

THE DETERMINANTS OF BANK LOAN PROVISION  
IN MALAYSIA

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## DECLARATION

We hereby declare that:

- (1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.
- (2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.
- (3) Equal contribution has been made by each group member in completing the research project.
- (4) The word count of this research report is 13110.

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## **PREFACE**

This research paper is submitted in partial fulfillment of the requirement for Bachelor of Business Administrations (Hons) Banking and Finance. The supervisor on this project is Ms Lu Ming Pey. The final year project (FYP) is made only by the authors but it is based on other researches and the resources are quoted as in references.

This paper is conducted under the title of “The Determinants of Bank Loan Provision in Malaysia”. There are so many studies concluded on this topic by the past researches but yet, there are only a few researches that talked about this topic in Malaysia. Thus, this motivates us to conduct this paper.

In the context of banking applications in this paper, students are expected to be able to have a better understanding in banking industries even more.

## **ABSTRACT**

The main purpose of this paper is to analyze the determinants of bank loan provisions in Malaysia. A total of 9 commercial banks are chosen to represent the commercial banks in Malaysia during the time line from 2003 to 2011. The variables which have been chosen for this research are gross domestic product (GDP), earnings before tax and provision (EBTP), bank size, non-performing loan (NPL), market lending rate, equity ratio, total loan.

After running these data on the data analysis software which uses Panel Least Square regression (PLS), it is found that GDP and market lending rate are insignificant variables while the other five variables are significant in determining the bank loan provision in Malaysia.

### LIST OF ABBREVIATIONS

LLP	Loan Loss Provision
GDP	Gross Domestic Product
BS	Bank Size
EBTP	Earnings before Tax and Provision
NPL	Non-Performing Loan
MLR	Market Lending Rate
EAR	Equity Ratio
TL	Total Loan

## **CHAPTER 1: RESEARCH OVERVIEW**

### **1.0 Introduction**

The purpose of conducting this paper is to investigate the internal and external factors that will affect the decisions of banks loan loss provision. The first chapter of this paper covers the introduction of loan loss provision, risk weighted capital adequacy framework and overview of loan loss provision. Then it will be continued with the problem statement, research objectives, research questions, hypotheses of the study, significance of the study, chapter layout and conclusion.

### **1.1 Research Background**

#### **1.1.1 Introduction of Loan Loss Provisions**

During the last decade, many financial crises have been happening in the developing countries due to the lack of a stable macroeconomic environment, a well-organized legislative-administrative structure, and a perfect surveillance-supervision system (Duvan & Yurtoglu, 2004). At the same time, bank failures happened from time to time and the rate of bank failures around the world has been increasing significantly over the last several years. The examples of the biggest banks failure are Washington Mutual, Indy Mac Bank, Colonial Bank, Bank United and others.

Banks are in the business of using the funds provided by the depositors to make loan to borrowers and loans comprise a large part of the banking business. The loans can be short term, medium term or long term. Short term loan usually has a maturity of one year or less; medium term loan has maturity of one to three years and long term loan usually has a maturity of three to ten years. Loans can be repaid in the form of installments spread over a period of time or in a lump sum amount and there is an interest charged on the amount that lent out to the customers. Loans are normally secured against tangible assets of the company.

However, lending entails assuming the risk that some loans would not be collected back which are known as default debts. Asian financial, US sub-prime and Euro debt crisis and consequences have increased the default loans among the commercial banks. Hence, banks are required to create a cushion against the possibility of the future unexpected and expected loan losses in order to safeguard against financial risks that the banks face and to protect the banks and country from bankruptcy. In principle, loan loss provisions are widely used by the commercial bank managers to manage the risk exposure that may occur in their lending and financing activities. Commercial bank managers need to estimate the losses that will inherent in a bank's loan portfolio at a given moment of time and set aside as a loan loss provision for this likelihood in order to guarantee a bank's solvency and capitalization if and when the loan defaults occur. The loan loss provision will be charged to the banks' profit and loss statements that creates a reserve on their balance sheets. Ideally, the amount of the loan loss provision should be proportional to the riskiness of the loans that offered by the banks and the overall strength of the economy. However, federal bank and securities regulators recognize that the provisions cannot accurately match the actual losses (Montgomery, 1998).

In the wake of the Asian financial crisis, many Asian central banks and supervisory authorities have reinforced their approaches to loan loss



provisioning, as well as prudential supervision. This has helped in constructing a stronger banking system in the region. (Angklomliew, George & Packer, 2009). According to Betty and Liao (2009), loan loss provisioning policy is a great importance for the banks as it is critical in assessing the soundness of the banking sector's financial system and it is a key determinant of bank's earnings and capital positions, which has a bearing on banks' supply of credit to the economy. There are no internationally-adopted standards for loan loss provisions. The quality and quantity limits of provisioning requirement will be differed in each country (Pinho & Martins, 2009). Thus, each country must follow the rules of loan loss provisions set by bank regulators. In Malaysia, all the commercial banks are obligatory to disclose the amount of the loan loss provisions in their profit and loss accounts, which will decrease the pre-tax earnings.

Prior studies indicated that loan loss provisions were used for the purpose of earning management which aiming of earning from loan instead of safety of bank (Ahmed, Takeda and Thomas, 1999; Beatty, Chamberlain and Magliolo, 1995; Greenawalt and Sinkey, 1988), capital management that prefers of safeness instead of earning power (Collins, Shackelford and Wahlen, 1995; Kim and Kross, 1998), signaling future intentions to the stock market (Liu and Ryan, 1995), providing signals about future losses and earnings and complying with the legal requirements (Zoubi and Al-Khazali, 2007).

### **1.1.2 Risk Weighted Capital Adequacy Framework**

In Malaysia, commercial banks are required to obey with the risk-weighted capital adequacy framework by using loan loss provisions to manage the risks that may occur in their lending and financing activities. The risk-weighted capital adequacy framework has been introduced by the Basel Committee on Banking Supervision (BCBS) in year 1988 and it is developed

based on the international standards on capital adequacy. However, it is also named as Basel 1. All the banking institutions are required to maintain a minimum amount of 8% of total capital based on a percent of risk-weighted assets (RWA). The total capital consists of Tier 1 and Tier 2 capitals. Tier 1 capital is considered as core capital and it must exceed at least 4 % of the risk weighted assets and 3% of total assets. Tier 1 capital includes common stock, undivided profits, paid-in-surplus, non-cumulative perpetual preferred stock, and minority interests in consolidated subsidiaries less goodwill and other intangible assets. On the other hand, Tier 2 capital is also known as supplementary capital which the amount must not exceed the amount of Tier 1. Tier 2 includes revaluation reserves, perpetual preferred stock, hybrid capital instruments, perpetual debt, mandatory convertible debt securities, subordinated term debt and intermediated preferred stock. In June 2004, the BCBS has revised Basel I and it is further known as Basel II. The Basel II did not change the amount required for capital adequacy and it is implemented in two stages which are 2008 for the Standardized Approaches and 2010 for the Internal Ratings-Based (IRB) Approach (“Risk-Weighted Capital Adequacy,” 2012).

### **1.1.3 Overview of Loan Loss Provision**

Loan loss provision cannot be adjusted easily. It is the expenses instead of management’s estimation of the year’s net change in probable loan default. Therefore, when loan loss provision varies, problems may arise. According to Beaver, Eger, Ryan and Wolfson (1989), a boost in loan loss provision is fine. This is because they found that the boost shows that the good enough earning ability of bank absorbs even on a massive loss from default loan. Besides, customers of bank would like to see a rise in loan loss provision. This conveys a good news to customers as it represents the strength of a bank’s future earnings. However, a raise in loan loss provision can also be viewed as bad news. Especially it only occurs in a single bank. This shows that there is a

decrease in the earning ability of that bank. Since loan loss provision is an indicator of loan default, the higher the loan loss provision, the higher level of loan default may be faced. The good news component will be conveyed by a boost in loan loss provision only when certain indicators of loan default such as vary in nonperforming loans, loan loss allowance and loan charge-offs are controlled as referred to Liu and Ryan (1995).

Poorly performing banks, which those banks that are not efficient in profit earning, will reduce their earnings if they rise up their loan loss provision. This will enlarge the probabilities that they will be audited by bank regulatory agencies and this can increase their insurance premiums as well. Furthermore, since an increase in loan loss provision will reduce reported earnings and result in lower management compensation, customers will lose their confidence in those banks. According to Kanagaretnam, Yang and Lobo (2005), a sudden increase in loan loss provision will reduce bank's reputation. In their research, banks are not willing to lose their reputation, so banks will set a high loan loss provision from the beginning to avoid sudden increase of loan loss provision due to various reasons.

Different studies have provided the same point of view. Beaver, Eger, Ryan and Wolfson (1989) found that unexpected boost in loan loss provision will be interpreted by investors as a decrease in a bank's financial strength. Besides, other studies (Grammatikos and Saunders, 1990; Musumeci and Sinkey, 1990; Elliott, Hanna and Shaw, 1991; Griffin and Wallach, 1991) also showed that an increase in loan loss provision of a bank will be followed positively by the capital market. This is because a boost in loan loss provision shows that banks are able to resolve on debt.

In a nutshell, banks manipulated loan loss provision to meet their primary objective but with associated costs (Anandarajan, Hasan and Lozano-Vivas,

2005). For those banks that aiming on capital management, they will increase loan loss provision, thereby increasing the loan loss reserve and inflating the capital adequacy ratio. The effect resulted in moving distressed banks away from violation of minimum capital requirement with the side effect of lowering of earnings. While for those banks that have earning management as primary objective, they are willing to set a lower loan loss provision. By setting it lower, those banks can loan out even more funds to earn more profit.

