THE DETERMINANTS OF COMMERCIAL BANK LENDING IN MALAYSIA

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Abstract

This study investigates the bank specific and macroeconomic determinants of commercial bank lending in Malaysia using a sample of 27 banks covering the period from 2005 to 2014. This study also examines the impact of macroprudential policy measure implemented in 2010 on the lending activities of Malaysian commercial banks. Employing a random effects estimation, the findings demonstrate that bank size and volume of deposit positively influence commercial bank lending in Malaysia, while liquidity negatively influences the lending activities. With regard to macroeconomic determinants, this study does not find any conclusive evidence to support the influence of gross domestic product (GDP), lending rate and cash reserve requirement on commercial bank lending activities in Malaysia. Moreover, the findings of this study also reveal that the macroprudential policy measure which was implemented in 2010 to curb the high level of household indebtedness does not give any significant impact on lending activities in Malaysia during the study period.

Abstrak

Kajian ini menyiasat penentu pinjaman bank komersial di Malaysia dari aspek sifat-sifat tertentu bank dan faktor makroekonomi dengan menggunakan sampel 27 bank meliputi tempoh kajian dari tahun 2005 sehingga 2014. Kajian ini juga mengkaji kesan langkah dasar kehematan makro yang dilaksanakan pada tahun 2010 ke atas aktiviti pinjaman bank komersial di Malaysia. Menggunakan kesan anggaran rawak *(Random effects)*, hasil kajian menunjukkan bahawa saiz bank dan jumlah deposit mempengaruhi pinjaman bank komersial di Malaysia secara positif, manakala mudah tunai mempengaruhi aktiviti pinjaman secara negatif. Berhubung dengan penentu makroekonomi, kajian ini tidak menemui sebarang bukti yang kukuh untuk menyokong pengaruh keluaran dalam negara kasar (KDNK), kadar pinjaman, dan keperluan rizab tunai ke atas aktiviti pinjaman bank komersial di Malaysia. Selain itu, hasil kajian ini juga menunjukkan bahawa langkah dasar kehematan makro yang dilaksanakan pada tahun 2010 untuk membendung hutang isi rumah yang tinggi tidak memberi kesan yang signifikan ke atas aktiviti pinjaman bank komersial di Malaysia dalam tempoh kajian.

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CHAPTER 1

INTRODUCTION

1.1 Background of the study

The lending activities can be described as the heart of commercial bank's banking business. The commercial bank plays an intermediary's role by linking the surplus unit and the deficit unit in the financial market together. Commercial bank accepts deposit from customers who have surplus of fund while at the same time uses the fund to grant loans to the deficit unit in the financial market. Malede (2014) depicts lending plays a primary role in commercial bank daily banking activities where loan and advances is the largest component in the bank's asset portfolio and it is also the predominant sources of revenue for the bank.

In the context of Malaysia, lending activities is important for the commercial bank's banking business. This is because approximately 62% of the commercial bank's asset portfolio is constitutes by the loan and advances (Bank Negara Malaysia, 2015). Moreover, lending activities is also the main drivers of earnings for the commercial bank in Malaysia which approximately 70% of the commercial banks operating income is contributed by the interest income from the lending activities (Bank Negara Malaysia, 2014). Furthermore, the commercial bank lending also play an important role in supporting Malaysian economy. This is evidenced by the commercial bank loans to gross domestic product ratio have increased steadily from year 2005 to year 2014, which the ratio had recorded 78.37% on year 2005 and increased to 98.44% on year 2014 (Bank Negara Malaysia, 2015). This implies that commercial bank have a significant contribution in financing the economic activities in Malaysia.

Therefore, it is crucial for bank management and regulators to know the drivers of the lending activities of commercial banks in Malaysia. This is because commercial banks can create strategies to enhance their lending activities as well as improving their interest income. While, the regulator can formulate effective policies to ensure that the bank lending can continuously support the growth of Malaysian economy.

Previous studies investigate the determinants of bank lending from the perspective of bank-specific characteristic and macroeconomic determinants. Sarath & Pham (2015) utilize bank specific determinants which include non-performing loan, volume of deposits, and liquidity to investigate the determinants of bank lending in Vietnam. Chernykh & Theodossiou (2011) employ bank size and non-performing loans as variables to examine the bank lending in Russia. Tomak (2013) employs macroeconomic determinants like gross domestic product and lending rate as the explanatory variable to examine the determinants of bank lending in Turkey from year 2003 to year 2012. While, Olokoyo (2011) uses gross domestic product, lending rate, and cash reserve requirement as variables to investigate the determinants of bank lending in Nigeria.

Although there are many studies investigate the determinants of bank lending across countries around the globe, there are limited studies investigating the determinants of commercial bank lending in Malaysia particularly for the period from year 2005 to year 2014.

Thus, this study aims to investigate the determinants of commercial bank lending in Malaysia covering the period from year 2005 to year 2014. This study extends the commercial bank lending literature by investigating the influence of bank specific characteristic and macroeconomic determinants on commercial bank lending in Malaysia. Furthermore, this study also intends to explore the influence of the implementation of macroprudential policy measures in 2010 on commercial bank lending in Malaysia. The macroprudential policy measures was implemented by Bank Negara Malaysia as an initiative to curb the high level of household indebtedness in Malaysia as the household debts had increased rapidly with the average rate of 12% annually (Bank Negara Malaysia, 2013). Thus, it is interesting to explore whether the implementation of macroprudential policy measures will give any impact on the commercial bank lending in Malaysia.

1.2 Problem statement

There are number of studies that have examined the determinants of commercial bank lending in various countries around the globe (Sarath & Pham, 2015; Tomak, 2013; Rabab'ah, 2015; Amidu, 2014; Chernykh & Theodossiou, 2011; Imran & Nishat, 2013).

In the context of bank specific determinants, Amidu (2014) examines the determinants of bank lending in Sub-Saharan African countries. The findings of the study conclude that bank size has a positive relationship with bank lending. The study also provides evidence that non-performing loan and liquidity negatively influence the bank lending in Sub-Saharan African countries. On the contrary, Sarath & Pham (2015) contend that non-performing loans does not influence bank lending in Vietnam and suggest that liquidity and volume of deposit is the most important bank specific determinants of bank lending in

Vietnam. On the other hand, Malede (2014) claims that liquidity and volume of deposit do not influence bank lending in Ethiopia.

Rabab'ah (2015) investigates the macroeconomic determinants of bank lending in Jordan and suggests that gross domestic product has a positive relationship with bank lending. However, Tomak (2013) argues that gross domestic product does not have any impact on bank lending in Turkey. In terms of lending rate, Karim et. al, (2011) conclude that lending rate plays a pivotal role influencing bank lending in Malaysia and has a negative relationship with bank lending. In addition, Cargill & Mayer (2006) claim that cash reserve requirement plays an important role to influence bank lending in America. The study documents that reserve requirement tends to negatively influence bank lending in the United States. On the contrary, Olokoyo (2011) claims that lending rate and cash reserve requirement do not have any significant impact on bank lending in Nigeria.

The mixed findings of the existing studies probably due to banks behave differently under diverse regulation, political background, and banking culture. This implies that similar study using other jurisdiction's sample might produce different findings. It is therefore important to evaluate the determinants of commercial bank lending in Malaysia.

There are relatively few studies that examine the determinants of commercial bank lending in Malaysia. The only literature that relates closely with the study on bank lending in Malaysia is the study done by Karim et. al., (2011). The study employs the disaggregated bank level data to examine the role of credit channel in the monetary transmission of Malaysia. In this respect, the determinants of commercial bank lending in Malaysia is still remain unclear.

In addition, beginning year 2010, Bank Negara Malaysia had implemented macroprudential policy measures as an initiative to curb the high level of household indebtedness in Malaysia. This is because the household debts in Malaysia were continually growing at a strong pace with the average rate of 12% annually since year 2008 (Bank Negara Malaysia, 2013). Furthermore, the household debts to gross domestic product ratio had increased rapidly from year 2010 to year 2014, in which the ratio recorded 74.5% in year 2010 and increased to 87.9% in year 2014 (Bank Negara Malaysia, 2015). However, the empirical impact of this policy measures on commercial bank lending still remain ambiguous. To the best of the researcher's knowledge, there is no study investigates the influence of macroprudential policy measures on commercial bank lending in Malaysia particularly for the period from year 2005 to year 2014.

The above issues left some interesting questions; What are bank specific characteristics that influence commercial bank lending in Malaysia? What are the macroeconomic determinants that influence commercial bank lending in Malaysia? Does the implementation of macroprudential policy measures have an impact on the commercial bank lending in Malaysia?

1.3 Objective of the study

The objectives of this study are:

1. To examine the bank-specific determinants of commercial bank lending in Malaysia.
2. To examine the macroeconomic determinants of commercial bank lending in Malaysia.
3. To examine the impact of macroprudential policy measures on commercial bank lending in Malaysia.

