mathematically, VIF can be written as follows (Widarjono, 2013):

$$\text{VIF j} = \frac{1}{(1-Rj^2)}$$

Where R_j^2 is R^2 obtained from auxiliary regression between independent variabels with the rest of independent variables (*k-1*). When R_j^2 approaching one or in other words there are collinearity between the independent variables, the VIF will rise and approach infinity if the value R_j^2=1. If VIF enlarged, models allegedly contains multicollinearity. Multicollinearity is said to occur if the VIF value exceeding 10, as R_j^2 more than 0.90.

To detect multicollinearity problems in multiple regression models can also use the value of tolerance. Value of tolerance (TOL) can be written as follows:

$$TOL = (1-R_j^2) = \frac{1}{VIF}$$

If $R_j^2 = 0$ means there is no collinearity between the independent variable is equal to 1 then TOL Conversely, if the value $R_j^2 = 1$ means there is collinearity between the independent variables, the value of TOL is equal to zero.

3.5.4.2. Heteroscedasticity Test

Heteroscedasticity test aimed at testing whether the regression model of the residual variance inequality occur one other observation to observation. A good regression model according to Gujarati (2009) is the homoscedastic. Homoscedasticity assumption assume that the disturbance term (error term e_i) have a mean value of zero, variance of each disturbance term is some constant number equal to σ^2 (equal variance) and not correlated with each other individually (Widarjono, 2013). Detection of heteroscedasticity problem in this research is done by using a test developed by Glejser. Glejser test conducted by regressing equation between residual absolute value with independent variables in the model (Widarjono, 2013). The equation regression for this test is as follows:

$$|\hat{e}_i| = \beta_0 + \beta_1 CAR_{i1} + \beta_2 LDR_{i2} + \beta_3 NPL_{i3} + \beta_4 CIR_{i4} + \beta_5 LP_{i5} + \beta_6 SENSI\_GDP_{i6} + \beta_6 SENSI\_INF_{i6} + v_i$$

The decision presence or absence problem of heteroscedasticity test based on statistical estimator β. If β is not significant by t-test it can be concluded there is no heteroscedasticity because residual variance does not depend on the independent variables. Conversely, if β is statistically significant by t-test then the model contains elements of heteroscedasticity, because the size of the residual variance is determined by the independent variable. Glejser test procedure can be written as follows:

1. Regression to existing models with OLS and then get a residual.
2. Absolute regression residuals against the independent variables.
3. If the t-statistic <t critical value table, then there is no heteroscedasticity
4. If the t-statistic> critical value table t, then there is heteroskedasticity

3.5.4.3. Autocorrelation Test

Autocorrelation test aims to test whether in a linear regression model occur correlation between the residuals (errors confound) in the period before (t-1). Autocorrelation arises because sequential observations over time are related to each other and regression models that are good that do not contain autocorrelation. Whether there is a problem of autocorrelation in the regression model can be test through the Durbin-Watson test (DW). This test compares the value of DW-statistic with the DW-critical value of the Durbin-Watson table. If the value of du < DW-stat < 4-du, then there is no autocorrelation in the regression model.

Table 3.3

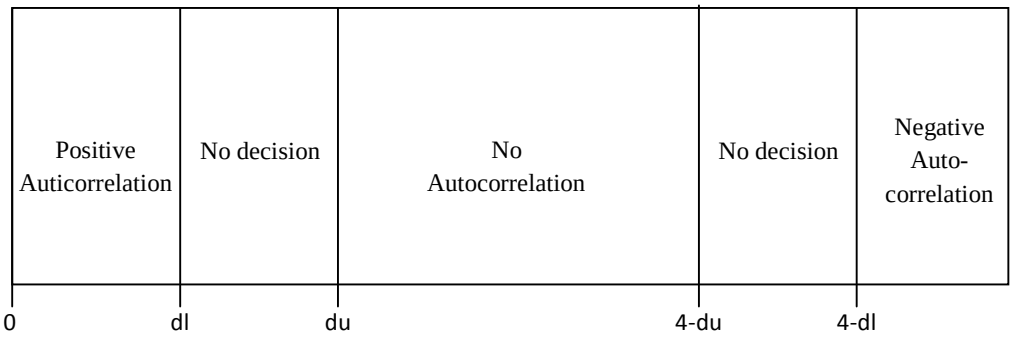
Durbin Watson Statistic Test

Null Hypothesis	Decision	If
No positive autocorrelation	Reject	$0 \leq d \leq dl$
No positive autocorrelation	No decision	$dl = d = du$
No negative autocorrelation	Reject	$4 - dl \leq d \leq 4$
No negative autocorrelation	No decision	$4 - du = d = 4 - dl$
No positive or negative autocorrelation	Not rejected	$du \leq d \leq 4 - du$

Source: Ghozali, 2013

Figure 3.1

The Decision Taking of Autocorrelation Test



Source: Widarjono, 2013

3.5.5. Goodness of Fit Test (Statistic Test)

3.5.5.1. Coefficient Determination (R^2) and Adjusted R^2 Test

The coefficient of determination (R^2) was essentially measures how far the ability of the model to explain variation in the dependent variable. Determination coefficient is between zero and one. Small value of R^2 means the ability of the independent variables in explaining variation in the

dependent variable is very limited. Value close to one means that the independent variables provide almost all the information needed to predict the variation in the dependent variable (Ghozali, 2013).

The fundamental weakness using the coefficient of determination is biased against the number of independent variables that entered into the model. Every additional one independent variable, then R^2 must increase, no matter whether these variables significantly influence the dependent variable or not. Therefore, the value of Adjusted R^2 is used when evaluating where the best regression model. Adjusted R^2 value can be negative, although desired to be positive. If the empirical tests obtained adjusted R2 value is negative, then the adjusted R^2 value is considered zero. Mathematically, if the value of R^2 = 1, then the adjusted R^2 = R^2 = 1, while if the value of R^2 = 0, then the adjusted R^2=(1-*k*)/(*n*-*k*). If *k*>1, then the adjusted R^2 is negative.

3.5.5.2 Simultaneous Significance Test (F-Statistic Test)

F-statistical test basically shows whether all the independent variables included in the model have simultanously influence on the dependent variable (Ghozali, 2013).

This test is done by comparing the value of F-statistic with the F-critical value in the F distribution table, the following decisions were taken:

1. If the value of the F-statistic is greater than the value of the F-critical, then H_0 is rejected and H_a is not rejected. This means that the independent variables have a significant effect simultaneously on the dependent variable.

2. If the value of the F-statistic is smaller than the F-critical value, then H_0 is not rejected and H_a rejected. This means that the independent variables simultaneously have no significant effect on the dependent variable.

3.5.5.3. Individual Parameter Significance Test (Statistical t-Test)

Ghozali (2013), states that the statistical t-test basically shows how much influence an individual independent variable in explaining variation in the dependent variable. To test this hypothesis t test was used to compare the value of the t-statistic with the critical t-value of the t distribution table, the following decisions were taken:

1. If the value of the t-statistic greater than the value of the F-critical then H_0 is rejected and H_a is not rejected. This means that the independent variables have a significant effect on the dependent variable individually.
2. If the value of the t-statistic is smaller than the critical t-value, then H_0 is not rejected and Ha rejected. This means that the independent variables do not individually have a significant influence on the dependent variable.