## **1.2 Problem Statement**

The unstableness of the economic condition in the world is still not being recovered due to the attack of Asian financial crisis 1997 and not long after the subprime mortgage crisis 2007. These incidents are significantly affected all the financial and banking sector institutions in the world.

Lehman Brothers which was the fourth largest investment bank in United States went bankrupt in 2008 September 15 due to the attack of subprime mortgage crisis. The bankruptcy of Lehman brothers caused the uproar in the world. Everyone has started to question about why Lehman Brothers such a big organization could not resist by the attack of subprime mortgage crisis, it is because Lehman Brothers was lacked of liquidity asset and ready cash. During subprime mortgage crisis, many people default on their loans and lead to a significant loss to all organizations. By rescuing, Arcy (2009) found that Lehman Brothers lack of ready cash can be recognized as loan loss provision. Therefore, they have no choice but to sell off the assets at lower price. However, this action could not save them from being bankrupt.

Besides, all the banks refused to help out because Lehman brothers did not have enough liquidity on hand. As Lehman brothers lacked of market confidence, its

business almost faced bankrupt. After the solvency of Lehman brothers, CBS News (2012) proved that 26000 employees lost their jobs; millions of investors lost almost all their money, and caused the recession of United State to become worse.

In short, loan loss provision plays a vital role in determining a bank’s success and failure. If a bank fails to handle loan loss provision properly it will lead to a significant loss to the bank.

On the other hand, the banks’ loan loss provision in Malaysia is shown below:

Diagram 1.1: Loan loss provisions of all local banks in Malaysia from year 2003 to 2011

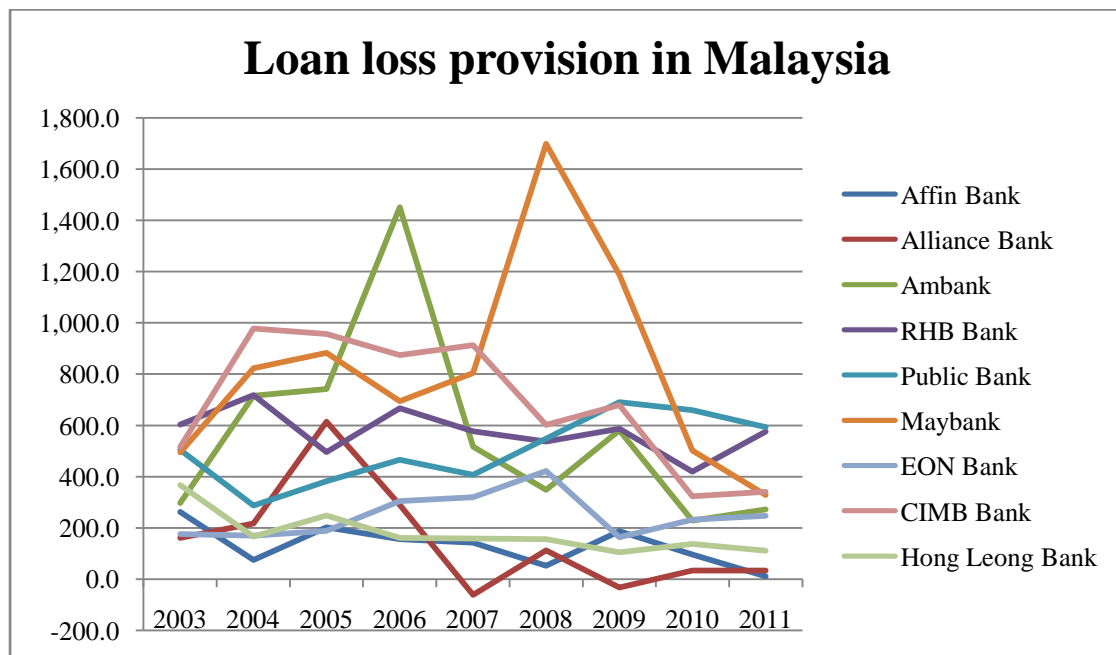


Diagram 1.1 shown above is the loan loss provisions of all local banks in Malaysia from year 2003 to 2011. As what can be seen here, all the local banks’ loan loss provisions fluctuate very differently yet not consistent. Some banks do not have much

fluctuation however some do fluctuate greatly over time. For example, Maybank, Ambank and Alliance Bank fluctuate greatly compared to all other banks.

Diagram 1.2: Average loan loss provision of local banks in Malaysia from year 2003 to 2011 in Malaysia

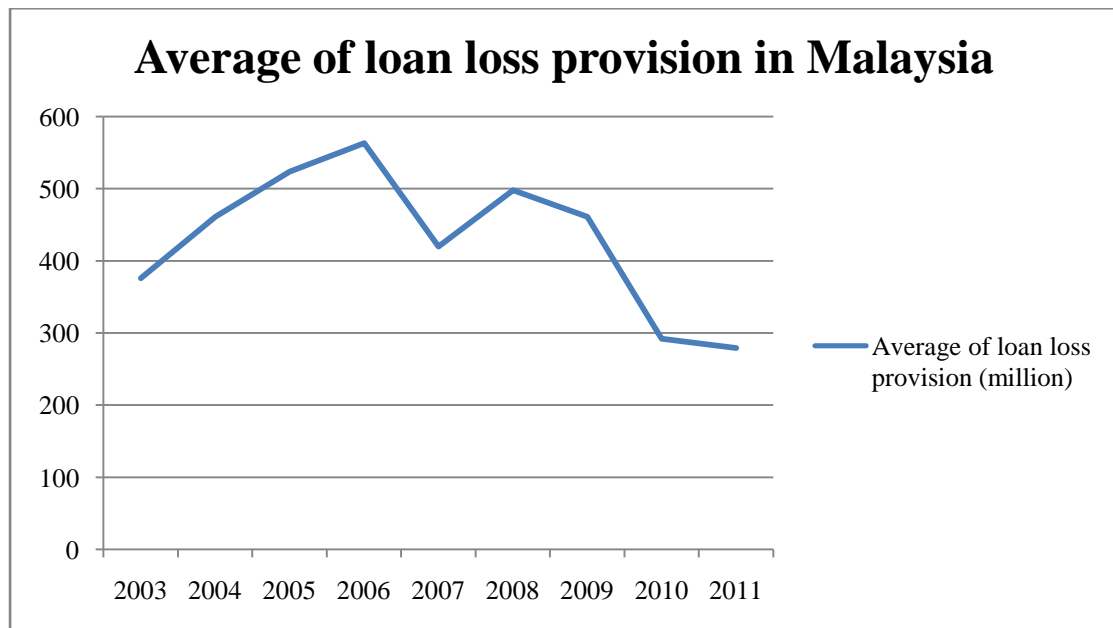


Diagram 1.2 shown above is the average of all the banks' loan loss provisions. It still shows a big fluctuation over the years. The highest loan loss provision in Malaysia is about 563 million in the year of 2006 while the lowest loan loss provision is about 279 million in the year of 2011.

After reviewing past journals, it is found out that less research was conducted about the determinants of loan loss provision in Malaysia. Therefore, there is an urge to extend this research in Malaysia as due to the huge fluctuation of all the banks' loan loss provisions.

## 1.3 Research Objectives

### 1.3.1 General Objective

Loan loss provision is very important to both bank and country. If a bank fails to handle it in a proper way, it will significantly affect the bank and indirectly affect the country and people as well. This study investigates that what variables that will affect and how to affect the loan loss provision of the banks in order for the banks to take note on these variables' movement in managing their loan loss provision more effectively to reduce losses.

### 1.3.2 Specific Objectives

Regarding to this research, it will be going to investigate on how the GDP, bank size, earnings before tax and provision, non-performing loan, market lending rate, equity ratio and total loan will affect banks' loan loss provision in Malaysia. Below is the list that shows the investigation in a clearer form.

- i) To examine the relationship of loan loss provision with GDP.
- ii) To examine the relationship of loan loss provision with bank size.
- iii) To examine the relationship of loan loss provision with earnings before tax and provision.
- iv) To examine the relationship of loan loss provision with non-performing loan.
- v) To examine the relationship of loan loss provision with market lending rate.
- vi) To examine the relationship of loan loss provision with equity ratio.
- vii) To examine the relationship of loan loss provision with total loan.

## 1.4 Research Questions

There are seven research questions that will be going to review as stated below.

- i) What is the relationship between loan loss provision and GDP
- ii) What is the relationship between loan loss provision and bank size
- iii) What is the relationship between loan loss provision and earnings before tax and provision
- iv) What is the relationship between loan loss provision and non-performing loan
- v) What is the relationship between loan loss provision and market lending rate
- vi) What is the relationship between loan loss provision and equity ratio
- vii) What is the relationship between loan loss provision and total loan

## 1.5 Hypotheses of the Study

After the literature review is completed, the hypotheses that have been developed are stated below.

- i) GDP

$H_0$  : There is no significant relationship with *GDP* and loan loss provision.

$H_1$  : There is a significant relationship with *GDP* and loan loss provision.

- ii) Bank size

$H_0$  : There is no significant relationship with *bank size* and loan loss provision.

$H_1$  : There is a significant relationship with *bank size* and loan loss provision.



iii) Earnings before tax and provision

$H_0$  : There is no significant relationship with *earnings before tax and provision* and loan loss provision.

