

The copyright © of this thesis belongs to its rightful author and/or other copyright owner. Copies can be accessed and downloaded for non-commercial or learning purposes without any charge and permission. The thesis cannot be reproduced or quoted as a whole without the permission from its rightful owner. No alteration or changes in format is allowed without permission from its rightful owner.



**IMPACT OF HOME FINANCING ON LIQUIDITY RISK IN MALAYSIAN
BANKS**

BY

AIUOB ALI ABDULQADER ABDO



**MASTER OF ISLAMIC FINANCE AND BANKING
UNIVERSITI UTARA MALAYSIA
DECEMBER, 2019**

**IMPACT OF HOME FINANCING ON LIQUIDITY RISK IN MALAYSIAN
BANKS**

BY

AIUOB ALI ABDULQADER ABDO



**Thesis Submitted to
Islamic Business School,
Universiti Utara Malaysia,
In Fulfillment of the Requirement for the
Master in Islamic Finance and Banking**



Pusat Pengajian Perniagaan Islam
ISLAMIC BUSINESS SCHOOL
كلية إدارة الأعمال الإسلامية
Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PENYELIDIKAN
(Certification of Research Paper)

Saya, mengaku bertandatangan, memperakukan bahawa
(I, the undersigned, certified that)

AIUOB ALI ABDULQADER ABDO (822264)

Calon untuk Ijazah Sarjana
(Candidate for the degree of)

MASTER IN ISLAMIC FINANCE AND BANKING (MIFB)

telah mengemukakan kertas penyelidikan yang bertajuk
(has presented his/her research paper of the following title)

Impact of home financing on liquidity risk in Malaysian banks

Seperti yang tercatat di muka surat tajuk dan kulit kertas penyelidikan
(as it appears on the title page and front cover of the research paper)

Bahawa kertas penyelidikan tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan.
(that the research paper acceptable in the form and content and that a satisfactory knowledge of the field is covered by the research paper).

Nama Penyelia : **DR. MOHAMAD YAZID BIN ISA**
(Name of Supervisor)

Tandatangan :
(Signature)

Tarikh : **11 DISEMBER 2019**
(Date)

PERMISSION TO USE

In presenting this thesis in fulfilment of the requirements for a Post Graduate degree from the Universiti Utara Malaysia (UUM), I agree that the Library of this university may make it freely available for inspection. I further agree that permission for copying this thesis in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor(s) or in their absence, by the Dean of Islamic Business School (IBS) where I did my thesis. It is understood that any copying or publication or use of this thesis or parts of it for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the UUM in any scholarly use which may be made of any material in my thesis. Request for permission to copy or to make other use of materials in this thesis in whole or in part should be addressed to:

Dean of Islamic Business School (IBS)
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman



ABSTRACT

Liquidity risk in banks is a major issue following the 2008 Global Financial Crisis. Liquidity risk as one of the main risks faced by the bank and cannot be ignored anymore in the banks. liquidity risk refers to the inability of banks in meeting the due date obligation. The main objectives of this study to investigate the impact of home financing and other factors on the liquidity risk of Islamic and conventional banks in Malaysia. The total numbers of 12 Islamic and 12 conventional banks are used as sample of the study for the period of 2004-2018 to be regressed using Fixed Effect Model (FEM). The results of the study show that home financing has positive relationship with Islamic and commercial bank liquidity risk in Malaysia and bank size has negative and significant relation with the liquidity risk. Expense to net income has significant relationship with the conventional banks and it is insignificant for Islamic banks. For conventional banks only inflation has significant impact on the liquidity risk of Malaysian banks. The limitation of the study only considering home financing and selected Islamic and commercial banks in Malaysia. therefore, it is recommended, to consider studying other types of loan and all the Islamic and commercial banks in Malaysia. Future studies should also consider examining the impact of the two new ratios suggested by the Basel Committee on liquidity risk in Malaysian Islamic and commercial banks.

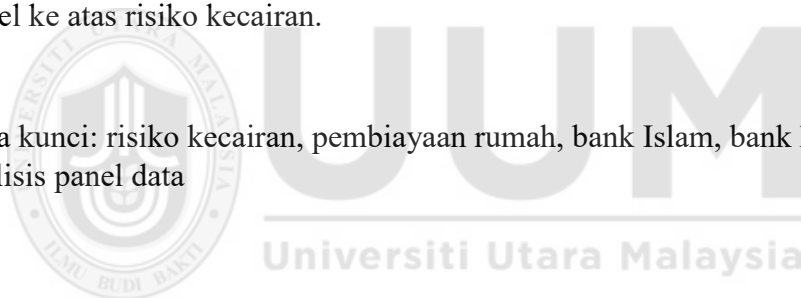
Keywords: liquidity risk, home financing, Islamic banks, conventional banks, Panel Data Analysis