1.4 Significance of the study

This study aims to contribute to the existing literature by investigating the determinants of commercial bank lending in Malaysia for the period year 2005-year 2014.

Firstly, this study investigates the effect of the implementation of macroprudential policy measures started in year 2010 on commercial bank lending in Malaysia. The specific policy measures was implemented in order to curb the high level of household indebtedness in Malaysia. Hence, the findings could shed some light on the effectiveness of the new policy measures on the commercial bank lending in Malaysia.

Secondly, this study enriches the related literature by focusing on bank lending in Malaysia. This is because there are relatively few studies investigating the determinants of commercial bank lending in Malaysia. Thus, the findings of this study will add to the existing literature on Malaysian context.

1.5 Organization of the study

The organization of this study is as follow. Chapter 2 provides the overview of lending activities in Malaysia and reviews the previous studies related to the determinants of bank lending. Chapter 3 reports the data, sample, model and technique of analysis used in this study. Chapter 4 discusses the findings of this study. Chapter 5 will make a conclusion for the study and provide suggestion for the future study.

CHAPTER 2

OVERVIEW OF LENDING ACTIVITIES IN MALAYSIA AND LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of commercial bank lending in Malaysia and reviews the existing literature. Section 2.2 presents the overview of commercial bank lending in Malaysia and Section 2.3 reviews the existing studies on the determinants of bank lending and develops the hypothesis statements.

2.2 Overview of commercial bank lending in Malaysia

The Malaysian financial institutions can be divided into two main component which are banking institutions and non-banking financial institutions. The identity of these two type of financial institutions can be differentiate from their daily activities (Sufian, 2009).

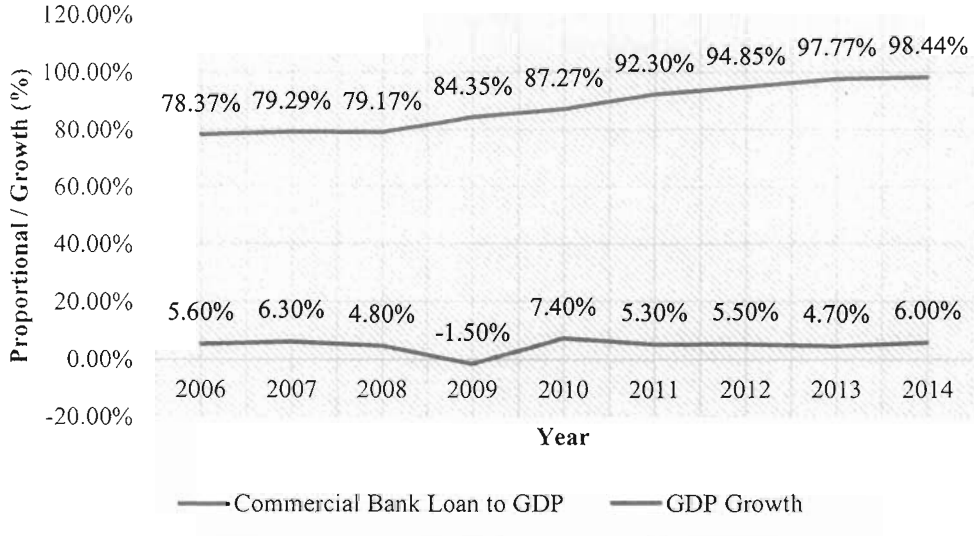
There are three types of banking institutions in Malaysia namely commercial banks, Islamic banks and investment banks. Currently, there are 27 commercial banks, 16 Islamic banks and 11 investment banks operating in Malaysia banking sectors. In the context of commercial bank, there are 8 domestically incorporated commercial banks and 19 locally incorporated foreign commercial banks in Malaysia (Bank Negara Malaysia, 2013). Commercial banks are the main participants in the Malaysian financial system as they are the biggest and most apparent fund's suppliers in the financial market which commercial banks contribute about 70% of the financial system's total assets (Sufian, 2009).

Malaysian commercial banks also enjoy the widest extent of banking business (Sufian, 2009). According to Financial Services Act 2013, the commercial banks in Malaysia are allow to undertake banking business which includes taking customer's deposit on saving account, current account and other similar account. Commercial banks are also obligate to honor the cheques drawn by their customers. Furthermore, the commercial banks also can run the provision of finance such as lending money, leasing business, and other activities.

Moreover, the commercial banks in Malaysia are also the largest and most significant of funds providers in the financial system (Sufian, 2009). At the end of year 2014, the total loans and total deposits of commercial banks are recorded at RM 980,824 million and RM 1,204,421 million respectively (Bank Negara Malaysia, 2015). This implies that approximately 80% of the deposits collected by the commercial banks will be used to grant loan to the public. As a result, this indicates that the commercial banks play an active intermediaries role as they mobilize the funds and act as the main sources of financing which support the economic activities in Malaysia.

Figure 2.1

Commercial bank loans to GDP ratio and GDP growth



Sources: Bank Negara Malaysia Monthly Statistical Bulletin March 2016

Figure 2.1 shows the commercial bank loans to gross domestic product ratio and the growth rate of gross domestic product from year 2006 to year 2014. It shows that for the period 2006-2014, the commercial bank loans to gross domestic product ratio undergo an upward trend. The commercial bank loans to gross domestic product ratio was recorded above 75% from year 2006 to year 2014.

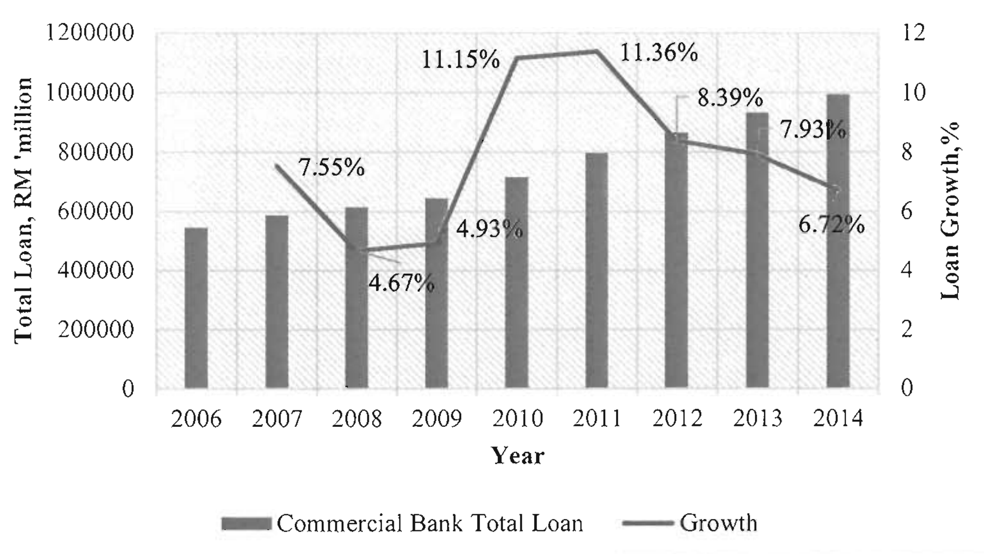
Moreover, Figure 2.1 also shows the commercial bank loans to GDP ratio from year 2010 to year 2014 has increases rapidly from 87.27% to 98.44%. The rapid incremental trend in commercial bank loans to gross domestic product ratio is due to the outperform growth rate of gross domestic product which has average increment of 5.78% over the last five year.

The global financial crisis that happened in year 2008 had caused the global economy to slow down and Malaysia economy is not exempted from this incident. This can be shown by the growth rate of Malaysia GDP which it had decreased to 4.8% in year 2008 and became worsen in year 2009 which it had recorded -1.5%. Interestingly, during the global financial crisis period, the commercial bank loan to GDP ratio continues to grow from 79.17% to 87.27% from year 2008 to year 2010. Thus, this indicates the global financial crisis in year 2008 did not give a serious impact on the ability of commercial banks to grant loan.

The steady growth of the commercial bank loans to GDP ratio during the period of global financial crisis is due to the commercial banks in Malaysia did not take excessive risk in their lending activities, hence the banks were able to withstand the impact of financial crisis. Moreover, commercial banks in Malaysia are also well-capitalized and they have ample of liquidity to cushion the shocks arises from the global financial crisis (Bank Negara Malaysia, 2011).

Figure 2.2

Total loan and loan growth of commercial bank in Malaysia



Sources: Bank Negara Malaysia Monthly Statistical Bulletin March 2016

Figure 2.2 shows the total loans and loans growth of commercial bank in Malaysia from year 2006 to 2014. The total loans granted by the commercial bank had increased approximately 1.8 times from year 2006 to year 2014. In addition, the average growth rate of the total loans grant by the commercial banks in Malaysia are about 8.41% and it achieved its highest annual growth rate on year 2011 which is 11.36%. This might because Malaysian economy started to recover from the impact of global financial crisis as shown by the GDP's growth rate which is 11.15% and 11.36% respectively in year 2010 and year 2011.