$H_1$  : There is a significant relationship with *earnings before tax and provision* and loan loss provision.

iv) Non-performing loan

$H_0$  : There is no significant relationship with *non-performing loan* and loan loss provision.

$H_1$  : There is a significant relationship with *non-performing loan* and loan loss provision.

v) Market lending rate

$H_0$  : There is no significant relationship with *market lending rate* and loan loss provision.

$H_1$  : There is a significant relationship with *market lending rate* and loan loss provision.

vi) Equity ratio

$H_0$  : There is no significant relationship with *equity ratio* and loan loss provision.

$H_1$  : There is a significant relationship with *equity ratio* and loan loss provision.

vii) Total loan

$H_0$  : There is no significant relationship with *total loan* and loan loss provision.

$H_1$ : There is a significant relationship with *total loan* and loan loss provision.

## 1.6 Significance of the Study

In the previous studies, there are a few researchers studied about the determinants of loan loss provision in Malaysia. This study contributes to the existing researcher by analyzing the relationship between the variables and loan loss provision in Malaysia. This study investigates on how the GDP, bank size, earnings before tax and provision, non-performing loan, market lending rate, equity ratio and total loan will affect banks' loan loss provision.

Besides, this study provides the bank managers with a better understanding on the specific variable that will bring most effects to the bank's loan loss provision, so that they can work well with the specific variable to manage the bank's loan loss provision more effectively to prevent losses. It will provide the banks with a healthier financial status and attract a lot of investors to invest or deposit their money in order to earn more profit.

Last but not least, this study also provides the knowledge to the readers of how the variables will affect banks' loan loss provision and what is the relationship between them. Thus, the students will have a better understanding about the changes in banks' loan loss provision.

## 1.7 Chapter Layout

This research project is organized as follows:-

Chapter 1 will provide an overview of the study context by presenting the background of the selected research area. It covers the introduction, research background, problem statement, research objectives which consists of general and specific objectives, research questions, hypotheses and significant of the study.

Chapter 2 covers the literature review of the previous studies relating to bank loan loss provisions and this chapter includes the review of literature, review of relevant theoretical models, proposed theoretical/ conceptual framework and hypotheses development.

Chapter 3 is an introductory overview of the research methodology which describes how the research is carried out. In this chapter, it includes the research design, data collection methods which is secondary data, sampling design, research instrument, constructs measurement, data processing and data analysis.

Chapter 4 is presenting the patterns of the results and analyses of the results which are relevant to the research questions and hypotheses. The data collected will be analyzed in this chapter through descriptive analysis, scale measurement and inferential analyses.

Lastly, chapter 5 provides an overall conclusion of the entire research project and it covers with the summary of statistical analyses, the discussion of major findings, implication and limitation of the study and recommendations for future research.

## 1.8 Conclusion

In a nutshell, banks loan loss provision was affected by internal factors (bank size, earning before tax and provision, non-performing loan, equity ratio and total loan) and external factors (GDP and market lending rate) according to some empirical results of previous studies. First chapter of this paper briefly explained the concept of loan loss provisions in order to provide a clearer picture and idea of the loan loss provisions used in Malaysia.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.0 Introduction**

This chapter will discuss about the previous literatures related to the scope of this study and the determinants suggested by several studies regarding the loan loss provisions. The proposed theoretical framework, actual framework and hypothesis will be shown in this chapter to study the relationship between the dependent variable (Loan Loss Provision) and independent variables (GDP, bank size, earnings before tax and provision, non-performing loan, market lending rate, equity ratio and total loan).

### **2.1 Review of the Literature**

The banking system in Malaysia is comprised of commercial banks, Islamic banks and investment bank. In Malaysia, the commercial banking system is operated independently under Banking and Financial Institutions Act (1989) which is governed by Malaysia Central Bank, Bank Negara Malaysia (BNM). According to Aisyah (2010), there were 22 local banks and 16 foreign banks altogether since 1990. In the late 1990s, Bank Negara Malaysia has launched a consolidation program in order to encourage sustainability in the face of financial liberalisation. From the latest information that extracted from Bank Negara Malaysia website, Malaysia currently has 8 local banks and 19 foreign banks (List of Licensed Banking Institutions in Malaysia, 2012).

Commercial banks have always played a critical role in the banking system as they are the largest and most significant providers of funds in the banking system and they

have contributed immensely financing to support the country's economic development. However, many financial crises such as Asian financial, US sub-prime, Euro debt crisis and consequences have been experienced in the developing countries during last two decades and these have caused many commercial banks failure. Loans comprise a large part of the commercial banking business and the financial crises have increased the default loans among the commercial banks in Malaysia. This has raised the concern of the commercial bank managers to aware about the loan loss provision in order to safeguard the banks against financial risks and to protect the banks and country from bankruptcy.

Many studies have been done to determine the factors that affecting the loan loss provision of commercial banks. However, in this research, the factors that determine bank loan loss provision have been divided into internal factors and external factors. Internal factors include bank size, equity ratio, earning before taxes and provision, non-performing loan and total loan. All these factors are referring to the factors that can be managed by the management of a bank. For the external factors which are also macroeconomic factors, it includes gross domestic product (GDP) and market lending rate. All these factors are beyond the control of a bank's management.

### **2.1.1 Gross Domestic Product (GDP)**

According to Bikker and Metzmakers (2005), there is negative relationship between GDP growth and loan loss provision. They concluded that when GDP growth is lower, it is more risky for the loan to get default. Thus, loan loss provision should be raised to overcome this.

While Cavallo and Majnoni (2002) had analyzed the ways how large commercial banks use provisions to stabilize their income. And they found that the bankers, on average will set lower provision to earn more profit during the good times. This proved that they found a negative relationship between loan loss provision and GDP growth.

Pain (2003) and Arpa, Giulini, Ittner and Pauer (2001) investigated the influence of the business cycle on loan loss provision in UK and Austrian banks respectively. They showed that, banks set a higher provision when GDP reduces. Provision gets a boost during the time when the fall in GDP was concluded. Also, raise of banks' profitability in good time can encourage banks to have a lower provision.

Laeven and Majnoni (2002) supported that loan loss provision has a negative relationship with GDP growth. This is because they found that bankers set small provision in good times but forced to adjust it larger during cyclical downturns as a cushion to absorb shocks.

Craigwell and Elliott (2011) analyzed that loan loss provision has negative relationship with logarithm of real GDP. When economy expands, default of loan has less probability to occur due to the increase in income of the borrower. Thus, a lesser provision can be set.

However, there are some journals stated that loan loss provision is positively related to GDP. Anandarajan, Hasan and McCarthy (2007) have a different point of view with all of the authors above. They stated that when GDP increases, firms or companies tend to increase their borrowing to expand activities. This may improve the risk of borrowing. Banks need to increase

loan loss provision to absorb the additional risk. Therefore, the relationship between loan loss provision and GDP is treated as positive.

### **2.1.2 Bank Size (BS)**

Eng and Nabar (2007) have found that bank size which equals to log of total assets influences the loan loss provision as size controls for the possibility that the loan loss variables differ for large and small banks. Their studies have showed that there is a significant negative relationship between bank size and loan loss provision, suggesting that large banks make relatively small provisions.

This is further supported by Kanagaretnama, Lobo, and Yang (2003) in their research on determinants of signalling by banks through loan loss provisions who found out that the propensity to signal varies negatively with the bank size and is statistically significant. Thus, the hypothesis that larger banks have weaker incentives to signal than smaller banks is statistically supported by the sample data. However, bank size in this research is measured as the natural logarithm of total loans outstanding at the end of each year. This is because total loans outstanding are well-suited for this study primarily because the room for managerial discretion over loan loss provision mainly depends upon the magnitude of outstanding loans.

Though, there are some other previous studies provide different results. Dahl, O'Keefe, and Hanweck (1998) in their studies of the influence of examiners and auditors on loan-loss recognition argued that loan loss provisions tended to be significantly and positively related to bank size as measured by the logarithm of assets. Kwak, Lee, and Eldridge (2009) also proved that it is significant and has positive association between loan loss provisions and bank



size which measured by natural log of total assets in their studies. This result is consistent with size being a proxy for political sensitivity or exposure to costly regulatory intervention so that larger banks are more likely to report higher loan loss provision.

Besides, this result is also supported by Anandarajan, Hasan, and Vivas (2003) in their research on the role of loan loss provisions in earnings management, capital management and signalling on the Spanish experience. They have found out that there is a positive association between natural logarithm of total assets as a measure of bank size and loan loss provision. This is because larger banks may have higher levels of business and thus, it should have higher loan loss provisions than smaller banks as larger bank may have higher levels of risk to face. Even if for a different reason, Watts and Zimmerman's (1986) "political cost" theory also implied a positive relationship between bank size and loan loss provision as larger bank would reduce their earnings, via loan loss provision increases, in order to avoid larger political visibility.

### **2.1.3 Earnings before Tax and Provision (EBTP)**

According to Zhou (2007), there is a positive significant correlation between the loan loss provision and earnings before tax and provision (EBTP). This positive association indicates that loan loss provision acts as a pure expense in order to reduce the taxable income. Thus, when the earnings needed to be reported higher, banks can reduce the loan loss provision. On the other hand, if banks would like to keep the earnings for a better tomorrow, they can increase the loan loss provision.