ABSTRAK

Risiko kecairan di sektor perbankan merupakan antara isu utama terutama semasa krisis Kewangan Global 2018. Ia merupakan risiko utama yang dihadapi oleh bank dan tidak boleh diabaikan lagi. Risiko kecairan merujuk kepada ketidakupayaan bank dalam memenuhi obligasi kewangan ketika sampai tempohnya. Objektif utama kajian ini adalah untuk mengkaji kesan pembiayaan rumah dan faktor-faktor lain terhadap risiko kecairan bank Islam dan bank konvensional di Malaysia di mana sebanyak 12 buah bank Islam dan 12 buah bank konvensional digunakan sebagai sampel kajian bagi tempoh 2004-2018. Kajian ini menggunakan Model Kesan Tetap (Fixed Effect Model) dan dapatan kajian menunjukkan pembiayaan rumah mempunyai hubungan positif dengan risiko kecairan bank Islam dan bank konvensional di Malaysia. Di samping itu saiz bank menunjukkan hubungan negatif dan signifikan dengan risiko kecairan. Perbelanjaan juga menunjukkan hubungan yang signifikan dengan risiko kecairan bank konvensional dan tidak bagi bank Islam. Bagi bank konvensional, inflasi menunjukkan hubungan yang signifikan dengan risiko kecairan. Limitasi kajian hanya menilai pembiayaan rumah bagi bank Islam dan bank konvensional di Malaysia. Adalah disyorkan, kajian hadapan perlu mengkaji kesan nisbah yang disyorkan oleh Jawatankuasa Basel ke atas risiko kecairan.

Kata kunci: risiko kecairan, pembiayaan rumah, bank Islam, bank konvensional, analisis panel data



Acknowledgement

In the name of Allah, the Most Compassionate, the Most Merciful.

First and foremost, all praise be upon Allah, Lord of the Universe for all blessings that He has given His creatures. And may His blessings, peace and favours descend in perpetuity on our beloved Prophet Muhammad peace be upon him who was sent as mercy to the entire world. Truthfully, without Allah's blessings, grace and guidance, this dissertation would not have seen the light of day. My wish is that this work will be beneficial to my country Yemen and Islamic finance industry everywhere.

I would like to convey my highest appreciation to my parents. My prayers go to my father, I am deeply indebted to him for his teaching, support, encouragement, assistance and prayers which enabled me to reach this stage of my education and maturity. My heartfelt thanks go to my beloved mother who, always make prayer for me. My gratitude also goes to my beloved sisters for their constant support, help, sincere love and prayers.

This dissertation would not have been completed without the help of many people. I would like to first express my deepest gratitude to my supervisor Dr. Mohamad Yazid Isa for his guidance, scholarly support, dedication, constant feedback and commitment to developing this dissertation from start to finish. Without his encouragement, this dissertation would not have become a reality. I would like to express my gratitude to all my lecturer for their contribution to all areas, which has enabled me more to acquire knowledge.

I want to express my deepest gratitude to my beloved family. My wife's and my son Mohammed unwavering support was central to the success of this research. Her constant prayers, encouragement and patience, throughout my Master pursuit contributed in no small measure to the completion of this work and arduous journey. Among those who also contributed indirectly to the completion of this thesis are my brothers, Abdul-Basit and Abdul-Munim for their financial support during my study. Not forgotten my brother in law Moyhdeen Shawtari for his endless support. Many thanks accrue to my uncles Dr. Fekri Ali and Dr. Hussein Ali for the assistance provided. Special thanks to mother-in-law for their prayers in order and taking care of my wife and son while I am in Malaysia. There are many well-wishers who encouraged me throughout my studies, and I am grateful to them all.

TABLE OF CONTENTS

PERMISSION TO USE.....	i
ABSTRACT.....	ii
ABSTRAK.....	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS.....	v
CHAPTER ONE: INTRODUCTION	1
1.1 Introduction.....	1
1.2 Study Background.....	1
1.3 Development of Conventional Banks in Malaysia.....	2
1.4 Development of Islamic Banks in Malaysia	3
1.5 Problem statement.....	4
1.6 Research Question	5
1.7 Research Objectives.....	6
1.8 Scope of the study	6
1.9 Significant of the study	6
1.10 Organisation of the study	7
CHAPTER TWO LITERATURE AND THEORETICAL REVIEW	8
2.0 Introduction.....	8
2.1 Theoretical review	8
2.1.1 Financial Intermediation Theory.....	8
2.1.2 Shiftability Theory	9
2.1.3 The Anticipated Income Theory	9
2.2 Liquidity in Financial Institution	10
2.3 Empirical Literature Review.....	12
2.3.1 Liquidity measurement	13
2.1.2.1 Loan to Total Assets	13
2.1.2.2 Total loan to total Deposit.....	13
2.3.2 Factors influence liquidity risk of commercial and Islamic bank	14
2.3.2.1 Bank Size	14
2.3.2.2 Net Interest margin.....	15
2.3.2.3 Non-performing loan.....	16
2.3.2.4 Expenses to net income.....	17
2.3.2.5 Inflation.....	17

