A05

THE SYSTEMATIC AND UNSYSTEMATIC FACTORS THAT AFFECT THE LIQUIDITY CREATION OF ISLAMIC BANKS IN MALAYSIA

BY

LEE KOK MAN
LIM WOOI TONG
MOH SAU TUNG
NG ENYANG
WONG JUNE PHIN

A final year project submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF BUSINESS ADMINISTRATION
(HONS) BANKING AND FINANCE

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE
DEPARTMENT OF FINANCE

AUGUST 2019

DECLARATION

We hereby declare that:

(1) This undergraduate FYP is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the FYP.

(4) The word count of this research report is 12,074 words.

Name of Student:	Student ID:	Signature:
1. LEE KOK MAN	17ABB00431	_____
2. LIM WOOI TONG	17ABB00358	_____
3. MOH SAU TUNG	17ABB00329	_____
4. NG ENYANG	17ABB00683	_____
5. WONG JUNE PHIN	16ABB07571	_____

Date: 13 July 2019

ACKNOWLEDGEMENT

We hereby would like to take this golden opportunity to show our gratitude to Universiti Tunku Abdul Rahman (UTAR) by providing us a chance to carry out this research project. Additionally, we would like to dedicate the contribution of everyone who has spent their quality time in presenting several ideas and guidelines to complete this research project.

First and foremost, a special thanks to our beloved final year project supervisor, Mr. Koh Chin Min who has provided valuable advices to accomplish this research. We are grateful to his inspiration and motivation throughout this research, along with his encouragement and patient guidance in improving the value of this research. We are grateful to have him as he always helps us when we are in need for assistance.

Second, we would like to thank all the group members for the hard work and teamwork paid in accomplishing this research project. We appreciate those valuable time sacrificed and full commitments paid by them in this research project. By carrying out this research, we have learnt team spirits, cooperation and support among the group members to complete the research.

Lastly, we would like to express our love to our families and friends who have supported us mentally and physically. Without their understanding and supporting, we are not able to complete this research project on time. Besides, we will face many difficulties without their valuable contributions.

TABLE OF CONTENTS

CHAPTER 5 DISCUSSION, CONCLUSION AND IMPLICATIONS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BIMB	Bank Islam Malaysia Berhad
CAP	Bank's Capital
CAR	Capital to Risk Weighted Assets Ratio
CAMELS	Capital Adequacy, Asset Quality, Management Quality, Earning Quality, Liquidity, Sensitivity
CLRM	Classical Linear Regression Model
DFUs	Deficit Fund Units
INF	Inflation Rate
LIQ	Liquidity Creation
NPF	Non-performing Financing
MAS	Monetary Authority of Singapore
OLS	Ordinary Least Square
ROA	Return on Assets
RRR	Required Reserve Ratio
SFUs	Surplus Fund Units
SIZE	Bank's Size
UNP	Unemployment Rate
VIF	Variance Inflation Factor

LIST OF APPENDICES

PREFACE

In banking industry, liquidity is actually considering as one of the significant economic measures of financial market, and is corresponded with solvency. The factors affected the liquidity creation of Malaysia Islamic bank will be examined by using Eviews software in this research. The research data are retrieved from 8 out of 16 Malaysia Islamic banks within period 2009 to 2017.

Liquidity creation is the explained variable of Islamic banks, the unit for liquidity creation is in percentage in this research. Besides, determinants of liquidity creation are categorized into systematic factor and unsystematic factors. The systematic factor are inflation rate and unemployment rate; while the unsystematic factors are bank's size, bank's capital and non-performing financing.

The process of carrying out the research is quite challenging as we have faced different problems and difficulties in accomplishing the research. However, we are able to learn how to solve the problems faced effectively and efficiently after conducted this research. Furthermore, the guidance from our supervisor and contribution from all the group mates are much appreciated. Supervisor has helped us a lot by giving valuable advice and guidance in conducting the research. Meanwhile, we have also built a good relationship and teamwork among every group mate in overcoming problems that we faced. From this research, we have learned a lot of knowledge about banking field and we believe that this knowledge will benefit us in the future career.

ABSTRACT

This research aims to study the systematic and unsystematic determinants that influence the liquidity creation of Islamic bank in Malaysia. The explanatory variables are categorized into systematic factors and unsystematic factors. The systematic factors include bank's size, bank's capital and non-performing financing; meanwhile the unsystematic factors include inflation rate and unemployment rate. This research utilizes the secondary data collected from the data stream for systematic factors as well as yearly financial reports of Islamic banks in Malaysia during the year 2009 to 2017 for unsystematic factors. According to the result, bank's size, bank's capital, inflation rate and unemployment rate have significant impact on liquidity creation of Islamic bank in Malaysia. However, the non-performing financing has no significant impact on liquidity creation of Islamic bank in Malaysia. In addition, all of the variables are positively correlated with the Islamic banks' liquidity creation. Various parties such as government, policy makers, academician and industry can be beneficial from this research paper in enhancing their welfare in relate of liquidity creation determination. Several implications and recommendations were proposed to the related parties and future researches in the last part of the research paper.

CHAPTER 1 RESEARCH OVERVIEW

1.0 Introduction

For every country, financial institutions take significant part that contributes to development of economic. These financial institution functions as financial intermediaries that offers plenty of financial services to the customers. For instance, time deposit services, financing services, processing transactions services and credit creation services (Dodoo, 2007). Apart from these services, financial intermediaries do also provide trust services which the bank act as agent to safe keeps the assets for the next of kin and charging the service or commission fee (Dodoo, 2007).

One of the purposes of the bank is channeling the money from the surplus fund units (SFUs) to the deficit fund units (DFUs). Hereby, the bank is literally pooling short-term deposits and offering for long-term financing. This might lead to the bank encounter liquidity shortage. Besides, banks are suffering the liquidity shortage in the event of depositors withdraw large amount of funds. A bank faced liquidity risk when it does not have enough liquidity to meet their short-term obligations. Basel Committee for Banking Supervision (2000) mentioned that liquidity is essential for a bank's daily routine operations so that the bank can fulfill their short-term obligations.

Thus, the objective of this study is to determine how the systematic factors and unsystematic factors affect the liquidity creation of Malaysia's Islamic banks. Chapter 1 included the background of study, problem statement, objectives, research questions, study hypothesis, significance of study, chapter layout and conclusion.

1.1 Research Background

A research done by Kaleem (2000) explained that most of the Islamic countries have operated a full-fledged Islamic banking system or dual banking system. Todays, Malaysia operates on dual banking system which is conventional banking system and Islamic banking system. They function respectively in the dual banking system which the Islamic banking system operates side by side with the conventional banking system.

Islamic banking was introduced in Malaysia in 1983 with the establishment of first Islamic bank in Malaysia, Bank Islam Malaysia Berhad (BIMB) with Lembaga Tabung Haji as the major shareholder. In year 1993, in order to increase the number of institutions offering lower cost for the Islamic banking services, the Malaysia's central bank enabled commercial banks to exercise Islamic "windows" by applying the Interest-free Banking Scheme (Mokhtar, Abdullah & Al-Habshi, 2006). However, in year 2002 central bank instruct all the conventional banks in Malaysia to replace their Islamic windows with Islamic subsidiaries because of some argument that the services or financial merchandise provide by these Islamic windows might carry interest (riba). The Islamic subsidiaries of commercial banks are regulating by Islamic Banking Act of 1983 (Ariff, 2017), while the Islamic windows which were regulated under the Banking and Financial Institutions Act (BAFIA) of 1989.

The fundamental principles that possess Islamic banking are sharing of profit and loss between parties according to the part they played in the business. Besides, the risk sharing is promoted by the Islamic banking in the economic transactions. Any financial activities that comprise interest (riba), gambling (maysir), uncertain trading (gharar) and hoarding are strictly prohibited. Whereby, financial activities that emphasis entrepreneurship, trading and investments that bring economic growth and benefit to the community are encouraged (Elasrag, 2011).

For banking industry, liquidity is actually considering as one of the significant economic measures of financial market, and is corresponded with solvency. Based on Bonfim and Kim (2012), the banking sector is significantly impact by the liquidity risk since the late 1990's financial crisis in the Asian banking sector and the global credit crunch of 2007. Berger, Boubakri, Guedhami and Li (2017) argued that as the economic devastation caused by financial crisis, the consequences of bank liquidity creation also contribute to the growth of important research and policy issues. Bank Negara Malaysia act as lender of last resort had set up a grand liquidity backup for the banking industry, yet there are a few banks collapse even with this backup, proving that securing liquid fund, credit lines or money available could be vanish with ease in terms of capital adequacy and asset valuation (Osama, Bassam, Jamal & Usama, 2017). Meanwhile, the liquidity risk will be higher for Islamic bank because of several restrictions to acquire the fund which acceptable by Shariah's law at a reasonable time and cost (Rahman, Said & Sulaiman, 2017).

Moreover, the previous studies are mainly highlights on conventional bank and have found out that the bank liquidity is essential for a bank to exist. According to Lee, Lim, Lingesh, Tan and Teoh (2013), they explained that the higher liquidity, banks will have remarkable revenue as well as performance and thus promoting confidence of the public and soundness of the conventional banks. Also, Berger and Bouwman (2013) stated that liquidity is an important role of conventional banks. In addition, Anamika and Sharma (2016) determine bank-specific and macroeconomic determinants that influence the liquidity of conventional banks in Indian to improve awareness and comprehension of liquidity in growing economies such as India.

This research is focusing on identifying the systematic and unsystematic determinants that influence the liquidity creation of Islamic bank in Malaysia as most of the past studies focus on conventional bank rather than Islamic bank.

1.2 Problem Statement

In the banking industry, one of the main activities is to manage the risk that arises in financial transactions. The risk profile of Islamic bank is almost same with the conventional interest-based bank. Among the risks, financial institution has to focus on risk of liquidity as liquidity risk is one of the most important risks for the financial institution. Basically, liquidity risk exists due to difference between demands of funds and supply of funds (Alzoubi, 2017). According to Alzoubi (2017), banks can use the three strategies which are liabilities liquidity management, assets liquidity management or balanced liquidity management in order to manage their liquidity position. Conventional banks would not be facing any issues in apply any of these three methods. Nonetheless, based on Salem (2013), Islamic banks encountered with some obstacles in controlling their liquidity position as there have several restrictions placed on them related to the Shariah principle.

The well-structured establishment and rapid growth of Islamic banking industry in Malaysia facilitated the country be recognized as a model of Islamic finance, regardless manageable challenges (Rahman, Said & Sulaiman, 2017). The significant role of Malaysia in the global Islamic finance industry raised the demand for a study of the contribution of Islamic finance to the real economic activity. Kassim (2016) revealed that Islamic banking effectively carrying-out the financial intermediation role of pooling and channeling funds to the investment activities, which the contributions to the real economic are undeniable.

During Global Islamic Finance Forum 2018, Deputy Finance Minister Datuk Amiruddin Hamzah commented that Malaysia sustained its stand as the global leader in Islamic finance and the sector has matured to become vibrant with a diverse set of industry players. In 2017, Malaysia held 51 percent of the US$396 billion of total global outstanding sukuk, while continuing to lead in Islamic wealth management industry with 36.5 percent of the global share as at

end-2017. With this, Malaysia still remained as the main driver for the sukuk market (Bername, 2018). Besides, the Association of Islamic Banking and Financial Institutions Malaysia highlighted Malaysia's Islamic banking industry will achieve 40 percent market share in total banking assets by 2020 with introduction of value-based intermediation by BNM (Zainul, 2018).

The restrictions placed on Islamic banks cause more difficulty in managing the liquidity. Islamic banks are prohibited from involve in common financial products investment as they bear interest income which is prohibited in Islamic and Islamic banks can only invest in Shariah-compliant instruments. According to Ahmed (2009), Islamic banks confront the liquidity problem whereby the Islamic money market are finite and above that, most of the assets of Islamic banks are debt-based which cause low liquidity because of conditions on sale of debt. In additions, Islamic banks faced with shortage of Islamic interbank market and unavailability of lender of last resort facilities (Ali, 2012). Hence, Islamic banks are vulnerable to liquidity risk whenever there is disparity between business partners.

According to Rosly (2015), before the 2007 US subprime crisis, the banks commonly use money market funds instead of deposits to provide financing. When money market funds dried up due to rise the uncertainty during the crisis, banks are not able to match their assets and liabilities.

This crisis that happened in 2007 had taught banking institution valuable lessons in which evoked the financial institutions to indicate the determinants that might influence the liquidity creation of a bank more consent than in the past in order to manage liquidity risk. Factors from either systematic factors (external factors) or unsystematic factors (internal factors) should be precisely identified to enable Islamic bank managers have better decision making regarding liquidity management.

1.3 Definition of Key Term

Terms	Definition
Inflation Rate	Inflation rate indicates in an economy, on average, the price of products and services increase a period of time.
Unemployment Rate	Unemployment rate refers to number of unemployment in percentage. It calculated by quantity of individual who unemployed divided by individuals who currently in labor force.
Bank's Size	Bank's size refers to bank's ownership towards the assets. Bank may provide low cost for the financial service when their ownership of assets is high.
Bank's Capital	Bank's capital refers to the bank's net worth or the assets of bank minus liabilities of bank.
Non-Performing Financing (NPF)	NPF refers to borrower do not made the payments for a specified period.