Besides, Curcio and Hasan (2008) found that earnings management is one of the main issues to affect the provisioning decision made by the banks. They

found that EBTP is positively and significantly related with the loan loss provision. Their research result also supported by the research study of Misman and Ahman (2011). Loan loss provision is required to move with earnings. When the earnings of the banks are lower than the target set by them, they need to decrease the loan loss provision in order to stabilize them, and vice versa.

Based on the study of Packer and Zhu (2012), they also supported that the relationship between EBTP and loan loss provision is positively correlated. Bank will put in more loan loss provision when their earnings are high. The function of the countercyclical provisioning is to lessen the volatility of bank's reported earnings. Thus, banks can use it when earnings of the banks are unstable. Packer and Zhu (2012) recommended that Asian banks have been a loan loss provisioning in a countercyclical trend by reserve additional cushion during high earning period.

In additional, Dong, Liu and Hu (2012) also proved that the correlation of EBTP and loan loss provision is positively related. They stated that normally banks will use the earnings management scheme when preparing for the loan loss provision of the banks. Banks tend to prepare more loan loss provision when the current earnings of the banks are higher. Banks store up certain amount of reserves in response to earnings fluctuations' smooth in the upcoming year. However, banks tend to prepare less loan loss provision when the banks' current earnings are lower in order to smooth the earnings of the recent year by borrowing the future earnings' reserves.

Furthermore, the study result of Fonseca and Gonzalez (2008) is consistent with the study results of Bikker and Metzemaker (2005) and Pinho and Martins (2009). They found that the loan loss provisions are high when the

bank's earnings are high; and loan loss provisions low when the bank's earnings are low.

The result of journal by Dinamona (2008) is in compliance to the conclusion found by Anandarajan (2005). The relationship between EBTP and loan loss provision is significantly negative correlated. It indicates that the banks take full advantage of the loan loss provision when their earnings are low and lessen the loan loss provision when their earnings are high. According to Dinamona (2008), he stressed that the banks implement irresponsible actions regarded to their provisioning policy.

In addition, the study result of Laeven and Majnoni (2003) is also totally different from many research studies which supported that there is a positive relationship between EBTP and loan loss provision. They found out that there is a negative relationship between EBTP and loan loss provision. It shows that banks will create higher loan loss provision when the banks suffer losses or negative level of earnings before provisions and tax, and vice versa.

#### **2.1.4 Non-Performing Loan (NPL)**

According to Eng and Nabar (2007) research in Hong Kong, Malaysia and Singapore, non-performing loan has a significant effect on bank's loan loss provision. This suggests that bank increases their provisions in response to an increase in credit risk. Therefore, it shows a positive relationship between non-performing loan and bank's loan loss provision, when non-performing loan increases, it will cause bank's loan loss provision to increase.

In addition, a study in Asian banks by Packer and Zhu (2012), their result shows that when Asian banks' credit risk asset is higher, the provision will set to be higher. This indicates that non-performing loan has a positive relationship with loan loss provision. They also found out that banks with high non-performing loan might adopt different provisioning strategies in relation to credit and economic cycles. For the case in China and India, there is no evidence that different provisioning strategies have implemented by low-credit-quality banks.

Besides, Kanagaretnam, Lobo and Yang (2005), Kwak, Lee and Eldridge (2009) research in Japan and Isa (2011) research in Malaysia have also found the same result as Eng and Nabar (2007) which non-performing loan shows a positive effect on bank's loan loss provision.

However, Boudriga, Boulila Taktak and Jellouli (2009) consider loan loss provision as a controlling mechanism over expected loan losses which refer to the previous finding of Hassan & Wall, (2004). The previous researchers found out that higher levels of non-performing loans are associated with high rates of provision but according to the findings of Boudriga et al (2009), non-performing loans and loan loss provision has a significant negative relationship. Their result shows that countries with higher rates of non-performing loan expose to a lower level of loan loss provision and vice versa.

### **2.1.5 Market Lending Rate (MLR)**

According to Glen and Mondragon-Velez (2011), changes of lending rate will affect the ability of borrowers to continue paying interest for the loan borrowed. When the economic grows healthily, bank will not expect abnormal deterioration in their loan portfolio performance. This is because only a little

portion of the loans will go default. However, if the recession occurs, borrowers may not be able to pay for the interest of the loan borrowed. The probability of default in loan increases. Thus, they believe that loan loss provision is positively related to lending rate.

#### **2.1.6 Equity Ratio (EAR)**

Yeh (2009) research in Taiwanese banks, equity ratio has a significant effect on bank's loan loss provision. This suggested that bank with higher equity ratio tends to tolerate more losses arising from defaulting loans and thus, may report lower loan loss provision, leading to divergence from the efficient frontier. According to the study by Yeh (2009) emphasized that a positive relationship between equity ratio and loan loss provision is inefficient. Therefore, it shows a negative relationship between equity ratio and bank's loan loss provision, when equity ratio increases, it will cause bank's loan loss provision to decrease.

#### **2.1.7 Total Loan (TL)**

Kanagaretnam, Krishnan, and Lobo (2010) found that total loan of the banks is positively correlated to loan loss provision. When the total loans of the bank increase, loan loss provision will increase too. The increase of total loans may lead to higher defaults of the loans. Thus, banks normally will set high loan loss provision in order to prevent the banks from being bankrupt.

However, the study of Craigwell and Elliott (2011) is inconsistent with the study of Kanagaretnam et al. (2010). Based on the result of the study of Craigwell and Elliott (2011), they found that there exists significant negatively

relationship between total loan and loan loss provision. When the total loan of banks increases, loan loss provision moves in opposite direction. Some banks, for example, larger banks in Barbados that have largest loan portfolios normally able to forecast the possibility of default of the loans. Thus, banks will expect that loan loss provision should decrease when total loans increase.

## 2.2 Relevant Theoretical Models

Figure 2.1: Nine independent variables which proposed by a few researchers

Independent variables

Dependent variable

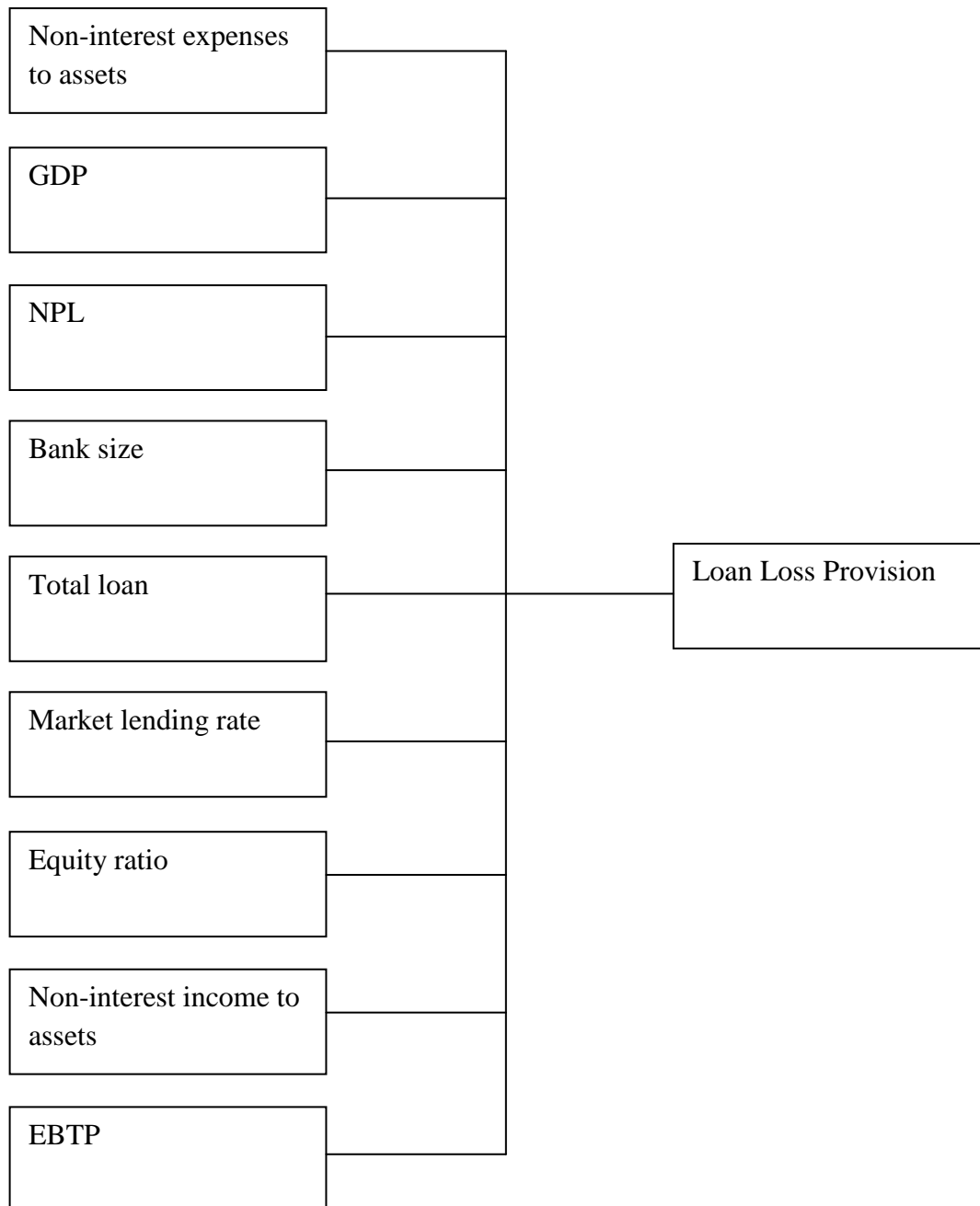


Figure 2.1 shows nine independent variables which proposed by a few researchers. Glen and Velez (2011) proposed market lending rate that shows positive relationship with loan loss provision; Lobo, et al (2005) proposed bank size and non-performing loan; Zhou (2007) proposed that earnings before tax and provision has positive relationship; Yeh (2009) proposed non-interest income to assets, non-interest expenses to asset and equity ratio; Roland and Wayne (2011) proposed GDP and total loans.



