INSTITUTIONAL AND MACRO DETERMINANTS OF CAPITAL STRUCTURE AND DISTRESS IN ISLAMIC BANKS

BY

ZAHID UR REHMAN KHOKHER

A thesis submitted in fulfilment of the requirement for the degree of Doctor of Philosophy in Islamic Banking and Finance

IIUM Institute of Islamic Banking and Finance
International Islamic University Malaysia

JUNE 2020
This study aims to examine corporate finance as well as bank specific, market and regulatory determinants of capital structure based on data of 33 publicly-listed Islamic banks in 12 countries between 2008 – 2017. At the same time, taking a broader sample of 65 listed and unlisted Islamic banks from the same countries, this study also examines the financial stability parameters that effectively predict distress in Islamic banks. Apart from testing corporate finance parameters from past literature by systemically choosing between pooled ordinary least square, fixed and random effect models for panel regression, this study adds several idiosyncratic, legal and regulatory determinants of capital structure unique to Islamic banks. The significant factors are tested for market and book leverage as well as newly introduced ‘Islamic banking leverage’ that considers the impact of risk absorbency on investment accounts. The results show that larger Islamic banks with higher growth opportunities, more tangibility, smaller profitability and lower risk are likely to have higher leverage. Similarly, the findings suggest the important role played by investment accounts, off-balance sheet assets and regulatory environment in leverage decisions, providing evidence of the significance of trade-off and pecking order theories in the capital structure of Islamic banks. The results are more robust for market leverage and confirm the relevance of market-based determinants in understanding Islamic bank capital decisions. Among the macroeconomic variables, GDP growth, inflation and exchange rate are found to be significant. The findings also confirm that there are significant differences in the motivations of leverage in smaller vis-à-vis larger, systemically important Islamic banks, which suggests a relatively simple determinant model for smaller, non-systemic Islamic banks. For predicting distress in Islamic banks, logistic regression and Cox proportional hazard models were employed for testing 10-year annual data of 65 Islamic banks from 12 countries in a CAMELS framework. The study also intended to discover whether simple ratios perform better than more complex, risk-weighted measures in predicting distress in these banks. Apart from testing base model, a total of eight alternative capital and leverage indicators were examined in the model that mainly relied on financial and accounting data, and supplemented by market leverage for listed banks. In order to capture the variability in cross-country analysis and the impact of economic conditions and shocks, the study also added several macroeconomic indicators in the model. The results suggest that several formulations of equity-based, risk-weighted capital ratios and standard stability indicators offer a robust framework for the regulation and supervision of Islamic banks. Similarly, the findings suggest that market leverage for listed Islamic banks and gross revenue ratio for full sample are relevant for appraising Islamic bank stability and should be considered by standard setters and bank supervisors in their supervisory toolkit as well as other stakeholders such as investors, creditors and fund providers. The findings, however, reflect that the relatively simpler Basel III leverage ratio do not offer effective early warning signal. The study was limited by the unavailability of consistent data for listed Islamic banks in fully Islamic banking systems such as Iran and Sudan, and data of other countries for a longer time period. Similarly, the study does not investigate the ‘optimality’ of capital structure from the perspective of bank performance, profitability or efficiency. Moreover, several other potential determinants could have been tested had the data been available. For bank distress prediction, qualitative and non-financial factors are not included. On the same note, more than one variable for each CAMELS dimension could be tested in future studies.
ملخص البحث

هدفت هذه الدراسة إلى التعرف على تمويل الشركات والمصارف على وجه الخصوص، وقياس المحددات السوقية والتنظيمية في هيئة رأس المال وذلك بناءً على بيانات تمتثل الثلاثة وثلاثون من المصارف الإسلامية المدرجة في السوق المحلي في 12 بلدًا خلال الفترة من 2008 إلى 2017م، وفي نفس الوقت تم أخذ عينة أكبر تتألف من 65 من المصارف الإسلامية المدرجة وغير المدرجة بالسوق المحلي في البلدان المعنية.