2.3.2.6 Gross Domestic Product.....	18
2.3.2.7 Based lending rate.....	19
2.3.3 The influence of loan on liquidity risk.....	20
2.3.3.1 Home financing influence on liquidity risk	21
2.4 Summary of the chapter.....	22
CHAPTER THREE: DATA AND METHODOLOGY	23
3.1 Introduction.....	23
3.2 Data collection	23
3.3 Research framework	24
3.4 Research Model	26
3.5 Hypotheses development	27
3.6 Panel Regression.....	28
3.7 Diagnostic test.....	30
3.7.1 Auto-correlation test	30
3.7.2 Heteroscedasticity test.....	30
3.7.3 Multicollinearity Test.....	30
CHAPTER FOUR: FINDING AND DISCUSSION	32
4.1. Introduction.....	32
4.2. Descriptive analyses.....	32
4.3 Trend Analysis	34
4.3.1 Total loan to total assets.....	34
4.3.2 Total loan to total deposit.....	35
4.3.3 Home financing.....	36
4.4. Diagnostic Tests.....	36
4.4.1. Variance Inflation Factor (VIF).	36
4.4.2. Wald Test for Heteroscedasticity.....	37
4.4.3 Autocorrelation test.....	38
4.5. Fixed and Random test model.....	39
4.6. Regression panel	39
4.6.1 Regression result: Commercial Banks	39
4.6.2 Regression Result: Islamic banks	42
CHAPTER FIVE: CONCLUSION AND RECOMMENDATION	45
5.1 Introduction.....	45
5.2 Summary of the findings.....	45
5.3 Contributions to the study	47
5.4 Limitation of the study.....	49

5.5 Conclusion	51
References.....	52
Appendixes	57
Appendix 1: List of Commercial banks in Malaysia	57
Appendix 2 List of Islamic Banks in Malaysia.....	58
Appendix 3: List of Study selected banks.....	58
Appendix 4: Hausman test Islamic Banks.	59
Appendix 5: Hausman test Conventional Banks.....	59
Appendix 6: Serial correlation Islamic banks	60
Appendix 7: Serial correlation Conventional Banks.....	60
Appendix 8: Heteroscedasticity Islamic banks	60
Appendix 9: Heteroscedasticity Conventional banks	60
Appendix 10: Robust test Islamic Banks	60
Appendix 11: Robust test Conventional Banks	61
Appendix 12: Fixed Effect model result of commercial banks.....	61
Appendix 13: Fixed Effect Model of Islamic Banks	62



LISTS OF TABLES

table 4. 1 Descriptive Statistics Of Islamic Banks	32
Table 4. 2 Descriptive Statistics Of Conventional Banks	33
Table 4. 3 Result Of Vif For Commercial Banks	37
Table 4. 4 Result Of Vif For Islamic Banks	37
Table 4. 5 Result Of Autocorrelation For Islamic Banks.....	38
Table 4. 6 Result Of Autocorrelation For Commercial Banks.....	38
Table 4. 7 Regression Result Commercial Bank	40
Table 4. 8 Regression Result Of Islamic Bank	42



LISTS OF FIGURES

Figure 3. 1 Conceptual Framework Of The Study.....	24
Figure 3. 2 Data Flow Chart.....	29
Figure 4. 1 Total Loan To Total Assets	32
Figure 4. 2 Total Loan To Total Deposit	33
Figure 4. 3 Home Financing Of Conventional And Islamic Banks	34



LIST OF ABBREVIATIONS

LR	Liquidity risk
IB	Islamic bank
CB	Conventional bank
NIM	Net interest margin
INF	Inflation
GDP	Gross Domestic Product
BLR	Based Lending Rate
TA	Total Assets
HF	Home financing
NPL	Non-Performing loan
EXPPAT	Expense to net income
TLTD	Total Loan to Total deposit
LTA	Loan to Total assets
ALM	Assets Liabilities Management
LNTA	Logarithm Total assets
LHF	Logarithm home financing
RE	Random effect
FE	Fixed effect
IV	Independent variables
DV	Dependent variables

CHAPTER ONE:

INTRODUCTION

1.1 Introduction

The study aims to investigate the impact of home financing and other variables on liquidity risk in Malaysian Islamic and conventional banks. This chapter covers the background of the study, development of the Islamic and conventional banks in Malaysia. Moreover, discusses the objectives of the research, problem statement, scope, limitation and significant of the study.

1.2 Study Background

Banking institution plays important roles in the economic system of any country. The main objective of the bank is to facilitate the economics activities as transferring the surplus units to the deficit units and promote greater efficiency in meeting the investment and liquidity needs of the economic agents in the financial system (Ghajar & Korea, 2011). As well bank services represent the main brick and edifice of the economics. Banks considered an important tool to measure its effectiveness and its applications support its objectives in the society and contribute to building the economic reality in the country.

On this basis, banks provide funds to customers and one of the usages of funds is by channelling them to loans and advances. One type of loan offered by banks is home financing and it contributes to the large portion of bank where more than 40% of the total loan are channelled to this type of loans (Drehmann & Nikolaou, 2013).