### 2.3 Proposed Theoretical / Conceptual Framework

Figure 2.2: Seven independent variables which proposed in this research

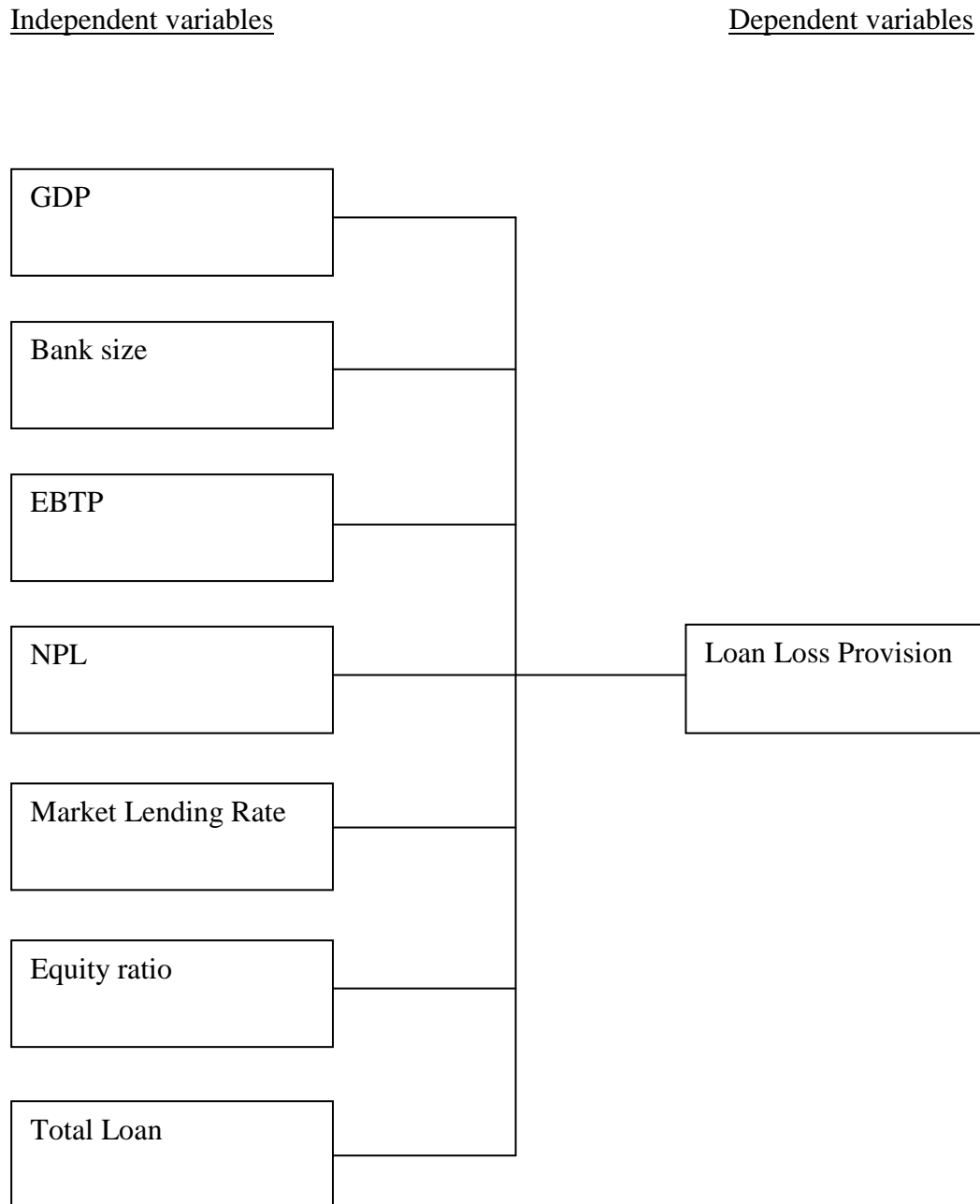


Figure 2.1 shows seven independent variables which proposed in this research. Bikker and Metzmakers (2005), Balla and McKenna (2009), Cavallo and Majnoni (2002), Pain (2003), Arpa et al. (2001), Laeven and Majnoni (2002), Craigwell and Elliot (2011) found that GDP and loan loss provisions have a negative relationship. While Anandarajan et al. (2007) proved that there is a positive relationship.

For the bank size, Eng and Nabar (2007) and Kanagaretnama et al. (2003) showed that it has a negative relationship with loan loss provision whereas, Dahl et al. (1998), Kwak et al. (2009), Anandarajan et al. (2003) and Watts and Zimmerman's (1986) proved that they are positively related.

Other than that, Zhou (2007), Curcio and Hasan (2008), Mismam and Ahman (2011), Packer and Zhu (2012), Dong et al. (2012), Fonseca and Gonzalez (2008), Bikker and Metzmakers (2005), Pinbo and Martins (2009) believed that there is a positive relationship between EBTP and loan loss provision. However, Dinamona (2008), Anandarajan (2005) and Laeven and Majnoni (2003) showed that EBTP is negatively related to loan loss provision.

For another variable which is non-performing loan, Eng and Nabar (2007), Packer and Zhu (2012), Kanagaretnam et al. (2005), Kwak et al. (2009) and Isa (2011) proved that non-performing loan has a positive relationship with loan loss provision. While Boudriga et al. (2009) found that it is negatively related to loan loss provision.

Besides, according to Glen and Mondragon-Velez (2011), market lending rate is positively related to loan loss provision.

For the equity ratio, Yeh (2009) found that there is a negative relationship between equity ratio and loan loss provision.

Lastly, Kanagaretnam et al. (2008) proved that total loan has a positive relationship with loan loss provision. But, Craigwell and Elliott (2010) believed that there is a negative relationship between them.

## 2.4 Hypothesis Development

### *i) GDP*

Bikker and Metzmakers (2005), Balla and McKenna (2009), Cavallo and Majnoni (2002), Pain (2003), Arpa et al. (2001), Laeven and Majnoni (2002), Craigwell and Elliott (2011) found that GDP and loan loss provision have a negative relationship. When economy grows, loan loss provision is reduced.

On the other hand, Anandarajan et al. (2007) proved that when economy grows, loan loss provision will increase as well. This shows that there is a positive relationship between GDP and loan loss provision.

$H_0$  : There is no significant relationship with *GDP* and loan loss provision.

$H_1$  : There is a significant relationship with *GDP* and loan loss provision.

### *ii) Bank size*

According to Eng and Nabar (2007) and Kanagaretnama et al. (2003), bank size has a negative relationship with loan loss provision. As bank size increases, loan loss provision will relatively decrease.

While according to Dahl et al. (1998), Kwak et al. (2009), Anandarajan et al. (2003) and Watts and Zimmerman's (1986), bank size is positively related to loan loss provision. As bank size increases, loan loss provision decreases.

$H_0$  : There is no significant relationship with *bank size* and loan loss provision.

$H_1$  : There is a significant relationship with *bank size* and loan loss provision

iii) **Earnings before tax and provision (EBTP)**

Zhou (2007), Curcio and Hasan (2008), Mismam and Ahman (2011), Packer and Zhu (2012), Dong et al. (2012), Fonseca and Gonzalez (2008), Bikker and Metzemaker (2005), Pinho and Martins (2009) proved that there is a positive relationship between EBTP and loan loss provision. When EBTP increases, loan loss provision increases as well.

However, Dinamona (2008), Anandarajan (2005) and Laeven and Majnoni (2003) showed that EBTP is negatively related to loan loss provision. When EBTP increases, loan loss provision will decrease.

$H_0$  : There is no significant relationship with *earnings before tax and provision* and loan loss provision.

$H_1$  : There is a significant relationship with *earnings before tax and provision* and loan loss provision.

iv) **Non-performing loan**

Eng and Nabar (2007), Packer and Zhu (2012), Kanagaretnam et al. (2005), Kwak et al. (2009) and Isa (2011) showed that non-performing loan has a positive relationship with loan loss provision. A higher non-performing loan exhibits higher level of loan loss provision.

But, Boudriga et al (2009) found that non-performing loan is negatively related to loan loss provision. A higher non-performing loan will bring to a lower level of loan loss provision.

$H_0$  : There is no significant relationship with *non-performing loan* and loan loss provision.

$H_1$  : There is a significant relationship with *non-performing loan* and loan loss provision.

v) **Market lending rate**

According to Glen and Mondragon-Velez (2011), market lending rate is positively related to loan loss provision. When market lending rate increases, loan loss provision will also increase.

$H_0$  : There is no significant relationship with *market lending rate* and loan loss provision.

$H_1$  : There is a significant relationship with *market lending rate* and loan loss provision.

vi) **Equity ratio**

Yeh (2009) found that there is a negative relationship between equity ratio and loan loss provision. A higher equity ratio tends to decrease loan loss provision.