كما هدفت الدراسة أيضاً إلى اختبار محددات الاستقرار المالي والتي يتم استخدامها بشكل متكرر حسب حالات الفشل المالي في المصارف الإسلامية. تشير الأدبيات السابقة إلى أنه يتم الاختبار بصورة منتظمة بين استخدام طريقة المربعات الصغرى المجمعة، وتعلم البيانات المجهينة عند اختبار محددات تمويل الشركات والوصول للهيكل المالي الأمثل. بالإضافة إلى ذلك، تميزت هذه الدراسة بإدخال خصائص عديدة المنهج المقدر كمحددات التنظيمية والقانونية في هيئة رأس المال المالي بالعلاقة الإسلامية. حيث تم اختبار العوامل الجوهرية، وتم إدخال "فرعية الصيغة الإسلامية" التي تأخذ بين الاعتبار تأثير احتمال الخسائر في حسابات الاستقرار. أظهرت نتائج الدراسة أن المصارف الإسلامية الكبيرة التي تتميز بتحقيق معدلات فائدة مرتفعة، ولم تكن وفرة في - أصول المحفظة، ومعدل ربحتها أقل، مع ارتفاع مستوى على التعرض للمخاطر، من المرجح أن تحقق معدلات رفع مالي عالية. وبالتالي، يُشير النتائج إلى الدور الرئيسي الذي تلعبه حسابات الاستقرار والأصول خارج الميزانية والبيئة التنظيمية في قطاعات الفائدة المالي، وهذا يثبت أهمية نظريات التبادل وأولويات التمويل في هيئة رأس المال المصارف الإسلامية. كما تمّت تقييم النتائج بالتصالح من حيث التأثير في السوق، وتؤكد تلك النتائج على أهمية المحددات المذكورة في السوق في فهم تمويل المصرف الإسلامي. وعلى صعيد متغيرات الاقتصاد الكلي، يتم النظر على المتغيرات مثل نمو الناتج المحلي الإجمالي، و معدل التضخم وسعر الصرف على أحماض معنوية وذات دلالة إحصائية. كما تبين النتائج أيضاً وجود فروق ذات دلالة إحصائية بشأن دوافع الرفع في المصارف الإسلامية الأقل أهمية مقارنة بالمصارف الإسلامية ذات الأهمية النظيمة، واقترنتت الدراسة نموذج مسبباً للمصارف الإسلامية الأصغر حجمًا ذات الأهمية النظيمة الأمثل. وللتمييز بالفشل في المصارف الإسلامية تم توظيف نموذج الأخذ اللوحي (CAMELS) ومحاولة المخاطر النسبية لتنوير النتائج المطلوبة لاختبار عينية الدراسة المكونة من 65 من المصارف الإسلامية والتي تمثل 12 بلدًا وفق معايير التقييم المصرفية المعترف عليها، تمتد لعشر سنوات باستخدام منهجية السلاسل الزمنية، للعثور على الأوضاع المالية للمصارف، وفهمت الدراسة أيضاً إلى التحقق من انتهاج طريقة النسب السببية في التنبؤ بالفشل المالي، مما يؤدي إلى نتيجة أفضل من طريقة المخاطر المرجحة في هذه المصارف. وبنظر النظر عن اختبار النموذج المقدر الأساسي،
فقد تم اختبار ما مجموعته مئوية مؤشرات بديلة لرأس المال والرافعة المالية في النموذج الذي اعتمدت أساساً على البيانات المالية والمحاسبية، وتم استخدامها لراغية السوق للمصارف المدرجة. أضافت الدراسة العديد من مؤشرات الاقتصاد الكلي في النموذج المقترح وذلك من أجل معرفة ووفق على التبادل بين الدول وتأثير الظروف والصدامات الاقتصادية. وتشير النتائج إلى أن نسبة حقوق الملكية، نسبة رأس المال المرجحة بأوزان المخاطر، ومؤشرات الاستقرار المحورية أتاحت إطاراً قوياً لتنظيم المصارف الإسلامية والإشراف عليها. وبالمثل، تشير النتائج إلى أن رagogue السوق للمصارف الإسلامية المدرجة ونسب الإيرادات المالية لكل مشاهدات العينة أمواً مهماً لاستقرار المصارف الإسلامي، ويجب أن ينظر إليها من قبلا واسع المعايير والمشرفيين على تلك المصارف من خلال مجموعة أدوات الإشراف وكذلك أصحاب المصلحة الآخرين مثل المستثمرين والدائنين، ومقدمي الأموال. ومع ذلك، فإن النتائج تعكس أن نسبة الرافعة المبسطة وفق بارل لا تعطي إشارة إصدار مبكر فعالة. وقد كانت هنالك بعض أوجه القصور بالدراسة نتيجةً لعدم توفر بيانات متسقية للمصارف الإسلامية المدرجة في الأنظمة المصرفية الإسلامية الكاملة مثل إيران والسودان، وكذلك البيانات التي تستم من طول الفترة الزمنية للدول الأخرى. وبالمثل، لم تختبر الدراسة مسألة "تحسين" هيكل رأس المال من منظور أداء المصرف أو رحيته أو كفاءته. وعلاوة إلى ذلك، فقد كان من الممكن اختبار العديد من المحددات المحتملة إن تتوفر البيانات المطلوبة. وفيما يتعلق بالنتائج بالفشل المالي للمصارف فإنه لم يتم تضمين العوامل النوعية وغير المالية. وعلى نفس النسق يمكن اختبار أكثر من متغير لكل عنصر من عناصر (CAMELS) في الدراسات المستقبلية.
The thesis of Zahid Ur Rehman Khokher has been approved by the following:

___________________________________
Syed Musa Al Habshi  
Supervisor

___________________________________
Razali Haron  
Internal Examiner

___________________________________
M. Kabir Hassan  
External Examiner

___________________________________
Rosylin Mohd. Yusof  
External Examiner

___________________________________
Saim Kayadibi  
Chairman
DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degree at IIUM or other institutions.

Zahid Ur Rehman Khokher

Signature ………………………………… Date ……11.06.2020…………..
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

DECLARATION OF COPYRIGHT AND AFFIRMATION OF FAIR USE OF UNPUBLISHED RESEARCH

A STUDY OF SIGNIFICANT INSTITUTIONAL AND MACRO-ENVIRONMENTAL DETERMINANTS OF CAPITAL STRUCTURE AND DISTRESS IN ISLAMIC BANKS

I declare that the copyright holders of this thesis are jointly owned by Zahid Ur Rehman Khokher and the International Islamic University Malaysia.

Copyright © 2020 by Zahid Ur Rehman Khokher. All rights reserved.

No part of this unpublished research may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without prior written permission of the copyright holder except as provided below.

1. Any material contained in or derived from this unpublished research may be used by others in their writing with due acknowledgement.

2. IIUM or its library will have the right to make and transmit copies (print or electronic) for institutional and academic purposes.

3. The IIUM Library will have the right to make, store in a retrieval system and supply copies of this unpublished research if requested by other universities and research libraries.

By signing this form, I acknowledged that I have read and understood the IIUM Intellectual Property Right and Commercialization policy.

Affirmed by Zahid Ur Rehman Khokher

[Signature] .......................... 11.06.2020 .................
Signature Date
ACKNOWLEDGEMENTS

All thanks, admiration, and praise belong to Almighty Allah (S.W.T) the One and Only – the Creator, Sustainer, Guide, Protector and Lord of the universe. May Allah’s peace and blessing be upon Prophet Muhammad (S.A.W), on His family and His companions.

This dissertation represents my over half decade research journey, which I undertook in part-time, along with a management job and family of four children. While this journey required hard choices for me to balance various life roles, it was only made possible with the encouragement, support and (in case of family) sacrifice of many people around me.

