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

BY

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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
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JUNE 2020

ABSTRACT

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 لهيكل رأس المال وذلك بناءً على بيانات شملت ثلاثة وثلاثون من المصارف الإسلامية المدرجة في السوق المالي في 12 بلداً خلال الفترة من 2008 إلى 2017م، وفي نفس الوقت تم أخذ عينة أكبر تتكون من 65 من المصارف الإسلامية المدرجة وغير المدرجة بالسوق المالي في البلدان المعنية. كما هدفت الدراسة أيضاً إلى اختبار محددات الاستقرار المالي والتي يتم استخدامها بفعالية للتنبؤ بحدوث حالات الفشل المالي في المصارف الإسلامية. تُشير الأدبيات السابقة إلى أنه يتم الاختيار بصورة منتظمة بين استخدام طريقة المربعات الصُغرى المجمّعة، ونماذج البيانات الهجينة عند اختبار محددات تمويل الشركات والوصول للهيكل المالي الأمثل. بالإضافة إلى ذلك، تميزت هذه الدراسة بإدخال خصائص عديدة للنموذج المقدّر كالمحددات التنظيمية والقانونية لهيكل رأس المال الخاص بالمصارف الإسلامية. حيث تم اختبار العوامل الجوهرية وتم إدخال "رافعة الصيرفة الإسلامية" التي تأخذ بعين الاعتبار تأثير امتصاص المخاطر في حسابات الاستثمار. أظهرت نتائج الدراسة أن المصارف الإسلامية الكبيرة التي تتميز بتحقيق معدلات نمو مرتفعة، ولديها وفرة في – أصولها الملموسة، ومعدل ربحيتها أقل، مع احتمالية منخفضة للتعرض للمخاطر، من المرجح أن تحقق معدلات رفع مالي عالية. وبالمثل، تُشير النتائج إلى الدور الرئيسي الذي تلعبه حسابات الاستثمار والأصول خارج الميزانية والبيئة التنظيمية في قرارات الرفع المالي، وهذا يثبت أهمية نظريتي التبادل وأولويات التمويل في هيكل رأس المال المصارف الإسلامية. كما تتميز النتائج بالصلابة من حيث التأثير في السوق، وتؤكد تلك النتائج على أهمية المحددات المرتكزة على السوق في فهم قرارات التمويل للمصرف الإسلامي. وعلى صعيد متغيرات الاقتصاد الكلي، تم العثور على المتغيرات مثل نمو الناتج المحلي الإجمالي ومعدل التضخم وسعر الصرف على أنها معنوية وذات دلالة إحصائية. كما تُبيّن النتائج أيضاً وجود فروق ذات دلالة إحصائية بشأن دوافع الرفع في المصارف الإسلامية الأقل أهمية مقارنة بالمصارف الإسلامية ذات الأهمية النظامية، واقترحت الدراسة نموذج مبسط نسبياً للمصارف الإسلامية الأصغر حجماً ذات الأهمية النظامية الأقل. وللتنبؤ بالفشل في المصارف الإسلامية تم توظيف نموذج الانحدار اللوجستي ونماذج المخاطر النسبية للتوصل للنتائج المطلوبة لاختبار عينة الدراسة المكونة من 65 من المصارف الإسلامية والتي تمثل 12 بلداً وفق معيار التقييم المصرفي المتعارف عليه (CAMELS) وذلك لفترة زمنية تمتد لعشر سنوات باستخدام منهجية السلاسل الزمنية، للتعرف على الأوضاع المالية للمصارف. وهدفت الدراسة أيضاً إلى التحقق من انتهاج طريقة النسب البسيطة في التنبؤ بالفشل المالي ربما يؤدي إلى نتيجة أفضل من طريقة المخاطر المرجحة في هذه المصارف. وبغض النظر عن اختبار النموذج المقدّر الأساسي،