$H_0$  : There is no significant relationship with *equity ratio* and loan loss provision.

$H_1$  : There is a significant relationship with *equity ratio* and loan loss provision.

vii) **Total loan**

Kanagaretnam et al. (2008) proved that total loan is positively related to loan loss provision. When the total loans of the bank increase, loan loss provision will increase.

However, Craigwell and Elliott (2010) stated that there is a significant negative relationship between total loan and loan loss provision. When the bank's total loan increase, then loan loss provision will move in the opposite direction.

$H_0$  : There is no significant relationship with *total loan* and loan loss provision.

$H_1$  : There is a significant relationship with *total loan* and loan loss provision.

## 2.5 Conclusion

This chapter has reviewed each of the factors that will affect the loan loss provisions based on the studies done by previous researchers. Relevant theoretical models and proposed theoretical/ conceptual framework also included in this chapter. The hypotheses development in this chapter will be further discussed in this study. In chapter 3, research methodology will be discussed.

## **CHAPTER 3: METHODOLOGY**

### **3.0 Introduction**

Research methodology will be discussed in this chapter. Research design, data collection methods, sampling design, data processing and data analysis are further discussed in details and secondary data is applied in this study. There are 81 observations from 9 banks to be analyzed by using E-views program with Panel Least Square regression (PLS).

### **3.1 Research Design**

This paper is a quantitative research that obtaining data from secondary source. In this study of determinants of loan loss provision, 9 years of data will be included from 2003 till 2011. The log method is used since the data that collected from annual report of 9 banks in Malaysia is too huge.

### **3.2 Data Collection Methods**

#### **3.2.1 Secondary Data**

9 years (2003-2011) annual reports of 9 local commercial banks in Malaysia (Affin Bank, Alliance Bank, Ambank, RHB bank, Public bank, Maybank, EON bank, CIMB bank, and Hong Leong bank) are reviewed. Variables such as bank size, earning before tax and provision, non-performing loan and total



loan are collected annually in the form of secondary data through annual report viewing. Other than that, equity ratio is calculated by using figures that obtained from annual report. Besides, Malaysia's gross domestic product (GDP) and market lending rate are obtained from World Databank website in local currency unit (LCU) and percentage respectively. There are a total of 81 observations.

Table 3.1: Sources of data of the variables

<b>Variables</b>	<b>Proxy</b>	<b>Source of Data</b>
Gross Domestic Product	GDP	World Databank
Bank Size	BS	Annual report
Earnings Before Tax and Provision	EBTP	Annual report
Non-performing Loan	NPL	Annual report
Market Lending Rate	MLR	World Databank
Equity Ratio	EAR	Annual report (calculation)
Total Loan	TL	Annual report

### 3.3 Sampling Design

#### 3.3.1 Target Population

Heldall and Jentoft (2013) defined target population as the group of individuals where the researchers interested in studying and making statistical inferences. In this research, the target population is the licensed local commercial banks in Malaysia. By year 2011, there are a total of 9 licensed local commercial banks in Malaysia. As mentioned above, Malaysia currently has 8 local commercial banks which was due to Hong Leong Bank has completed its merger with EON Bank in July 2011. Therefore, the data from 9 licensed local commercial banks in Malaysia from the year frame of 2003 to 2011 will be obtained for this research purpose. The local commercial banks include:

- i. Affin Bank Berhad
- ii. Alliance Bank Malaysia Berhad
- iii. AmBank (M) Berhad
- iv. CIMB Bank Berhad
- v. Hong Leong Bank Berhad
- vi. Malayan Banking Berhad (Maybank)
- vii. Public Bank Berhad
- viii. RHB Bank Berhad
- ix. EON Bank Berhad

### **3.3.2 Sampling Technique**

All the collected data were entered into Microsoft Excel and the sampling technique that used to conduct this research is Econometric Views software which is also known as E-Views. This software is used to analyse the data collected and to investigate the relationship between the determinants and loan loss provision of the local commercial banks in Malaysia with Panel Least Squares regression (PLS). E-Views is a software package that is frequently used in practical econometrics as it provides data analysis, regression and forecasting tools. In this research, panel data method is used to increase the observation in order to perform a more accurate and reliable data.

### **3.3.3 Sampling Size**

Sampling size can be defined as the number of elements in a population to be studied in the research. This research will be carried out from the annually period of January 2003 to December 2011 and 9 licensed local commercial banks in Malaysia are used in the measurement on how independent variables influence the bank loan loss provision to acquire the relevant data. Therefore, there are total 81 observations are used in this research.

## **3.4 Data Processing**

First of all, the data will be collected from two sources which are the banks' annual reports and also World Databank website. Then, the collected data will all be rearranged, edited and calculated. After that, those data will become a very useful data

for this research paper. After that, the useful data will be analyzed by using E-views. In the end, the results from E-views are ready for interpretation. Basically, these are the steps of data processing.

### **3.5 Data Analysis**

After data collection, data analysis begins. The collected data were analyzed by using E-views program with Panel Least Squares (PLS). E-views will be used to analyze the data collected and it gives the outcomes of the relationship between the determinants and loan loss provisions. In order to have a more accurate data, panel data will be used because it increases the observation numbers.

After analyzing, the result in PLS regression is then hypothesis tested. The significant level is set to be 0.05. Thus, any variable with a probability of t-statistic below 0.05, it will be considered to have a significant effect on the loan loss provisions.

### **3.6 Conclusion**

In chapter 3, 81 observations are gathered from the period of 2003 to 2011 from 9 listed local commercial banks in Malaysia. Panel Least Squares (PLS) is carried out to analyze this data. Last but not least, data analysis and major finding which produced by E-Views will be discussed in the next chapter.

## **CHAPTER 4: DATA ANALYSIS**

### **4.0 Introduction**

Previous chapter is about research methodology where the research design, data collection methods, sampling design, data processing and data analysis are discussed. In this chapter, the interpretation and analysis of the results that obtained through the Panel Least Squares regression (PLS) will be preceded. This chapter will discuss about the description of the data and the empirical models, diagnostic checking and the empirical result interpretations. Hausman Test is also performed to detect which panel regression model should be used in this research in order to give a more consistent and efficient result.

### **4.1 Description of the Data**

This study examines the relationship between loan loss provision and its determinants in Malaysia by using secondary data to perform the regression analysis. The data is collected from World Databank and annual reports of the banks from year 2003 to year 2011. However, all the data are estimated in yearly form. The regression analysis is used to determine GDP, bank size, earnings before tax and provision, non-performing loan, market lending rate, equity ratio and total loan. This model is analyzed by using Panel data regression model.

## 4.2 Description of the Empirical Models

The following constructed model represents the determinants of loan loss provision in Malaysia.

### Economic Function:

Loan loss provision = F (GDP, bank size, earnings before tax and provision, non-performing loan, market lending rate, equity ratio, total loan)

### Economic Model:

$$LLP_t = \beta_0 + \beta_1 GDP_t + \beta_2 BS_t + \beta_3 EBTP_t + \beta_4 NPL_t + \beta_5 MLR_t + \beta_6 EAR_t + \beta_7 TL_t + \varepsilon_t$$

### Definitions of Variables:

$LLP_t$	: Loan loss provision	(In logarithm form)
$GDP_t$	: Gross Domestic Product	(In logarithm form)
$BS_t$	: Bank size	(In logarithm form)
$EBTP_t$	: Earnings before tax and provision	(In logarithm form)
$NPL_t$	: Non-performing loan	(In logarithm form)
$MLR_t$	: Market Lending Rate	(In percentage)
$EAR_t$	: Equity ratio	(In percentage)
$TL_t$	: Total loan	(In logarithm form)

Loan loss provision is the non-cash expense that banks used to reserve for default loans. In other words, it means that loan loss provision is the amount that is set aside in the event of default loans so that it can cover the loss faced by banks. Banks will use the loan loss provision to manage the risk exposure in lending and financial activities. Loan loss provision in this study is measured in logarithm form due to its figure is too large. According to the previous researchers such as Cavallo and Majnoni (2002), Eng and Nabar (2007), Kanagaretnama et al. (2003), Zhou (2007), Curcio and Hasan (2008), Misman and Ahman (2011), Packer and Zhu (2012), Glen and Mondragon-Velez (2011), Yeh (2009), loan loss provision is affected and cross-related to GDP, bank size, earning before tax and provision, non-performing loan, market lending rate, equity ratio and total loan.

GDP is referred to the monetary value of all finished goods and services produced within a country in a given period. It is commonly used as an indicator of the economic health of a country. GDP in this study is measured to logarithm form. Cavallo and Majnoni (2002) found that bankers will reduce their loan loss provision when GDP grows. In this study, it is expected that GDP will show a negative relationship with loan loss provision.

Bank size is referred to total assets of the banks. Bank total assets are defined as the money and property that owned by the banks such as reserves, loan, physical assets and investment securities. In this study, bank size is measured in logarithm form. According to Eng and Nabar (2007) and Kanagaretnama et al. (2003), bank size is negatively related to loan loss provision. This means that as bank size increases, loan loss provision will relatively decrease. Thus, it is expected that bank size will show a negative relationship with the loan loss provision in Malaysia.

Earnings before tax and provision are the profits of pre-tax and pre-loan loss preparation. It is used to control the incentives to use the loan loss provision to smooth the earnings of the banks. EBTP in this study is measured in logarithm form.