Special thanks to my supervisor, Associate Professor Dr. Syed Musa Alhabshi for his knowledge, compassion and kind support which helped me to steer through this research. The meetings and consultations with him were vital in inspiring me to expand my horizon and look from various dimensions to form an objective and lucid critique. He was willing to give me time and space to manoeuvre through the challenges of balancing the study, hectic work and travel schedule, family and personal life. I am also obliged to my internal examiner Associate Professor Dr. Razali Haron who gave practical ideas, support and guidance in various aspects of methodology and analysis of my thesis.

I am also grateful to Dr Abideen Adeyemi Adewale, ex Associate Professor at IIBF for his reviews of the draft and useful suggestions. Similarly, I want to record my appreciation for Dr. Ronald Rulindo, Abdul Hamid Abdul Wahab, Dr. Faraz Ahmad Shaikh, Sister Siham Ismail, Sisters Haslina Othman and Nurfadila Fauzi at IIBF, Dr Muhammad Aslam and Ibu Khaladun al-Juhany for providing valuable assistance and support during various phases of this research. Notably, I cannot thank enough to my good friend and Associate Professor Dr. Tahir Jan for his continuous encouragement and fruitful guidance. My previous employer, Islamic Financial Services Board, has paid for large part of my university fees and I would like to acknowledge this contribution.

I want to express gratitude to my family for all their love, patience and encouragement. My late father, Bashir Ahmad Khokher, was an inspiration to me who has greatest influence on my perspective about life and relationships, and especially the ardor for knowledge and nature. The prayers and benevolence of my mother, Hamida Begum, has been the greatest asset of my life, and I learned a lot from her about the virtue of hard work and selfless care of family members. My elder brother Shahid ur Rehman Khokher and sisters Farhat Bashir and Nighat Bashir have also been continuously following up and providing due encouragement to complete this dissertation and I am quite grateful to them.

Nevertheless, the person who has endured most during this undertaking has been none other than my wife, Samina Zahid. Your love and caring attitude has been of tremendous help to me in achieving this goal, without which it was simply impossible to pay attention to the emotional and daily needs of four children and carry out other responsibilities. I will now clear all the papers off the bedroom as I promised! I have taken a lot of time from my children Muhammad Faizan Zahid, Ayesha Zahid, Muhammad Afzaan Zahid and Wajeeha Zahid and I undertake to increase time allocation for you guys! Wajeeha was born in the midst of writing this thesis and I will always cherish her birth during this period.

I also wish to express gratitude to all my friends, ex-teachers (especially my high school inspiration, Mr Matloob Khan), past and existing colleagues, cousins, uncles and aunties, nephews and nieces for their encouragement and morale-boosting. I hope that some in my next generation will take this untrodden path of PhD and exhibit their penchant to explore new depths of knowledge. May Allah (S.W.T) make this endeavour a first step towards making further contribution to the knowledge and supporting the aspiration of an equitable and just financial system globally.
# TABLE OF CONTENTS

Anabstract......................................................................................................................... ii
Abstract in Arabic............................................................................................................... iii
Approval Page ..................................................................................................................... v
Declaration........................................................................................................................ vi
Copyright Page ................................................................................................................ vii
Acknowledgements ......................................................................................................... viii
List of Tables .................................................................................................................... xi
List of Figures ................................................................................................................... xvii
List of Abbreviations ....................................................................................................... xviii

## CHAPTER ONE: INTRODUCTION .............................................................................. 1

1.1 Background.................................................................................................................... 1

1.1.1 Capital Structure Decisions in Banks and Islamic Banks .................. 2

1.1.2 Financial Distress Indicators in Islamic Banks ............................... 5

1.2 Statement of the Problem ......................................................................................... 7

1.3 Research Objectives ............................................................................................. 15

1.4 Research Questions .................................................................................................. 15

1.5 Significance and Contribution of the Study ....................................................... 16

1.6 Organisation of the Study ....................................................................................... 18

## CHAPTER TWO: CAPITAL MANAGEMENT IN ISLAMIC BANKING –
THEORETICAL AND REGULATORY ISSUES ................................................... 20

2.1 Introduction............................................................................................................... 20

2.2 The Growth and Development of Islamic Finance ....................................... 20

2.2.1 The Current Status of Islamic Banking Sector ........................................... 22

2.2.2 Islamic Banking in Various Regions ......................................................... 25

2.2.2.1 Islamic Banking Sector in the GCC ..................................................... 25

2.2.2.2 Islamic Banking in Middle East and North Africa ........................... 26

2.2.2.3 Islamic Banking in Asia .................................................................. 27

2.2.2.4 Islamic Banking in Europe, Africa and Other Regions ................. 29

2.2.3 Other Sectors of Islamic Finance ................................................................. 30

2.3 The Implementation of Capital Rules for Conventional Banks ............... 34

2.3.1 Bank Capital in Pre-Basel Era ................................................................. 36

2.3.2 The Development of Bank Capital Rules under the Basel Committee ........................................ 37

2.3.3 Changes in Basel Capital Framework after the Financial Crisis ....... 42

2.4 The Application of Capital Requirements for Islamic Banks ............... 44

2.4.1 Considerations for Capital in Islamic Banks Based on Unique Balance Sheet Characteristics ........................................................................ 45

2.4.1.1 Asset Profile and Islamic Bank Capital ............................................. 45

2.4.1.2 Funding and Capital Instruments and Islamic Bank Capital ......................... 47

2.4.1.3 Other Considerations of Islamic Bank Capital .................................. 51

2.4.2 The Global Capital Standards for Islamic Banks ................................ 55
2.4.2.1 The AAOIFI Proposal .......................................................... 55
2.4.2.2 The IFSB’s Standards and Guidelines on Islamic Bank
   Capital .................................................................................. 56
2.4.2.3 Implementation of IFSB Capital Standards by Countries 60
2.4.2.4 Non-Regulatory Considerations on the Use of Debt in
   the Capital of Islamic Banks ................................................. 61