References

- Abdulrehman, A. A., & Nyamute, W. (2018). Effect of mortgage financing on financial performance of commercial banks in Kenya. *Journal of International Business, Inovation and Strategic Management*, 1(6), 91–122.
- Ahmed, S. F., & Malik, Q. A. (2015). International Journal of Economics and Financial Issues Credit Risk Management and Loan Performance: Empirical Investigation of Micro Finance Banks of Pakistan. *International Journal of Economics and Financial Issues*, 5(2), 574–579.
- Almazari, A. A. (2013). Capital Adequacy , Cost Income Ratio and the Performance of Saudi Banks. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 3(4), 284–293. <https://doi.org/10.6007/IJARAFMS/v3-i4/21>
- Alzoubi, T. (2017). Determinants of liquidity risk in Islamic banks. *Banks and Bank Systems*, 12(3), 142–148. [https://doi.org/10.21511/bbs.12\(3\).2017.10](https://doi.org/10.21511/bbs.12(3).2017.10)
- Amin, S. I. M., Mohamad, S., & Shah, M. E. (2017). Do cost efficiency affects liquidity risk in banking? Evidence from selected OIC countries. *Jurnal Ekonomi Malaysia*, 51(2), 55–71.
- Bell, A., Fairbrother, M., & Jones, K. (2019). Fixed and random effects models: making an informed choice. *Quality and Quantity*, 53(2), 1051–1074. <https://doi.org/10.1007/s11135-018-0802-x>
- Bell, A., & Jones, K. (2015). Explaining Fixed Effects: Random Effects Modeling of Time-Series Cross-Sectional and Panel Data. *Political Science Research and Methods*, 3(1), 133–153. <https://doi.org/10.1017/psrm.2014.7>
- Bernanke, B. (2018). *The Real Effects of the Financial Crisis*.
- Beutler, T., Bichsel, R., Bruhin, A., & Danton, J. (2017). The Impact of Interest Rate Risk on Bank Lending. *Swiss National Bank Working Papers*, (4), 1–42. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=121422974&site=ehost-live&scope=site>
- Brunnermeier, M., Krishnamurthy, A., Markus, B., Gary, G., & Arvind, K. (2015).

- Liquidity Mismatch Measurement. *Risk Topography*, (2012), 99–112. <https://doi.org/10.7208/chicago/9780226092645.003.0008>
- Chen, Y. K., Shen, C. H., Kao, L., & Yeh, C. Y. (2018). Bank Liquidity Risk and Performance. *Review of Pacific Basin Financial Markets and Policies*, 21(1). <https://doi.org/10.1142/S0219091518500078>
- Chowdhury, M., Zaman, S., & Chowdhury, M. M. (2018). Effect of Liquidity Risk on Performance of Islamic banks in Bangladesh An Analysis of Guest Occupancy and Profit of Private and Public Hotels in Cox's Bazar View project Consumer Knowledge, Attitudes and their intentions to buy Milk: Insights from emergin. *IOSR Journal of Economics and Finance*, 9(4), 1–09. <https://doi.org/10.9790/5933-0904010109>
- Drehmann, M., & Nikolaou, K. (2013). *Funding liquidity risk: Definition and measurement. Journal of Banking and Finance*. (316), 37(7), 2173-2182.
- El-chaarani, H. (2019). Determinants of Bank Liquidity in the Middle East Region. *International Review of Management and Marketing*, 9(2), 64–75.
- Ghajar, A. J., & Korea, M. (2011). *The Financial System: Chapter 5*.
- Glasser, S. P. (2008). Essentials of clinical research. In *Essentials of Clinical Research*. <https://doi.org/10.1007/978-1-4020-8486-7>
- Gupta, R. (1978). Theory of Financial Intermediation: A Portfolio Approach. *Vikalpa: The Journal for Decision Makers*, 3(2), 133–138. <https://doi.org/10.1177/0256090919780205>
- Hakimi, A. (2017). The Determinants of Liquidity Risk: Evidence from Tunisian Banks. *Journal of Applied Finance & Banking*, 7(2), 1–5.
- Hamadi, H., & Awdeh, A. (2012). The Determinants of Bank Net Interest Margin : Evidence from the Lebanese Banking Sector. *Journal of Money, Investment and Banking*, 23(23), 85–98.
- Hazra, A., & Gogtay, N. (2017). Biostatistics series module 7: The statistics of diagnostic tests. *Indian Journal of Dermatology*, 62(1), 18–24. <https://doi.org/10.4103/0019-5154.198047>
- Hsiao, C. (2007). Panel data analysis-advantages and challenges. *Test*, 16(1), 1–22. <https://doi.org/10.1007/s11749-007-0046-x>

- Islahi, A. (2009). Hennie Van Greuning and Zamir Iqbal Risk Analysis for Islamic Banks The World Bank, Washington, D.C. 2008, 309+xxiii pp. *Journal of King Abdulaziz University-Islamic Economics*, 22(1), 197–204. <https://doi.org/10.4197/islec.22-1.5>
- Jaara, O. O., Jaara, B. O., Shamieh, J., & Fendi, U. A. (2017). Liquidity Risk Exposure in Islamic and Conventional Banks. *International Journal of Economics and Financial Issues*, 7(6), 16–26.
- Kumar, M., & Yadav, G. C. (2013). Liquidity Risk Management in Bank: A Conceptual Framework. *AIMA Journal of Management and Research*, 7(2/4), 20–35.
- Kunhibava, S. (2012). Islamic Banking in Malaysia . *International Journal of Legal Information*, 40(1–2), 191–201. <https://doi.org/10.1017/s0731126500006478>
- Labonte, M. (2012). Inflation: Causes, costs, and current status. *Inflation and the Consumer Price Index: Costs and Considerations*, 1–18.
- Lebbe, A., & Rauf, A. (2016). *Impact of loan performance on net profit of banks : evidence from banking sector in Sri Lanka*. (XI), 62–69.
- M, A. (2015). An empirical analysis of liquidity, profitability and solvency of Bangladeshi banks. *Journal of business & financial Affairs*, 04(03). <https://doi.org/10.4172/2167-0234.1000157>
- Madhi, D. (2017). The Macroeconomic Factors Impact on Liquidity Risk: The Albanian Banking System Case. *European Journal of Economics and Business Studies*, 7(1), 32. <https://doi.org/10.26417/ejes.v7i1.p32-39>
- Mathuva, D. M. (2009). Capital Adequacy, Cost Income Ratio and the Performance of Commercial Banks: The Kenyan Scenario. *The International Journal of Applied Economics and Finance*, 3(2), 35–47. <https://doi.org/10.3923/ijaef.2009.35.47>
- Md. Isa, M., Ahmad, R., & Yik Wan, C. (1996). Financial Positioning Of Commercial Banks And Its Implications To Bank Management. *Asian Academy of Management Journal (AAMJ)*, Vol. 1, pp. 1–10.
- Muthumoni, D. A., & Raj, R. (2017). Impact Of Liquidity Risk On Profitability – A Case Study Of Bank Of Baroda. *International Journal of Research in Economics and Social Sciences (IJRESS)*, 7(9), 117–126. Retrieved from