On the contrary, the annual growth rate of total loans of commercial bank had declined to 4.67% and 4.93% respectively in year 2008 and 2009. This is probably due to the global financial crisis happened in year 2008.

Moreover, the growth rate of commercial bank loan had gradually declines from year 2012 to year 2014 after it hits the highest annual growth rate in year

2011. The annual growth rate of commercial bank loan from year 2012 to year 2014 had recorded 8.39%, 7.93% and 6.72% for the respective year.

The downward trend from year 2012 to year 2014 might be due to the effort by Bank Negara Malaysia to curb the high level of household indebtedness. Since year 2008, the Malaysia's household debts was continued increase at a strong pace with the average annual rate of 12%. (Bank Negara Malaysia, 2013). Moreover, the household debt to gross domestic product ratio also had increased rapidly from year 2010 to year 2014, which the ratio recorded 74.5% on year 2010 and increased to 87.9% on year 2014 (Bank Negara Malaysia, 2015). Thus, Bank Negara Malaysia had introduced several policy measures such as strengthening the application and usage of credit card, limit the maximum of 10 year tenure for personal financing and limit the maximum loan to value ratio of housing loan at 70% as an initiative to promote a sound and sustainable household sector (Bank Negara Malaysia, 2013).

2.3 Literature review and hypothesis statements

There are several studies investigate the determinants of commercial bank lending in various country around the globe (Olokoyo, 2011; Malede, 2014; Tomak, 2013; Rabab'ah, 2015; Sarath & Pham, 2015; Amidu, 2014; Chernykh & Theodossiou, 2011; Moussa & Chedia, 2016; Imran & Nishat, 2013). Most of these studies examine the effect of bank specific characteristics factors and external macroeconomic factors on bank lending. However, the evidences from the previous studies are rather inconclusive and very little examine the determinants of commercial bank lending in Malaysia particularly for the period between year 2005 to year 2014. Moreover, the mixed results from the previous studies might be due to different methodologies, dataset used, time period of study, and different economic backgrounds adopted in the aforementioned literature. There are several common bank's specific characteristics and macroeconomic variables used in the previous studies to determine bank lending. Generally, the bank specific characteristics are bank size, non-performing loan, liquidity and volume of deposit. While, the macroeconomic variables are gross domestic product, lending rate and cash reserve requirement.

2.3.1 Bank's specific characteristics

The bank's specific characteristics refer to the determinants that are primarily affected by the bank's management decisions and the bank's policy objective (Sufian, 2009). Generally, bank size, non-performing loan, volume of deposit and liquidity are the most common bank's specific characteristics use in the previous studies for investigate the determinants of bank lending. The following subsections discuss in detail the bank specific characteristics that commonly used in previous studies to determine the bank lending.

2.3.1.1 Bank size

Bank size is commonly measured by the size of total asset of a bank. The bank size is used to measure the commercial bank lending as it shows the economics of scale enjoyed by the bank (Chernykh & Theodossiou, 2011).

There are several previous studies from African nation claim that bank size is among the factors that affect bank lending. For instance, Costant & Ngomsi (2012) which employ a sample of bank from six countries in the Central African Economic and Monetary Community. The findings of the study reveal the bank size is the most crucial and persistent factor to determine a bank's tendency to give loan.

Moreover, Malede (2014) and Amidu (2014) also study the determinants of bank lending in the context of Africa countries and they claim bank size is positively influences the bank lending. Furthermore, Rabab'ah (2015) who investigate the commercial bank in Jordan and the study concludes that the bigger banks tend to provide higher credit facilities to the public.

In the context of European countries, Tomak (2013) reveals that larger commercial bank in Turkey tends to provide more business loan to the public. In Russia, Chernykh & Theodossiou (2011) suggest that larger banks have more accessibility and bigger fund to grant loan to the public.

On the contrary, Podpiera (2007) examines the characteristics of bank's loan supply in Czech and the findings of the study contends that the bank size tend to negatively influence the growth rate of loans.

Generally, empirical evidence from the earlier studies indicate that bank size can positively influence commercial bank lending. Theoretically, the bank size tends to positively influence the commercial bank lending as larger bank have more accessibility and have larger fund to grant loan to the public. Thus this study hypothesizes that:

H1: Bank size has a positive relationship with the commercial bank lending in Malaysia.

2.3.1.2 Non-Performing Loan

The non-performing loan refers to the loan where its scheduled loan repayment is overdue for more than 90 days and it is no longer accrues any interest income for the bank (Rose & Hudgins, 2013).

According to some scholarly studies, non-performing loan is one of the common factors that influence bank lending. For example, Amidu (2014) utilizes a sample of 264 banks across 24 Sub-Saharan Africa countries and suggests that high portion of non-performing loan on the bank balance sheet will discourage the credit delivery of the bank, thus it indirectly reduce the lending volume of the bank.

In the context of Asia countries, Rabab'ah (2015) investigates the factors affecting the bank lending in Jordan and concludes that high proportion of non-performing loans will decrease the credit facilities granted by the commercial bank in Jordan.

In the context of Europe, Tomak (2013) concludes that the non-performing loans tends to negatively influence the lending capacity of commercial bank in Turkey.

In summary, non-performing loan will influence the bank lending negatively. Theoretically, the high non-performing loans in the bank's lending portfolio will induce the bank to allocate more loan loss provision to cushion the potential losses, thus it indirectly reduces the lending capacity of the commercial bank. Thus, the hypothesis 2 is as follow:

> H2: Non-performing loan has a negative relationship with the commercial bank lending in Malaysia.

2.3.1.3 Liquidity

Liquidity describes the ability of a bank to convert its assets into cash with minimum losses (MacDonald & Koch, 2006). Liquidity is used to determine the effect of the proportional of liquid assets held by the bank against the commercial bank lending (Rabab'ah, 2015).

Based on the evidences found in Asia countries, Rabab'ah (2015) finds that the high liquidity maintained by the bank will reduce the ability of the bank to grant loan to the public. Sarath & Pham (2015) investigate the determinants of commercial bank lending in Vietnam for the period from year 2008 to year 2012 and the findings conclude that higher liquidity held by the bank will negatively affect the bank lending.

Furthermore, there are several studies in Africa also provide substantial evidences that liquidity will influence bank lending negatively. As proof, Moussa & Chedia (2016) investigate the determinants of bank lending in Tunisia and the findings suggest that the higher proportional of liquid assets held by the banks will lower the commercial bank lending. Similarly, Amidu (2014) employs a sample data of 264 commercial banks across 24 Sub-Saharan Africa countries and the study concludes that liquidity is negatively influence the commercial bank lending.

On the other hand, the study of Podpiera (2007) which employ the sample data of commercial bank in Czech. The findings of the study discover that liquidity positively influence the loan's growth especially in the situation of tightening of monetary policy.

In summary, the empirical evidence from previous studies indicate that the liquidity can negatively influence the commercial bank lending. Theoretically, the high proportion of liquid assets held by the bank will directly reduce the funds available for bank to grant loan to the public. Therefore, hypothesis 3 is as follows:

H3: Liquidity has a negative relationship with the commercial bank lending in Malaysia.

2.3.1.4 Volume of deposit

Customer's deposits are crucial for bank lending as they supply most of the raw materials for banks to grant loan and generate profits for the bank (Rose & Hudgins, 2013). The commercial banks act as intermediary by accepting the deposit from the depositors and use the fund to grant loan to the deficit unit in the financial market.

Numerous studies in Asia show that volume of deposit indeed have an effect on bank lending. Refer to the previous studies, Al-Kilani & Kaddumi (2015) suggest that banks in Jordan should attract more deposits from theirs depositors.

This is because high volume of deposit will provide more funds for the banks to grant loan and advances to the public. Moreover, Imran & Nishat (2013) investigate the determinant of bank lending in Pakistan and the study claim that banks with high volume of domestic deposits will have more liquidity to provide loan to the public. Swamy (2012) indicates that deposit positively affect the commercial bank lending in India whether the economy is in pre-recession, during recession and after recession period. Furthermore, Sarath & Pham (2015) also find that the higher deposit growth will facilitate the growth of commercial bank lending in Vietnam.

In addition, there are several studies in Africa also find that volume of deposit will influence bank lending positively. For instance, Olokoyo (2011) and Olumuyiwa et. al (2012) find that volume of deposit have a positive and significant relationship with the bank lending. They suggest that bank should put more effort to attract more deposit to enhance their bank lending.

Generally, previous studies indicate that volume of deposit will affect the bank lending positively. Theoretically, the high capabilities of commercial banks to attract more deposit from theirs customer will enhance the ability of commercial bank to grant loan to the public. Thus, the hypothesis 4 is as follow:

H4: Volume of deposit has a positive relationship with the commercial bank lending in Malaysia.