2.5 Summary .................................................................................. 62

CHAPTER THREE: LITERATURE REVIEW ........................................... 65
3.1 Introduction .............................................................................. 65
3.2 Capital Structure Theories for Firms And Banks ...................... 66
   3.2.1 The Evolution of Capital Structure Theories for Firms .......... 66
   3.2.2 Capital Structure Theories for Conventional Banks .......... 72
   3.2.3 Empirical Testing of Capital Structure Theories and Search for
      Significant Determinants of Capital ....................................... 77
      3.2.3.1 Testing of Capital Structure Theories ............................ 77
      3.2.3.2 Quest for Significant Determinants of Capital in Firms
          and Banks ...................................................................... 79
   3.2.4 Literature on Significant Determinants of Islamic Bank Capital .. 87
      3.2.4.1 Application of Capital Structure Theories on Islamic
          Banks ........................................................................... 87
      3.2.4.2 Empirical Studies on Significant Determinants of
          Capital in Islamic Banks .................................................. 92
3.3 Assessing Bank Resilience Through Stability Ratios ................. 96
   3.3.1 The Need for Early Warning Systems on Bank Distress .......... 98
   3.3.2 Models for Predicting Bank Distress ................................. 99
   3.3.3 Capital and Other Parameters for Predicting Bank Distress .... 101
   3.3.4 Past Studies on Distress Prediction in the Banking Sector .... 103
      3.3.4.1 Literature on Predicting Distress in Conventional
          Banks ........................................................................... 103
      3.3.4.2 Literature on Predicting Distress in Islamic Banks ....... 108
3.4 Gaps in the Previous Literature ................................................. 112
3.5 Hypothesis Development for Research Questions .................... 115
   3.5.1 Choice of Dependent Variables ........................................ 115
      3.5.1.1 Capital Determinants of Islamic Banks ..................... 115
      3.5.1.2 Definition of Distress in Islamic Banks ...................... 117
3.6 Independent Variables Selection and Description .................... 120
   3.6.1 Determinants of Capital .................................................. 120
      3.6.1.1 Primary Capital Determinants from Past Literature .... 120
      3.6.1.2 Additional Capital Determinants from Past Literature .. 123
      3.6.1.3 Additional Bank-Specific Determinants for Islamic
          Banks ........................................................................... 126
      3.6.1.4 Additional Determinants on Legal and Regulatory
          Environment for Islamic Banks ........................................ 127
      3.6.1.5 Capital Determinants for Systemically Important
          Islamic Banks ............................................................... 130
   3.6.2 Predicting Distress in Islamic Banking .............................. 132
      3.6.2.1 The Model for Distress Prediction in Islamic Banking .. 132
      3.6.2.2 The Introduction of the Alpha Dummy ...................... 135
CHAPTER FOUR: DATA AND RESEARCH METHODOLOGY ..........143
4.1 Introduction .................................................................................143
4.2 Research Design ........................................................................143
  4.2.1 Population of Study .................................................................145
  4.2.2 Sample Size ...........................................................................146
  4.2.3 Sampling Technique .................................................................148
  4.2.3.1 Removing of Outliers .........................................................149
  4.2.4 Data Selection .......................................................................150
4.3 Description and Sources of Data ..................................................151
  4.3.1 Data Extraction Process, Conventions Used and Data Sources ..151
    4.3.1.1 Overview of the Data Sources .........................................152
    4.3.1.2 Accounting and Financial Statements Data ........................153
    4.3.1.3 Data Based on Market Indicators ......................................155
    4.3.1.4 Data on Legal and Regulatory Indicators ..........................156
    4.3.1.5 Macroeconomic Data .......................................................156
  4.3.2 Pre-Selection Data Challenges ................................................157
  4.3.3 Post-Selection Data Challenges ...............................................158
4.4 Research Methods ........................................................................159
  4.4.1 Research Model for Capital Structure Determinants ................159
    4.4.1.1 Panel Data Estimation ......................................................159
    4.4.1.2 Robustness Checks .........................................................160
    4.4.1.3 Pooled OLS, Fixed Effect and Random Effect Estimation ....162
    4.4.1.4 Assessing the Significance and Fit of Regression Model ..........164
  4.4.2 Research Model for Predicting Islamic Bank Distress .............165
    4.4.2.1 Bank Failure Models - Logistic Regression and Survival Analysis 165
    4.4.2.2 Measures of Fit and Information Measures (Pseudo-R^2, AIC and BIC) 168
    4.4.2.3 Checks on Model Fitness .................................................171
    4.4.2.4 Goodness of Fit Tests ......................................................171
4.5 Overall Research Methodology ....................................................173
4.6 Summary ....................................................................................175

CHAPTER FIVE: EMPIRICAL RESULTS AND ANALYSIS ...............176
5.1 Introduction ...............................................................................176
5.2 Determinants of Capital Structure in Islamic Banks .....................177
  5.2.1 Descriptive Statistics and Robustness Checks .........................177
  5.2.2 Empirical Results of Base Model Regression for Book and Market Leverage ..................................................183
  5.2.3 Significance of Potential Determinants with Islamic Banking Leverage Definition ..................................................199
  5.2.4 Empirical Test Results with Additional Idiosyncratic and Regulatory Variables .................................................203
5.2.5 Determinants of Capital Structure in Systemically Important Islamic Banks .............................................................. 220
5.3 Predicting Distress in Islamic Banking ............................................................ 229
  5.3.1 Descriptive Statistics ........................................................................ 229
  5.3.2 Pairwise Correlation and Variance Inflation Factors .......................... 245
  5.3.3 Empirical Results of the Base Model ................................................... 248
  5.3.4 Goodness of Fit and Prediction Accuracy Tests ................................. 254
  5.3.5 Empirical Results with Alternative Capital Ratios ............................ 257
  5.3.6 Goodness of Fit and Prediction Accuracy Tests ................................. 262
5.4 Summary ................................................................................................. 266