1.4 Research Objectives

This study is to determine the factor that will impact on bank's liquidity creation.

1.4.1 General Objective

In this study, the objective is to investigate the systematic and unsystematic factors that impact the liquidity creation of Malaysia Islamic bank.

1.4.2 Specific Objective

1. To investigate whether the inflation rate has significant effect on liquidity creation of Malaysia Islamic bank.
2. To investigate whether the unemployment rate has significant effect on liquidity creation of Malaysia Islamic bank.
3. To investigate whether the bank's size has significant effect on liquidity creation of Malaysia Islamic bank.
4. To investigate whether the bank's capital has significant effect on liquidity creation of Malaysia Islamic bank.
5. To investigate whether the non-performing financing has significant effect on liquidity creation of Malaysia Islamic bank.

1.5 Research Questions

1. Is the inflation rate has significant effect on liquidity creation of Malaysia Islamic bank?
2. Is the unemployment rate has significant effect on liquidity creation of Malaysia Islamic bank?
3. Is the bank's size has significant effect on liquidity creation of Malaysia Islamic bank?
4. Is the bank's capital has significant effect on liquidity creation of Malaysia Islamic bank?
5. Is the non-performing financing has significant effect on liquidity creation of Malaysia Islamic bank?

1.6 Hypotheses of the Study

H1: The inflation rate has significant impact on liquidity creation of Malaysia Islamic bank.

H2: The unemployment rate has significant impact on liquidity creation of Malaysia Islamic bank.

H3: The bank's size has significant impact on liquidity creation of Malaysia Islamic bank.

H4: The bank's capital has significant impact on liquidity creation of Malaysia Islamic bank.

H5: The non-performing financing has significant impact on liquidity creation of Malaysia Islamic bank.

1.7 Significance of Study

This study examines the various components that impact on Islamic banking and finance, focus on the main findings and deliver a guide for future research. The restrictions placed on Islamic banks turn managing of liquidity become toughly task compare to conventional banks. Hence, Islamic banking must have a well plan on their liquidity positions and assess their liquidity risk on a regular basis. This study can give support and information to the Islamic bank and financial institution by studying several factors that influence the liquidity creation on Islamic banking significantly.

There are several past studies that evaluate the liquidity creation of conventional bank in Malaysia, but not Islamic bank. This paper is an academic research of displaced liquidity creation of Islamic banks in Malaysia which has not been widely covered from both economics and finance perspectives. The outputs from this research are essential ingredients for the Islamic banks to express appropriate strategies to conquer the existence of liquidity risk in Malaysian Islamic banking industry.

Moreover, the result collected from this study will provide vital reference for banking students. The results from this research will be useful for the banking students in which, it identifies the important components that impact on liquidity in Malaysia Islamic banking industry and how it is different with conventional banks. Besides that, this study also will be a source of reference to policy makers and central bank in Malaysia in order to better manage and control the liquidity of banks.

1.8 Chapter Layout

The organization of this research will be as follow:

Chapter 1 delivers a brief introduction on the study, starting with research background and the problem statements as well as research objectives. It is then followed by the hypotheses, significance of the study, chapter layout and conclusion.

Chapter 2 gives a literature review on liquidity of Malaysia Islamic banks. These reviews arouse researchers' curiosity on what systematic factors and unsystematic factors can impact on liquidity of the Malaysia's Islamic banks.

Chapter 3 analysis the data and methodology used in this research. This chapter begins with the data collection methods as well as ends with analysis of the collected data.

Chapter 4 contributes the findings and analysis of our results. The findings include which systematic factors and unsystematic factors that have significant relationships with the liquidity creation of the Islamic bank. These will be answer for the previous research questions.

Chapter 5 is the last chapter which presents the implications and limitations of the research and ends of the chapter will provide few suggestions for future research.

1.9 Conclusion

This research is to investigate the factors that influence the liquidity creation for Malaysia's Islamic banks. The systematic as well as unsystematic factors of liquidity creation for Islamic bank are the main focus in the research and the finding might not consistent with the past study because of the determinants included maybe not similar and other reasons may also affect the finding of the research.

CHAPTER 2 LITERATURE REVIEW

2.0 Introduction

In this chapter, literature review by past researchers will be presented. Vast bodies of literature have been done to analyze the components of liquidity creation of Malaysia Islamic banks. The further insight additional information about this research topic have been given by previous researchers. The journals and working papers that have been referred will be summarizing in this chapter. In addition, the subsequent parts of this chapter will discuss the relevant theoretical models, and conceptual frameworks for the research.

2.1 Review of the Literature

Literature review establishing a framework and gives a clear picture to identify the gap from the previous researches. In order to better explained the liquidity creation of Islamic bank, this research target on 8 Malaysia's Islamic banks. Besides, this study also selected the systematic and unsystematic factors to investigate the liquidity creation of Malaysia's Islamic bank.

2.1.1 Bank's Liquidity

Bank for International Settlement (2008) define liquidity as the financial institution's ability to fund asset growth and fulfill its obligations as they fall due without incurring unacceptable losses. Another explanation for liquidity is the capability of a bank or firm to fulfil the cash demand of its policy and contract that it holds with minimal or no loss (Sekoni, 2015). Moore (2009) commented that in order for bank to meet the depositors claim without any barrier, banks must keep enough liquidity, otherwise bank runs may occur. In the similar Hazimah and Wahidah (2017) stated that the interaction between asset and funding will cause a problem of liquidity, the bank would buffer of liquid assets whenever the short-term funds have been withdrawn by depositors. Hence, banks must clearly understand the liquidity creation in order to efficiently manage their liquidity to prevent bank run.

There are several previous studies done by scholars on bank liquidity. However, most of the studies are using commercial bank as subject, there are few analysis study on the liquidity creation of Islamic bank, especially Malaysia's Islamic banks. According to Sheefeni and Nyambe (2016), the inflation is negatively correlated with commercial banks' liquidity. Moussa (2015) investigated the components of bank's liquidity in Tunisia using two measures of liquidity which are total loan divided by total deposits and liquid assets over total assets. The concluded shows that operating costs over total assets, capital over total assets, financial performance and inflation rate significantly influence the bank liquidity.

Moreover, Khan and Ahmad (2017) studied on the determinants of commercial banks liquidity in Pakistan from a population of 37 commercial banks. The bank-specific determinants include capital of bank, size of bank, non-performing financing and bank while macro specific determinant is inflation rate. The result reveals that bank's capital has positive correlation with bank liquidity while non-performing financing and bank's size have negatively affecting bank liquidity, while inflation and return on equity are statistically insignificant to bank liquidity in Pakistan.

On the other hand, Waemustafa and Sukri (2016) analyzed the influence of internal and external determinants that contribute to the liquidity risk of conventional banks and Islamic banks in Malaysia. They concluded that Islamic and conventional banks' macroeconomic variables have a similar correlation to the liquidity risk. However, the different nature of the Islamic banking requires a different management process to control the liquidity and to become competitive in the financial industry as the activities and principle of Islamic banking system is unique compared to commercial banking system.

According to Alzoubi (2017) who evaluated the factors of liquidity risk in 15 Arab countries Islamic bank such as Egypt, Bahrain and Algeria and so on. The finding suggested that the cash ratio is significantly and negatively affecting the risk of liquidity. Whereas, securities held by bank, bank's equity and bank's size are negatively correlated with bank liquidity risk. In other words, high cash ratio allows the bank to hold more securities and high bank's equity will lead to high liquidity, low liquidity risk. However, return on asset and bad finance is positively correlated with liquidity of bank.

According to the literature, it is highlighted a number of bank-specific determinants and macroeconomic determinants of bank liquidity creation. The most common bank-specific determinants use by researcher to examine bank liquidity (conventional and Islamic) is bank's size, bank's capital and non-performing financing. Whereas, the macroeconomic factors are inflation rate and unemployment rate.

In this study, liquidity of bank is quantified by the liquid assets over total assets. The lower the ratio, the lower the banks capability to overcome the shortage of liquidity, ceteris paribus (Vodova, 2011).

2.1.2 Inflation Rate

According to the Bunda and Desquilbet (2008); Vodova (2011), inflation rate represented an incentive for banks to hold liquid assets as it will influence the nominal value of customer loan. Karl, Ray and Sharon (2002) stated that inflation has negatively effect to the people who are retired and living on a fixed income. When the inflation rate increases, the consumers cannot afford the goods and services as they could previously. It also affects the repayment of loan and discourages savings because the money is worth more presently. According to Moussa (2015), the banks of Tunisia revealed that an increase in inflation rate will decrease the bank's liquidity. Similar studied done by Sheefeni and Nyambe (2016) found out that the inflation rate negatively affect the bank's liquidity. This result is consistent with Vodova (2011); Bunda and Desquilbet (2008) stated that banks are customer-oriented, and the banks will increase their long term lending in order to satisfy their customers. Since loan are part of the bank's assets, bank's liquid asset holdings will be greatly reduced. Vodova (2011) stated that the inflation decays overall macroeconomic environment and hence lowers bank liquidity.

On the other hand, Tseganesh (2012); Trujillo-Ponce (2013) found out that there is a positive relationship between inflation rate and bank's liquidity as the bank can adjust interest rates to increase revenues faster than costs if the inflation rate is completely foreseen by the bank's management. This is especially important to Islamic banks as Waemustafa and Sukri (2016) pointed out Islamic banks have to preserve more cash reserve to maintain a sound liquidity position that that operate their business in a high inflation environment and at the same time maintain a larger cash reserve to maintain their sound liquidity position as they operate business in a high inflation environment. Anamika and Sharma (2016) have the similar result as the banks will start to hold more liquidity to control the effect of inflation on the economy in the event of rising inflation rate.

However, the study from Audo (2014), the result shows that the inflation rate is negatively correlated with bank liquidity and inflation rate is insignificantly affecting bank liquidity. This result is in accordance with Saad and El-Moussawi (2012) who examine the bank in Lebanon.

Thereby, it has been found that inflation rate significantly determines bank's liquidity as consumer price index is related with the changes in the inflation rate in Malaysia.

2.1.3 Unemployment Rate

Unemployment rate refers to a situation where somebody is in a working age would like to participate in a full-time employment but unable to get a job. According to Madhi (2017), unemployment rate is significant and has negative correlation with bank liquidity. A high rate of unemployment causes a decrease in the Loan/Total Asset index, due to the fact that banks do not want to participate in hazardous activities such as provide a financing to customer who are unable to fulfill their obligations in either short or medium period. This finding was in line with Hackethal, Rauch, Steffen and Tyrell (2010) who stated that higher unemployment rate shows a deterioration in general economic condition, which in turn reflected in the lower availability of liquidity. According to Trenca, Petria and Corovei (2015), a rise in the unemployment rate can be translated into a rise in non-performing financing and thus lowering bank liquidity. In addition, Vodova (2011), Shaha, Khan, Tahir and Shaha (2018) found out that rate of unemployment has negative correlation with bank liquidity creation as higher unemployment rate decreased capital and limit bank liquidity. This conclusion is in consistent with the reality that financial institutions may suffer from a decline in customers' ability to make repayment and result lower liquidity during economic tough times.

Differently, study done by Munteanu (2012) suggested that a rise in bank liquidity was resulted by an increase in unemployment rate. Horváth, Seidler and Weill (2014) pointed out that increase in unemployment rates reduced the customers' demand for loan which will subsequently increase bank liquidity. In other words, the credit risk of borrowers increases during the periods of high unemployment. The bank will try to decrease the amount of loan provided and hence increase their liquidity creation. In addition, positive coefficient obtained from the studies proved that a rise in unemployment rate will increase the bank liquidity.

In short, customers demand for loan will be affected by the unemployment, thereby impacting the overall bank's portfolio. In this study will discuss how the bank's liquidity will be influence by unemployment rate.

2.1.4 Bank's Size

According to Ahmad, Arrif and Skully (2009), they mentioned that different bank's sizes will influence the liquidity. Thus, the logarithm is proxy to capture the bank's size effect for different banks. By summarized various studies, bank's size had significant impact on liquidity creation. Iqbal (2012) proposed that the bank's size brings positive impact on the risk of liquidity in bank because of the less liquidity hold. Findings about bank's size is positively correlated with liquidity of bank also support by Berger and Bouwman (2009) which pointed out that a smaller bank will have a smaller amount of liquidity and therefore will be prioritize on intermediation transactions and transformation activities.

However, Singh and Sharma (2016); Lee, Lim, Lingesh, Tan and Teoh (2013) stated that the bank's size has a negative correlation with liquidity of bank. The reason behind is large banks usually rely more on the liabilities to overcome the liquidity problem. Same result was obtained by Hackethal, Rauch, Steffen and Tyrell (2010) in Germany banks. Alger and Alger (1999) justified that larger banks will have lesser liquidity because of a large number of deposits they hold. Furthermore, larger banks will better access to external funding and involve more in diversified depositor's population.

