LENDING STRUCTURE AND BANK RISK EXPOSURES: THE CASE OF ISLAMIC AND CONVENTIONAL BANKS IN MALAYSIA

BY

AISYAH BINTI ABDUL RAHMAN

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Institute of Islamic Banking and Finance
International Islamic University
Malaysia

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ABSTRACT

This research investigates the impact of lending structure and the other bank specific variables on the six types of risk exposure: insolvency risk, market risk, interest rate risk, exchange rate risk, total risk, and unsystematic risk. The insolvency risk exposure is based on the Zrisk index developed by Hannan and Hanweck (1988) while the other five risk exposures are estimated based on the three-factor Capital Asset Pricing Model (CAPM). For each risk exposure, four lending structure measures are analysed namely, the real estate lending, the specialization index, the short run lending stability, and the medium term lending stability. Further, a comparative analysis of the risk behaviour between the Islamic and conventional banks is made. In addition, the effect of bank consolidation program and financial crisis period is incorporated. Using Generalised Least Square (GLS) panel regression techniques, three different data sets are analysed individually for the period of 1994 to 2006. Out of the three GLS models (the none effect, the fixed effect and random effect), the best model is selected based on the Likelihood Ratio (LR) and Hausman test. In general, the findings in this study show that real estate lending is positively related to the insolvency risk exposure of the conventional banks, but negatively related to the Islamic banks. Meanwhile, the lending structure variables to some extent affect the market, interest rate and unsystematic risk exposures. Also, this study finds that each risk exposure has different determinants. Hence, the policy makers, practitioners, and investors should react accordingly in the decision making process.

ملخص البحث

يحقق هذا البحث تأثير هيكلة القروض وغيرها من المتغيرات البنكية الخاصة على ستة أنواع من كشف المخاطر وهي: خطورة الإفلاس، وخطورة التسويق، وخطورة نسبة الفوائد، وخطورة نسبة تبادل العملات، والخطورة الإجمالية، والخطورة غير النظامية. ويعتمد كشف خطورة الإفلاس على مؤشر (زريسك) المنسوب إلى حنّان و هانويك (1988) في حين أن كشف المخاطر الخمسة الباقية تعتمد على ثلاثة عناصر في نموذج التسعير الأصلي لرأس المال. ولكل كشف للمخاطر أربعة هياكل محللة لقياس القروض وهي: قروض العقارات، والمؤشرات المتخصصة، واستقرار القروض للمدى القريب، واستقرار القروض للمدى المتوسط. بالإضافة إلى تحليل مقارن لأساليب المخاطر بين البنوك الإسلامية والتقليدية. وكذلك فاعلية برنامج تعزيز البنوك، وفترة الخطورة المالية وكيفية اتحادهما. وباستعمال تقنية ارتداد اللوحة بواسطة تعميم أقل المربعات فهناك ثلاثة معلومات وضعت وحللت بشكل منفرد لفترة مابين 1994 الى 2006. وبعيدا عن نموذج تعميم أقل المربعات الثلاثة (غير المؤثر، وثابت التأثير، وعشوائي التأثير) فإنه يعد أفضل النماذج المختارة والتي تعتمد على إمكانية النسبة واختبار هاوسمان. بشكل عام، فقد أظهرت الدراسة أن قروض العقارات كانت إيجابية فيما يتعلق بكشف خطورة الإفلاس في البنوك الإسلامية. في حين أظهرت الدراسة تأثيرات غير مجدية في مقياس العناصر الثلاثة لنموذج التسعير الأصلي لرأس المال. كما أوضحت الدراسة أن كل كشوف المخاطر لها تعزيزات مختلفة. لذلك فإن على صانعي القرار، والمهنيين، والمستثمرين أن يتفاعلوا وفقا لذلك في إجراءات صنع القرار.

APPROVAL PAGE

The thesis of Aisyah Binti Abdul Rahman has been approved by the following:

Mansor H. Ibrahim
Supervisor

Ahamed Kameel Mydin Meera
Supervisor

Mohd Azmi Hj. Omar
Internal Examiner

Bala Shanmugam
External Examiner

N. Hussien

Nasr Eldin Ibrahim Ahmed Hussien
Chairman

DECLARATION

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

Aisyah Binti Abdul Rahman

Signature.....................

Date.....1 AUG 2009.....