CHAPTER SIX: CONCLUSIONS, LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH .......................................................... 273
6.1 Introduction ............................................................................................... 273
6.2 Key Research Findings ............................................................................ 273
  6.2.1 Determinants of Capital Structure in Islamic Banks .......................... 273
  6.2.2 Determinants of Distress in Islamic Banks ......................................... 276
6.3 Theoretical Contributions of the Study .................................................... 279
6.4 Practical Implications and Policy Recommendations ................................ 285
  6.4.1 For Regulators, Government and Other Policy Markets ................. 285
    6.4.1.1 Central Banks, Regulatory and Supervisory Authorities of Islamic Banks .............................................................. 286
    6.4.1.2 Governments ........................................................................... 295
    6.4.1.3 Other Regulators, Self-Regulatory Organisations and Policy Makers .............................................................. 298
  6.4.2 For Islamic Finance Standards Setting Bodies .................................... 300
  6.4.3 For International Organisations and Multilateral Development Banks .............................................................. 302
  6.4.4 For Islamic Banks and Other Stakeholders ..................................... 306
6.5 Limitations of the Study ........................................................................... 308
6.6 Avenues of Further Research .................................................................... 310
6.7 Conclusion ............................................................................................... 312

REFERENCES .................................................................................................. 315

APPENDIX I : DEFINITIONS OF VARIABLES USED ........................................ 331
APPENDIX II : ADDITIONAL DESCRIPTIVE STATISTICS ............................ 333
APPENDIX III: MAJOR DATABASES USED FOR DATA COLLECTION .... 351
APPENDIX IV : DETAIL OF SAMPLE ISLAMIC BANKS ................................ 353
# LIST OF TABLES

Table 2.1  Global Islamic Finance by Sector and by Region (USD billion, as at 2017) ................................................................. 22

Table 2.2  Islamic Banking Sector Profile, GCC (as at Q4-2017) ........................................................................................................ 26

Table 2.3  Islamic Banking Sector Profile, MENA (Ex-GCC) (as at Q4-2017) .............................................................................. 27

Table 2.4  Islamic Banking Sector Profile, Asia (as at Q4-2017) ....................................................................................................... 28

Table 2.5  Islamic Banking Sector Profile, Asia (as at Q4-2017) ....................................................................................................... 30

Table 3.1  Prominent Capital Structure Theories for Firms ................................................................................................................. 71

Table 3.2  Capital Structure Theories for Banks ............................................................................................................................... 76

Table 3.3  Determinants of Capital Structure with Predicted Relationship and Expected Sign .......................................................... 81

Table 3.4  Dimensions and Determinants Tested for Capital Structure, Observed Significance and Relationship with Leverage .......... 84

Table 3.5  Application of Capital Structure Theories on Islamic Banks .............................................................................................. 91

Table 3.6  Studies on the Capital Structure of Islamic Firms and Banks .......................................................................................... 93

Table 3.7  Significant Determinants of Capital Structure in Islamic Banks for Book Leverage ......................................................... 95

Table 3.8  Literature on Failure/Distress in Islamic Banks .................................................................................................................. 109

Table 3.9  Advantages and Disadvantages of Book Leverage and Market Leverage as Dependent Variable in Studies of Capital Determinants 116

Table 3.10 Bank Failures in United States (2007-2017) ...................................................................................................................... 118

Table 3.11 Research Questions and Hypotheses, Dependent and Explanatory Variables and Expected Signs .................................. 140

Table 4.1  Sample Islamic Banking Countries, Share in Domestic Banking Sector and Global Islamic Banking Assets (Q4-2017) .......... 146

Table 4.2 Description of the Sample (based on country of origin) ................................................................................................. 148

Table 5.1  List of Countries and Bank Description .......................................................................................................................... 177