In contrast, only Bunda and Desquilbet (2008) highlighted that the bank size is insignificantly affecting bank liquidity in their study.

As generally accepted, bank's size is quantified using the logarithm of bank's total assets (Bunda & Dequilbet, 2008; Aspachs Nier & Tiesset, 2005). Therefore, this study will discuss on how bank's size will bring impact to the liquidity of bank.

2.1.5 Bank's Capital

In banking sector, banks usually use their capital as a source of fund in order to cushion the unforeseen losses and help to overcome a firm's liquidity risks. In this case, the capability of a bank to create liquidity will influenced by the amount of capital owned by a bank. Alger and Alger (1999) stated that the more capital a bank hold, the more liquidity the bank is. Thus, more liquidity will be hold for safeguard measure. This finding is consistent with Diamond and Dybvig (1983); Berger and Bouwman (2009); Coval and Thakor (2005); Bhattacharya and Thakor (1993), whereby these researchers pointed out that liquidity holding will increase when the capital is higher. The studied done by Allen and Gale (2004); Singh and Sharma (2016) also proved that the bank's capital has positive correlation with bank liquidity.

However, Gonzalez-Eiras (2003); Diamond and Rajan (2000a) mentioned that the bank's capital has negative correlation with bank liquidity whereby increase in bank's capital will increase the liquidity of bank will decrease. Vodova (2011) determinate that a lower capital for a bank will be more focus on their liquidity management, therefore more liquidity will be hold.

In this research, bank's capital is quantified by bank's capital divide by bank's total assets. This ratio represents a measurement to mitigate liquidity shock when a financial crisis happens (Iqbal, 2012). Therefore, bank's capital is important to take into account for estimating the impact of the bank's capital on bank's liquidity.

2.1.6 Non-performing Financing (NPF)

Non-performing financing (NPF) is the financing that customers failed to fulfill his/her contractual obligations either unable to make principal or interest payments. By understanding, NPF will give negative impact to banks. In banking sector, an increase in portfolio of non-performing financing is critically in causing financial distress. A study conducted by Iqbal (2012), NPF ratio has negative correlation with the bank liquidity. It is because the high NPF ratio could lead to shortage of liquidity. Madhi (2017) justified that large portions of financing will turn into bad debts and thus reducing the liquidity of bank.

Moreover, other researches also have the same findings that NPF has a negatively impact on liquidity. Joseph, Edson, Manuere, Clifford and Michael (2012); Nawaz, Munir, Siddiqui, Tahseen-ul-Ahad, Asif and Ateeq (2012) explained that NPF have a negative relationship towards bank liquidity. Obviously, NPF will reduce profits as well as liquidity of banks. However, a research done by Vodova (2011) on banks in Slovakia shows that the NPF ratio shows no relationship with banks' liquidity.

In this research, NPF divided by total volume of financing is used to compute the bank's NPF (Vodova, 2011). Moreover, this study will discuss on how bank's NPF will influence the bank's liquidity.

2.2 Review of Relevant Theoretical Model

Relevant theoretical models will describe all theorized relationship between variables. Besides, it will help to make sense of the relationship incur among the variables logically, therefore allow to give a fundamental to create the proposed theoretical.

2.2.1 Informational Friction Theory

Informational Friction Theory suggested inflation rate is positively correlated with liquidity of bank. The rise in rate of inflation will affect the return on assets, consequently promote rational of lending and increases banks liquidity (Al-Harbi, 2017). According to the theory, when the inflation rate increases, it reduces the actual rate of return not only in term of asset. It will also effect on real returns to fall and stimulates the credit market frictions. Due to frictions of the market that trigger rationing of credit, the growth of inflation will further increase credit rationing. In turn, lesser loan will be offered by financial sector, distribution of resource become low effective, Hence, during the high inflation, the liquid volume or liquidity securities own by financial agency or institution will increase (Belete, 2015).

2.2.2 Shift Ability

Shift Ability is a way to keep banks has sufficient liquidity by supporting the shifting of assets (Mugenyah, 2015). This theory proposes when the bank size rise, liquidity of bank also rise. When a bank is shortage of liquid asset like cash money, it is able to sell its assets to a bank with more liquid. Shift ability theory also able to protect a bank from huge deposit withdrawals by holding liquidity reserve (Mugenyah, 2015). This includes commercial paper, banker acceptance and Treasury bills.

2.2.3 The Financial Fragility-Crowding Out Theory

The "financial fragility-crowding out" theory advocates that higher capital reduces liquidity creation. At first, the bank will collect funds from depositors and lends them to borrowers. Once the loan is issued, the bank monitors the borrower and obtains private information on its borrowers that gives it an advantage in assessing the borrowers' profitability. This informational advantage, however, creates an agency problem, whereby the bank may try to shark up rents from its depositors by demanding a greater share of the loan income. As depositors know that the bank may abuse their trust, they become leery about depositing their money with the bank. If depositors refuse to pay the higher costs, the bank threatens to curtail its monitoring or loan collecting efforts. Hence, the bank is forced to establish its commitment to depositors by adopting a fragile financial structure (whereby the bank runs the risk of losing funding if it attempts to withhold depositors) with a large share of liquid deposits. Consequently, by allowing the bank to receive more deposits and finance more loans, financial fragility favors liquidity creation. As greater capital reduces financial fragility, it enhances the bargaining power of the bank and hinder the credibility of their

commitment to the depositors. Thus, greater capital works to diminish liquidity creation (Zuzana, Laurent & Zhou, 2010).

2.2.4 Crowding Out of Deposit Effects

According to a research done by Gorton and Winton (2017), it shows on how the liquidity creation may be reduce due to a higher capital ratio through the crowding out of deposits effects. They highlighted that for an investor, the liquidity is efficient protection against the agents that will invest during capital of bank. Therefore, increase in capital will turn the investor's relatively asset in term of money effect on the bank of liquidity and capital of bank. Hence, will affect the total amount of bank's liquidity creation.

2.2.5 A Theory of Bank's Capital

The theory of the capital of bank proposes that the capital of bank and bank's liquidity have negative relationship. It reveals that the banks able to create liquidity due to their deposits are accessible and frangible. Kashyap, Rajan and Stein (2002) mentioned that banks create liquidity on both sides of the balance sheet which the bank provides liquidity for the entrepreneur and the depositor. Based on the theory of bank's capital, demand deposits will provide liquidity to depositors and when some of the depositors create demand to get back their money due to the ordinary business, the bank needs not to liquidate the current borrower. The bank can just borrow from new depositors who put saving or investing in their branches. Hence, the bank

can meet the withdrawal of depositors by obtaining a fragile and rigid capital structure in order to enhance the capability to generate liquidity.

However, this rigid capital structure may cause bank runs when values of real asset values. Therefore, the bank will compensate liquidity creation due to bank runs. Banks willing to partially finance themselves with a softer claim like capital. In short, capital is considered as a reserve which bank cannot utilize, hence decreasing its capability to generate liquidity (Diamond & Rajan, 2000b).

2.2.6 The Risk Absorption Hypothesis

This bank capital has been suggested in this theory that has positive influence on liquidity creation. Allen and Santomero (1998); Allen and Gale (2004) encourage risk of the bank effect on the liquidity creation in this study. Due to losses may incur when bank creating higher liquidity as the bank requires disposing of less liquidity assets to fulfill what are customers needed. On the other hand, Repullo (2004); Bhattacharya and Thakor (1993) that argues that bank capital allow bank to conduct risk and increase bank's ability to bear the risk. Integrated both of the points of view, the bank is able to generate more liquidity when the capital ratio are high enough.

2.2.7 CAMELS Framework

CAMELS is an acknowledged rating system wherein the bank regulatory agencies apply to evaluate financial institution's or bank's performance and determine their strengths and weaknesses (Baidoo, Amankwah & Tobazza, 2018). Under this rating system, the regulators mark the bank by a scale from 1 to 5, where 1 is considered the best while 5 is considered the worst. The acronym CAMELS refers to sis elements that regulators apply for rating bank is as follows:

i. Capital Adequacy

Researchers use capital adequacy to measure bank's capability to keep capital commensurate with the risk of bank and measures the bank's ability to fulfil all its responsibilities towards the depositors without discontinuing its operations. A bank has to adhere with dividend and interest rules and work out for getting a high capital adequacy rating.

Capital to risk weighted assets ratio (CAR) is one of a popular measurement of capital adequacy. According to BASEL agreement, 8 per cent CAR is the minimum requirement. In addition, CAR helps to determine how well a financial institution can cushion losses to their balance sheets. A good capital base enhances depositors' confidence and promotes monetary stability in the country.

ii. Asset Quality

An asset quality determines the health status of bank against the deficit of asset value. According to AmosWeb (n.d.), the largest asset category of most banks is loan and advances (financing), which generates interest revenue. Advances can classify into performing and non-performing financing (NPFs). The bank will classify an account as NPFs only when the interest is unable to payoff within 3 months from the end of the relevant quarter.

Popular indicators to determine the asset quality are such as NPF to advances, recover rate and advance payment of loan default. The asset of financial institutions will directly affect their solvency. Thus, when the financial institutions' assets are impaired, their solvency will also be effected. Therefore, asset quality indicators must be monitored based on tendency in NPF together with the healthiness and profitability of borrowers, especially corporate sector.

The ratio apply in this research is the Gross Non-Performing Loan Ratio (Gross NPA/ Total loan) which use to determine whether or not the bank's gross NPAs are rising quarterly or yearly. If yes, it indicates the new NPL stock is added into the bank. In this case, it means the bank is either not caution enough when providing financing or is too loose in repaying the borrower. The higher the ratio, the worse the credit decisions of financial institutions.

iii. Management Efficiency

Sound management is one of the most critical elements behind the performance of bank. The top-level management are the critical persons for the successful functioning of the banking operations. Management's effectiveness is reflected in how strong the management responds to the fluctuating market conditions, how strong they detect and monitor the risk, how well the job and obligations are assigned, how well the policies of compensation and job task are designed. It includes the ability of management to assure safety operation of the bank while complying with all the regulations.

iv. Earnings and Profitability

Earnings and profitability are the dominant source of increase in capital base and it can be examined regarding to the policies of interest rate and the provision with adequacy (AmosWeb, n.d.). Besides, the institution may help to reinforce present and future operations and the ability reflects on banks' profitability profile. Moreover, Return on Assets (ROA) is an indicator that widely used and different indicators are used for difference purpose. In addition, the trend in profitability is difficult to interpret compared with other indicators. For instance, unusually excessive risk taking can reflect by high profitability. Therefore, the profitability has been excluded in this study since it is difficult to interpret.

v. Liquidity

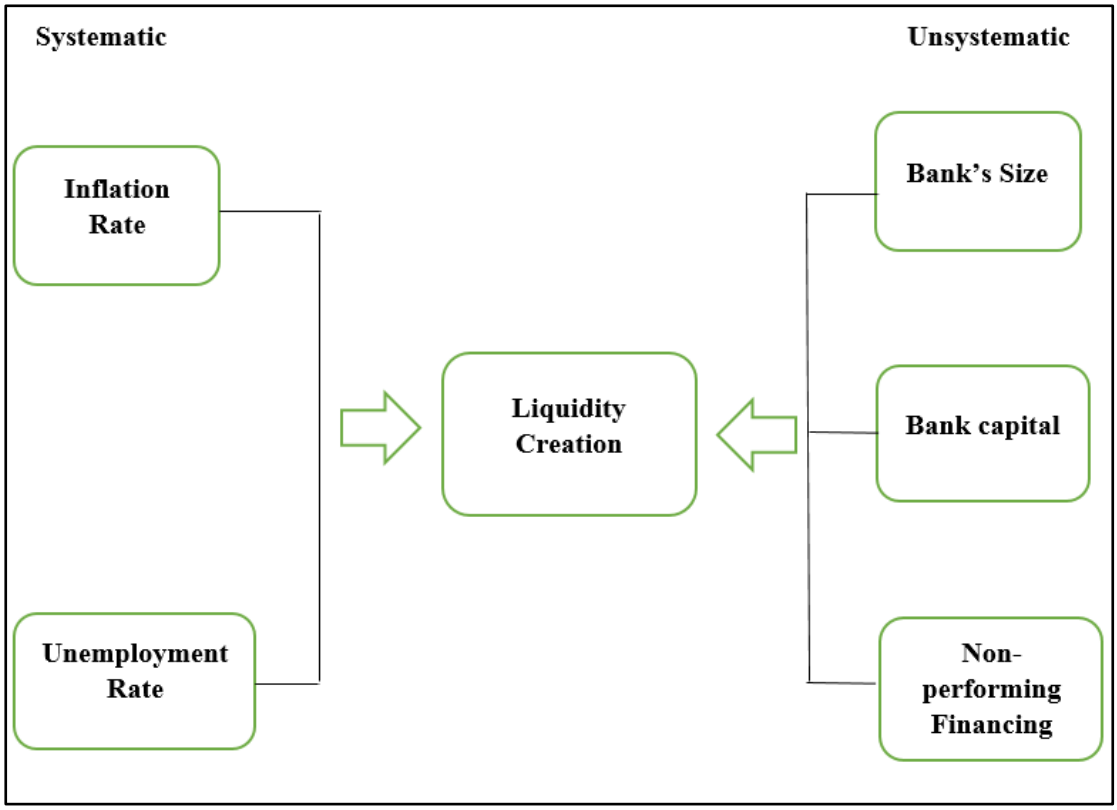
According to AmosWeb (n.d.), bank's liquidity indicates the capability to accomplish their short-term obligations as they come due. An institution can attract more depositors to deposit into the bank or convert its assets into cash at a reasonable cost for obtaining sufficient funds. To assess the liquidity of bank, examiner will focus on the sensitivity of interest rate risk, availability of assets that can converted into cash easily. In addition, make sure the bank's liquidity remains an acceptable condition is one of the challenges for the bank. Thus, when the mismatching happens between overall assessed in terms of all the assets and liability management, it will cause a higher liquidity risk.

vi. Sensitivity to Market Risk

Risk sensitivity can be evaluated by monitor and control the market risk which also known as the risk that the investment value will reduce because of the market factors changed. The performance of the financial markets will affect by these market factors and it only is decrease by diversification into the investments that are not related with the market. In addition, the market risk is also known as systematic risk. For instance, inflation rate and unemployment rate are the systematic risk of this study.