- Press, C. (2017). *The Institutional Basis for the Shiftability Theory of Bank Liquidity* Author (s): Waldo F . Mitchell Published by : The University of Chicago Press Stable URL : <http://www.jstor.org/stable/2354871>. 1(3), 334–356.
- Razak, D. A., & Tazwar, F. (2018). Islamic home financing practices in selected OIC countries: an assessment in the light of Maqasid al-Shariah. *Journal of Islamic Management Studies*, 1(2), 1–11. Retrieved from <http://irep.iium.edu.my/65753/>
- Riahi, Y. M. (2019). How to explain the liquidity risk by the dynamics of discretionary loan loss provisions and non-performing loans? The impact of the global crisis. *Managerial Finance*, 45(2), 244–262. <https://doi.org/10.1108/MF-12-2017-0520>
- Roman, A., & Sargu, A. C. (2015). The impact of bank-specific factors on the commercial banks liquidity: empirical evidence from CEE Countries. *Procedia Economics and Finance*, 20(15), 571–579. [https://doi.org/10.1016/s2212-5671\(15\)00110-0](https://doi.org/10.1016/s2212-5671(15)00110-0)
- Sahyouni, A., & Wang, M. (2019). Liquidity creation and bank performance: evidence from MENA. *ISRA International Journal of Islamic Finance*, 11(1), 27–45. <https://doi.org/10.1108/IJIF-01-2018-0009>
- Scannella, E. (2016). Theory and regulation of liquidity risk management in banking. *International Journal of Risk Assessment and Management*, 19(1–2), 4–21. <https://doi.org/10.1504/IJRAM.2016.074433>
- Shamas, G., Zainol, Z., & Zainol, Z. (2018). The impact of bank’s determinants on liquidity risk: evidence from Islamic Banks in Bahrain. *Journal of Business & Management (COES&RJ-JBM)*, 6(1), 1–22. <https://doi.org/10.25255/jbm.2018.6.1.1.22>
- Singh, A., & 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. <https://doi.org/10.1016/j.fbj.2016.01.001>
- Spencer, P. D., & Spencer, P. d. (2011). the theory of financial intermediation. *The structure and regulation of financial markets*, 159–175.

<https://doi.org/10.1093/acprof:oso/9780198776093.003.0008>

- Tabash, M. I. (2018). An empirical investigation between liquidity and key financial ratios of Islamic banks of United Arab Emirates (UAE). *Business and Economic Horizons*, 14(3), 713–724. <https://doi.org/10.15208/beh.2018.50>
- Terraza, V. (2015). the effect of bank size on risk ratios: implications of banks' Performance. *Procedia Economics and Finance*, 30(15), 903–909. [https://doi.org/10.1016/s2212-5671\(15\)01340-4](https://doi.org/10.1016/s2212-5671(15)01340-4)
- Thiongo, P. K., Matata, K., & Simiyu, A. (2016). *effect of loan portfolio growth on financial performance of commercial banks in Kenya*. (11), 2113–2141.
- Tran, T. T. T., Tran, L., Nguyen, Y. T., & Nguyen, T. T. H. (2019). The determinants of liquidity risk of commercial banks in Vietnam. *Banks and Bank Systems*, 14(1), 94–110. [https://doi.org/10.21511/bbs.14\(1\).2019.09](https://doi.org/10.21511/bbs.14(1).2019.09)
- Umar, M., & Sun, G. (2016). Non-performing loans (NPLs), liquidity creation, and moral hazard: Case of Chinese banks. *China Finance and Economic Review*, 4(1). <https://doi.org/10.1186/s40589-016-0034-y>
- Vayanos, D., & Wang, J. (2012). Theories of liquidity. *Foundations and Trends in Finance*, 6(4), 221–237. <https://doi.org/10.1561/05000000014>
- Vodová, P. (1934). *Determinants of Commercial Banks ' Liquidity in the Czech Republic 1 2 Bank Liquidity and its Measuring 3 Determinants of Bank Liquidity*. (January 2011), 92–97.
- Yaacob, S. F., Rahman, A. A., & Karim, Z. A. (2016). The Determinants of Liquidity Risk: A Panel Study of Islamic Banks in Malaysia. *Journal of Contemporary Issues and Thought*, 6, 73–82. https://doi.org/10.5176/2251-1997_AF13.31
- Yaffee, R. (2003). A primer for panel data analysis. *Connect Information Technology at NYU*, (January 2003), 1–11. Retrieved from papers2://publication/uuid/811319C1-BFB6-43F6-B729-65AC1FA20A4D