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IN THE NAME OF ALLAH, THE MOST BENEFICENT, THE MOST MERCIFUL

Dedicate to

My Beloved Husband
(Mohd Saiful Rizal Bin Muhamad)

My Mother
(Hajjah Fatimah Binti Abu Bakar)

My Father
(Hajji Abdul Rahman Bin Mohamed)

And

My Children
(Muhammad Adam Danial Bin Mohd Saiful Rizal)
(Muhammad Hakim Mikhail Bin Mohd Saiful Rizal)

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INTRODUCTION

1.1 OVERVIEW OF THE STUDY

Risk management has been a subject that received much attention in the banking literature since the mid 1980's. Indeed, the recurring financial crisis has heightened interest in this subject. When discussing the risk management, one cannot run away from the four steps involved in the process namely, 1) risk identification, 2) risk quantification, 3) risk monitoring and controlling, and 4) risk reporting (Basel Committee on Banking Supervision, 2001). While the role in the last process is applicable to practitioners and policy makers, this study attempts to provide information for the first three steps by empirically examining factors affecting various type of bank risk exposures while at the same time focusing on the impact of lending structure on these risk exposures.

In measuring the various types of risk exposures, this study employs the Capital Asset Pricing Model (CAPM, hereafter) as well as the financial ratio approach. For the CAPM approach, researches in the 1980's and 1990's acknowledge the two-factor CAPM risk exposures. For example, findings by Chamberlain and Popper (1997), Bodnar and Gentry (1993), Akella and Greenbaum (1992), Choi and Kopecky (1992), Bae (1990), Brooth and Officer (1985), and Flannery and James (1984) show that banks are exposed to market and interest rate risk. Nonetheless, a recent finding by Hahm and Mishkin (2004) support the three-factor CAPM by indicating that foreign exchange rate is another alarming risk factor on top of the two. Focusing, on the asymmetric information problems, they suggest that the deterioration of bank valuation is an important factor leading to a banking crisis. The cause of that deterioration, among other factors, is the unexpected movements in market returns, interest rates and exchange rates. Unfortunately, very limited studies in the risk management field were concerned about those risk exposures.

For the financial ratio measure, despite the typical accounting ratio (standard deviation of ROE and ROA), this study adopts the insolvency risk index (Zrisk index, hereafter) to examine bank insolvency risk exposure. The Zrisk index was developed by Hannan and Hanweck (1988). The index's establishment starts with a hypothesis that banks are subject to market discipline from the perspective of uninsured depositors in controlling risk taking behaviour. Hannan and Hanweck believe that the existence of such disciplining mechanism is through a positive relationship between uninsured deposit interest rates and the level of risk taking. As their hypothesis has been supported by empirical evidence, many studies since then have adopted the Zrisk index as a measure of bank insolvency risk. To name a few, researchers in the banking field like Liang and Savage (1990), Eisenbeis and Kwast (1991), Sinkey and Nash (1993), Nash and Sinkey (1997), Blasko and Sinkey (2006), and Rubi et al. (2006), have adopted the Zrisk index as a proxy to bank insolvency risk exposure.

Against this background, this study incorporates both the insolvency and three-factor CAPM risk exposures. Taken together, six risk measures will be evaluated namely, the insolvency, market, interest rate, exchange rate, total, and unsystematic risk exposure.

With regards to risk determinants, special attention is given to the impact of lending structure on the risk exposures. Why is this vital? Hanson et al. (2008) suggests that if firm parameters come from different distributions (different sectors), there will be further scope for credit risk diversification by changing the portfolio weights, even in the case of a sufficiently large portfolio. The implication of their work to the banking sector is that if lending composition from different sectors is fairly diversified, the deterioration of bank capital in an uncertain economy would be lower. In fact, exploratory studies in the aftermath of the 1997 financial crisis suggest that real estate lending is responsible for the banking crisis for the Asian countries (Krugman, 1998; Herring and Susan, 1999; Tan, 2000, Mera & Renaud, 2000; Quiley, 2001; Collyns & Senhadji, 2002; Pavlov & Watcher, 2004, and Koh et al., 2005). Moreover, Blasko and Sinkey Jr. (2006) provide empirical evidence for the case of the United States by showing that concentration in mortgage lending challenges the capability of banks to manage interest rate risk, especially during rising climate. They highlight that without proper regulatory supervisions, banks which lend heavily on a specific sector (which in their case was the real estate sector) could shift their risks onto the government safety net, especially if those banks were established to fulfil certain government objectives. Also, Madura et al. (1994) find that real estate lending could increase the implied risk for the U.S. financial institutions as a whole, but such relationship disappears for the case of commercial banking. For the Malaysian context, Nor Hayati and Muhammad Ariff (2003, 2004b) reveal that loans on broad property sectors, consumer credit, and purchase of securities could only increase market risk exposure, but not total and unsystematic risk exposure for the case of financial institutions, which comprise commercial banks, merchant banks, and finance companies. Having said this, the result for commercial banking in Malaysia is still questionable.