2.3 Conceptual Framework

Figure 2.1: Conceptual Framework



2.4 Conclusion

In this chapter, the major part is to study the determinants that affect Malaysia Islamic banks' liquidity creation. This topic from previous researches and this research has been justified being useful by giving correct instruction together with much information to this study. This information will further explain in the following chapters.

CHAPTER 3 METHODOLOGY

3.0 Introduction

This chapter is going to discuss the methodology that has adopted in this study. The data can be found from others resources. This study investigates few predictor variables inside this model. These include rate of inflation and unemployment rate as the systematic factors, while for bank's size, capital of bank and non-performing financing are the unsystematic factors. This study involved 8 out of 16 Malaysia Islamic banks within period 2009 to 2017.

3.1 Research Design

This study is to investigate among two factors which are systematic and unsystematic factors that affect liquidity creation in Malaysia Islamic banks. Thus, quantitative research which is numerical has been chosen to provide the empirical results to interpret the liquidity creation.

Hopkins (2008) mentioned that quantitative research is determining the relationship of the variable. Since, the results will required to provide the independent variables, hence the research design is fit to this research. The predictor variables used to examine the liquidity creation of Malaysia Islamic banks are the inflation rate, unemployment rate, size of bank, capital of bank and non-performing financing of bank.

3.2 Data Collection Method

The empirical tests carry out by the researcher by using secondary data. The data have two subsets within systematic and unsystematic factor's data. Liquidity is the explained variable of Islamic banks, the unit for liquidity is in percentage and is obtained from World Development Indicators. Besides, towards the explanatory variables, data that concern on bank's size, bank' capital and non-performing financing are collected from company annual report, while for the inflation rate and unemployment rate are collected through Data Stream.

Table 3.1: Data Resources

Type of data	**Source**	**Unit Measurement**
Systematic factors		
Inflation rate	Data Stream	Percentage (%)
Unemployment rate	Data Stream	Percentage (%)
Unsystematic factors		
Bank's size	Bank Financial Report	Ringgit Malaysia (RM)
Bank's capital	Bank Financial Report	Percentage (%)
Non-performing financing	Bank Financial Report	Percentage (%)

3.3 Sampling Design

Malaysia consists of sixteen Islamic banks. However, the main bank that this research taken will be 8 banks from Malaysia's Islamic bank. Xu, Hu and Das (2019) proved the contribution to systematic risk and higher idiosyncratic risk are combined of the market based activities, leverage, and wholesale funding, and the bank profitability is also important to the financial stability. According to the

Managing Director of the Monetary Authority of Singapore (MAS), he commented that bank profitability is important for bank stability, and low profitability may affect banks' ability and willingness to lend. The Islamic bank was selected based on bank's profitability because bank's profit implies the influence of that Islamic bank in Islamic financial system (Today, 2019). The 8 out of 16 Malaysia's Islamic banks are chosen, and investigate the liquidity creation are presented as below:

Table 3.2: Malaysia Islamic banks

1. Maybank Islamic Berhad
2. CIMB Islamic Bank Berhad
3. Bank Islam Malaysia Berhad
4. Public Islamic Bank Berhad
5. RHB Islamic Bank Berhad
6. MBSB Islamic Bank Berhad
7. Hong Leong Islamic Bank Berhad
8. Ambank Islamic Berhad

3.3.1 Sampling Size

Size for the sampling can refer through the study of the population. In this study, the 8 Malaysia's Islamic bank within year 2009 to 2017 with 72 sample size is used by the researchers.

3.4 Data Analysis

This study used panel data (cross-sectional and time series) to determine the factors that impact on liquidity creation Malaysia's Islamic bank cover with duration of year 2009 to 2017. It also can separate into unbalanced and balanced data. Panel data is balanced when there is a fixed data, which means the number in the same period can observation through the cross-sectional unit. Whereas, for the panel data that is unbalanced, means that there may be some missing observations (Dupuis, Kimball, Bockelman, Srinivasan & Dougherty, 2006). Panel data have been chosen in this study because it means that the data contains more detail and efficiency of econometrics estimates comparing to other data.

3.4.1 Descriptive Analysis

According to Dawood (2014), standard deviation, mean, maximum and minimum was included in descriptive analysis. From the 8 Islamic banks that have been chosen in this study, the average variable for the values of means will reflect from the time period of year 2009 to year 2017. The minimum and maximum of the bank profitability will reflect among 8 Malaysia Islamic banks. According to the Almazari (2014), it can determine the value of means through the set of data from the standard deviation.

3.4.2 Panel Data Regression Model

This model refers to statistic model that measures two dimensions of panel data, such as time dimension and cross-sectional. On the other hand, this statistical method is used to test the performance of the model with the several units on individual unit or cross sectional by observing the result.

A Pooled Ordinary Least Squares (Pooled OLS) model is estimated by pooling all observations from all banks that have been selected in this research and applying the regression analysis on the pooled sample. In this study, the regression of panel data can investigate through systematic and unsystematic factors that effected the liquidity creation of Malaysia Islamic banks.

The Pooled OLS solution is illustrated as below through regression model of panel data:

$$Liq_{it} = \beta_0 + \beta_1 INF_{it} + \beta_2 UN_{it} + \beta_3 \log SIZE_{it} + \beta_4 CAP_{it} + \beta_5 NPF_{it} + \varepsilon_{it}$$

Where,

i = Cross-sectional data
t = Time series data
Liq = Liquidity creation
INF = Inflation rate
UN = Unemployment rate
$SIZE$ = Bank's size
CAP = Bank's capital
NPF = Non-performing financing
ε = Error term

3.4.3 Individual Significance Test

T-test is applied to investigate the individual effect of predictor variables on the predicted variable.

The hypothesis testing is shown as below:

H_0: The liquidity creation is not significantβ_i.
H_1: The liquidity creation is significant β_i.

Where the predictor variable can identify i = 1, 2, 3, 4, 5.

Under p-value approach, the p-value will be rejected when smaller that the level of significant. Inversely, cannot be reject. It wills rejection when there is enough evidence to decide that β_i significantly influence liquidity creation.

3.4.4 Overall Significance Test (F-test)

The Pooled OLS model is an effective method to investigate the impact of all predictor variables on the predicted variable. According to Dupuis et al. (2011), POLS model are able to evaluate the parameters of the available model and stabilize the panel data that is significantly matched to this research, thus effectively measuring the data.

The hypothesis for F-test is as below:

H_0: All predictor variables are insignificant to explain liquidity creation.
H_1: At least one predictor variable is significant to explain liquidity creation.

Under p-value approach, the p-value will be rejected when smaller that the level of significant, inversely, cannot be reject. It will reject when there is sufficient evidence to decide that all predictor variables are significant to explain liquidity creation. In other words, the overall model is significant.

3.4.5 Diagnostic Tests

These tests such as Ramsey RESET test, Jarque-Bera (JB) test, VIF, Breusch-Pagan / Cook-Weisberg test. It also has Durbin-Watson Test or Durbin's h Test at lastly is Breusch-Godfrey LM test. These overall tests can be determined through the assumption of the Classical Linear Regression Model (CLRM). The assumptions of CLRM are as below:

- Does not suffer multicollinearity, if the regressor variables do not have relationship.
- Homoscedasticity will happen when constant among the variance of error term.
- No autocorrelation problem within all the error term (μ) at the period t and the error term at period before t if there is no relationship.

Once CLRM assumptions are fulfilled, the result will show the Best Linear Unbiased Estimator (BLUE). The estimator will become efficient when achieve the optimum level of the variance of errors, when occurs BLUE in the result. Furthermore, the solution of p-values will be accurate and reliable as they are not overestimated or underestimated.

3.4.5.1 Multicollinearity

Multicollinearity happens if there is relationship between predictor variables. This problem occurs when improper use of dummy variable, including a variable computed twice from other variable in an. In the event of multicollonearity, although BLUE, the OLS estimator have large variances, will cause difficult to make a precise estimation. The multicollinearity can be detected through some various methods. Firstly, if the model has highest R-square and there is few or no significant regressor variables. Secondly, if both variables have more than 80% correlation under the correlation matrix, the researchers may suspect multicollinearity problem.

Next, the regressor variable can be estimated the seriousness of multicollinearity through the Variance Inflation Factor (VIF). When VIF is 1, this implies the model does not suffer the problem of multicollinearity. However, if VIF is greater than and equal to 10, it shows that the model suffers a serious problem of multicollinearity. Below shows the formula of VIF and the guideline for interpreting the VIF:

$$VIF = \frac{1}{1 - R^2_{x_1,x_2}}$$

Table 3.3: Guideline to interpret the VIF

VIF = 1	No multicollinearity
VIF = 1 to 10	Poor multicollinearity
VIF ≥ 10	Strong multicollinearity

3.4.5.2 Heteroscedasticity

The variance of error terms is not constant will happen heteroscedasticity. Their estimators will become inefficient in the event of Heteroscedasticity. To test heteroscedasticity can use Breusch-Pagan or Cook-Weisberg test, researcher also can use the p-value to evaluate whether the model suffer the problem of heteroscedasticity. When p-value is greater than 1% significant level, it indicates that the model will exclude the problem of heteroscedasticity.

H_0: There is homoscedasticity.
H_1: There is heteroscedasticity problem.

Researches will reject H_0 if p-value is lesser than 0.01, 0.05 and 0.10 for the significant level, inversely, cannot be reject. If the model does not suffer problem of heteroscedasticity, it must have sufficient evidence to conclude the model.

3.4.5.3 Autocorrelation

This problem will exist in the model in the case that the error term (μ) at the period t is correlated with the error term at period before t (past error terms). In the event of autocorrelation problem, the t statistic value and F statistic value are invalid and will directly lead to p-value of hypothesis test results to be biased. The researchers can use Durbin-Watson Test / Durbin's h Test / Breusch-Godfrey LM test to detect autocorrelation problem. The p-value obtained can also be examining the existing of problem of autocorrelation. If the result shows that p-value greater than 1% significance level, it indicates the model do not suffer any autocorrelation problem.

H_0: The model does not suffer autocorrelation problem.
H_1: The model suffers autocorrelation problem.

Under p-value approach, reject H_0 when p-value is lesser than the significant level 0.01, 0.05, and 0.10, otherwise, do not reject H_0. The rejection of H_0 defines that there is insufficient evidence to conclude that the model has no suffer the autocorrelation.

3.4.5.4 Normality of the error term

The Classical Linear Regression Model expects the error term (μ) is normally distributed. It assumes that the mean of error become zero because positive and negative error will neutralize each other. The result will be unreliable if the normality assumption is not valid. In order for us to test the normality of μ more precise, we can conduct Jarque-Bera (JB) test with Eviews. To compute the value of test statistics, it needs to obtain the value of skewness and kurtosis from the model. However, it also can decide the output through comparing Jarque-Bera p-value with the significance level.

H_0: The error term is normally distributed.
H_1: The error term is not normally distributed.

By using p-value approach, do not reject H_0 if p-value is greater than the significant level 0.01, 0.05, and 0.10, otherwise, reject H_0. The rejection of H_0 defines there are not enough evidence to justify that the error term is normally distributed.

3.5 Conclusion

The sources of secondary data collected have been mentioned in this chapter. Apart from that, the approach that applied in the study to analyze and investigate the measurement testing also has been explained in the chapter. The next chapter will mention in particulars about the hypothesis and diagnostic testing that have been applied.

CHAPTER 4 DATA ANALYSIS

4.0 Findings and Discussions

In this chapter, the data set and the output generated by E-Views 10 will be interpreted in details. Firstly, the descriptive analysis for the model will be interpreted. Besides that, inferential analysis mentioned in previous chapter will also be carried out. Moreover, several diagnostic checking has been conducted in order to enhance the validity of the estimators. There are four checking included which are multicollinearity, heteroscedasticity, autocorrelation and normality test.