Appendixes

Appendix 1: List of Commercial banks in Malaysia

No	Bank Name	Total assets	Ownership
	Affin Bank Berhad	49,130,609	Local
	Alliance Bank Malaysia Berhad	42,816,618	Local
	AmBank (M) Berhad	11,000,480	Local
	BNP Paribas Malaysia Berhad	2,040,836	Foreign
	Bangkok Bank Berhad	5,480,894	Foreign
	Bank of America Malaysia Berhad	4,460,698	Foreign
	Bank of China (Malaysia) Berhad	13,269,852	Foreign
	CIMB Bank Berhad	321,935,304	Local
	China Construction Bank (Malaysia) Berhad	4,390,178	Foreign
	Citibank Berhad	38,556,867	Foreign
	Deutsche Bank (Malaysia) Berhad	9,354,785	Foreign
	HSBC Bank Malaysia Berhad	65,727,435	Foreign
	Hong Leong Bank Berhad	169,111,037	Local
	India International Bank (Malaysia) Berhad	462,131	Foreign
	Industrial and Commercial Bank of China (Malaysia) Berhad	4,829,695	Foreign
	J.P. Morgan Chase Bank Berhad	2,622,532	Foreign
	MUFG Bank (Malaysia) Berhad	28,619,585	Foreign
	Malayan Banking Berhad	456,613,298	Local
	Mizuho Bank (Malaysia) Berhad	8,300,030	Foreign
	OCBC Bank (Malaysia) Berhad	269,856,092	Foreign
	Public Bank Berhad	331,786,540	Local
	RHB Bank Berhad	181,043,287	Local
	Standard Chartered Bank Malaysia Berhad	40,451,289	Foreign
	Sumitomo Mitsui Banking Corporation Malaysia Berhad	17,109,395	Foreign
	The Bank of Nova Scotia Berhad	1,634,287	Foreign
	United Overseas Bank (Malaysia) Bhd.	112,982,714	Foreign

Appendix 2 List of Islamic Banks in Malaysia

No	Bank Name	Total assets as FY 2018,0000	Ownership
1.	Affin Islamic Bank Berhad	49,130,609	Local
2.	Alliance Islamic Bank Berhad	9,893.40	Local
3.	AmBank Islamic Berhad	36,536.40	Local
4.	Bank Islam Malaysia Berhad	63,938,893	Local
5.	Bank Muamalat Malaysia Berhad	23,946,561	Local
6.	CIMB Islamic Bank Berhad	97,513,968	Local
7.	Hong Leong Islamic Bank Berhad	31,421,540	Local
8.	Maybank Islamic Berhad	181,794.60	Local
9.	Public Islamic Bank Berhad	62,173,912	Local
10.	RHB Islamic Bank Berhad	181,043,287	Local
11.	Al Rajhi Banking & Investment Corporation (Malaysia) Berhad	7,578,502	Foreign
12.	HSBC Amanah Malaysia Berhad	20,349,355	Foreign
13.	Kuwait Finance House (Malaysia) Berhad	9,292,211	Foreign
14.	MBSB Bank Berhad	7,292,054	Foreign
15.	OCBC Al-Amin Bank Berhad	15,873,344	Foreign
16.	Standard Chartered Saadiq Berhad	7,859,855	Foreign

Appendix 3: List of Study selected banks.

Number	Islamic Bank name	Conventional bank Name
1.	Affin Islamic Bank Berhad	Affin Bank Berhad
2.	Alliance Islamic Bank Berhad	Alliance Bank Malaysia Berhad
3.	Bank Islam Malaysia Berhad	CIMB bank berhad

4.	Bank Muamalat Malaysia Berhad	Citibank Berhad
5.	Citi Bank Islamic Berhad	Hong Leong Bank Berhad
6.	Hong Leong Islamic Bank Berhad	HSBC Bank Malaysia Berhad
7.	HSBC Amanah Malaysia Berhad	Malayan Banking Berhad
8.	Maybank Islamic Berhad	OCBC Bank (Malaysia) Berhad
9.	OCBC Al-Amin Bank Berhad	Public Bank Berhad
10.	Public Islamic Bank Berhad	RHB Bank Berhad
11.	RHB Islamic Bank Berhad	Standard Chartered Bank Malaysia Berhad
12.	Standard Chartered Saadiq Berhad	United Overseas Bank (Malaysia) Bhd.