2.3.2 Macroeconomic determinants

The macroeconomic determinants refer to those variables that are not under the control of bank management but reflect the monetary, economic and legal compliance of a country that influence the lending activities of a banking institutions (Amidu, 2014). Generally, gross domestic product, lending rate and cash reserve requirement are the most common determinants use by the previous studies to examine the bank lending.

2.3.2.1 Gross domestic product

The gross domestic product is one of the crucial factors that influence the bank lending due to the pace of the economy activity might indirectly influences the preference of the bank to grant loan to the public.

Various studies have been made with regard to gross domestic product of a country and its relationship with bank lending. Based on studies in Africa, Constant & Ngomsi (2012) investigate the long-term lending behavior of 35 commercial banks in Central Africa and the findings of the study discover that the gross domestic product has a positive and significant relationship with the bank lending. The study also suggests that GDP growth is one of the most vital and consistent factors to define a bank's propensity to lend long term business loan. Similarly, Amidu (2014) claims that when the gross domestic product increases, it will lead to the increment of bank lending in Sub-Saharan Africa countries. Moreover, Olokoyo (2011) also discovers that gross domestic product in Nigeria have a positive and significant relationship with the bank lending.

Several previous studies in Asia countries also find that gross domestic product will positively influence the bank lending. For example, Rabab'ah (2015) points out that the higher rate of economic growth in Jordan tends to increase the proportional of credit facilities. Similarly, Al-Kilani & Kaddumi (2015) investigate the lending behavior of banking sector in Jordan for the period year 2000 to year 2013. The findings of the study also agree that the gross domestic products has a positive significant effect on bank lending.

Moreover, Imran & Nishat (2013) investigate the determinant of bank credit of Pakistan and the study posits that the growth in real gross domestic product able to accelerate the manufacturing sectors as well as aggregate people's wages which will stimulate the domestic deposits. As a result, it will improve the bank's liquidity and facilitate the bank to lend more for investment needs. Sarath & Pham (2015) examine the determinants of lending behavior in Vietnam and the study recommends that the gross domestic product is positively influences the loan growth.

On the other hand, Moussa & Chedia (2016) investigate the determinants of bank lending in Tunisia and the study contends that the gross domestic product have a negative relationship with bank lending.

In summary, previous studies indicate the gross domestic product may influence the bank lending positively. Theoretically, the gross domestic product will influence bank lending positively as when the economic boom, private sectors are increase their frequent to borrow money for investment and doing business. Thus, the hypothesis 5 is as follow:

H5: Gross domestic product has a positive relationship with commercial bank lending.

2.3.2.2 Lending rate

Lending rate refers to the interest rate charged by the banks to its customers who request financing from the banks. The lending rate charged on the customer's loan is important for the bank as it provides the most significant sources of income for the banks (Moussa & Chedia, 2016). Moreover, the lending rate is also one of the monetary policy instruments used by the Central Bank to control the liquidity in the financial market.

Several previous studies have made contribution about the influences of lending rate on bank lending. For example, Richard & Okeye (2014) examine the factors that affect lending behavior of deposit money banks in Nigeria and the study recommends that higher lending rate tends to increase the volume of loan and advances grant by the bank.

In the context of Asia countries, Swamy (2012) investigates bank lending behavior by using a sample of commercial banks in India from year 2006 to year 2011. The findings indicate that the lending rate has a positive and significant relationship with the commercial bank lending during pre-recession period and recovery period of economic, but it tend to negatively influence the commercial bank lending during the period of recession. On the other hand, Karim et. al. (2011) conclude that the lending rate tend to negatively affect the bank lending in Malaysia.

In summary, empirical evidence from existing studies show that lending rate can influence the commercial bank lending negatively. Based on the economic theory, the lending rate tends to negatively affect the commercial bank lending due to higher lending rate charged by the bank on borrower's loan will increase the financial cost of the borrower, so it will reduce the desire of the public to borrow money from the commercial banks. Thus, the hypothesis 6 is as follow:

H6: Lending rate has a negative relationship with commercial bank lending in Malaysia.

2.3.2.3 Cash reserve requirement

The cash reserve requirement is one of the monetary policy instruments which allows the Central Bank to manage the liquidity and credit creation in the banking system. The banking institutions in Malaysia are required to keep certain proportion of their eligible liabilities in their Statutory Reserve Accounts (Bank Negara Malaysia, 1999).

Previous study by Cargill & Mayer (2006) investigate the effect of reserve requirement on bank lending in the context of America and the findings conclude that the bank tends to reduce its earning assets in order to increase the reserve requirement set by the Federal Reserve. Thus, the study suggests that cash reserve requirement is an important monetary policy instruments which it tends to negatively influence the bank lending.

In Africa countries, Richard & Okeye (2014) examine the lending behavior of deposit money bank in Nigeria covering from year 1990 to year 2011. The findings of the study suggest that the cash reserve requirement have a significant positive impact on the volume of loan advances over the years. Similarly, Olumuyiwa et al. (2012) also conclude that the cash reserve requirement tends to influence the commercial bank lending in Nigeria positively.

Generally, the empirical evidence from the previous study finds that cash reserve requirement can affects the commercial bank lending negatively. According to the economy theory, cash reserve requirement tends to influence commercial bank lending negatively as the commercial bank in Malaysia are require to reserve some proportional of its eligible liabilities with Bank Negara Malaysia, hence it will restrict the credit creation of the commercial bank in Malaysia. Therefore, the hypothesis 7 is as follow:

H7: Cash reserve requirement ratio has a negative relationship with commercial bank lending.

From the review of the existing studies, Table 2.1 summarizes the findings of previous studies which relate bank specific characteristics and macroeconomic determinants on bank lending.

Table 2.1

Summary of previous findings on determinants of bank lending

Authors	Variables	Findings
Olokoyo (2011)	DV: Loan and advances IV: Volume of deposits Lending rate Cash reserve requirement Gross domestic product	Volume of deposits (+) Gross domestic product (+)
Malede (2014)	DV: Bank lending IV: Bank size Non-performing loan Liquidity Volume of deposit Gross domestic product Cash reserve ratio Lending rate	Bank size (+) Non-performing loan (+) Liquidity (+) Gross domestic product (+)
Tomak (2013)	DV: Total business loan IV: Bank size Total liability Non-performing loan Gross domestic product Interest rate	Bank size (+) Total liability (+) Non-performing loan (-)
Olumuyiwa et al. (2012)	DV: Loans and advances IV: Volume of deposits Liquidity Lending rate Gross domestic product Cash reserve requirement	Volume of deposit (+) Gross domestic product (+) Cash reserve requirement (-)

Table 2.1 (Continued)

Authors	Variables	Findings
Rabab'ah (2015)	DV: Credit facilities IV: Deposit Non-performing loans Liquidity Bank size Lending rate Legal reserve ratio Gross domestic product	Non-performing loans (-) Liquidity (-) Bank Size (+) Gross domestic product (+)
Sarath & Pham (2014)	DV: Loan growth IV: Growth rate of deposit Liquidity Non-performing loan Gross domestic product	Growth rate of deposit (+) Liquidity (-) Gross domestic product (+)
Amidu (2014)	DV: Bank lending IV: Bank size Liquidity Non-performing loan Gross domestic product	Bank size (+) Liquidity (-) Non-performing loan (-) Gross domestic product (+)
Richard & Okeye (2014)	DV: Loan and advances IV: Lending rate Volume of deposit Liquidity ratio Cash reserve ratio	Lending rate (+) Liquidity ratio (+) Cash reserve ratio (+)

Table 2.1 (Continued)

Authors	Variables	Findings
Chernykh & Theodossiou (2011)	DV: Total business loan Long-term business loan IV: Bank size Long-term liabilities Provision of loan loss	Bank size (+) Provision of loan loss (+)
Moussa & Chedia (2016)	DV: Total loan and advances IV: Bank size Liquidity Total deposit Gross domestic product	Bank size (+) Total deposit (-) Liquidity (-) Gross domestic product (-)
Imran & Nishat (2013)	DV: Loan and advances IV: Domestic deposit Gross domestic product	Domestic deposit (+) Gross domestic product (+)
Podpiera (2007)	DV: Total loan IV: Bank size liquidity Gross domestic product	Bank Size (-) liquidity (+) Gross domestic product (+)

2.4 Conclusion

This chapter has deliberate the bank specific characteristics determinants and macroeconomic determinants as variables that will be used for analyze in next chapters. The discussion highlights that bank size, non-performing loan, volume of deposit, liquidity, gross domestic product, lending rate and cash reserve requirement act as the independent variables for analysis. While, the commercial bank lending will become the dependent variable. Moreover, a summary table about the findings of previous literatures also been prepare at the end of this chapters.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter reports the data and methodology used to analyze the determinants of commercial bank lending in Malaysia in order to answer the research objectives. This chapter is organized as follows: Section 3.1 presents the organization of this study. Section 3.2 discusses the regression model of this study. Section 3.3 presents the technique of analysis use in this study. Section 3.4 discusses the measurement of variables in this study. Lastly, Section 3.5 summarizes the whole chapter.