4.1 Descriptive Analysis

Table 4.1: Descriptive Analysis

	LIQ	INF	UNP	SIZE	CAP	NPF
Mean	16.57444	3.588889	3.222222	17.39007	7.066389	2.024306
Median	14.34000	3.500000	3.200000	17.40114	6.950000	1.215000
Maximum	22.55000	5.300000	3.500000	19.12623	15.27000	19.70000
Minimum	12.93000	2.600000	2.800000	16.02839	3.190000	0.150000
Std. Dev.	3.924996	0.701619	0.200156	0.654073	2.085176	3.057468
Skewness	0.615843	1.273563	-0.648110	0.277369	1.494012	4.277927
Kurtosis	1.533841	4.531858	2.863008	3.532875	6.910812	22.77802

Table 4.1: Descriptive Analysis

Jarque-Bera	11.00002	26.50332	5.096865	1.775074	72.66822	1393.118
Probability	0.004087	0.000002	0.078204	0.411669	0.000000	0.000000
Sum	1193.360	258.4000	232.0000	1252.085	508.7800	145.7500
Sum Sq.Dev.	1093.797	34.95111	2.844444	30.37457	308.7051	663.7160
Observations	72	72	72	72	72	72

This paper has collected the data of liquidity, inflation rate, unemployment rate, bank's capital, bank's size and non-performing financing across 8 Islamic bank within Malaysia from year 2009 until year 2017. These data sets are collected from Bank Negara Malaysia and the World Development Indicators by the World Bank.

Mean is the average of all the figures which is computed "central value of a set of numbers". It can be computed by summing up all of the figures then divided by the number of observations. From the table above, the mean value for liquidity, inflation, unemployment rate, bank's capital, bank's size and non-performing financing is 16.57444, 3.588889, 3.222222, 7.066389, 17.39007 and 2.024306 subsequently. The middle number in an arrangement of a data set is known as median which order by its value size. From the table above, the mean value for liquidity, inflation, unemployment rate, bank's capital, bank's size and non-performing financing is 14.34000, 3.500000, 3.200000, 6.950000, 17.40114 and 1.215000 subsequently.

Standard deviation is a measure that is used to specify the amount of variation of a data set values. From the table above, the mean value for liquidity, inflation, unemployment rate, bank's capital, bank's size and non-performing financing is 3.924996, 0.701619, 0.200156, 2.085176, 0.654073 and 3.057468 subsequently. According to the results generated, bank liquidity has the highest volatility compared to other variables due to greater standard deviation obtained. Besides that, the value of skewness obtained shows that all the variables are positively skewed while only the unemployment rate is negatively skewed. Next, the result get from the Jarque-Bera statistics implies that the variables of liquidity, inflation, bank's capital and non-performing financing are not normality distributed at all three significant level (1%, 5%, and 10%). However, the variable of unemployment rate was normally distributed at 1% and 5% significance level. Contrary, the bank's size was normally distributed at all significance level. These conclusions are made by obeying the decision rule which stated that the H_0 will be rejected when the p-value is smaller than the significance level.

4.2 Inferential Analysis

This research's econometric model is shown as below:

$$Liq_{it} = -54.09603 + 1.756135\, INF_{it} + 10.73308\, UN_{it} + 0.015989\, log\, SIZE_{it} + 0.267875\, CAP_{it} + 0.042210\, NPF_{it}$$

Where,

i = Cross-sectional data

t = Time series data

Liq = Liquidity creation

INF = Inflation rate

UN = Unemployment rate

SIZE = Bank's size

CAP = Bank's capital

NPF = Non-performing financing

Table 4.2: Estimation Model Output from E-view 10

Variables	Coefficient	P-value
Intercept	-54.09603	0.0000 ***
Inflation	1.756135	0.0003 ***
Unemployment	10.73308	0.0000 ***
Bank's Size	0.015989	0.0040 ***
Bank's Capital	0.267875	0.0752 *
Non-performing Financing	0.042210	0.6968
R^2	0.621994	
Adjusted R^2	0.593358	
Prob. (F-statistics)	0.000000	

*NOTE: *, **, *** implies the rejection of null hypothesis at 10%, 5%, and 1% significance level.*

In this study, researcher uses F-Test to test the overall significance in the model and whether or not the linear regression model enhances the fitness to a dataset than a model with no independent variables. The p-value for the F-test is used to compare with the significance level. If the p-value is lower than the significance level, it has enough evidence to conclude that researcher's regression model suit the data better than the model with no independent variables. According to table 4.2, the model is significant at significance level 1% as the p-value for F-test is 0.0000 which is lower than 1% significance level and therefore it can be said that the determinants in the model improve the fitness of model.

At the same time, R-square (Hereinafter as R^2) is used to compute the percentage of the total variation in the regressand that can be elucidated by the total variation in the regressor. The dimension of R^2 is within 1% to 100%. It indicates that low variation of regressand can be elucidated by the variation of regressor when the value of R^2 is near to 1%. However, it indicates that high variation of regressand can be elucidated by the variation of regressor when the value of R^2 is near to 100%. From table 4.2, the value of R^2 is 0.621994 which is equal to 62.20% and indicates that 62.20% variation of bank's liquidity can be elucidated by the variation of inflation rate, unemployment rate, bank's size, bank's capital and non-performing financing. Nonetheless, a remaining of 37.80% is cannot be elucidated in this model.

On the other hand, hypothesis testing for individual t-test is carried out for each parameter to test whether they are significant in the model. According to table 4.2, the intercept of the model is -54.09603 which means the liquidity is -54.09603% when all the independent variables are zero.

For the first independent variable, the coefficient of inflation rate is 1.756135 which implies that on average, the liquidity will increase by 1.756135 percentage point if the inflation rises by 1 percentage point, ceteris paribus. According to table 4.2, the inflation rate is significant as the p-value (0.0003) is less than 1% significance level. This significant and positive result is in accordance with the studies done by Waemustafa and Sukri (2016) who suggest that increases in inflation rate will increase bank's liquidity creation. This is because Islamic banks will preserve a larger cash reserve to protect the bank's sound liquidity position when operating their business in the event of rising inflation rate. Similar results were obtained by Trujillo-Ponce (2013) which found out that increases in inflation rate will increase banks liquidity if the bank's management is fully anticipated by adjusting interest rates to increase revenue quicker than costs.

It is found that unemployment rate is significant as the p-value (0.0000) is lower than 1% significance level. According to table 4.2, the coefficient value of unemployment rate is 10.73308 which imply that on average, the liquidity will increase by 10.73308 percentage point if the unemployment rate rises by 1 percentage point, holding other variables constant. This positive relationship outcome is in line with the studies obtained by Horváth, Seidler and Weill (2014) which highlighted that during the periods of high unemployment, credit risk of potential borrower rises whilst demand for loans will reduce. Subsequently, the bank will try to rise their liquidity by minimizing the amount of loans provided. Thus, a rise in the unemployment rate will raise the amount of bank liquidity.

This studies also found a significant positive correlation between bank's size and bank liquidity as the p-value (0.0040) is lower than 1% significance level. The coefficient value of bank's size is 0.267875 which implies that the liquidity will rise by 0.015989 percentage point when the bank's size increases by 1%, ceteris paribus. The studied done by Berger and Bouwman (2009) obtained the same results as a smaller bank will be focus on transformation activities and intermediation processes and therefore, have a lesser liquidity creation. Hence, increases in bank's size will increase bank liquidity.

In addition, bank's capital has a similar result with most of the variables which is significant and positively affecting bank liquidity as the p-value (0.0752) is lower than 5% significance level. According to table 4.2, the coefficient of bank's capital is 0.267875 which implies on average, the liquidity will increase by 0.267875% if the bank's capital rises by 1 percentage point, ceteris paribus. This finding is in accordance with Singh and Sharma (2016) which pointed out that when the bank holds more capital, the bank is subsequently holding more liquidity for safeguard measure. Similar results also obtained by Berger and Bouwman (2009), and Allen and Gale (2004) which concluded that bank's liquidity holding will be increase when the capital is higher.

However, non-performing financing is the only variable that is positively correlated whilst insignificantly affecting bank liquidity in the study as the p-value (0.6968) is greater than all significance level and the coefficient value is 0.042210. Moreover, on average, the liquidity will increase by 0.042210% when the non-performing financing increases by 1 percentage point, ceteris paribus. This outcome is inconsistent with past studies as most of the studies identified that the non-performing financing is negatively related with bank's liquidity. However, Umar and Sun (2016) has same result with this study and explained that the situation of non-performing financing will positively correlated with bank liquidity may exist when the banks occur moral hazard problem. The logic behind is that the shareholders may go for risky portfolios by ultimately transferring risk to depositors. It might result in a manifestation of discreet policy of the banks as they neutralized the greater credit risk with circumspect management on liquidity risk. Therefore, a moral hazard problem exists since the liquidity increases when non-performing financing increased.

4.3 Diagnostic Testing

In order to improve the validity of the estimators, this study is going to subject the residual to a diagnostic test so that best linear unbiased estimators (BLUE) and Classical Liner Regression Model assumptions will not be violated. Multicollinearity, heteroscedasticity test, autocorrelation test and normality test have been included in the diagnostic testing.

4.3.1 Multicollinearity

Multicollinearity happen when the independent variables are correlated with each other's. It may be caused by the incorrect use of dummy variable, included variables computed from other variable in the equation or includes the same variable twice. It may be due to too many variables adopted in the model (Jeeshim, 2002).

Based on the outcome, the value of R^2 is 0.621994 which is considered as high while the p-value of F-ratio is 0.00000 which is lower than all significant level (1%, 5%, and 10%). Hence, the null hypothesis will be rejected and can conclude that the model is significant. At the same time, three variables (Inflation, Unemployment and bank's size) are significant at all significant levels (p-value is less than α = 0.01, 0.5, 0.1), whereas, only two variables (bank's capital and non-performing financing) are insignificant at 1% significance level. In short, there is a high R^2, model is significant with a few significant t-ratios. Therefore, we can conclude that the model consists of weak multicollinearity problem.

Furthermore, it can also use the Variance Inflation Factor (thereinafter as VIF) to encounter multicollinearity problem. According to the rule of thumb, if a variable's VIF value outstrips 10, this variable is considered as highly collinear (Gujarati & Porter, 2010).

Table 4.3: VIF results for the Independent Variables

Independent Variable	**VIF (1/ 1-R^2)**
Inflation Rate	1 / (1 - 0.139377) = 1.161949
Unemployment Rate	1 / (1 - 0.042611) = 1.044508
Bank's Size	1 / (1 - 0.075639) = 1.081828
Bank's Capital	1 / (1 - 0.281585) = 1.391953
Non-performing Financing	1 / (1 - 0.188830) = 1.232787

The table above represents the VIF value of the independent variables are all in the range of 1 to 2, which is not nearer to 10. Thus, it can be concluded that the model is unlikely to have multicollinearity problem.

4.3.2 Heteroscedasticity

Heteroscedasticity happened if the residuals' scatter is dissimilar, which depends on the other independent variables' values. In this paper, Heteroscedasticity Test is utilized to analyse the presence of heteroscedasticity problem in the models

Table 4.4: Summary result of Heteroscedasticity Test (Cross-Section Test)

	Result
F-statistic	0.952267
P-value	0.998500
Decision	Do not reject null hypothesis (1%, 5%, 10%)

Table 4.5: Summary result of Heteroscedasticity Test (Period Test)

	Result
F-statistic	1125.269
P-value	0.0000
Decision	Reject null hypothesis (1%, 5%, 10%)

Table 4.4 and table 4.5 show the outcome of heteroscedasticity testing for the model. For the cross-section test, it does not reject the null hypothesis since the p-value (0.952267) is more than all significance level. Hence, it can conclude that the model does not occur heteroscedasticity problem at all significance level. On the other hand, the period test rejects the null hypothesis since p-value (0.0000) is less than all significance level. Hence, it can conclude that the model does occur heteroscedasticity problem in the period test. According to Gujarati and Porter (2009), the researchers proposed that the coefficients would remain unbiased and consistent although there is a heteroscedasticity problem.

4.3.3 Autocorrelation

Autocorrelation will happen if the residual for the observations is linked to the residual of another observation. This situation is typically happened in a time series data. Therefore, autocorrelation problem is detected by applying Durbin-Watson Test in this research paper.

Table 4.6: Summary result of Autocorrelation Test

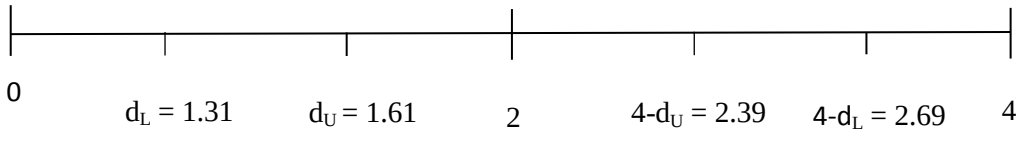
	Results
Test Statistic	1.824615
	
Decision	Do not reject null hypothesis (1%)

Table 4.6 illustrates that there is enough evidence to conclude that the model does not occur autocorrelation problem as the test statistic (1.824615) fall within the non-rejection area (1.61 and 2).