As the significance of analyzing the lending structure-risk relationship is obvious, the measurement for lending structure instruments adopted by the previous study is not extensive. Those study focus strongly on the impact of lending structure by investigating the ratio of lending in certain sectors, which is considered as a risky sector. Meanwhile, a few researches have moved forward by adopting a specialization index or Herfindahl index. This study adds value to the lending structure measurement by employing four different lending structure models adopted from Mansor and Ruzita (2004) and Shiela and Micheal (1997; 1999). Even though those studies focus on a different issue, the objective is however similar; that is to analyse how the structure of one variable influences the other variable. The four lending structure instruments are 1) real estate lending, 2) specialization index, 3) short term lending portfolio stability, and finally 4) medium term lending portfolio stability.

Turning to the scope of study, this research investigates the issue for the case of Islamic and conventional banks. This is due to the fact that Malaysia practices a dual banking system, in which the conventional banks operate hand in hand with the Islamic banks. Despite the fact that both banks have different objectives, undergo different operational process, and are bound by to different regulatory acts, one wonders what would be the end results. **Against this background, the research problem in this study is to investigate the relationship between lending structure and risk exposures for the Islamic and conventional banks that operate in the same economic landscape.** Even though some may argue that Islamic and conventional banks are not comparable, the purpose of comparison in this study is just a benchmarking process, which is as a response to the deputy prime minister Datuk Seri Najib Tun Razak's keynote address at the Kuala Lumpur International Islamic Finance Forum at the JW Marriot Hotel as reported in the Star, dated 30th November 2005, which is quoted as follows:

> "Obviously, stakeholders and customers want to be certain of the level of performance of a particular financial institution. The Industry needs

to have common standards which are measureable, comparable and, more importantly, of global application".

1.2 OBJECTIVE OF THE STUDY:

The central focus of this research is on the relationship between lending structure and commercial bank risk exposures. More explicitly, this study has the following targets:

1. To investigate the relationship between lending structure and bank risk exposures via four lending structure measurements. The six types of risk reflect the insolvency and three-factor CAPM risk exposures.
2. To identify the determinants affecting the various types of risk exposures as the theoretical and empirical framework for risk measurements is not yet established.
3. To make a comparison of the findings for the case of Islamic and conventional banks for the purpose of benchmarking.
4. To draw policy implications for the commercial banking policy in general as well as the Islamic banking policy in particular.

1.3 RESEARCH QUESTIONS:

Specifically, this study seeks answers to six research questions based on the aforementioned objectives:

1. Does lending structure have an impact on bank risk exposures?
2. If it does, what are the signs of directions?
3. Is the impact of the four lending structure measures robust for each type of risk exposure?

4. Does the relationship between lending structure and risk similar for different types of risk exposures?
5. What are the determinants for the six types of risk exposures?
6. Does the risk taking behaviour differ between the Islamic and conventional banks?
7. How can the findings from this study help the policy makers in generating a proactive policy?

1.4 SIGNIFICANCE OF THE STUDY

This study creates significant contributions from at least three perspectives; to the body of knowledge, to the policy makers, and to the practitioners. Firstly, this study offers empirical evidence on the determinants of the various types of risk exposures in general as well as the relationship between lending structure and commercial bank risk in particular as an extension of knowledge in the risk management field. Although the idea of linking lending concentration on risk is not new, the novelty of this study is to introduce a comprehensive measure of lending structure by analyzing four different types of lending structure measurements on six different types of risk exposures. Secondly, the findings from this research could offer some insight on the degree of risk exposures contributed by lending structure so that the policy makers and regulators can proactively make decisions that should promote the desired results of the monetary policy. Also, the policy relevance of this study could be viewed from the target set by Bank Negara Malaysia (BNM) for the Islamic banks to command a 20 percent market share by year 2010 as outlined in its financial sector master plan. This is because the sustainability of Islamic banks in the future partly depends on how efficient the banks operate in terms of risk management and service delivery in a competitive environment. Thirdly, it is hoped that the findings could create awareness to the Islamic and conventional banks regarding factors affecting various types of risk exposures so that they can properly manage risks, particularly in strategizing the loan portfolio composition. Last but not least, the investors or stakeholders of commercial banks could also benefit from the findings in this study as they can have a better picture of risk that they are exposed to if their investments (banks) rely heavily on a particular sector.