Table 5.2 Descriptive Statistics, Listed Islamic Banks (2008-2017) ............................................................................................... 178
Table 5.3 Variance Inflation Factors (VIF) of Selected Variables (2008-2017) 180
Table 5.4 Pairwise Correlation between Independent Variables (2008-2017) 181
Table 5.5 Determinants of Market Leverage in Islamic Banks (Base Model) 188
Table 5.6 Determinants of Book Leverage in Islamic Banks (Base Model) 190
Table 5.7 The Effect of Additional Variables on Market and Book Leverage of Islamic Banks 193
Table 5.8 Determinants of Market and Book Leverage (including Close to Capital). 197
Table 5.9 Determinants of Islamic Banking Leverage 201
Table 5.10 Additional Unique Idiosyncratic Determinants of Leverage in Islamic Banks. 205
Table 5.11 The Full Model of Capital Determinants in Islamic Banks 210
Table 5.12 The Full Model of Capital Determinants in Islamic Banks (REM-final model for market and book leverage) 212
Table 5.13 Expected and Actual Sign and Significance of Potential Determinants of Capital Structure in Islamic Banks (full model) 214
Table 5.14 The Full Model of Capital Determinants in Islamic Banks, When Approaching Regulatory Capital Requirements 216
Table 5.15 The Full Model of Capital Determinants in Islamic Banks, When Approaching Regulatory Capital Requirements (REM-Final only for market and book leverage) 218
Table 5.16 Determinants of Market Leverage, Book Leverage and Islamic Bank Leverage in Islamic Banks, Subsample (D-SIBs) 223
Table 5.17 Determinants of Market Leverage, Book Leverage and Islamic Bank Leverage in Islamic Banks, Subsample (D-SIBs) 225
Table 5.18 Determinants of Market Leverage, Book Leverage and Islamic Bank Leverage in Islamic Banks, Subsample (Non D-SIBs) 227
Table 5.19 List of Countries and Bank Description for Testing Distress in Islamic Banks 229
Table 5.20 Descriptive Statistics (Mean and SD of total, healthy and distressed banks) 232
Table 5.21 Descriptive Statistics (2008-2017) – Full Sample 234
Table 5.22 Descriptive Statistics (year by year, 2008-2017) 238
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.23</td>
<td>Descriptive Statistics (year by year, 2008-2017) Cont’d.</td>
</tr>
<tr>
<td>5.25</td>
<td>Descriptive Statistics (year by year, 2008-2017) Cont’d.</td>
</tr>
<tr>
<td>5.26</td>
<td>Descriptive Statistics (year by year, 2008-2017) Cont’d.</td>
</tr>
<tr>
<td>5.27</td>
<td>Pairwise Correlation among Major Independent Variables</td>
</tr>
<tr>
<td>5.28</td>
<td>Variance Inflation Factors (VIF) among Main Independent Variables</td>
</tr>
<tr>
<td>5.29</td>
<td>Predicting Islamic Bank Distress Using CAMELS Indicators</td>
</tr>
<tr>
<td>5.30</td>
<td>Predicting Islamic Bank Distress with Additional Macroeconomic Variables</td>
</tr>
<tr>
<td>5.31</td>
<td>Goodness of Fit Test (Logit Model)</td>
</tr>
<tr>
<td>5.32</td>
<td>Prediction Accuracy (Logit Model)</td>
</tr>
<tr>
<td>5.33</td>
<td>Goodness of Fit Test (Cox PH Model)</td>
</tr>
<tr>
<td>5.34</td>
<td>Goodness of Fit Test (Logit Model)</td>
</tr>
<tr>
<td>5.35</td>
<td>Prediction Accuracy (Logit Model)</td>
</tr>
<tr>
<td>5.36</td>
<td>Goodness of Fit Test (Cox PH Model)</td>
</tr>
<tr>
<td>5.37</td>
<td>Predicting Islamic Bank’s Distress Using Alternative Capital Adequacy Ratios, without Macroeconomic Variables (Logit Model)</td>
</tr>
<tr>
<td>5.38</td>
<td>Predicting Islamic Bank Distress Using Alternative Capital Adequacy Ratios, Without Macroeconomic Variables (Cox PH Model)</td>
</tr>
<tr>
<td>5.39</td>
<td>Goodness of Fit Test (without Macroeconomic Variables – Logit Model)</td>
</tr>
<tr>
<td>5.40</td>
<td>Prediction Accuracy (Alternative Capital Ratios – Logit Model)</td>
</tr>
<tr>
<td>5.41</td>
<td>Goodness of Fit Test (Alternative Capital Ratios – Cox PH Model)</td>
</tr>
<tr>
<td>5.42</td>
<td>Summary of Results, Significance of Variables and Observed Sign</td>
</tr>
<tr>
<td>II.1</td>
<td>Descriptive Statistics, Bahrain (2008-2017)</td>
</tr>
</tbody>
</table>
Table II.5 Descriptive Statistics, Kuwait (2008-2017) .................................................. 335
Table II.6 Descriptive Statistics, Malaysia (2008-2017) .................................................. 336
Table II.7 Descriptive Statistics, Qatar (2008-2017) .......................................................... 337
Table II.8 Descriptive Statistics, Pakistan (2008-2017) .................................................... 337
Table II.9 Descriptive Statistics, Saudi Arabia (2008-2017) ............................................. 338
Table II.10 Descriptive Statistics, Turkey (2008-2017) ...................................................... 338
Table II.11 Descriptive Statistics, United Arab Emirates (2008-2017) ............................. 339
Table II.12 Descriptive Statistics, Egypt (2008-2018) ....................................................... 340
Table II.13 Descriptive Statistics (year by year) – Bank Distress Model Variables .......... 341
Table II.14 Descriptive Statistics (year by year) – Capital Structure Model Variables ....... 346
LIST OF FIGURES