فقد تم اختبار ما مجموعه ثمانية مؤشرات بديلة لرأس المال والرافعة المالية في النموذج الذي اعتمد أساساً على البيانات المالية والمحاسبية، وتم استكماله برافعة السوق للمصارف المدرجة. أضافت الدراسة العديد من مؤشرات الاقتصاد الكلي في النموذج المقدّر وذلك من أجل معرفة والوقوف على التباين بين الدول وتأثير الظروف والصدمات الاقتصادية. وتشير النتائج إلى أن نسبة حقوق الملكية، نسبة رأس المال المرجحة بأوزان المخاطر، ومؤشرات الاستقرار المعيارية أتاحت إطاراً قوياً لتنظيم المصارف الإسلامية والإشراف عليها. وبالمثل، تشير النتائج إلى أن رافعة السوق للمصارف الإسلامية المدرجة ونسب الإيرادات الإجمالية لكل مشاهدات العينة أمراً مهماً لاستقرار المصرف الإسلامي، ويجب أن ينظر إليها من قبل واضعي المعايير والمشرفين على تلك المصارف من خلال مجموعة أدواتهم الإشرافية وكذلك أصحاب المصلحة الآخرين مثل المستثمرين والدائنين، ومقدمي الأموال. ومع ذلك، فإن النتائج تعكس أن نسبة الرافعة الميسّطة وفق بازل 3 لا تعطي إشارة إنذار مبكّر فعالة. وقد كانت هنالك بعض أوجه القصور بالدراسة نتيجةً لعدم توفر بيانات متسقة للمصارف الإسلامية المدرجة في الأنظمة المصرفية الإسلامية الكاملة مثل إيران والسودان، وكذلك البيانات التي تتسم بطول الفترة الزمنية للدول الأخرى. وبالمثل، لم تختبر الدراسة مسألة "تحسين" هيكل رأس المال من منظور أداء المصرف أو ربحيته أو كفاءته. وعلاوة إلى ذلك، فقد كان من الممكن اختبار العديد من المحددات المحتملة إن توفرت البيانات المطلوبة. وفيما يتعلق بالتنبؤ بالفشل المالي للمصرف فإنه لم يتم تضمين العوامل النوعية وغير المالية. وعلى نفس النسق يمكن اختبار أكثر من متغير لكل عنصر من عناصر (CAMELS) في الدراسات المستقبلية.

APPROVAL PAGE

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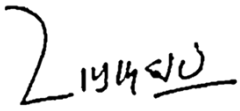
DECLARATION

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



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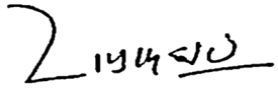

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ACKNOWLEDGEMENTS

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 Ibnu Khaldun 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 Affan 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.

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LIST OF ABBREVIATIONS

AAOIFI	Accounting and Auditing Organisation for Islamic Financial Institutions
AIC	Akaike Information Criterion
AUM	Assets under Management
BCBS	Basel Committee on Banking Supervision
BCEAO	Banque Centrale des États de l'Afrique de l'Ouest (Central Bank of West African States)
BIC	Bayesian Information Criterion
BIS	Bank for International Settlements
BLUE	Best, Least, Unbiased Estimate
BPLM	Breusch-Pagan Lagrange Multiplier
BRSA	Banking Regulation and Supervision Agency, of Turkey
CAMELS	Capital Adequacy, Asset Quality, Management, Earnings, Liquidity, and Sensitivity to Market Risk Model
CAR	Capital Adequacy Ratio
D-SIB	Domestic Systemically Important Bank
EU	European Union
FDIC	Federal Deposit Insurance Corporation, of the United States
FSAP	Financial Sector Assessment Programme
FSB	Financial Stability Board
FTSE	Financial Times Stock Exchange
FEM	Fixed Effect Model
G-20	Group of Twenty Nations
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GFC	Global Financial Crisis
G-SIB	Global Systemically Important Bank
IADI	International Association of Deposit Insurers
IAH	Investment Account Holders
ICAAP	Internal Capital Adequacy Assessment Process
IFSB	Islamic Financial Services Board
IIFM	International Islamic Financial Market
IMF	International Monetary Fund
IRR	Investment Risk Reserve
MENA	Middle East and North Africa
MSCI	Morgan Stanley Capital International Index
MTB	Market-to-Book Ratio
NPF	Non-Performing Financing
OECD	Organisation for Economic Co-operation and Development
OIC	Organisation of Islamic Cooperation
OJK	*Otoritas Jasa Keuangan* or Financial Services Authority, of Indonesia
OLS	Ordinary Least Squares
PER	Profit Equalisation Reserve
PHM	Proportional Hazard Model

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 & Merrouchec, 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 authorities[1] 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.