Appendix 4: Hausman test Islamic Banks.

```

hausman fe
----- Coefficients -----
      (b)      (B)      (b-B)      sqrt(diag(V_b-V_B))
      fe      .      Difference      S.E.
-----
lnta      -.0907375      .0284426      -.1191801      .0241183
lnhfi      .118129      .0505148      .0676142      .0122892
exppat      .0103354      .0072757      .0030597      .
npl      .0004914      .0007263      -.000235      .
nim      -.0026903      .0022884      -.0049787      .
inf      .0085056      .0091186      -.000613      .
gdp      .0011302      .0012704      -.0001402      .
blr      .0119362      .0018852      .010051      .
-----
b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

      chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
            = 22.09
Prob>chi2 = 0.0047
(V_b-V_B is not positive definite)

```

Appendix 5: Hausman test Conventional Banks

```

hausman fe
----- Coefficients -----
      (b)      (B)      (b-B)      sqrt(diag(V_b-V_B))
      fe      .      Difference      S.E.
-----
lnta      -1.999077      -1.196484      -.8025929      .
lnhfi      1.693392      1.167874      .5255186      .
exppat      .5143851      .5114825      .0029026      .
npl      -.0317408      -.006866      -.0248748      .
nim      -.1194799      -.1009103      -.0185695      .
inf      -.0360169      -.0147756      -.0212413      .
gdp      -.0000983      .0054378      -.005536      .
blr      .0369144      -.0579538      .0948683      .

```

```

-----
                b = consistent under Ho and Ha; obtained from xtreg
                B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test:   Ho:   difference in coefficients not systematic

                chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                =      11271.46
Prob>chi2 =      0.0000
(V_b-V_B is not positive definite)

```

Appendix 6: Serial correlation Islamic banks

```

xtserial lta lnta lnhfi exppat npl nim inf gdp blr

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F( 1,      11) =      37.277
    Prob > F =      0.0001

```

Appendix 7: Serial correlation Conventional Banks

```

. xtserial lta lnta lhfi exppat npl nim inf gdp blr

Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F( 1,      11) =      40.136
    Prob > F =      0.0001

```

Appendix 8: Heteroscedasticity Islamic banks

```

. xttest3

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (12) =      404.85
Prob>chi2 =      0.0000

```

Appendix 9: Heteroscedasticity Conventional banks

```

xttest3

Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (12) =      306.80
Prob>chi2 =      0.0000

```

Appendix 10: Robust test Islamic Banks

```

xtreg lta lnta lnhfi exppat npl nim inf gdp blr, fe robust

Fixed-effects (within) regression                Number of obs   =      150
Group variable: code                            Number of groups =      12

```


R-sq: within = 0.3470 Obs per group: min = 10
 between = 0.4927 avg = 12.5
 overall = 0.0553 max = 13

corr(u_i, Xb) = -0.7133 F(8,11) = 16.47
 Prob > F = 0.0000

(Std. Err. adjusted for 12 clusters in code)

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
lta						
lnta	-.0907375	.0467893	-1.94	0.079	-.19372	.012245
lnhfi	.118129	.0338901	3.49	0.005	.0435374	.1927206
exppat	.0103354	.00769	1.34	0.206	-.0065901	.0272609
npl	.0004914	.0038659	0.13	0.901	-.0080173	.0090001
nim	-.0026903	.0178664	-0.15	0.883	-.042014	.0366334
inf	.0085056	.004434	1.92	0.081	-.0012537	.0182648
gdp	.0011302	.0027122	0.42	0.685	-.0048394	.0070998
blr	.0119362	.0336373	0.35	0.729	-.062099	.0859713
_cons	.2342274	.5200393	0.45	0.661	-.9103713	1.378826
sigma_u	.21168251					
sigma_e	.09194132					
rho	.84129218	(fraction of variance due to u_i)				

Appendix 11: Robust test Conventional Banks

. xtreg lta lnta lnhfi exppat npl nim inf gdp blr, fe robust

Fixed-effects (within) regression Number of obs = 160
 Group variable: code Number of groups = 12

R-sq: within = 0.7035 Obs per group: min = 11
 between = 0.0477 avg = 13.3
 overall = 0.1340 max = 15

corr(u_i, Xb) = -0.9131 F(8,11) = 3.67
 Prob > F = 0.0248

(Std. Err. adjusted for 12 clusters in code)

	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
lta						
lnta	-1.999077	.4446693	-4.50	0.001	-2.977788	-1.020366
lnhfi	1.693392	.6026284	2.81	0.017	.3670162	3.019768
exppat	.5143851	.2878284	1.79	0.101	-.1191209	1.147891
npl	-.0317408	.0470957	-0.67	0.514	-.1353977	.0719162
nim	-.1194799	.1139565	-1.05	0.317	-.3702963	.1313366
inf	-.0360169	.0228593	-1.58	0.143	-.0863298	.014296
gdp	-.0000983	.0103571	-0.01	0.993	-.022894	.0226975
blr	.0369144	.094064	0.39	0.702	-.1701191	.243948
_cons	8.573688	5.522461	1.55	0.149	-3.581165	20.72854
sigma_u	1.3921767					
sigma_e	.38992593					
rho	.92725942	(fraction of variance due to u_i)				

Appendix 12: Fixed Effect model result of commercial banks

Total Loan to Total assets

xtreg lta lnta lnhfi exppat npl nim inf gdp blr, fe

Fixed-effects (within) regression Number of obs = 160
 Group variable: code Number of groups = 12