Figure 2.1 Islamic Banking Market Share in Domestic Banking Assets (as at 1H2017) ................................................. 23
Figure 2.2 Shares of Global Islamic Banking Assets in USD (as at 1H2017) ................................................................. 24
Figure 2.3 The Trend of Sovereign and Corporate Ṣukūk Issues, Assets in USD (as at 1H2017) ........................................ 31
Figure 2.4 Corporate Ṣukūk Issuance by Jurisdiction (as at 2017) ....................................................................................... 32
Figure 2.5 Growth in Assets under Management and Number of Islamic Funds (as at 2017) ................................................. 33
Figure 2.6 Islamic Fund Listing, Assets (as at 2017) .............................................................................................................. 33
Figure 2.7 Asset Profile of Islamic Banks and Unique Capital Considerations ...................................................................... 47
Figure 2.8 Liability/Equity Profile of Islamic Banks and Unique Capital Considerations ................................................. 51
Figure 2.9 Capital Framework of Islamic Banks ................................................................................................................. 54
Figure 4.1 Research Design .................................................................................................................................................. 144
Figure 4.2 Methodological Framework for Research ......................................................................................................... 174
Figure 5.1 Average Capital Adequacy Ratio of Healthy and Distressed Islamic Banks (2008-2017) .................................... 243
Figure 5.2 Average Book Leverage (Lb) of Healthy and Distressed Islamic Banks (2008-2017) ........................................ 244
Figure 5.3 Average Basel Leverage (Bl) of Healthy and Distressed Islamic Banks (2008-2017) ........................................... 244
Figure 5.4 Average Market Leverage (Lm) of Healthy and Distressed Islamic Banks (2008-2017) ..................................... 245
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAOIFI</td>
<td>Accounting and Auditing Organisation for Islamic Financial Institutions</td>
</tr>
<tr>
<td>AIC</td>
<td>Akaike Information Criterion</td>
</tr>
<tr>
<td>AUM</td>
<td>Assets under Management</td>
</tr>
<tr>
<td>BCBS</td>
<td>Basel Committee on Banking Supervision</td>
</tr>
<tr>
<td>BCEAO</td>
<td>Banque Centrale des États de l'Afrique de l'Ouest (Central Bank of West African States)</td>
</tr>
<tr>
<td>BIC</td>
<td>Bayesian Information Criterion</td>
</tr>
<tr>
<td>BIS</td>
<td>Bank for International Settlements</td>
</tr>
<tr>
<td>BLUE</td>
<td>Best, Least, Unbiased Estimate</td>
</tr>
<tr>
<td>BPLM</td>
<td>Breusch-Pagan Lagrange Multiplier</td>
</tr>
<tr>
<td>BRSA</td>
<td>Banking Regulation and Supervision Agency, of Turkey</td>
</tr>
<tr>
<td>CAMELS</td>
<td>Capital Adequacy, Asset Quality, Management, Earnings, Liquidity, and Sensitivity to Market Risk Model</td>
</tr>
<tr>
<td>CAR</td>
<td>Capital Adequacy Ratio</td>
</tr>
<tr>
<td>D-SIB</td>
<td>Domestic Systemically Important Bank</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>FDIC</td>
<td>Federal Deposit Insurance Corporation, of the United States</td>
</tr>
<tr>
<td>FSAP</td>
<td>Financial Sector Assessment Programme</td>
</tr>
<tr>
<td>FSB</td>
<td>Financial Stability Board</td>
</tr>
<tr>
<td>FTSE</td>
<td>Financial Times Stock Exchange</td>
</tr>
<tr>
<td>FEM</td>
<td>Fixed Effect Model</td>
</tr>
<tr>
<td>G-20</td>
<td>Group of Twenty Nations</td>
</tr>
<tr>
<td>GCC</td>
<td>Gulf Cooperation Council</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GFC</td>
<td>Global Financial Crisis</td>
</tr>
<tr>
<td>G-SIB</td>
<td>Global Systemically Important Bank</td>
</tr>
<tr>
<td>IADI</td>
<td>International Association of Deposit Insurers</td>
</tr>
<tr>
<td>IAH</td>
<td>Investment Account Holders</td>
</tr>
<tr>
<td>ICAAP</td>
<td>Internal Capital Adequacy Assessment Process</td>
</tr>
<tr>
<td>IFSB</td>
<td>Islamic Financial Services Board</td>
</tr>
<tr>
<td>IIFM</td>
<td>International Islamic Financial Market</td>
</tr>
<tr>
<td>IMF</td>
<td>International Monetary Fund</td>
</tr>
<tr>
<td>IRR</td>
<td>Investment Risk Reserve</td>
</tr>
<tr>
<td>MENA</td>
<td>Middle East and North Africa</td>
</tr>
<tr>
<td>MSCI</td>
<td>Morgan Stanley Capital International Index</td>
</tr>
<tr>
<td>MTB</td>
<td>Market-to-Book Ratio</td>
</tr>
<tr>
<td>NPF</td>
<td>Non-Performing Financing</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OIC</td>
<td>Organisation of Islamic Cooperation</td>
</tr>
<tr>
<td>OJK</td>
<td>Otoritas Jasa Keuangan or Financial Services Authority, of Indonesia</td>
</tr>
<tr>
<td>OLS</td>
<td>Ordinary Least Squares</td>
</tr>
<tr>
<td>PER</td>
<td>Profit Equalisation Reserve</td>
</tr>
<tr>
<td>PHM</td>
<td>Proportional Hazard Model</td>
</tr>
</tbody>
</table>
PSIA  Profit Sharing Investment Accounts
PSIFI  Prudential and Structural Islamic Financial Indicators, by the IFSB
REM  Random Effect Model
ROE  Return on Equity
RSA  Regulatory and Supervisory Authority
SEC  Securities and Exchange Commission, of the United States
SD  Standard Deviation
SIFI  Systemically Important Financial Institutions
S&P  Standard and Poor’s Global Rating
TCE  Tangible Common Equity
US/USA  United States (of America)
USD  United States Dollar
VIF  Variance Inflation Factor
CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND

Firms use borrowed money as an investment strategy to increase their potential return on investment. An optimal mix of equity and debt will result in the maximisation of a firm’s value and minimisation of the cost of capital on an overall basis (Sheikh & Qureshi, 2017). Thus, while the use of borrowed capital or debt to finance assets or investment in various financial instruments by ‘leveraging’ the firm has long since been used, theories to understand their underlying motivations only started developing in the second half of the last century, with the proposition of capital structure irrelevance introduced by (Modigliani & Miller, 1958).

Since Modigliani and Miller’s conjuncture on the irrelevance of a firm’s capital structure in perfect markets, literature on capital structure has significantly evolved. Various theories have been developed over the years offering determinants of leverage and decision making of firms on their capital structure, though the empirical analyses of these theories have sometimes offered conflicting results. Some of these theories include the pecking order theory, trade-off theory, signalling theory, managerial timing theory, etc. (Miglo, 2010). In some other theories, the concept of “dynamic capital structure” was introduced which endeavoured to overcome the limitation of static or one-period capital structure models (Haron, 2016; Sorokina, 2014).
1.1.1 Capital Structure Decisions in Banks and Islamic Banks

It is to be noted that the capital structure of financial firms, especially banks, was considered significantly different from those of non-financial firms for two reasons: 1) banks take deposits to run their business; and 2) banks are highly regulated by the governments (Gropp & Heider, 2009). This understanding, nonetheless, was transcended in last two decades when several researchers attempted to study the capital structure of banks by applying well-tested corporate finance theories. These studies – mostly undertaken on banks in advanced economies – demonstrated that apart from regulatory capital requirements, there are other drivers of bank capital holdings which are similar to firms in other sectors, and that many banks keep ‘discretionary capital holdings’ or a ‘buffer’ of capital over and above the stipulated requirements.