3.2 Data

This study employs unbalanced panel data over the period of 2005-2014 in order to investigate the determinants of commercial bank lending in Malaysia. The annual financial data of all commercial banks were extracted from the respective bank's income statement and balance sheets which were downloaded from the commercial bank's official website. Moreover, the macroeconomic data which consists of Malaysia's gross domestic product, lending rate and statutory reserve requirement ratio were collected from the Bank Negara Malaysia website and the World Bank website.

The unbalanced panel data set employed in this study refers to a sample in which some of the cross sectional unit (i) have an unequal number of time series observation (t) (Mayer, 2010). The unbalanced panel data set are common in the general economic empirical setting especially in the bank industry, where there are some banks have to be dropped out from the sample due to merger and acquisition activities take place during the study period (Baltagi, 2005). This study utilizes the unbalanced panel data set due to there are few foreign banks and domestic banks have incorporated in Malaysia in the later years of the study period, thus the relevant commercial banks does not have complete time series data set for the entire study period.

There are several advantages for utilizing panel data in this study. Firstly, panel data able to control for bank and time invariant variables. Secondly, panel data able to expand the sample size by combining time-series of cross section observations. Thirdly, panel data provide more variability and less collinearity among the variables employed in the study. Fourthly, panel data grants higher degrees of freedom and more efficiency to the study. Fifthly, panel data enable the study to discover and measure the effect that simply cannot be identified in the pure cross-section or pure time series data. Sixthly, panel data enable the researcher to study more complicated behavior model. Last but not least, panel data can minimize the bias which resulted from aggregation of individuals or firm into broad aggregate (Baltagi, 2005).

3.3 Sample

A sample of commercial bank in Malaysia is utilized in this study to investigate the determinants of commercial bank lending in Malaysia. There are 27 commercial banks operating in Malaysia which consist of 8 domestically incorporated commercial banks and 19 locally incorporated foreign commercial banks. Table 3.1 shows the list of commercial banks in Malaysia which are used as a sample in this study.

Table 3.1

List of commercial banks in Malaysia

No.	Commercial Banks	Ownership
1.	Affin Bank Berhad	L
2.	Alliance Bank Malaysia Berhad	L
3.	Ambank (M) Berhad	L
4.	BNP Paribas Malaysia Berhad	F
5.	Bangkok Bank Berhad	F
6.	Bank of America Malaysia Berhad	F
7.	Bank of China (Malaysia) Berhad	F
8.	Bank of Tokyo-Mitsubishi UFJ (Malaysia) Berhad	F
9.	CIMB Bank Berhad	L
10.	Citibank Berhad	F
11.	Deutsche Bank (Malaysia) Berhad	F
12.	HSBC Bank Malaysia Berhad	F
13.	Hong Leong Bank Berhad	L
14.	India International Bank (Malaysia) Berhad	F
15.	Industrial and Commercial Bank of China (Malaysia) Berhad	F
16.	J.P. Morgan Chase Bank Berhad	F
17.	Malayan Banking Berhad	L
18.	Mizuho Bank (Malaysia) Berhad	F
19.	National Bank of Abu Dhabi Malaysia Berhad	F
20.	OCBC Bank (Malaysia) Berhad	F
21.	Public Bank Berhad	L
22.	RHB Bank Berhad	L
23.	Standard Chartered Bank Malaysia Berhad	F
24.	Sumitomo Mitsui Banking Corporation Malaysia Berhad	F
25.	The Bank of Nova Scotia Berhad	F
26.	The Royal Bank of Scotland Berhad	F
27.	United Overseas Bank (Malaysia) Berhad	F

Note: L: Domestically incorporated commercial banks; F: Locally incorporated foreign commercial banks

Sources: Bank Negara Malaysia website

3.4 Regression model

A baseline regression model is developed to investigate the determinants of commercial bank lending in Malaysia. The baseline regression model employed in this study is a modified model based on Rabab'ah (2015), Tomak (2013) and Chernykh & Theodossiou (2011). The baseline regression model is as follows:

$LDTA_{it}=\alpha 0 + \beta_1 LOGTA_{it} + \beta_2 NPL_{it} + \beta_3 LIQ_{it} + \beta_4 DEP_{it} + \beta_5 GDP_{it} + \beta_6 LR_{it} + \beta_7 SRR_{it} + \beta_8 DUM10 + \mu_{it}$

(Equation 1)

Where:

$LDTA_{it}$: Total loans and advances of bank i at year t scaled by total assets.

$LOGTA_{it}$: The logarithm of total assets of bank i at year t.

NPL_{it}: Non-performing loans of bank i at year t scaled by total loans and advances.

LIQ_{it}: Total liquid assets of bank i at year t scaled by total assets.

DEP_{it}: Total deposits of bank i at year t scaled by total assets.

GDP_t: Annual growth rate of Malaysian Gross Domestic Product at year t.

LR_t: The annual average lending rate at year t.

SRR_t: The cash reserve requirement ratio at year t.

$DUM10_t$: = Dummy for macroprudential policy measures 2010 at year t, where =1 for the period of 2010-2014 and =0 for the period of 2005-2009.

$\mu_{it:}$ The error term of regression.

3.5 Measurement of variables

3.5.1 Dependent variable

3.5.1.1 Commercial bank lending (LDTA)

The dependent variable of this study is the commercial bank lending (LDTA) which it is measured by the total loans and advances as a percentage of total assets. It demonstrates the size of loans and advances granted by the banks to the public. The total loans and advances to total assets ratio is employed by the previous studies to measure the bank lending (Chernykh & Theodossiou, 2011; Rabab'ah, 2015; Costant & Ngomsi, 2012; Tomak, 2013). Thus, this study will employ the total loans and advances to total assets ratio to measure the commercial bank lending in Malaysia.

3.5.2 Independent variables

3.5.2.1 Bank size (LOGTA)

According to the studies of Amidu (2014), Costant & Ngomsi (2012), Chernykh & Theodossiou (2011), the logarithms value of total assets (LOGTA) is used to capture the size of the bank. The bank size is used to measure the ability of banks to lending money due to economics of scale may be enjoyed by the bank where large size bank might have lower cost of production and information , thus it will indirectly facilitate the bank lending.

A positive coefficient of LOGTA with the LDTA is expected due to larger banks are more diversified and they have large amount of available fund to grant loan to the public. Moreover, larger banks also have greater opportunity to deal with the larger and high creditworthy customers, which will facilitate the commercial bank lending (Chernykh & Theodossiou, 2011).

3.5.2.2 Non-performing loan (NPL)

According to the studies of Sarath & Pham (2015) and Tomak (2013), non-performing loans to total loans ratio (NPL) is used to measure the credit risk and the quality of bank lending portfolio. The non-performing loan refers to the loan which its scheduled loan repayment is overdue for more than 90 days and it is no longer accrues any interest income for the bank (Rose & Hudgins, 2013).

Generally, the non-performing loan tends to move negatively with the commercial bank lending as banks with high non-performing loan tend to have riskier bank lending portfolio where the banks have to allocate more loan loss provision to cushion the default risk (Chernykh & Theodossiou, 2011). Hence, banks with high NPL will hinder its credit delivery and reduce their lending to the public (Amidu, 2014).

3.5.2.3 Liquidity (LIQ)

Based on the previous studies, total liquid assets to total assets ratio (LIQ) is used as a proxy to measure the bank's liquidity (Rabab'ah, 2015; Podpiera, 2007; Amidu, 2014; Rabab'ah, 2015). This variable is used specifically to measure the effect of proportional of the liquid assets which held by the bank against the bank lending (Rabab'ah, 2015). Liquidity depicts the ability of a bank to convert its assets to cash with minimum losses (MacDonald & Koch, 2006). Commercial banks have to ensure that they have adequate liquidity at all time in order to meet theirs contractual obligations such as withdrawals of retail deposits and drawdown by customers on committed loan facilities. (Rose & Hudgins, 2013).

A negative coefficient with the LIQ is expected due to the high portion of liquid assets held by the commercial banks, the lower the funds are available for commercial bank to grant loan to the public. Therefore, the higher the LIQ, the lower will be the LDTA.

3.5.2.4 Volume of deposit (DEP)

Previous studies of Malede (2014) and Rabab'ah (2015) employ total deposits to total assets ratio (DEP) as a proxy of the volume of deposit to investigate its relationship with the commercial bank lending. Following a similar approach, present study will employ total deposits to total assets ratio (DEP) to access the relationship between the volume of deposit and the commercial bank lending in Malaysia. Customer's deposit supplies most of the raw material for banks to grant loan and generating profits to sustain the bank's growth (Rose & Hudgins, 2013). Most of the deposits of commercial banks are made up by the non-interest bearing demand deposits and interest bearing demand deposits. The non-interest bearing demand deposits refer to the deposit where bank does not pay interest for their customers but provide payment services, such as current accounts. On the other hand, the interest bearing transactions deposits refer to the deposits which the bank pay interest to their depositors, for instance savings deposits and time deposits.