4.3.4 Normality Test

According to Kennedy and Moses (2016), it is essential to carry out normality test after the model has passed through heteroscedasticity test and autocorrelation test. Thus, if the normality assumption is being violated, it may lead an invalidity outcome. In this research, Jarque-Bera Testing is being practiced to analyse the normality status.

Table 4.7: Summary result of Normality Test

	Results
Jarque-Bera Test	3.893201
Probability	0.142759
Decision	Do not reject null hypothesis (1%, 5%, 10%)

According to table 4.7, there is sufficient evidence to conclude that the model meets the normality assumption on the error term at all significance level as the p-value (0.142759) is greater than all significance level. Hence, it can use hypothesis testing to test the parameters as the error are normally distributed.

4.4 Summary

As a summary, the descriptive analysis, inferential analysis and diagnosis checking have been illustrated in this chapter. The results were figured out in details together with the statistics obtained from the software of E-Views 10. The next chapter will summarize the whole study that has been conducted from the beginning to the end of this research.

CHAPTER 5 DISCUSSION, CONCLUSION AND IMPLICATION

5.0 Introduction

Chapter 5 covers whole study's conclusion. It involved justification of analysis of statistical which discussed in the chapter 4, major findings and implications for this study, followed by recommendations. The last section will be the conclusion that summarizes the findings of the study.

5.1 Summary of Statistical Analyses

Table 5.1: Summary Result of Diagnostic Check

Diagnostic Check	Decision	Solution
1. Multicollinearity	All variables' VIF not more than two	-
2. Heteroscedasticity	Do not reject H_0 (Cross Section Test) Reject H_0 (Period Test)	Re-estimate the model by applying Generalized Least Squares (GLS) or Weighted Least Squares (WLS)
3. Autocorrelation	Reject H_0	-
4. Normality	Do not Reject H_0	-

This section had summarized the empirical results from Chapter 4 which are generated by E-view 10. The summarized results included multicollinearity, heteroscedasticity, autocorrelation and normality test. According to the table 5.1, it indicates that an appropriate way to solve all issues from econometric. In this case, the result of researchers is credible and able to explain respectively.

5.2 Discussions of Major Findings

Table 5.2: Major Findings

Variables	**Expected Sign**	**Actual Result**
Inflation Rate	+	+
Unemployment Rate	+	+
Bank's Size	+	+
Bank's Capital	+	+
Non-performing Financing (NPF)	-	+

From the table 5.2, the result indicates that the expected sign between explained variable and explanatory variables are positive relationship. Whereas, according to the actual result, Non-performing Financing is the only independent variable different with the expected sign.

The result of Non-performing Financing (NPF) is positive relationship which supported by Umar and Sun (2016). They explained the positive relationship between NPF and the liquidity creation may happen when the bank involves moral hazard problem. The reason behind is that the shareholders may ultimately

transferring risk to depositors because they prefer risky portfolios. This can be explained by the banks' prudential policy as they will offset the greater risk of credit through prudent the management of liquidity risk. Therefore, a moral hazard problem exists since NPF increase and the liquidity increase.

5.3 Implications of the study

Based on the result in this study will propose practical implications for the government, Islamic banking industry and education. The implication of this study is to suggest relevant strategies and certain policies, so that government and banks can better control their liquidity creation by managing systematic and unsystematic factors to ensure the efficiency of Islamic banking industry.

The finding shows that all these factors have significant positive impact on Islamic bank's liquidity creation. The nominal value of bank's total asset will decrease when the nominal value of financing reduced which affected by inflation, therefore banks have to take countermeasures to against inflation. Central bank or Islamic bank's management should adjust the financing (loan) profit rate during inflation to reduce the impact of the deterioration of the value of the current assets of bank. Besides, Islamic banks must carefully and strictly in approve the financing during high unemployment in order to maintain their liquidity. If not, high default risk during high unemployment will result in liquidity shortage of Islamic bank. On the other hands, larger bank or small banks are encouraged to invest into money market or government securities such as Treasury Bills because these securities are easily converted into cash. Since financing is the main assets of the bank, so banks have to consider the financing (loan) period and prevent focus on long-term financing because it is illiquidity and riskier. Therefore, banks should plan well their financing portfolio so that the liquidity risk will reduce.

Furthermore, central bank can formulate a policy which increases the required reserve ratio (RRR) of the banks. Increase in RRR will lower down the investment risk because the required reserve that bank should hold is increase. Furthermore, banks can attract potential shareholders by issuing new shares which can increase the bank capital, thus reduce the liquidity risk. All these are to improve the Malaysia Islamic banks' liquidity. Briefly, the risk of liquidity of Islamic banks will decline.

Lastly, the result collected from this study will provide vital reference for banking students. The results from this research will be useful for the banking students in which, it identifies the important components that impact on liquidity in Malaysia Islamic banking industry and how it is different with conventional banks.

5.4 Limitation of the Study

This research is to investigate the Malaysia Islamic banks' liquidity creation and how the liquidity creation can influence by the five factors. However, there are some existing limitations have been discovered in this study.

In this paper, there is only studies the Islamic banks of Malaysia without include conventional banks. In this study, there are two macroeconomic variables has been selected and another three bank-specific factors to study the liquidity creation of the Islamic bank. Independent variable that included in this study is inflation rate, unemployment rate, bank's size, bank's capital and non-performing financing. However, the effect of variables might be different from different banking system in Malaysia since Malaysia has dual banking systems.

Lastly, as each country has their own political environment, cultural environment and law, this study which is only aim on Malaysia's Islamic banks, the result and justification provided in this paper are only meaningful and applicable for Islamic banks and government regulation in Malaysia. Therefore, in case for other countries, the researcher or policy maker might apply the finding of this paper only as referral but do not recommend applying this finding into their country's condition.

5.5 Recommendation for Future Research

Based on the limitations on the research, future researchers are encouraging to make further improvement in the research on similar or related topics.

Future researchers are encouraged to study the liquidity creation on both Islamic bank and conventional bank together. By doing so, the finding will have better explain on different variables effect the Islamic and conventional banks' liquidity creation. Thus, the different between the Islamic bank and conventional bank can be comparing, and the results are more inclusive and suitable to be used by policies maker to make decision or implement policies.

This research only covered Malaysia Islamic banks. Thus, the results only useful in Malaysia or countries with similar characteristic. Therefore, the future researcher should widen their field of studies by studying on Islamic banks in several countries such as Singapore, Brunei, Indonesia as well as those Islamic banks in Europe or other countries.

5.6 Conclusion

This research project aims to study how the systematic factors as well as unsystematic factors that affect Malaysia Islamic banks' liquidity creation. The panel data has been used in this research among 8 out of 16 Malaysia Islamic banks from year 2009 to year 2017; by using Ordinary Least Squares (OLS) method. According to hypothesis testing result, the researcher can form the following conclusion.

The result shows the inflation rate, unemployment rate and bank capital have significant at all significant level (1%, 5%, and 10%) effect on the liquidity creation. Whereas, the bank's size is insignificant at significant level (1% and 5%) and non-performing financing are insignificant at all significant level (1%, 5%, and 10%) effect on the liquidity creation.

This last chapter has summarized the statistical analyses, major findings, implication and limitation. The researcher put maximum efforts on this study, but still undergo from few limitations. However, these few limitations will not affect the results and it can be solving when problem occurs.

Last but not least, the researcher achieved the objective in this research project of the systematic factors as well as unsystematic factors that affect Malaysia Islamic banks' liquidity creation. For those who interested to study on this topic can use this research paper as referral in the future.

REFERENCES

Ahmad, R., Arrif, M., & Skully, M. (2009). Factors determining mergers of banks in Malaysia's banking sector reform. *Multinational Finance Journal, 11*(1/2), 1-31.

Ahmed, H. (2009). Financial crisis, risks and lessons for Islamic finance. *ISRA International Journal of Islamic Finance, 1(*1), 7-32.

Alger, G., & Alger, I. (1999). Liquid assets in banks: Theory and practice. *GREMAQ, Universite Des Sciences Sociales*.

Al-Harbi, A. (2017). Determinants of banks liquidity: Evidence from OIC countries. *Journal of Economic and Administrative Sciences, 33*(2), 164-177.

Ali, S. S. (2013). State of liquidity management in Islamic financial institutions. *Islamic Economic Studies, 130*(607), 1-36.

Allen, F., & Gale, D. (2004). Financial intermediaries and markets. *Econometrica, 72*(4), 1023-1061.

Allen, F., & Santomero, A. M. (1998). The theory of financial intermediation. *Journal of Banking and Finance, 21*, 1461-1485.

Almazari, A. A. (2014). Impact of Internal Factors on Bank Profitability: Comparative Study between Saudi Arabia and Jordan. *Journal of Applied Finance & Banking. 4*(1), 125-140.

Alzoubi, T. (2017). Determinants of liquidity risk in Islamic banks. Banks and Bank Systems, 12(3), 142.

AmosWeb. (n.d.). *Bank Asset.* Retrieved from http://www.amosweb.com/cgi-bin/awb_nav.pl?s=wpd&c=dsp&k=bank+assets.

Anamika, S. & Sharma, A. K. (2016). An empirical analysis of macroeconomic and bank-specific factors affecting liquidity of Indian banks. *Future Business Journal, 2*(1), 40-53.

Ariff, M. (2017). Islamic banking in Malaysia: The changing landscape. *Institutions and Economies*, 1-13.

Aspachs, O., Nier, E., & Tiesset, M. (2005). *Liquidity, banking regulation and the macroeconomy: Evidence on bank liquidity holdings from a panel of UK-Resident Bank.* Working paper, Bank of England.

Audo, P. N. (2014). The relationship between inflation rates and liquidity of commercial banks. Retrieved from http://erepository.uonbi.ac.ke/bitstream/handle/11295/76725/Audo%2CPatrick%20N_The%20relationship%20between%20inflation%20rates%20and%20liquidity%20of%20commercial%20banks%20in%20kenya.pdf?sequence=3&isAllowed=y.

Baidoo, W. T., Amankwah, S., & Tobazza, S. (2018, March). The use of CAMELS Model to evaluate banks: A case study of Seven Banks in Ghana. *International Conference on Applied Science and Technology Conference Proceedings, 4*(1), 1-13.

Bank for International Settlements. (2008). *Principles for sound liquidity risk management and supervision*.

Basel Committee on Banking Supervision. (2000). Sound Practices for Managing Liquidity in Banking Organisations.

Belete, F. (2015). *Factors affecting liquidity of selected commercial banks in Ethiopia* (Master dissertation), Addis Ababa University.

Berger, A. N., & Bouwman, C. H. (2009). Bank liquidity creation. *The review of financial studies*, *22*(9), 3779-3837.

Berger, A. N., & Bouwman, C. H. (2013). How does capital affect bank performance during financial crises?. *Journal of Financial Economics*, *109*(1), 146-176.

Berger, A. N., Boubakri, N., Guedhami, O., & Li, X. (2017). Liquidity creation and financial stability implications of Islamic banking: Evidence from a multinational study. *KFUPM Islamic Banking and Finance Research Conference, Dhahran*.

Bername. (2018). Malaysia maintains position as Islamic finance global leader. *New Straits Times*. Retrieved from https://www.nst.com.my/business/2018/10/417367/malaysia-maintains-position-islamic-finance-global-leader?fbclid=IwAR3u0BEvAV3DpAToFVMZ4KB23S3naKY_uFTQPRanMv13GJirYu5MGWDHVho.

Bhattacharya, S., & Thakor, A. V. (1993). Contemporary banking theory. *Journal of Financial Intermediation, 3*, 2-50.

Bonfim, D., & Kim, M. (2012). Liquidity risk in banking: Is there herding? *European Banking Center Discussion Paper*, *24*, 1-31.

Bunda, I., & Desquilbet, J. B. (2008). The bank liquidity smile across exchange rate regimes. *International Economic Journal*, *22*(3), 361-386.

Coval, J. D., & Thakor, A. V. (2005). Financial intermediation as a beliefs-bridge between optimists and pessimists. *Journal of Financial Economics, 75*(3), 493-736.

Dawood, U. (2014). Factors Impacting Profitability of Commercial Banks in Pakistan for the Period of (2009-2012). *International Journal of Scientific and Research Publications, 4*(3), 1-7.

Diamond, D. W., & Dybvig, P. H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of political economy, 91*(3), 401-419.

Diamond, D. W., & Rajan, R. G. (2000a). A theory of bank capital. The Journal of Finance, *55*(6), 2431-2465.

Diamond, D. W., & Rajan, R. G. (2000b). Corporate liquidity risk, liquidity creation, and financial fragility: A theory of banking. *The Journal of Political Economy, 109*(2), 287-327.

Dodoo, J. (2007). *Practical Approach Towards Commercial Banking and Finance*. Unpublished degree's thesis, Atlantic International University, Hawaii, United States.