1.5 SCOPE OF THE STUDY

Risk management of banks is a very wide scope. Starting from identifying, measuring, monitoring, controlling, mitigating, and reporting, all fall under the umbrella of risk management; thus, it is impossible for this study to investigate every single aspect of it. Hence, the scope of this study can be viewed from five aspects. First, from the eyes of risk management framework, this study explicitly focuses on the issues of risk identification and risk measurement. However, the finding of this study could indirectly lend some insight on the issue of risk monitoring and controlling. Second, as some empirical studies indicate that the result for commercial banking is different from the financial institutions as a whole; this study focuses only on the commercial banking. Despite that, it is further streamed down into the Islamic and conventional banking to investigate whether there are similarities or differences between the two as Malaysia employs a dual banking system. Third, for the risk measurement, this study focuses on the insolvency and three-factor CAPM risk exposures as it is most appropriate for Malaysia. The Malaysian financial market is relatively less developed as compared to the other industrial countries. Let alone the Islamic banking system itself. So, other types of risk measures, which are estimated based on subordinated market prices or call option prices, are not suitable in this study. Fourth, with respect to risk determinants, this study focuses only on the movements of the banks' financial statement items. As the theoretical framework for risk measurement is not yet established, the employment of such bank-specific variables follows the previous empirical studies on this issue. Finally, this study caters for the information derived from the secondary data source. Thus, the operational issues such as the effectiveness of risk management tools or the impact of technology on risk exposures is beyond the scope of this study as it requires primary data information.

1.6 STRUCTURE OF THE STUDY

The remainder of this thesis is organized as follows. Chapter 2 provides some background information on the structure of both the Islamic and conventional banking systems and an overview of the special features surrounding the Islamic banking principles and the objective of its establishment.

Chapter 3 extends the general concept of risk, the risk management framework, and the different methods used in risk measurement in order to understand the adoption of the different types of risk measurements in this study.

Chapter 4 documents the relevant empirical studies on risk exposure, especially the risk exposures estimated based on the financial ratio and CAPM approach. The potential determinants of risk exposure is also highlighted as they are included as control variables in this study to ensure that the coefficient of lending structure variable does not capture the effect of the other bank-specific variables.

Chapter 5 illustrates the empirical approach employed in this study. To extensively explain the types of risk measures used, the methodology in estimating the

Zrisk index and the three-factor CAPM risk exposure is highlighted. On top of that, the methodology of the four different lending structure models is pointed out to emphasize the novelty of the lending structure measurements employed in this study.

Chapter 6 analyses the findings of the previous chapter by examining the impact of lending structure in particular, as well as the other determinants on various types of risk exposure.

Chapter 7 draws conclusion according to the overall and robust findings of this study. This chapter also sheds some light on the policy implications, limitations of the study, and suggestions for future research.

CHAPTER 2

BACKGROUND INFORMATION OF THE STUDY

2.1 INTRODUCTION

It is important to take note that currently Malaysia applies a dual banking system where both conventional and Islamic banking products are offered to the same customers. Hence, the customers are left with two choices in selecting which banks they want to transact to meet their banking needs. Their decisions may be influenced by the risk exposures faced by the banks where those risk exposures are to some extent depend on the background information for each banking systems. Hence, this chapter offers some background information such as the objective of establishment, the historical background, the Islamic banking instruments, and the differences between the Islamic and conventional banking system.

2.2 OVERVIEW OF THE ISLAMIC BANKING SYSTEM

2.2.1 The Objective of Establishment

According to Kurshid (2000), Munawar and Llywellyn (2002), Munawar and Philip (2005) and Archer and Rifaat Ahmed (2007), the main objectives of Islamic banking can be viewed from five perspectives. First, the Islamic banking system rests in a system of interest-free financing. While some scholars dispute that the current practice of profit rate is sort of a back door to interest, others are urging that a truly interest-free financing could be achieved by employing a profit-sharing financing mode. Ideally, Islamic banks function on the principle of a variable return based on actual productivity of the entrepreneurship projects. It can be in many forms as may desired, both at the micro and macro levels. The equity and reward sharing should remain as the major mode of financing, and not just a simple cost-plus relationship.

The second objective links the role of Islamic banks and the economy as a whole. Islam wants the business and monetary transactions to move away from a debt-based relationship to an equity-based economy. Although the principle of *Qard Hasan* could be conducted for debt–based transactions, the overall aim of the economy would be towards risk-sharing arrangements, which needs a revolutionary change. This is because equity-based transactions require that all market players within the economy to participate in the productive system and prohibit the parties to get returns without taking any risk.

Third, the Islamic objective is initiated from an ethical framework. It not only represents a shift from a debt-based to equity-based economy, but also a change from purely profit-taking to a gainful and just economy. There is a framework of permissible (*halal*) and prohibited things that has to take place such as the principles of the entrepreneur and the bank, the social climate of the society, the legal framework, and the supervisory body. Several social and ethical questions must therefore be questioned and well answered before the Islamic banks adopt any banking strategy. Some possible questions are: would this action lead to the establishment of a just and sustainable society? Or would it end up with exploitation, moral degeneration and social inequalities? etc.

The fourth objective of Islamic banking is that it is entrepreneur-friendly. It must be expressed towards the physical expansion of economic productions and services, and not purely focus on financial expansion. This is due to the fact that money does not produce money. Instead, money is supposed to finance talent,