It is expected that the volume of deposit will have a positive relationship with the commercial bank lending. This is because when the banks have high volume of deposit, it tends to increase theirs liquidity and enable them to grant more loan to the public (Imran & Nishat, 2013).

3.5.2.5 Gross domestic product (GDP)

The economic growth is one of the crucial factors that influence the bank lending due to the high economic growth rate reflects the high pace of economic activity in the country and this will indirectly increase the demand for funding. Thus, this study will follow the previous studies by employing the annual percentage change in the gross domestic product at constant price (GDP) as a proxy to investigate the relationship between the economic condition and the commercial bank lending (Tomak, 2013; Moussa & Chedia, 2016; Sarath & Pham, 2015; Rabab'ah, 2015; Malede, 2014; Amidu, 2014; Costant & Ngomsi, 2012).

The GDP is expected to have a positive relationship with the commercial bank lending (LDTA). When the economy boom, loan demand from the public will be increase, thus this will provide more opportunities for the banks to grant loan to the public and resulting the bank lending tend to be increase. Moreover, Imran & Nishat (2013) also suggest that the high gross domestic product growth rate tends to facilitate the growth of the manufacturing sector in Pakistan as resulted increment in the people salaries, thus it will indirectly increases the deposits of the people in the bank and causes the banks have more liquidity for their lending activities.

3.5.2.6 Lending rate (LR)

Most of the researchers use average annual lending rate as a proxy to investigate the relationship between lending rate and bank lending (Malede, 2014; Rabab'ah, 2015). Thus, this study will also uses the average annual lending rate (LR) as the proxy of lending rate to determine the relationship between lending rate and the commercial bank lending in Malaysia. The average annual lending rate is computed by the average annual Base Lending Rate which the rate is regulated by the Bank Negara Malaysia. The regulation of Base Lending Rate on commercial bank's loan pricing is able to reduce stiff competition against the commercial bank in Malaysia. Moreover, the bank also should acts prudent in determines its lending rate on loans. This is because charging too low interest rate on loan will cause the bank unable to covers its cost of deposits and general expenses. However, if the bank charging too high interest rate on loan, this may induces the borrower default on their loan (Rabab'ah, 2015).

Typically, lending rate are expected to have a negative relationship with the commercial bank lending. This is because high lending rate will incur high financial cost for the borrower, hence it will reduce the desire of the public to borrow money from the commercial banks to do business or investment. As a result, there are less opportunities for the commercial banks to grants loan to the public and it will indirectly reduce the commercial bank lending.

3.5.2.7 Cash reserve requirement (SRR)

The cash reserve requirement is a monetary policy instrument used by the Central Bank to manage the liquidity in the financial market (Bank Negara Malaysia, 2016). In Malaysia, the cash reserve requirement is known as statutory reserve requirement (SRR) and it allows Bank Negara Malaysia to manage the liquidity and credit creation in the banking system (Bank Negara Malaysia, 2016). Therefore, all commercial banks in Malaysia are required to extract specific proportional of their eligible liabilities and keep it in the Statutory Reserve Account with the Central Bank of Malaysia (Bank Negara Malaysia, 2016).

This study follows the studies of Rabab'ah (2015) and Olokoyo (2011) by using the cash reserve requirement ratio (SRR) as a proxy to evaluate the relationship between cash reserve requirement and the commercial bank lending. A negative coefficient of SRR against the LDTA is expected due to the lower of cash reserve requirement ratio enables the bank to exploit more of its deposit for lending purpose, as this will facilitate the commercial bank lending.

3.5.2.8 Macroprudential policy measures dummy (DUM10)

Since year 2010, Bank Negara Malaysia has introduced a set of macroprudential policy measures as an initiative to prevent excessive household indebtedness and to strengthen responsible lending practice by key credit providers in the Malaysian financial market. Bank Negara Malaysia has strengthen the requirement for application and usage of credit card, limit the maximum of 10 years tenure of personal financing as well as limit the maximum loan to value ratio of housing loan at 70%. These policy measures had enforced by Bank Negara Malaysia in order to promote a sound financial and debt management among the household sector.

Theoretically, the macroprudential policy measures might influence the commercial bank lending negatively as it restricts the ability of public to take on more debt. As a result, there will be less opportunity for commercial banks to grant loans to the public. Thus, DUM10 is included in the Equation 1 to test the impact of the macroprudential policy measures on the commercial bank lending in Malaysia.

According to the explanations of all variables measurements employed in this study, Table 3.2 summarizes the measurements and expected sign of all the variables.

Table 3.2

Summary of all variables

Variable (Symbol)	Measurement of Variables	Expected Sign
Commercial Bank Lending (LDTA)	Total loans and Advances/ Total Assets	
Bank Size (LOGTA)	Logarithms of Total Assets	+
Non-Performing Loan (NPL)	Non-Performing Loans/ Total Loans	-
Liquidity (LIQ)	Total Liquid Assets/ Total Assets	-
Volume of Deposit (DEP)	Total Deposits/ Total Assets	+
Gross Domestic Product (GDP)	Annual Percentage change of Malaysian Gross Domestic Product	+
Lending Rate (LR)	Malaysian Base Lending Rate	-
Cash Reserve Requirement (SRR)	Malaysian Statutory Reserve Requirement Ratio	-
Macroprudential Policy Measures Dummy (DUM10)	0=2005-2009; 1=2010-2014	-

3.6 Technique of analysis

The Random Effect Model is employed in this study to investigate the relationship between bank specific characteristics and macroeconomic variables with the commercial bank lending in Malaysia from year 2005 to year 2014. This is because Random Effect Model enables the study to efficiently account for any remaining serial correlation which arises from unobserved time-constant factor (Wooldridge, 2002). Moreover, the Random Effect Model also infer that the entity of error term does not correlated with the predictors. According to the previous study on determinant of bank lending, random effect model has been utilized by Amidu (2014) to investigate the determinants of bank lending in Sub-Saharan countries. Amidu (2014) suggests that random effect model able to provide preference for the study to examine the effect of a number of time-invariant variables.

There are some benefits for using Random Effect Model to analyze the data of this study. Firstly, the Random Effect Model enables time invariant variables to play as the explanatory variable in the model (Torres-Rena, 2007). Furthermore, the Random Effect Model also provide economical in degrees of freedom as it does not require the study to estimate the N cross-sectional intercepts (N.Gujarati & Porter, 2009). Random Effects model also impose much more assumptions than those need for pooled OLS, which the Random Effect Model are strict exogeneity in addition to orthogonally between the error term and the explanatory variables (Wooldridge, 2002).

Moreover, Hausman test is applied in this study to determine whether Fixed-Effect Model or Random Effect Model should be used to analyze the panel data (Torres-Rena, 2007). The null hypothesis of the Hausman test state that there is no correlation between the error term and the regressors (Torres-Rena, 2007). In the situation where Chi square value is higher than 0.05, the null hypothesis is failed to be reject and it implies that Random Effect Model is the most suitable to use to analyses the model instead of Fixed Effect Model.

The correlation coefficient matrix is also utilizes in this study to check whether the presence of multicollinearity issues between the independent variables. In situations where the correlation coefficient value between two independent variables is higher than 0.8, it implies that they are highly correlated between each other. Thus, it show the first sign of sizeable multicollinearity (Simon Fraser University Canada, 2016).

The Variance Inflation Factor Test is employs in this study to further confirm there are no multicollinearity problem between the independent variables in this study. The Variance Inflation Factor (VIF) Test is the most common approach for detects the multicollinearity (Sekaran & Bougie, 2013). It demonstrates the extent to which one independent variable is explained by the other independent variable. The rule of thumb for the VIF test is the mean value of VIF is below 10, thus it show that there is no multicollinearity issue between the independent variable (Sekaran & Bougie, 2013).

3.7 Conclusion

This chapter discusses the data and sample employed in this study for the purpose to answer the research questions as well as to achieve the research objective. The sample of this study consists of 27 commercial banks in Malaysia which covering the time period from year 2005 to year 2014.

Furthermore, the dependent variable and independent variables of this study are defined based on the existing literature review. Moreover, Random Effect Model have been chosen to analyze the data. This is because the Hausman test shows that Random Effect Model is more appropriate to use than Fixed Effect Model.

Lastly, this study will perform Correlation Coefficient Matrix analysis and Variance Inflation Factor (VIF) test to identify the presence of multicollinearity problem between the independent variables.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter reports the results and findings of the study on the determinants of commercial bank lending in Malaysia. Section 4.2 reports the descriptive statistics analysis. Section 4.3 discusses the correlation coefficients matrix analysis. Section 4.4 presents the variance inflation factor test. Section 4.5 discusses the result of the Hausman test. Section 4.6 presents the regression output that constitute the main findings of this study. Lastly, Section 4.7 provides a summary for this chapter.