Dupuis, T., Kimball, E., Bockelman, D., Srinivasan, V., & Dougherty, J. (2016). *U.S. Patent No. 9*(450,552). Washington, DC: U.S. Patent and Trademark Office.

Elasrag, H. (2011). *Principals of the Islamic finance: A focus on project finance.* Available at SSRN 1806305.

Gonzalez-Eiras, M. (2003). Banks' liquidity demand in the presence of a lender of last resort. *Documento De Trabajo, 61*, 103-145.

Gorton, G., & Winton, A. (2017). Liquidity provision, bank capital, and the macroeconomy. *Journal of Money, Credit and Banking, 49*(1), 5-37.

Hackethal, A., Rauch, C., Steffen, S., & Tyrell, M. (2010). Determinants of bank liquidity creation. *Social Science Research Network*.

Hazimah, A., & Wahidah, A. (2017). Liquidity risk: An Islamic banking perspective. *Journal of Intellect, 12*(1), 2231-7716.

Hopkins, W. G. (2008). Quantitative research design. Retrieved from http://www.sportsci.org/jour/0001/wghdesign.html.

Horváth, R., Seidler, J., & Weill, L. (2014). Bank capital and liquidity creation: Granger-causality evidence. *Journal of Financial Services Research, 45*(3), 341-361.

Iqbal, A. (2012). Liquidity risk management: A comparative study between conventional and Islamic banks of Pakistan. *Global Journal of Management and Business Research, 12*(5), 54-64.

Joseph, M. T., Edson, G., Manuere, F., Clifford, M. & Michael, K. (2012). Non-performing loans in commercial banks: A case of CBZ Bank Limited in Zimbabwe. *Interdisciplinary Journal of Contemporary Research in Business, 4*(7): 467-488.

Joseph, M.T., Edson, G., Manuere, F., Clifford, M., & Michael, K. (2012). Non-performing loans in commercial banks: A case of CBZ Bank limited in Zimbabwe. *Interdisciplinary Journal of Contemporary Research in Business, 4*(7), 467-488.

Kaleem, A. (2000). Modeling monetary stability under dual banking system: the case of Malaysia. *International Journal of Islamic Financial Services, 2*(1), 21-42.

Karl. E. C., Ray. C. F., & Sharon. M. O. (2002). *Principles of Economics* (6th ed.). New York, NY: Prentice Hall Publishing.

Kashyap, A. K., Rajan, R., & Stein, J. C. (2002). Banks as liquidity providers: An explanation for the coexistence of lending and deposit-taking. *The Journal of Finance*, *57*(1), 33-73.

Kassim, S. (2016). Islamic finance and economic growth: The Malaysian experience. *Global Finance Journal*, *30*, 66-76.

Khan, F. A., & Ahmad, N. (2017). Determinants of dividend payout: An empirical study of pharmaceutical companies of Pakistan Stock Exchange (PSX). *Journal of Financial Studies & Research, 16*, 77-93.

Kotrlik, J. W. K. J. W., & Higgins, C. C. H. C. C. (2015). Organizational research: Determining appropriate sample size in survey research appropriate sample size in survey research. *Information technology, learning, and performance journal, 19*(1), 43.

Lee, K. C., Lim, Y. H., Lingesh, T. M., Tan, S. Y., & Teoh, Y. S. (2013). *The determinants influencing liquidity of Malaysia commercial banks and its implication for relevant bodies: Evidence from 15 Malaysia commercial banks* (Doctoral dissertation), Universiti Tunku Abdul Rahman.

Madhi, D. (2017). The macroeconomic factors impact on liquidity risk: The Albanian banking system case. *European Journal of Economics and Business Studies, 3*(1), 32-39.

Mokhtar, H. S. A., Abdullah, N., & Al-Habshi, S. M. (2006). Efficiency of Islamic banking in Malaysia: A stochastic frontier approach. *Journal of Economic Cooperation, 27*(2), 37-70.

Moore, W. R. (2009) Forecasting domestic liquidity during a crisis: What works best?. *Journal of Forecasting, 26*, 445-455.

Moussa, M. A. B. (2015). The determinants of bank liquidity: Case of Tunisia. *International Journal of Economics and Financial Issues, 5*(1), 249-259.

Mugenyah, L. (2015). Determinants of liquidity risk of commercial banks in Kenya. *Unpublished Masters Thesis. University of Nairobi*.

Munteanu, I. (2012). Bank liquidity and its determinants in Romania. *Procedia Economics and Finance, 3*, 993 – 998.

Nawaz, M., Munir, S., Siddiqui, S. A., Tahseen-ul-Ahad, F. A., Asif, M., & Ateeq, M. (2012). Credit risk and the performance of Nigerian banks. *Interdisciplinary Journal of contemporary research in Business, 4*(7), 49-63.

Osama, O. J., Bassam, O. J., Jamal, S. & Usama, A. F. (2017). "Liquidity risk exposure in Islamic and conventional banks." *International Journal of Economics and Financial Issues, Econjournals, 7*(6), 16-26.

Rahman, A., Said, N. L. H. M., & Sulaiman, A. A. (2017). Financing structure and liquidity risk: Lesson from Malaysian experience. *Journal of Central Banking Theory and Practice, 6*(2), 125-148.

Repullo, R. (2004). Capital requirements, market power, and risk-taking in banking. *Journal of financial Intermediation, 13*(2), 156-182.

Rosly, S. A. (2015). *Liquidity Risks in Islamic Banking.* Retrieved from https://www.inceif.org/kmimpact/2015/04/03/liquidity-risks-in-islamic-banking/.

Saad, W., & El-Moussawi, C. (2012). The determinants of net interest margins of commercial banks in Lebanon. *Journal of Money, Investment and Banking, 23*, 118-132.

Salem, R. A. (2013). *Risk management for Islamic banks* (Master dissertation), Edinburgh University Press.

Sekoni, A. (2015). *The basic concepts and feature of bank liquidity and its risk.*

Shaha, S. Q. A., Khan, I., & Shaha, S. S.A. & Tahir, M. (2018). Factors Affecting Liquidity of Banks: Empirical Evidence from the Banking Sector of Pakistan. *Colombo Business Journal, 9*(1), 1-18.

Sheefeni, J. P., & Nyambe, J. M. (2016). Macroeconomic determinants of commercial banks' liquidity in Namibia. *European Journal of Business, Economics and Accountancy, 4*(5), 19-30.

Today. (2019). *Bank profitability is important for bank stability: Ravi Menon.* Retrieved from https://www.todayonline.com/business/bank-profitability-important-bank-stability-ravi-menon?fbclid=IwAR0QAEFF8MHJZlXMo42UJzkibUHxsvbryg9jHFEtzn6OcgWWh8OJi5TAX6o.

Trenca, I., Petria, N., & Corovei, E. A. (2015). Impact of macroeconomic variables upon the banking system liquidity. *Procedia Economics and Finance, 32*, 1170-1177.

Trujillo-Ponce, A. (2013). What determines the profitability of banks? Evidence from Spain. *Accounting & Finance, 53*(2), 561-586.

Tseganesh, T. (2012). *Determinants of Banks Liquidity and their Impact on Financial Performance: empirical study on commercial banks in Ethiopia.* Retrieved from http://etd.aau.edu.et/bitstream/handle/123456789/14989/Tseganesh%20Tesfaye.pdf?sequence=1&isAllowed=y&fbclid=IwAR0tuCY97PcYtRs3KFG0TjCogzpd5RSZIeQQ857JKP9B4YVtB5Sk6wjyfAg.

Umar, M., & Sun, G. (2016). Determinants of different types of bank liquidity: evidence from BRICS countries. *China Finance Review International, 6*(4), 380-403.

Vodova, P. (2011). Determinants of commercial banks' liquidity in the Slovakia. *Journal Acta Unicersitatis Agriculturae et Silviculturae Mendeleianae Brunesis, 7*(60), 740-747.

Waemustafa, W., & Sukri, S. (2016). Systematic and unsystematic risk determinants of liquidity risk between Islamic and conventional banks. *International Journal of Economics and Financial Issues*, *6*(4), 1321-1327.

Xu, M. T., Hu, K., & Das, M. U. S. (2019). *Bank Profitability and Financial Stability. International Monetary Fund.*

Zainul, E. (2018). Malaysia's Islamic banking industry will achieve 40% market share by 2020, says AIBIM. *The Edge Markets*. Retrieved from http://www.theedgemarkets.com/article/malaysias-islamic-banking-industry-will-achieve-40-market-share-2020-says-aibim.

Zuzana, F., Laurent, W., & Zhou, M. M. (2010). Bank capital, liquidity creation and deposit insurance. *Journal of Financial Services Research, 51*(1), 97-123.

APPENDICES

Appendix 4.1: Descriptive Analysis

	LIQUIDITY	INFLATION	UNEMPLO...	SIZE	CAPITAL	NPF
Mean	16.57444	3.588889	3.222222	17.39007	7.066389	2.024306
Median	14.34000	3.500000	3.200000	17.40114	6.950000	1.215000
Maximum	22.55000	5.300000	3.500000	19.12623	15.27000	19.70000
Minimum	12.93000	2.600000	2.800000	16.02839	3.190000	0.150000
Std. Dev.	3.924996	0.701619	0.200156	0.654073	2.085176	3.057468
Skewness	0.615843	1.273563	-0.648110	0.277369	1.494012	4.277927
Kurtosis	1.533841	4.531858	2.863008	3.532875	6.910812	22.77802
Jarque-Bera	11.00002	26.50332	5.096865	1.775074	72.66822	1393.118
Probability	0.004087	0.000002	0.078204	0.411669	0.000000	0.000000
Sum	1193.360	258.4000	232.0000	1252.085	508.7800	145.7500
Sum Sq. Dev.	1093.797	34.95111	2.844444	30.37457	308.7051	663.7160
Observations	72	72	72	72	72	72

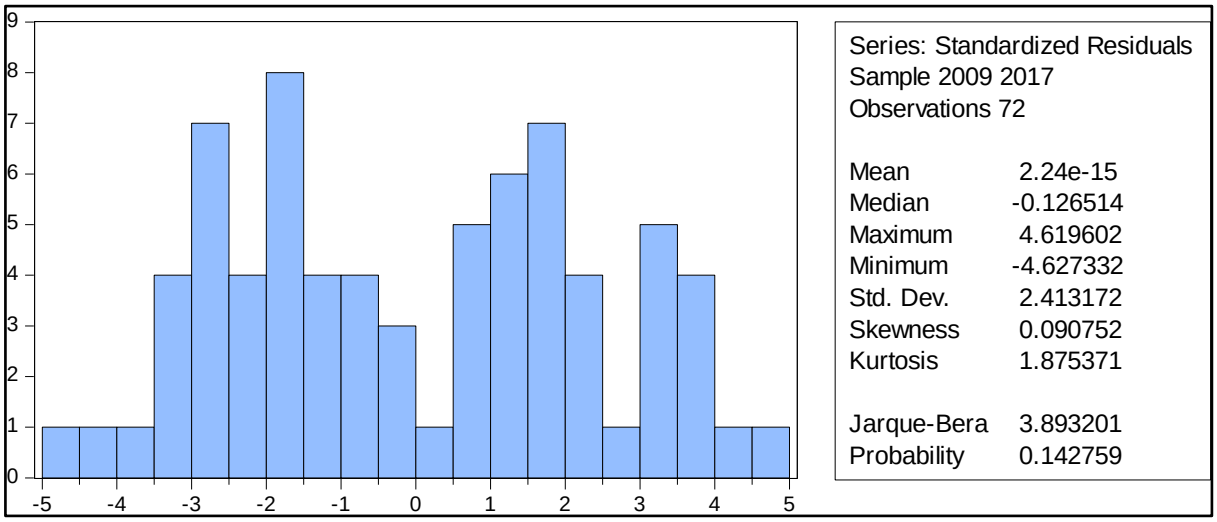
Appendix 4.2: Regression Model

Dependent Variable: LIQUIDITY
Method: Panel Least Squares
Date: 07/02/19 Time: 17:44
Sample: 2009 2017
Periods included: 9
Cross-sections included: 8
Total panel (balanced) observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-54.09603	10.04413	-5.385833	0.0000
INFLATION	1.756135	0.456361	3.848126	0.0003
UNEMPLOYMENT	10.73308	1.516710	7.076556	0.0000
SIZE	1.598910	0.535778	2.984278	0.0040
CAPITAL	0.267875	0.148167	1.807923	0.0752
NPF	0.042210	0.107869	0.391303	0.6968

R-squared	0.621994	Mean dependent var	16.57444
Adjusted R-squared	0.593358	S.D. dependent var	3.924996
S.E. of regression	2.502912	Akaike info criterion	4.752442
Sum squared resid	413.4614	Schwarz criterion	4.942164
Log likelihood	-165.0879	Hannan-Quinn criter.	4.827971
F-statistic	21.72011	Durbin-Watson stat	1.824615
Prob(F-statistic)	0.000000		