The study of Zhou (2007), Curcio and Hasan (2008), Misman and Ahman (2011), Packer and Zhu (2012), Dong et al. (2012), Fonseca and Gonzalez (2008), Bikker and Metzemaker (2005), Pinho and Martins (2009) found that there is a positive relationship between EBTP and loan loss provision. Therefore, it is expected that there is a positive relationship for the effect of EBTP on loan loss provision in this study.

Non-performing loan is a sum of borrowed money upon which the debtor has not made scheduled payments. It can be said that non-performing loan is a loan that is in default or close to being in default. In this study, non-performing loan had been measured in logarithm form too. According to Packer and Zhu (2012), when Asian banks' credit risk asset is higher, the provision will set to be higher as well. Therefore it is expected that non-performing loan has a positive relationship with loan loss provision.

Market lending rate is the rate that is set by bank to borrow or lend money from public, business firms or even government. This market lending rate is measured in percentage in this study. According to the research done by Glen and Mondragon-Velez (2011), loan loss provision is positively related to lending rate. This is due to there is higher probability that firms and individuals may not be able to service on their debt during recession. Hence, it is expected that there is a positive relationship between market lending rate and loan loss provision.

Equity ratio is defined as a measure of a company's financial leverage calculated by dividing its shareholder equity over total asset. This variable is measured in percentage. Yeh (2009) stated that, bank with higher equity ratio will be able to tolerate with more losses arising from defaulting loans and thus, may report lower loan loss provision. Thus, it is expected that equity ratio is negatively related to loan loss provision.



Total loan of the bank is defined as the extension of money or credit from the bank to another party such as consumer and business with the agreement that the borrowed funds have to be paid back with the interest charged by the banks. In this study, total loans are measured in logarithm form. Kanagaretnam et al. (2008) investigated that total loan is positively related to loan loss provision. It means that when total loans of the bank increase, loan loss provision will increase as well. Therefore, it is expected that total loans of the banks are positively related to loan loss provision in Malaysia.

### 4.3 Diagnostic Checking

#### 4.3.1 Panel Least Square Regression Model

A regression model has been run as shown below.

*Model 1*

$$LLP_t = 5.426041 - 0.882675GDP - 0.728065BS + 0.693101EBTP + 0.851200NPL + 0.070601MLR - 0.068680EAR + 0.185159TL$$

Table 4.1: Result of Panel Data Regression Model

<b>Variables</b>	<b>Standard error</b>	<b>T-statistic</b>	<b>P-value</b>
<b>GDP</b>	0.671164	-1.315140	0.1927
<b>BS</b>	0.235802	-3.087605	0.0029
<b>EBTP</b>	0.178443	3.884161	0.0002
<b>NPL</b>	0.416305	5.817973	0.0000
<b>MLR</b>	0.050329	1.402799	0.1650
<b>EAR</b>	0.022142	-3.101863	0.0028

<b>TL</b>	0.053755	3.444487	0.0010
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$R^2 = 0.784731$ ; Adjusted  $R^2 = 0.763507$

F-stats = 36.97429; Prob (F-stats) = 0.0000

#### 4.3.2 Hausman Test

Hausman Test is performed on Model 1 to detect which panel regression model should be used in order to give a more consistent and efficient result. The panel regression model includes Fixed Effect Model (FEM) and Random Effect Model (REM). The results are shown below:

Table 4.2: Result of Hausman Test

<b>Test Summary</b>	<b>Chi-sq. Statistic</b>	<b>Chi-Sq. d.f.</b>	<b>Probability</b>
<b>Cross-section random</b>	12.373414	7	0.0889

Reject  $H_0$  if p-value of chi-square is less than significance level (0.05). Otherwise, do not reject. Since the p-value of chi-square (0.0889) is more than the significance level (0.05), do not reject  $H_0$ . Therefore, there is enough evidence to conclude that Random Effect Model (REM) is consistent and efficient.

Therefore, the new model is formed below.

#### Model 2

$$LLP_t = 5.426041 - 0.882675GDP - 0.728065BS + 0.693101EBTP + 0.851200NPL + 0.070601MLR - 0.068680EAR + 0.185159TL$$

Table 4.3: Results of Random Effect Model

Variables	Standard error	T-statistic	P-value
<b>GDP</b>	0.644664	-1.369202	0.1753
<b>BS</b>	0.226492	-3.214530	0.0020
<b>EBTP</b>	0.171397	4.043830	0.0001
<b>NPL</b>	0.140529	6.057137	0.0000
<b>MLR</b>	0.048342	1.460464	0.1486
<b>EAR</b>	0.021267	-3.229374	0.0019
<b>TL</b>	0.051633	3.586082	0.0006

$R^2 = 0.784731$ ; Adjusted  $R^2 = 0.763507$

F-stats = 36.97429; Prob (F-stats) = 0.0000

After Random Effect Model (REM) is being applied, it provides a lower number of unknown parameter and the numbers of independent variables have been reduced, so that there is less possibility of multicollinearity problem exists in the model.

#### 4.4 Empirical Result Interpretations

##### Econometric model

Regression result:

##### Model 2

$$LLP_t = 5.426041 - 0.882675GDP - 0.728065BS + 0.693101EBTP + 0.851200NPL + 0.070601MLR - 0.068680EAR + 0.185159TL$$

Table 4.3: Result of Random Effect Model

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<b>GDP</b>	0.644664	-1.369202	0.1753
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<b>EAR</b>	0.021267	-3.229374	0.0019
<b>TL</b>	0.051633	3.586082	0.0006

$R^2 = 0.784731$ ; Adjusted  $R^2 = 0.763507$

F-stats = 36.97429; Prob (F-stats) = 0.0000

### **Expected sign**

The expected sign for GDP is negative (Cavallo and Majnoni, 2002). As the GDP increases, loan loss provision will decrease. From the E-views result, the value of estimator is negative. Therefore, it is consistent with the expected sign.

The expected sign for bank size is negative (Eng and Nabar, 2007 and Kanagaretnama et al., 2003). As the bank size decreases, the loan loss provision will increase. From the E-views result, the value of estimator is negative. Therefore, it is consistent with the expected sign.

The expected sign for earnings before tax and provision is positive (Zhou, 2007, Curcio and Hasan, 2008, Misman and Ahman, 2011, Packer and Zhu, 2012, Dong, Liu and Hu, 2012, Fonseca and Gonzalez, 2008, Bikker and Metzemaker, 2005, Pinho and Martins, 2009). As the earnings before tax and provision increase, the loan loss provision will increase. From the E-views result, the value of estimator is positive. Therefore, it is consistent with the expected sign.

The expected sign for non-performing loan is positive (Packer and Zhu, 2012). As the non-performing loan increases, loan loss provision will increase. From the E-views result, the value of estimator is positive. Therefore, it is consistent with the expected sign.

The expected sign for market lending rate is positive (Glen and Mondragon-Velez, 2011). As the market lending rate increase, the loan loss provision will increase. From the E-views result, the value of estimator is positive. Therefore, it is consistent with the expected sign.

The expected sign for equity ratio is negative (Yeh, 2009). As the equity ratio decreases, the loan loss provision will increase. From the E-views result, the value of estimator is negative. Therefore, it is consistent with the expected sign.

The expected sign for total loans is positive (Kanagaretnam et al., 2008)). As the market total loans increase, the loan loss provision will increase. From the E-views result, the value of estimator is positive. Therefore, it is consistent with the expected sign.

### **T-statistic (T-test)**

#### *i) Gross Domestic Price (GDP)*

Reject  $H_0$  if p-value of t-statistic is less than significance level (0.05). Otherwise, do not reject. Since the p-value of t-statistic (0.1753) is more than the significance level (0.05), do not reject  $H_0$ . Therefore, there is not enough evidence to conclude that the GDP is significant to loan loss provision.

#### *ii) Bank size (BS)*

Reject  $H_0$  if p-value of t-statistic is less than significance level (0.05). Otherwise, do not reject. Since the p-value of t-statistic (0.0020) is less than the significance level

(0.05), reject  $H_0$ . Therefore, there is enough evidence to conclude that the bank size is significant to loan loss provision.

iii) Earnings before tax and provision (EBTP)

Reject  $H_0$  if p-value of t-statistic is less than significance level (0.05). Otherwise, do not reject. Since the p-value of t-statistic (0.0001) is less than the significance level (0.05), reject  $H_0$ . Therefore, there is enough evidence to conclude that the earnings before tax and provision is significant to loan loss provision.

iv) Non-performing loan (NPL)

Reject  $H_0$  if p-value of t-statistic is less than significance level (0.05). Otherwise, do not reject. Since the p-value of t-statistic (0.0000) is less than the significance level (0.05), reject  $H_0$ . Therefore, there is enough evidence to conclude that the non-performing loan is significant to loan loss provision.

v) Market lending rate (MLR)

Reject  $H_0$  if p-value of t-statistic is less than significance level (0.05). Otherwise, do not reject. Since the p-value of t-statistic (0.1486) is more than the significance level (0.05), do not reject  $H_0$ . Therefore, there is not enough evidence to conclude that the market lending rate is significant to loan loss provision.

vi) Equity ratio (EAR)

Reject  $H_0$  if p-value of t-statistic is less than significance level (0.05). Otherwise, do not reject. Since the p-value of t-statistic (0.0019) is less than the significance level (0.05), reject  $H_0$ . Therefore, there is enough evidence to conclude that the equity ratio is significant to loan loss provision.

vii) Total loan (TL)

Reject  $H_0$  if p-value of t-statistic is less than significance level (0.05). Otherwise, do not reject. Since the p-value of t-statistic (0.0006) is less than the significance level (0.05), reject  $H_0$ . Therefore, there is enough evidence to conclude that the total loan is significant to loan loss provision.