4.2 Descriptive statistics analysis

Table 4.1

Descriptive statistics analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
LDTA	206	0.4651	0.2192	0.0003	0.7501
LOGTA	206	10.3875	0.7343	8.6629	11.6557
NPL	206	0.0317	0.0333	0.0001	0.1895
LIQ	206	0.2347	0.1679	0.0093	0.8208
DEP	206	0.6111	0.1810	0.0315	0.8452
GDP	206	0.0498	0.0221	-0.015	0.074
LR	206	0.0644	0.0034	0.0551	0.0679
SRR	206	0.0325	0.0117	0.01	0.04
DUM10	206	0.6019	0.4907	0	1

Table 4.1 reports descriptive statistics of all variables employed in this study. The result shows that the mean value of commercial bank lending (LDTA) is 46.51%. This indicates that commercial banks in Malaysia allocate on average

46.51% of theirs assets to grant loan to the public during the study period from year 2005-2014.

In the aspect of bank specific characteristics factors, the average value of bank size (LOGTA) is 10.3875. The bank size (LOGTA) are ranged from 8.6629 to 11.6557. Furthermore, the average value of non-performing loan ratio (NPL) is 3.17%. This implies that 3.17% of the commercial banks loan portfolio is make up by the non-performing loan. Moreover, the liquidity (LIQ) has recorded a mean value of 23.47%. This implies that the commercial banks in Malaysia put approximately 23.47% of theirs total assets in the form of liquid assets in order to meet short-term obligations, such as cash withdrawals by the depositors. The average value of volume of deposit (DEP) is 61.11%. This implies that the 61.11% of the commercial bank's total assets is financed by the deposits.

As for macroeconomic determinants, the gross domestic product (GDP) has a mean value of 4.98%. The gross domestic product has a minimum value of -1.5% and maximum value of 7.4%. The gross domestic product (GDP) recorded a negative growth in year 2009 due to the impact from the Global Financial Crisis from year 2008 to year 2010. The average value of the lending rate (LR) over the study period is 6.44% with the minimum value and maximum value of 5.51% and 6.79% respectively. Moreover, the average value of cash reserve requirement is reported at 3.25%. This indicates that the commercial banks in Malaysia are required to store an average 3.25% of its eligible liabilities with Bank Negara Malaysia over the study period.

4.3 Correlation coefficients matrix

Table 4.2

Correlation coefficients matrix

	LOGTA	NPL	LIQ	DEP	GDP	LR	SRR	DUM10
LOGTA	1.0000							
NPL	0.2244	1.0000						
LIQ	-0.6750	-0.2137	1.0000					
DEP	0.7132	0.1083	-0.5735	1.0000				
GDP	-0.0233	-0.0192	-0.0124	-0.1013	1.0000			
LR	-0.0302	-0.1101	-0.0188	-0.1043	0.7923	1.00000		
SRR	0.0016	-0.0125	-0.0483	-0.0817	0.3868	0.7572	1.0000	
DUM10	-0.1538	-0.4262	0.1271	-0.1160	0.4195	0.3505	0.0392	1.0000

Table 4.2 reports the correlation coefficient matrix of the independent variables employed in this study. The result shows that all of the correlations between the independent variables are lower than 0.8. Hence, the result satisfied the rule of thumb of less than 0.8 and this implies that they are no multicollinearity issues between the independent variables.

4.4 Variance inflation factor (VIF) test

Table 4.3

Variance inflation factor (VIF) test

Variable	VIF	1/VIF
LR	8.23	0.1215
GDP	4.05	0.2468
SRR	3.63	0.2758
LOGTA	2.66	0.3766
DEP	2.18	0.4594
LIQ	1.93	0.5168
DUM10	1.63	0.6120
NPL	1.37	0.7307
Mean VIF	3.21	

Table 4.3 presents the Variance inflation factor (VIF) result for the independent variables in this study. Although the correlation matrix shown in Table 4.2 does not suggests the likehood of any multicollinearity problem, the Variance Inflation Test was conducted to further confirm there are no multicollinearity problems between the independent variables.

According to the result shown in Table 4.3, the mean value of the VIF for all the independent variables in this study are 3.21 which is lower than 10. Hence, it indicates that there are no multicollinearity issues occur between the independent variables.

4.5 Hausman test

Table 4.4

Hausman test

	---- Coefficients ----			
	(b)	**(B)**	**(b-B)**	**sqrt(diag(V_b-V_B))**
	Fixed	**random**	**Difference**	**S.E.**
LOGTA	0.0174	0.0906	-0.0732	0.0278
NPL	-0.3716	-0.2868	-0.0848	-
LIQ	-0.1720	-0.2464	0.0744	0.0124
DEP	0.1021	0.1263	-0.0242	0.0043
GDP	0.2897	0.5974	-0.3077	-
LR	-2.1221	-3.8455	1.7234	-
SRR	0.4074	0.3141	0.0932	-
DUM10	0.0040	-0.0127	0.0167	0.0051

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 0.88
Prob>chi2 = 0.9989
(V_b-V_B is not positive definite)

Table 4.4 presents the result of Hausman test. Since the estimated chi-square value show 0.9989 which indicates that the result is insignificant, so the null hypothesis is unable to reject. There are significant difference in the estimated coefficient between the two models and it implies that there is no correlation between the error term and one or more regressor. As a result, the random effect model is more appropriate to be used in this study.

4.6 Random effect regression

Table 4.5

Random effect regression

Independent Variables	Coef.	Std. Err.	z	P>|z|
LOGTA	0.0906	0.0255	3.55	0.000
NPL	-0.2868	0.1841	-1.56	0.119
LIQ	-0.2464	0.0517	-4.76	0.000
DEP	0.1263	0.0636	1.99	0.047
GDP	0.5974	0.4052	1.47	0.140
LR	-3.8455	3.6191	-1.06	0.288
SRR	0.3141	0.7040	0.45	0.655
DUM10	-0.0127	0.0125	-1.02	0.308
Constant	-0.2786	0.2955	-0.94	0.346
Overall R-squared	0.5548			
Wald chi2(8)	69.82			
Prob.>chi2	0.0000			
Number of Observations	206			
Number of Groups	27			

Table 4.5 presents the regression result from the random effect estimation by using commercial bank lending (LDTA) as the dependent variable to analyze the determinants of commercial bank lending in Malaysia.

According to the results in Table 4.5, bank size (LOGTA) exhibits a positive relationship with commercial bank lending (LDTA) and statistically significant at 1% level. This implies that larger banks tend to provide more loans to the public. The mainly reason is because large banks are more diversified and they have a larger pool of fund to support higher loan demand from the public. This result is consistent with the studies of Malede (2014), Amidu (2014), Chernykh & Theodossiou (2011) and Tomak (2013).

Similar to the bank size (LOGTA), volume of deposit (DEP) has a positive and significant relationship with commercial bank lending (LDTA). The coefficient of volume of deposit (DEP) shows that the 1% increment of the volume of deposit will cause the commercial bank lending increased by 12.63%. Hence, it means that the higher the capabilities of commercial banks to attract more deposits from theirs customers, the higher the ability of commercial banks to grant loan to the public. This result is in line with the studies of Al-Kilani & Kaddumi (2015), Imran & Nishat (2013), Swamy (2012), Sarath & Pham (2015), Olokoyo (2011), and Olumuyiwa et al. (2012).

Liquidity (LIQ) has a negative and significant relationship with commercial bank lending (LDTA). According to the result, 1% increment of the commercial bank's liquidity will cause the commercial bank lending decline to 24.64%. The findings imply that the more liquid assets held by the commercial banks, the lower the loans will be granted by commercial banks in Malaysia. Hence, this result is consistent with the studies of Rabab'ah (2015), Sarath & Pham (2015) and Moussa & Chedia (2016).

As for non-performing loan (NPL), although its coefficient is negative, it does not show any significant relationship with the commercial bank lending (LDTA). This suggests that there is no evidence to support the influence of non-performing loan on commercial bank lending in Malaysia. One of the plausible explanations could be the commercial banks in Malaysia might not rely too much on their current non-performing loan ratio as a criteria to evaluate their loan application from the public. Commercial banks evaluates theirs customer's loans application mostly based on the repayment capacity of the borrowers as well as the prospect of the economy to access the loan default risk. This finding is in line with the study of Sarath & Pham (2015) as the study also concludes that the commercial bank lending in Vietnam was not influenced by the non-performing loan ratio of the commercial banks.

In the context of macroeconomic determinants, all the macroeconomics determinants do not give any impact on the commercial bank lending in Malaysia. The result from the Table 4.5 shows there is no relationship between the gross domestic product (GDP) and the commercial bank lending (LDTA) in Malaysia. Therefore, there is insufficient evidence to support the influence of gross domestic product on commercial bank lending in Malaysia. This result is consistent with the findings of Tomak (2013) and Karim et.al (2011).