Appendix 4.3: Normality Test



Appendix 4.4: Statistical Table for Durbin-Watson

Table B-6 Critical Values of the Durbin–Watson Test Statistics d_L and d_U: 1-Percent One-Sided Level of Significance (2-Percent Two-Sided Level of Significance)

N	K = 1		K = 2		K = 3		K = 4		K = 5	
	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U	d_L	d_U
15	0.81	1.07	0.70	1.25	0.59	1.46	0.49	1.70	0.39	1.96
16	0.84	1.09	0.74	1.25	0.63	1.44	0.53	1.66	0.44	1.90
17	0.87	1.10	0.77	1.25	0.67	1.43	0.57	1.63	0.48	1.85
18	0.90	1.12	0.80	1.26	0.71	1.42	0.61	1.60	0.52	1.80
19	0.93	1.13	0.83	1.26	0.74	1.41	0.65	1.58	0.56	1.77
20	0.95	1.15	0.86	1.27	0.77	1.41	0.68	1.57	0.60	1.74
21	0.97	1.16	0.89	1.27	0.80	1.41	0.72	1.55	0.63	1.71
22	1.00	1.17	0.91	1.28	0.83	1.40	0.75	1.54	0.66	1.69
23	1.02	1.19	0.94	1.29	0.86	1.40	0.77	1.53	0.70	1.67
24	1.04	1.20	0.96	1.30	0.88	1.41	0.80	1.53	0.72	1.66
25	1.05	1.21	0.98	1.30	0.90	1.41	0.83	1.52	0.75	1.65
26	1.07	1.22	1.00	1.31	0.93	1.41	0.85	1.52	0.78	1.64
27	1.09	1.23	1.02	1.32	0.95	1.41	0.88	1.51	0.81	1.63
28	1.10	1.24	1.04	1.32	0.97	1.41	0.90	1.51	0.83	1.62
29	1.12	1.25	1.05	1.33	0.99	1.42	0.92	1.51	0.85	1.61
30	1.13	1.26	1.07	1.34	1.01	1.42	0.94	1.51	0.88	1.61
31	1.15	1.27	1.08	1.34	1.02	1.42	0.96	1.51	0.90	1.60
32	1.16	1.28	1.10	1.35	1.04	1.43	0.98	1.51	0.92	1.60
33	1.17	1.29	1.11	1.36	1.05	1.43	1.00	1.51	0.94	1.59
34	1.18	1.30	1.13	1.36	1.07	1.43	1.01	1.51	0.95	1.59
35	1.19	1.31	1.14	1.37	1.08	1.44	1.03	1.51	0.97	1.59
36	1.21	1.32	1.15	1.38	1.10	1.44	1.04	1.51	0.99	1.59
37	1.22	1.32	1.16	1.38	1.11	1.45	1.06	1.51	1.00	1.59
38	1.23	1.33	1.18	1.39	1.12	1.45	1.07	1.52	1.02	1.58
39	1.24	1.34	1.19	1.39	1.14	1.45	1.09	1.52	1.03	1.58
40	1.25	1.34	1.20	1.40	1.15	1.46	1.10	1.52	1.05	1.58
45	1.29	1.38	1.24	1.42	1.20	1.48	1.16	1.53	1.11	1.58
50	1.32	1.40	1.28	1.45	1.24	1.49	1.20	1.54	1.16	1.59
55	1.36	1.43	1.32	1.47	1.28	1.51	1.25	1.55	1.21	1.59
60	1.38	1.45	1.35	1.48	1.32	1.52	1.28	1.56	1.25	1.60
65	1.41	1.47	1.38	1.50	1.35	1.53	1.31	1.57	1.28	1.61
70	1.43	1.49	1.40	1.52	1.37	1.55	1.34	1.58	1.31	1.61
75	1.45	1.50	1.42	1.53	1.39	1.56	1.37	1.59	1.34	1.62
80	1.47	1.52	1.44	1.54	1.42	1.57	1.39	1.60	1.36	1.62
85	1.48	1.53	1.46	1.55	1.43	1.58	1.41	1.60	1.39	1.63
90	1.50	1.54	1.47	1.56	1.45	1.59	1.43	1.61	1.41	1.64
95	1.51	1.55	1.49	1.57	1.47	1.60	1.45	1.62	1.42	1.64
100	1.52	1.56	1.50	1.58	1.48	1.60	1.46	1.63	1.44	1.65

Appendix 4.5: Heteroscedasticity (Cross-Section Test)

Cross-Section Test

Panel Cross-section Heteroskedasticity LR Test
Null hypothesis: Residuals are homoskedastic
Equation: UNTITLED
Specification: LIQUIDITY C INFLATION UNEMPLOYMENT SIZE CAPITAL NPF

	Value	df	Probability
Likelihood ratio	0.952267	8	0.9985

LR test summary:

	Value	df
Restricted LogL	-165.0879	66
Unrestricted LogL	-164.6118	66

Unrestricted Test Equation:
Dependent Variable: LIQUIDITY
Method: Panel EGLS (Cross-section weights)
Date: 07/02/19 Time: 17:46
Sample: 2009 2017
Periods included: 9
Cross-sections included: 8
Total panel (balanced) observations: 72
Iterate weights to convergence
Convergence achieved after 6 weight iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-56.96459	10.42177	-5.465921	0.0000
INFLATION	1.677034	0.453617	3.697026	0.0004
UNEMPLOYMENT	10.67181	1.495454	7.136169	0.0000
SIZE	1.787778	0.568531	3.144555	0.0025
CAPITAL	0.272968	0.133518	2.044421	0.0449
NPF	0.057509	0.097080	0.592391	0.5556

Weighted Statistics

R-squared	0.632605	Mean dependent var	16.76524
Adjusted R-squared	0.604772	S.D. dependent var	4.249781
S.E. of regression	2.505456	Akaike info criterion	4.739216
Sum squared resid	414.3026	Schwarz criterion	4.928938
Log likelihood	-164.6118	Hannan-Quinn criter.	4.814745
F-statistic	22.72860	Durbin-Watson stat	1.835157
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.621225	Mean dependent var	16.57444
Sum squared resid	414.3030	Durbin-Watson stat	1.777856

Appendix 4.6: Heteroscedasticity (Panel Test)

Period Test

Panel Period Heteroskedasticity LR Test
Null hypothesis: Residuals are homoskedastic
Equation: UNTITLED
Specification: LIQUIDITY C INFLATION UNEMPLOYMENT SIZE CAPITAL NPF

	Value	df	Probability
Likelihood ratio	1125.269	8	0.0000

LR test summary:

	Value	df
Restricted LogL	-165.0879	66
Unrestricted LogL	397.5468	66

Unrestricted Test Equation:
Dependent Variable: LIQUIDITY
Method: Panel EGLS (Period weights)
Date: 07/02/19 Time: 17:46
Sample: 2009 2017
Periods included: 9
Cross-sections included: 8
Total panel (balanced) observations: 72
Iterate weights to convergence
Convergence achieved after 8 weight iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23.35307	6.03E-06	-3874330.	0.0000
INFLATION	1.897406	9.16E-07	2071281.	0.0000
UNEMPLOYMENT	10.72934	3.30E-06	3253487.	0.0000
SIZE	5.23E-13	2.37E-10	0.002207	0.9982
CAPITAL	7.93E-14	1.19E-10	0.000668	0.9995
NPF	-4.74E-14	2.04E-10	-0.000232	0.9998

Weighted Statistics

R-squared	1.000000	Mean dependent var	3.72E+11
Adjusted R-squared	1.000000	S.D. dependent var	7.04E+11
S.E. of regression	43.42902	Akaike info criterion	-10.87630
Sum squared resid	124481.3	Schwarz criterion	-10.68658
Log likelihood	397.5468	Hannan-Quinn criter.	-10.80077
F-statistic	2.92E+20	Durbin-Watson stat	2.266943
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.415484	Mean dependent var	16.57444
Sum squared resid	639.3421	Durbin-Watson stat	1.227208

Appendix 4.7: Auxiliary Model (Inflation Rate)

Dependent Variable: INFLATION
Method: Panel Least Squares
Date: 07/02/19 Time: 17:54
Sample: 2009 2017
Periods included: 9
Cross-sections included: 8
Total panel (balanced) observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.761688	2.649285	-1.419888	0.1603
UNEMPLOYMENT	0.442124	0.402420	1.098663	0.2758
SIZE	0.334801	0.137474	2.435382	0.0175
CAPITAL	0.018798	0.039598	0.474723	0.6365
NPF	-0.014372	0.028824	-0.498614	0.6197

R-squared	0.139377	Mean dependent var	3.588889
Adjusted R-squared	0.087997	S.D. dependent var	0.701619
S.E. of regression	0.670038	Akaike info criterion	2.103951
Sum squared resid	30.07972	Schwarz criterion	2.262053
Log likelihood	-70.74223	Hannan-Quinn criter.	2.166892
F-statistic	2.712654	Durbin-Watson stat	2.193583
Prob(F-statistic)	0.037132		

Appendix 4.8: Auxiliary Model (Unemployment Rate)

Dependent Variable: UNEMPLOYMENT
Method: Panel Least Squares
Date: 07/02/19 Time: 17:56
Sample: 2009 2017
Periods included: 9
Cross-sections included: 8
Total panel (balanced) observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.454231	0.751435	3.266061	0.0017
INFLATION	0.040027	0.036433	1.098663	0.2758
SIZE	0.031002	0.042990	0.721158	0.4733
CAPITAL	0.010663	0.011863	0.898847	0.3720
NPF	0.004866	0.008668	0.561372	0.5764

R-squared	0.042611	Mean dependent var	3.222222
Adjusted R-squared	-0.014546	S.D. dependent var	0.200156
S.E. of regression	0.201607	Akaike info criterion	-0.298078
Sum squared resid	2.723239	Schwarz criterion	-0.139976
Log likelihood	15.73081	Hannan-Quinn criter.	-0.235137
F-statistic	0.745504	Durbin-Watson stat	1.693028
Prob(F-statistic)	0.564436		

Appendix 4.9: Auxiliary Model (Size)

Dependent Variable: SIZE
Method: Panel Least Squares
Date: 07/02/19 Time: 17:56
Sample: 2009 2017
Periods included: 9
Cross-sections included: 8
Total panel (balanced) observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.36308	1.117654	14.64056	0.0000
INFLATION	0.242904	0.099740	2.435382	0.0175
UNEMPLOYMENT	0.248446	0.344510	0.721158	0.4733
CAPITAL	-0.068874	0.032721	-2.104895	0.0391
NPF	-0.078359	0.022657	-3.458429	0.0009

R-squared	0.281525	Mean dependent var	17.39007
Adjusted R-squared	0.238631	S.D. dependent var	0.654073
S.E. of regression	0.570720	Akaike info criterion	1.783081
Sum squared resid	21.82336	Schwarz criterion	1.941183
Log likelihood	-59.19091	Hannan-Quinn criter.	1.846022
F-statistic	6.563276	Durbin-Watson stat	0.345077
Prob(F-statistic)	0.000161		

Appendix 4.10: Auxiliary Model (Capital)

Dependent Variable: CAPITAL
Method: Panel Least Squares
Date: 07/02/19 Time: 17:57
Sample: 2009 2017
Periods included: 9
Cross-sections included: 8
Total panel (balanced) observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.73668	7.959126	2.354113	0.0215
INFLATION	0.178332	0.375655	0.474723	0.6365
UNEMPLOYMENT	1.117366	1.243110	0.898847	0.3720
SIZE	-0.900576	0.427848	-2.104895	0.0391
NPF	-0.123318	0.087657	-1.406818	0.1641

R-squared	0.075639	Mean dependent var	7.066389
Adjusted R-squared	0.020453	S.D. dependent var	2.085176
S.E. of regression	2.063742	Akaike info criterion	4.353834
Sum squared resid	285.3550	Schwarz criterion	4.511936
Log likelihood	-151.7380	Hannan-Quinn criter.	4.416775
F-statistic	1.370620	Durbin-Watson stat	0.520415
Prob(F-statistic)	0.253485		

Appendix 4.11: Auxiliary Model (Non-Performing Financing - NPF)

Dependent Variable: NPF
Method: Panel Least Squares
Date: 07/02/19 Time: 17:57
Sample: 2009 2017
Periods included: 9
Cross-sections included: 8
Total panel (balanced) observations: 72

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.10881	10.53604	3.332258	0.0014
INFLATION	-0.257237	0.515903	-0.498614	0.6197
UNEMPLOYMENT	0.962052	1.713751	0.561372	0.5764
SIZE	-1.933123	0.558960	-3.458429	0.0009
CAPITAL	-0.232666	0.165385	-1.406818	0.1641

R-squared	0.188830	Mean dependent var	2.024306
Adjusted R-squared	0.140402	S.D. dependent var	3.057468
S.E. of regression	2.834716	Akaike info criterion	4.988676
Sum squared resid	538.3862	Schwarz criterion	5.146778
Log likelihood	-174.5923	Hannan-Quinn criter.	5.051617
F-statistic	3.899196	Durbin-Watson stat	0.172615
Prob(F-statistic)	0.006608		