**Interpretation of the coefficients**

$\widehat{\beta}_0$  equals to 5.426041. If the total amount of GDP, bank size, earnings before tax and provision, non-performing loan, market lending rate, equity ratio and total loan is equal to zero, the loan loss provision will equal to 5.43%.

$\widehat{\beta}_2$  equals to -0.728065. If bank size increases by 1%, loan loss provision will decrease by 0.73%, on average, holding other variables constant.

$\widehat{\beta}_3$  equals to 0.693101. If earnings before tax and provision increase by 1%, loan loss provision will increase by 0.69%, on average, holding other variables constant.

$\widehat{\beta}_4$  equals to 0.851200. If non-performing loan increases by 1%, loan loss provision will increase by 0.85%, on average, holding other variables constant.

$\widehat{\beta}_6$  equals to -0.068680. If equity ratio increases by 1%, loan loss provision will decrease by 0.07%, on average, holding other variables constant.

$\widehat{\beta}_7$  equals to 0.185159. If total loan increases by 1%, loan loss provision will increase by 0.18%, on average, holding other variables constant.

### **F-test**

Reject  $H_0$  if P-value of F-statistic is lesser than significant level (0.05), otherwise do not reject  $H_0$ . Since the p-value of F-statistic (0.00) is less than significant level (0.05), therefore reject  $H_0$  at 0.05. There is sufficient evidence to conclude that at least one of the independent variables is important in explaining the dependent variable.

### **R<sup>2</sup>**

In the model of this research,  $R^2$  equals to 0.784731, which means 78.47% of the total variation in the dependent variables can be explained by the variation in the independent variable.

## **4.5 Conclusion**

In conclusion, it is found that there are five variables show statistical significant relationship with the loan loss provisions, which are bank size (BS), earnings before tax and provision (EBTP), non-performing loan (NPL), equity ratio (EAR) and total loan (TL). Whereas, the other two variables which are gross domestic price (GDP) and market lending rate (MLR) show insignificant relationship with the loan loss provisions. Furthermore, the prior sign of coefficient for all independent variables in the result are consistent with the expected sign that are discussed in earlier chapter. The next chapter will discuss about the findings, implication of the study, limitation and recommendations for future research.



## **CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS**

### **5.0 Introduction**

This chapter consists of summary of statistical analysis that was presented and discussed in Chapter 4. It continues with the discussions of the major findings to validate the research objectives and hypothesis, policy implications, limitations of this study and recommendations for future research based on the limitations. In the last session of this chapter, conclusion of the overall of this research project also will be presented.

### **5.1 Summary of Statistical Analyses**

Hausman test is performed after the data have been analyzed by using E-views program with Panel Least Square regression (PLS). Random effect model gives a more consistent and efficient result which suggested by Hausman test at 95% confident level to carry out the analysis.

### **5.2 Discussion of Major Finding**

In this study, it is to examine the loan loss provision in Malaysia. Gross domestic product, bank size, earnings before tax and provision, non-performing loan, market

lending rate, equity ratio and total loan as the independent variables will affect the loan loss provision. Bank size, earnings before tax and provision, non-performing loan, equity ratio and total loan are significant at 95% confidence level while the other two independent variables which are gross domestic product and market lending rate are insignificant to loan loss provision.

In this study, earnings before tax and provision found out to be significant positively related to loan loss provision which is consistent with the findings of Packer and Zhu (2012) which suggested that the Asian banks have been loan loss provisioning in a countercyclical trend by reserve additional cushion during high earning period. Besides, Eng and Nabar (2007) suggested that banks increase their provisions in response to an increase in credit risk which consistent with this research's finding that non-performing loan is significant positively related to loan loss provision. Total loan also found to be significant positively related to loan loss provision; increase of total loans may lead to higher defaults of the loans. Thus, banks normally will set high loan loss provision in order to prevent the banks from bankruptcy (Kanagaretnam et al., 2008).

Bank size shows a significant negative relationship with loan loss provision which is similar with the research done by Kanagaretnama et al. (2008). Kanagaretnama et al. (2008) who showed that larger banks have weaker incentives to signal than smaller banks, is statistically supported by the sample data. Last but not least, there is a negative relationship between equity ratio and loan loss provision. This result is consistent with the findings of Yeh (2009), he implied that bank with higher equity ratio tends to tolerate more losses arising from defaulting loans and thus, may report lower loan loss provision, leading to divergence from the efficient frontier.

## 5.3 Implications of the Study

### 5.3.1 Managerial Implication

For bankers, lower loan loss provision gives benefit to them. The reason for this is simple. Lower loan loss provision may allow bankers to lend more loans to those in need so that they can earn more profit. Other than that, since more money is flown between depositors and lender, the economic will grow as well.

For policy implications, the decline in bank loan loss provision could be conducted by reducing the probability of the default loans which incurs in their lending activities through the help of Credit Counseling and Debt Management Agency (AKPK) which is an agency established by Bank Negara Malaysia in year 2006. The purpose of establishing this agency is to offer individual the credit financial education, counseling services and debt management program which is free of charge to the public. Individual borrowers can seek for an advice in managing and settling their debt or credit. AKPK helps individual to facilitate their debt repayment efforts and thus, it helps bank to minimize the incidence of the default loans to happen. Since there are not many individuals know about this agency, the banks should introduce this program to those customers that have loan repayment problems such as always late for making loan repayment and the customers who get into financial difficulties that are unable to repay their loan repayment. In addition, Bank Negara should try to place AKPK Agency at the commercial banks by offering its free service to public.

There are a few more ways that can lower down loan loss provision. Since non-performing loan is positively related to loan loss provision, by lower down non-performing loan will lower down loan loss provision as well. Non-performing loan is the loan that is nearly to be default. To avoid the loan that being lent out to get default, bankers can be stricter in evaluating for loan borrowers. For example, bankers can set higher earning power requirements for those who seek for loans. For sure, loan borrowers that have higher earning power can earn better to repay for loans. While for the surplus funds that is not lent out, they should invest them in low risk investments. This can avoid the increase in the risk thus; lower loan loss provision can be set. In this way, bankers can have safety return with lower risk. And for the return, bankers can get a better reputation and win confidence from customers.

Other than that, fiscal policy would be a good strategy to be implemented by the government in order to increase the aggregate demand and the rate of economic growth and thus, decrease the unemployment rate. Taxation and government spending is the primary fiscal policy tools. A higher unemployment rate may cause an increase of the volume of non-performing loans especially in the consumer financing. Therefore, a decrease in the unemployment rate can decrease the non-performing loan thereby the banks can decrease loan loss provision.

In a nutshell, for a bank that aims to get a higher profit, it should set a lower loan loss provision. While, through the cooperation with AKPK agency, government should set a higher loan borrowing requirement and even invest in low risk industry that may help bankers to diminish the risk taking. Besides, fiscal policy should also be implemented. Thus, lower loan loss provision and higher profit may be earned.

## **5.4 Limitation of the Study**

Like other researchers, there are some limitations in this research paper. Firstly, there are only a limited number of studies by Malaysian researchers on loan loss provision in Malaysia. Therefore, this research can only refer more to the journals from other countries like Taiwan, Hong Kong, Japan, Singapore and others.

Besides, before this research was done, Asian financial crisis was initially a dummy variable in this study. However, since financial crisis happened in the year 1997 to 1998, there are incomplete annual reports of most of the banks for the years before 2000 which would lead to an inaccurate result. Thus, it could not be included in this study.

In addition, the sample size in this research is relatively smaller compared to United States (US) studies. This cannot be avoided as the availability of data is limited. It is also because Malaysia's capital markets are obviously smaller than those in the US. Therefore, the results in this study might not be applicable for the countries out of Malaysia.

## **5.5 Recommendation for Future Research**

Basically, this research is done on the local commercial banks only. Future researchers are suggested to include the subsidiaries of foreign banks in Malaysia instead of focus only on local commercial banks. Therefore, this will provide a better comparison of loan loss provisions between local banks and foreign banks.

Moreover, as this research is just focusing only in Malaysia which is developing country, it is recommended that other developed or undeveloped countries should be included in the future researches such as Japan, United States, Germany, Africa, Afghanistan, and others. This will allow a cross country research which will be more interesting.

In addition, Asian financial crisis should be included as a dummy variable in the future research since it could not be included in this research. This is because it is believed that Asian financial crisis will be significantly affect loan loss provision.

Besides, a more complete set of data should be used since the sample size for this research is quite small which consists of 9 years. A longer period should be used for the analysis as this will help to achieve a more accurate and precise result to determine the loan loss provision.

## **5.6 Conclusion**

This paper has achieved the main objective of this study which is to investigate that what variables will affect and how it affect the loan loss provision of the banks in Malaysia. The internal variables include bank size, earnings before tax and provision, non-performing loan, equity ratio and total loan while external variables include Gross Domestic Product and market lending rate. This study uses Panel Least Square regression (PLS) to analyze the data. The period of the data is started from January 2003 to December 2011 and 9 licensed local commercial banks in Malaysia are used in measurement of loan loss provision, thus the sample size of this study is 81.

Besides, summary of statistical analysis, discussions of major findings and implications of the study have been included in this chapter. The limitations faced when this study is carrying out are also stated in this chapter along with the recommendations for future research based on the limitations.

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