The result show in Table 4.5 also reports that there is no significant relationship between the lending rate (LR) and the commercial bank lending (LDTA) in Malaysia. One of the plausible explanations is that Bank Negara Malaysia has set the Base Lending Rate as the reference rate for the commercial bank in Malaysia to determine their loan pricing to reduce stiff competition. Thus, all commercial banks in Malaysia will price their loan approximately same with the Base Lending Rate. As a result, the bank lending activities in Malaysia is not influenced by the movement in lending rate. The findings of this study is consistent with the studies of Olokoyo (2011), Malede (2014) and Rabab'ah (2015).

In the aspect of cash reserve requirement (SRR), the results also show that cash reserve requirement (SRR) does not have any significant relationship with the commercial bank lending (LDTA). This might due to the commercial banks in Malaysia do not lend full amount of their balance of deposit to the public and maintain a large proportional of deposit in the form of liquid asset after the portion of cash reserve requirement have been set aside. This finding is in line with the studies of Olokoyo (2011), Malede (2014), Rabab'ah (2015) and Al-Kilani & Kaddumi (2015).

Moreover, the result in Table 4.5 also indicates that the macroprudential policy measures dummy (DUM10) does not have any significant relationship with the commercial bank lending (LDTA). This implies that there is insufficient evidence to support the influence of macroprudential policy measures on the commercial bank lending during the period 2010 to 2014. One of the plausible reason are most of the macroprudential policy measures introduced by Bank Negara Malaysia was fully enforced in year 2013, thus it might take time to generate effect. Moreover, the level of household indebtedness in Malaysia is expected to remain elevated over the next few years due to the demand for credit is continuously remain strong especially from the young generation (Bank Negara Malaysia, 2014). Therefore, the implementation of Bank Negara Malaysia policy in year 2010 does not provide any significant effect on the commercial bank lending in Malaysia throughout the study period.

In summary, all bank specific characteristics like bank size, volume of deposit and liquidity will influence the commercial bank lending in Malaysia except the non-performing loan. Bank size and volume of deposit influence the commercial bank lending positively, while the liquidity negatively influences the commercial bank lending in Malaysia. Furthermore, the findings of this study also suggest that none of the macroeconomic determinants affect the commercial bank lending. Lastly, the findings of this study also reveal that the implementation of macroprudential policy measures in year 2010 as an initiative to curb high level of household indebtedness in Malaysia does not give any significant impact on the commercial bank lending in Malaysia.

4.7 Conclusion

This chapter has discussed the results and findings of this study. Firstly, the descriptive analysis was carried out to provide the mean, standard deviation, minimum value and maximum value of all variables. Secondly, the correlation coefficient matrix was performed to check the presence of multicollinearity problems between the independent variables. Thirdly, Variance Inflation Factor (VIF) Test was carried out to further identify the existence of multicollinearility problem between the independent variables. Fourthly, Hausman test was run to identify the most suitable regression model to be used for data analysis. Lastly, the random effect model was employed to analyze the data.

The result shows that the bank specific characteristics such as bank size, liquidity and volume of deposits have a significant relationship with the commercial bank lending in Malaysia from year 2005 to year 2014. Non-performing loans however, does not influence the commercial bank lending. On the other hand, all macroeconomic variables do not influence bank lending activities in Malaysia. Finally, the finding reveals that the implementation of macroprudential policy measures in year 2010 does not give any significant impact on commercial bank lending in Malaysia. Table 4.6 provides the summary for the hypothesis testing.

Table 4.6

Summary of the hypothesis testing results

No.	Hypothesis	Findings
1.	Bank size has a positive relationship with the commercial bank lending in Malaysia.	Supported
2.	Non-performing loan has a negative relationship with the commercial bank lending in Malaysia.	Not-supported
3.	Liquidity has a negative relationship with the commercial bank lending in Malaysia.	Supported
4.	Volume of deposit has a positive relationship with the commercial bank lending in Malaysia.	Supported
5.	GDP has a positive relationship with the commercial bank lending in Malaysia.	Not-supported
6.	Lending rate has a negative relationship with the commercial bank lending in Malaysia.	Not-supported
7.	Cash reserve requirement has a negative relationship with the commercial bank lending in Malaysia.	Not-supported

CHAPTER 5

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This study examines the determinants of commercial bank lending in Malaysia which covering the period from year 2005 to year 2014. Specifically, there are several bank specific characteristic and macroeconomic determinants employed in this study in order to determine their relationship with the commercial bank lending in Malaysia. The bank specific determinants used in this study are bank size, non-performing loan, liquidity and volume of deposit. Meanwhile, the macroeconomic determinants used in this study are gross domestic product, lending rate and cash reserve requirement. In addition, this study also examine whether the implementation of macroprudential policy measures in year 2010 gives an impact to the commercial bank lending in Malaysia.

The findings of this study conclude that all the bank specific characteristics like bank size, liquidity and volume of deposit have a significant relationship with the commercial bank lending except the non-performing loan does not show any significant relationship with the commercial bank lending in Malaysia. Bank size influences the commercial bank lending in Malaysia positively and this implies that larger bank tends to grant more loan to the public. This is because larger bank are more diversified and they have a larger pool of funds available to support loan demand from the public.

Similar to the bank size, volume of deposit also has a positive relationship with the commercial bank lending. This implies that the bank with high volume of deposit will have more available fund to grant loan to the public. Therefore, the higher the capabilities of commercial banks to attract more deposits from theirs customers, the higher will be the ability for the commercial banks to grant loan to the public. As a result, commercial bank in Malaysia should formulate effective strategies to attract and retain more deposit from theirs depositors in order to obtain more funds to facilitate their lending activities.

On the other hand, liquidity has a negative relationship with the commercial bank lending. The findings demonstrate that the higher portion of liquid assets held by the commercial banks, the lower the funds are available for the commercial bank to grant loan to the public.

In the aspect of macroeconomic determinants, this study does not find any conclusive evidence to support the influence of gross domestic product, lending rate and cash reserve requirement on commercial bank lending in Malaysia particularly for the period year 2005 to year 2014.

Moreover, the findings of this study also reveal that the implementation of macroprudential policy measures by Bank Negara Malaysia in year 2010 does not give any impact on the commercial bank lending in Malaysia. This implies that the effort of Bank Negara Malaysia to curb the high-level of household indebtedness in Malaysia are not so effective. This is in line with the report by Bank Negara Malaysia (2014) which state that the level of household indebtedness in Malaysia is expected to remain elevated over the next few year due to the demand for credit is continuously remain strong particularly from the young generation.

5.2 Contribution of the study

This study contributes to Malaysian bank lending area in several ways. Firstly, the findings of this study may shed some light on the effectiveness of the macroprudential policy measures introduced by Bank Negara Malaysia in 2010. The BNM may revise macroprudential policy measures to ensure its effectiveness in curbing the high level of household indebtedness in Malaysia.

Secondly, the findings of this study may provide relevant information to commercial banks in Malaysia to understand the drivers that influence the lending activities. Hence, the commercial banks in Malaysia would be able to formulate effective strategies to enhance their lending activities.

Thirdly, the future researchers may use the findings of this study as a reference to design their research framework to further investigate the determinants of bank lending in Malaysia.

5.3 Limitation of the study

There are several limitations encountered by this study. Firstly, time constraint issue is one of the limitations for this study. The duration allocated to conduct and complete this study is only 4 months period. Thus, it is a bit rush for the researcher to carry out the whole process of this study within the specific period of time.

Secondly, this study encounters the problem of data availability. This is due to some domestic banks and foreign banks have incorporated in Malaysia in the later years of the study period, hence the relevant commercial banks does not have complete data set for the entire study period. This might lower the accuracy of statistical analysis.

Lastly, this study is conducted using a sample of commercial banks in Malaysia. Hence, the findings and discussions of this study might only applicable to the government and commercial banks in Malaysia. This is due to every country have different political background, regulation and banking culture, hence the findings of this study could not generalized to other countries.

5.4 Recommendations for future study

There are few recommendations for future study. Firstly, future researchers are encouraged to employ longer period of time to investigate the determinants of commercial bank lending in Malaysia. The longer period of time will increase the number of observations and this could provide more accurate findings of the study.

Secondly, the future researchers could also extend the numbers of bank-specific characteristics determinants and macroeconomic determinants of commercial bank lending in Malaysia. This study mainly concentrate on the effect of 4 bank-specific characteristics determinants and 3 macroeconomics determinants to investigate the commercial bank lending in Malaysia. However, the R-square of this study is 0.5548 which means that the 55.48% of the commercial bank lending is able to explain by the bank specific characteristics determinants and macroeconomics determinants employ in this study and the other 44.52% is remain ambiguous. Thus, the extent of the number of determinants are able to provide more precise and comprehensive result for the future studies.

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