

## Bank Lending Determinants: Evidence from Malaysia Commercial Banks

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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 macro prudential policy measure implemented in 2010 on the lending activities of Malaysian commercial banks. Employing 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.

**Keywords:** BankLending; Malaysia; Commercial Banks; Macroprudential Policy

### INTRODUCTION

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.

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). 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. 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.

Thus, this study aims to investigate the determinants of bank lending in Malaysia covering the period from year 2005 to year 2014. Furthermore, this study also intends to explore the impact 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). 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). The empirical impact of this policy measures on commercial bank lending still remain ambiguous. To the best of the researcher's knowledge, there is limited study investigates the influence of macro prudential policy measures on commercial bank lending in

Malaysia particularly for the period from year 2005 to year 2014. Thus, it is interesting to explore whether the implementation of macroprudential policy measures will give any impact on the commercial bank lending in Malaysia.

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?

### LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

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.

#### Bank Specific Characteristic

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.

### *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 & Ngomsu (2012) which employ a sample of bank from six countries in the Central African Economic and Monetary Community suggest that 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 that bank size positively influences bank lending. Rabab'ah (2015) who investigates the commercial bank lending in Jordan 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 indicates 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.

### *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) 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.

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 tend 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 follows:

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

### *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 and conclude that higher liquidity held by the bank will negatively affect the bank lending. Furthermore, studies in Africa also provide substantial evidence that liquidity will influence bank lending negatively (Moussa & Chedia, 2016; Amidu, 2014).

On the other hand, the study of Podpiera (2007) which employs the sample data of commercial bank in Czech discovers 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 will be as follows:

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

### *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 their 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, 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 has 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. Thus, the hypothesis 4 is as follow:

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

### *Macroeconomic Factors*

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 used by the previous studies to examine bank lending.

### *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. Constant & Ngoms (2012) investigate the long-term lending behavior of 35 commercial banks in Central Africa and the findings 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 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 have 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 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, hypothesis 5 will be as follows:

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

### *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. Richard & Okeye (2014) examine factors that affect lending behavior of deposit money banks in Nigeria and the study recommends that higher interest 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, this study hypothesizes that:

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

### *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 African 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.

## METHODOLOGY AND DATA

### *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.

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### 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 1 shows the list of commercial banks in Malaysia which are used as a sample in this study.

**Table 1.** List of Sample

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

### 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:

$$TL_{it} = \alpha_0 + \beta_1 \text{LOGTA}_{it} + \beta_2 \text{NPL}_{it} + \beta_3 \text{LIQ}_{it} + \beta_4 \text{DEP}_{it} + \beta_5 \text{GDP}_{it} + \beta_6 \text{LR}_{it} + \beta_7 \text{SRR}_{it} + \beta_8 \text{DUM}_{10} + \mu_{it}$$

Where:

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

$\text{LOGTA}_{it}$ : The logarithm of total assets of bank  $i$  at year  $t$ .

$\text{NPL}_{it}$ : Non-performing loan of bank  $i$  at year  $t$  scaled by total loan and advances.

$\text{LIQ}_{it}$ : Total liquid assets of bank  $i$  at year  $t$  scaled by total assets.

$\text{DEP}_{it}$ : Total deposit of bank  $i$  at year  $t$  scaled by total assets.

$\text{GDP}_t$ : Annual growth rate of Malaysian Gross Domestic Product at year  $t$ .

$\text{LR}_t$ : The annual average lending rate at year  $t$ .

$\text{SRR}_t$ : The cash reserve requirement ratio at year  $t$ .

$\text{DUM}_{10}$ : = 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.

### Measurement of Variables

#### Commercial Bank Lending (TL)

The dependent variable of this study is the commercial bank lending (TL) which 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 loan and advances to total asset 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 employs the total loan and advances to total asset ratio to measure the commercial bank lending in Malaysia.

### Independent Variables

#### *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 TL 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).

#### *Non-performing Loan (NPL)*

According to the studies of Sarath & Pham (2015) and Tomak (2013), non-performing loan to total loan 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).

#### *Liquidity (LIQ)*

Based on the previous studies, total liquid assets to total asset 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 asset 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 their 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 TL.

#### *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). 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 their liquidity and enable them to grant more loan to the public (Imran & Nishat, 2013).

#### *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 (TL). 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.

*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 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.

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 fewer opportunities for the commercial banks to grants loan to the public and it will indirectly reduce the commercial bank lending.

*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 TL 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.

*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 2 summarizes the measurements and expected sign of all the variables.

**Table 2:** Summary of Variables

Variable (Symbol)	Measurement of Variables	Expected Sign
Commercial Bank Lending (TL)	Total loans and Advances/ Total Asset	
Bank Size (LOGTA)	Logarithms of Total Assets	+
Non-Performing Loan (NPL)	Non-Performing Loan/ Total Loans	-
Liquidity (LIQ)	Total Liquid Asset/ Total Assets	+
Volume of Deposit (DEP)	Total Deposit/ 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	-



**Technique of Analysis**

The Random Effect Model is employed in this study to investigate the relationship between bank specific characteristics and macroeconomic variable 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 infers that the entity of error term does not correlate with the predictors. 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 (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).

**EMPIRICAL RESULTS**

**Descriptive Statistics Analysis**

**Table 3:** *Descriptive Statistics*

Variable	Obs	Mean	Std. Dev.	Min	Max
TL	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 3 reports descriptive statistics of all variables employed in this study. The result shows that the mean value of commercial bank lending (TL) is 46.51%. This indicates that commercial banks in Malaysia allocate on average 46.51% of their assets to grant loans 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) is 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 made 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 their 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.

**Correlation Matrix**

**Table 4:** *Correlation Matrix*

	LOGTA	NPL	LIQ	DEP	GDP	LR	SRR	DUM10
LOGTA	1.0000							

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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 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 multi collinearity issues between the independent variables.

### Random Effect Regression

**Table 5:** *Regression Results*

Dependent variable: Commercial Bank Lending (TL)				
Independent Variables	Coefficient	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			

Notes: \*\*\*, \*\*, and \* indicate significance at 1%, 5%, and 10% levels, respectively

Table 5 presents the regression results from the random effect estimation by using commercial bank lending (TL) as the dependent variable to analyze the determinants of commercial bank lending in Malaysia. According to the results in Table 5, bank size (LOGTA) exhibits a positive relationship with commercial bank lending (TL) and statistically significant at 1% level. This implies that larger banks tend to provide more loans to the public. The main 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 (TL). 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 their customers, the higher the ability of commercial banks to grant loans 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 (TL). According to the result, 1% increment of the commercial bank's liquidity will cause the lending by commercial banks will decline to 24.64%. The finding implies that the more liquid assets held by the commercial banks, the lower the loans that will be granted to the customers. 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 (TL). 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 evaluate their 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 factors, all the macroeconomics factors do not give any impact on the commercial bank lending in Malaysia. The result from the Table 5 shows there is no relationship between the gross domestic product (GDP) and the commercial bank lending (TL) 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 5 also reports that there is no significant relationship between the lending rate (LR) and the commercial bank lending (TL) 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 are 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 (TL). 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 5 also indicates that the macroprudential policy measures

dummy (DUM10) does not have any significant relationship with the commercial bank lending (TL). 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 in Malaysia. 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 activities.

### CONCLUSION

This study examines the determinants of commercial bank lending in Malaysia which covering the period from year 2005 to year 2014. 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 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 their 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 their 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. 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 efforts 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 states that 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 particularly from the young generation.

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