R-sq: within = 0.7035 Obs per group: min = 11

```
between = 0.0477      avg = 13.3
overall = 0.1340     max = 15
```

```
corr(u_i, Xb) = -0.9131      F(8,140) = 41.53
                                  Prob > F = 0.0000
```

	lta	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnta		-1.999077	.1111538	-17.98	0.000	-2.218834	-1.77932
lhfi		1.693392	.171254	9.89	0.000	1.354814	2.031971
exppat		.5143851	.1500831	3.43	0.001	.2176627	.8111075
npl		-.0317408	.025205	-1.26	0.210	-.0815723	.0180908
nim		-.1194799	.0676287	-1.77	0.079	-.2531854	.0142257
inf		-.0360169	.0321084	-1.12	0.264	-.099497	.0274632
gdp		-.0000983	.0188669	-0.01	0.996	-.0373992	.0372026
blr		.0369144	.1465205	0.25	0.801	-.2527644	.3265933
_cons		8.573688	2.327648	3.68	0.000	3.971804	13.17557
sigma_u		1.3921767					
sigma_e		.38992593					
rho		.92725942		(fraction of variance due to u_i)			

```
F test that all u_i=0:      F(11, 140) = 26.77      Prob > F = 0.0000
```

Total loan to Total Deposit

```
xtreg ldep lnta lhfi exppat npl nim inf gdp blr, fe
```

```
Fixed-effects (within) regression      Number of obs = 160
Group variable: code                  Number of groups = 12
```

```
R-sq:  within = 0.2926      Obs per group: min = 11
        between = 0.0182      avg = 13.3
        overall = 0.0196     max = 15
```

```
corr(u_i, Xb) = -0.5867      F(8,140) = 7.24
                                  Prob > F = 0.0000
```

	ldep	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnta		.1218276	.0468619	2.60	0.010	.0291792	.2144761
lhfi		-.2800174	.0721998	-3.88	0.000	-.4227603	-.1372744
exppat		.2684418	.0632743	4.24	0.000	.1433451	.3935385
npl		.0115351	.0106263	1.09	0.280	-.0094737	.0325438
nim		-.0410609	.0285119	-1.44	0.152	-.0974305	.0153087
inf		-.0052104	.0135368	-0.38	0.701	-.0319733	.0215525
gdp		.0152995	.0079542	1.92	0.056	-.0004263	.0310254
blr		-.0618979	.0617723	-1.00	0.318	-.1840251	.0602293
_cons		3.460527	.9813249	3.53	0.001	1.520395	5.400659
sigma_u		.25368093					
sigma_e		.16439086					
rho		.70425872		(fraction of variance due to u_i)			

```
F test that all u_i=0:      F(11, 140) = 18.59      Prob > F = 0.0000
```

Appendix 13: Fixed Effect Model of Islamic Banks

Total Loan to Total assets

```
xtreg lta lnta lnhfi exppat npl nim inf gdp blr, fe
```

```
Fixed-effects (within) regression      Number of obs = 150
Group variable: code                  Number of groups = 12
```

```
R-sq:  within = 0.3470      Obs per group: min = 10
        between = 0.4927      avg = 12.5
        overall = 0.0553     max = 13
```

```
corr(u_i, Xb) = -0.7133      F(8,130) = 8.63
                                  Prob > F = 0.0000
```

lta	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnta	-.0907375	.0321314	-2.82	0.005	-.1543056	-.0271694
lnhfi	.118129	.0216569	5.45	0.000	.0752834	.1609746
exppat	.0103354	.0059753	1.73	0.086	-.0014861	.0221568
npl	.0004914	.0033653	0.15	0.884	-.0061665	.0071492
nim	-.0026903	.007581	-0.35	0.723	-.0176885	.0123078
inf	.0085056	.0083311	1.02	0.309	-.0079765	.0249876
gdp	.0011302	.004659	0.24	0.809	-.008087	.0103474
blr	.0119362	.034438	0.35	0.729	-.0561952	.0800676
_cons	.2342274	.3114629	0.75	0.453	-.3819648	.8504195
sigma_u	.21168251					
sigma_e	.09194132					
rho	.84129218	(fraction of variance due to u_i)				

F test that all u_i=0: F(11, 130) = 16.93 Prob > F = 0.0000

Total loan to Total Deposit

xtreg ldep lnta lnhfi exppat npl nim inf gdp blr, fe

Fixed-effects (within) regression Number of obs = 150
 Group variable: code Number of groups = 12

R-sq: within = 0.2051 Obs per group: min = 10
 between = 0.0086 avg = 12.5
 overall = 0.0706 max = 13

corr(u_i, Xb) = -0.2748 F(8,130) = 4.19
 Prob > F = 0.0002

ldep	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnta	-.10069	.1137716	-0.89	0.378	-.3257734	.1243935
lnhfi	.1961853	.0766833	2.56	0.012	.0444766	.347894
exppat	.0631268	.0211575	2.98	0.003	.0212693	.1049844
npl	.0163436	.0119159	1.37	0.173	-.0072306	.0399179
nim	.0215453	.0268431	0.80	0.424	-.0315605	.0746511
inf	.0515447	.0294989	1.75	0.083	-.0068154	.1099049
gdp	-.0190428	.0164966	-1.15	0.250	-.0516794	.0135938
blr	.0162397	.1219388	0.13	0.894	-.2250015	.257481
_cons	-.6461815	1.102835	-0.59	0.559	-2.828009	1.535646
sigma_u	.29170306					
sigma_e	.32554789					
rho	.44533279	(fraction of variance due to u_i)				

F test that all u_i=0: F(11, 130) = 7.10 Prob > F = 0.000