One of the initial models on bank capital structure was offered by (Diamond & Rajan, 2000) who argued that a banks’ capital structure decisions are motivated by factors distinct from other non-financial firms due to their key role in providing funding and liquidity to entrepreneurial projects. This was followed by a number of other studies on bank capital structure such as (Allen & Carletti, 2013; Allen, Carletti & Marquez, 2009; Baker & Wurgler, 2013; DeAngelo & Stulz, 2014; Gropp & Heider, 2009; Shleifer & Vishny, 2010); and (Sorokina, 2014). All these studies (elaborated in the literature review), while differ in approach, concur on the significance of studying the underlying factors and determinants of capital structure in banks, due to their differentiating characteristics from other firms and their unique business model that relies on high leverage due to customer deposits and debt-based instruments.

The emergence of Islamic banks on financial sector landscape in mid-1970s as a niche in some Muslim majority jurisdictions introduced an alternative banking model with distinct operational and product characteristics, balance sheet structures and risk
profiles. While other sectors in Islamic finance such as takāful, Islamic funds, ṣukūk, microfinance etc. have also gained ground over time, Islamic banking remains the largest segment of Islamic finance with over USD 1,700 billion worth of assets, covering about 76% share in Islamic finance (IFSB, 2018). The asset growth has also helped increase the market share of Islamic banking in domestic markets, which has resulted in enhancing financial inclusion, deepening financial markets and mobilising funds for development in certain countries (Ahmed, 2009; Bitar, Kabir Hassan & Hippler, 2018). The Islamic banking sector has achieved a market share of more than 15% of the overall banking sector in over 12 countries, with at least four of these countries showing a market share of over 50% (IFSB, 2018; IMF, 2018).

At the institutional level, many Islamic banks have grown in size and complexity and have expanded beyond their border, to become regional and international players. This growth of Islamic finance, especially Islamic banking across regions, has seen several Islamic banks achieve sizeable cross-sector activity and market connectivity which can result in them being considered as domestic systemically important banks by their regulators (IFSB, 2013). Owing to this significance, and its unique risk profile, the Islamic banking sector has financial stability implications for the domestic as well as regional markets (Beck, Demirgüç-kunt & Merrouche, 2013; M. Hasan & Dridi, 2011; IMF, 2017).

The increasing significance of the Islamic banking sector at domestic, regional and international levels has resulted in an increase in research and studies on the Islamic financial sector. Nevertheless, there is still limited literature available on the empirical investigation of classical capital structure theories on Islamic banks, more specifically on the determinants which motivate the capital structure decisions in Islamic banks. Similarly, there is also a dearth of literature on whether capital and leverage
determinants in Islamic banks have common determinants with conventional banks and firms (Bitar et al., 2018). Investigating the determinants of Islamic bank capital is important as capital regulation is the key regulatory tool applied by the central banks and regulatory authorities¹ as guided by the standards issued by the Basel Committee on Banking Supervision (BCBS) and the Islamic Financial Services Board (IFSB).

Capital regulation also serves as the primary instrument in the toolkit of regulatory and supervisory authorities (RSAs) throughout the world to monitor the performance of their banks, and is an early warning signal for corrective supervisory action if a bank falls below the stipulated requirements (Mayes & Stremmel, 2012). That being said, however, the size and scale of global financial crisis (GFC) has shown that owing to its reliance on risk weights, regulatory capital adequacy ratio (CAR) does not offer sufficient information to predict an impending distress in a banking institution (Kellermann & Schlag, 2013). It was the application of different risk weights for various asset classes that induced banks to engage in financial innovations through off-balance sheet vehicles, securitisation and financial derivatives, which allowed the banks to indulge in ‘capital arbitrage’ and increase the leverage ‘without any limits’ (Admati, 2016).

¹ In most of the sample jurisdictions, central banks play the role of both the regulatory and supervisory authority (RSA) for the banking sector. However, in at least two sample countries, the role of bank regulation and supervision – including that of Islamic banks – is performed by independent bodies such as Banking Regulation and Supervision Agency (BRSA) in Turkey and Financial Services Authority (or Otoritas Jasa Keuangan - OJK) in Indonesia. Therefore, while at most places, the terms central bank as well as RSA have been used interchangeably, in practice they could be different entities. Due to this distinction, these terms are sometimes used separately in this thesis to refer to different underlying roles between a financial sector regulator and a supervisor.
1.1.2 Financial Distress Indicators in Islamic Banks

The global standard setter for banks, the BCBS responded to this issue with two key measures: i) introducing a non-risk weighted leverage ratio as a ‘backstop’ to CAR, with the impact of off-balance sheet assets fully considered, and ii) stipulating two new standardised ratios for liquidity management – Liquidity Coverage Ratio and Net Stable Funding Ratio. Accordingly, in addition to focusing on the predictive power of CAR for bank distress, the literature produced post-GFC has also given consideration to the imposition of leverage ratio and its implications for banking supervision. Some literature has also suggested several alternative ratios such as gross revenue ratio, tangible common equity (TCE) ratio, base risk weight ratio etc. with the claim that these ratios offer better, or at least equivalent, predictive power on bank distress as the classical CAR.

However, there is fewer literature and studies available in Islamic banking which have empirically tested the possible metrics that can serve as early warning indicator of distress in Islamic banks. This could be due to the relative stability as well as infancy of Islamic banking sector. At the same time, there have not been many outright liquidations of Islamic banks in past decade or so. Nevertheless, it will not be correct to state that Islamic banks have been totally immune to any financial distress as previous studies such as (Abou-El-Sood, 2015; M. Hasan & Dridi, 2011; Pappas, Izzeldin & Fuertes, 2016) have recorded. For example, some Islamic banks in various jurisdictions have faced challenges in meeting regulatory CAR, some have been dissolved, while others have been taken over by supervisors.² There has also been several Islamic bank mergers or acquisitions due to financial difficulties. Many banks

² Some Islamic banks in Bangladesh included in the sample have their CAR lower than regulatory requirements. Similarly, some banks such as Asya Participation Bank in Turkey have been put under supervisory control in the past.