

DEPOSIT INSURANCE SYSTEM: AN EXPOSITION FOR THE ISLAMIC BANKS IN MALAYSIA

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—Abstract —

An important aspect of the new financial landscape is the increased focus on financial stability. A deposit insurance (DI) system accomplishes this purpose. While there are a great number of earlier studies that analyze the impact of DI on the conventional banking system, there is a lack of study that takes into account the moral hazard problem of DI on the Islamic banking system. Our paper aims to investigate the moral hazard implication by way of bank risk taking trailing the introduction of DI for the Islamic banks using the random effect model estimation for panel data. Malaysia is chosen as a sample for an Islamic banking system due to data availability and being the most advance country in Islamic banking. Our empirical study offers novel findings on the impact of the introduction of DI in both financial and operational risks taking for the Islamic banks. Our study reveals that Islamic banks have significantly higher operational risk after the introduction of DI. Added to that, our finding suggests that the risk-based premium method will significantly mitigate the moral hazard problem. We also find that management efficiency can be an alternative measure of operational risk.

Key Words: Islamic bank, Deposit insurance, Bank risk, Operational risk, Premium method

JEL Classification: G21, G28

1. INTRODUCTION

In banking, financial safety net that includes DI (deposit insurance) system is meant both to encourage prudent risk taking and to provide assistance (Kane, 2000) to depositors of insolvent banks who have miscalculated the risk involved. However, like other insurance scheme, DI could lead to moral hazard problem in the form of excessive risk taking by the banks. Whilst DI will preserve soundness and confidence in the financial sector, it could also be distortionary to the banks including Islamic banks due to the moral hazard problem by way of bank risk-taking behavior. Drawing a thin line between the moral hazard problems and to maximize the potential benefits¹ of DI remains the badgering issue among academics and policy makers. The empirical result on the implication of a DI system remains inconclusive². Although there is a significant amount of literature on the impact of DI on conventional banks, no empirical study has examined the impact of the DI system on the Islamic banks. Notably, Hadad, Agusman, Monroe, Gasbarro and Zumwalt (2011) ignored the five Indonesian Islamic banks in their country specific study but only include 104 Indonesian commercial banks despite a dual banking system in the country. Similarly, Yilmaz and Muslumov (2008) and Tuan, Ying, and Nya (2010) study of Turkish and Malaysian banking system respectively excludes Islamic banks from their study.

With the importance of Islamic banking, it is overwhelming that the impact of DI on the Islamic banks has not been analyzed as rigorously as the conventional banks. The Islamic banking system in the world either exists as a full fledged like Sudan or a dual banking system that operates alongside the conventional bank like Malaysia. However, only 10 countries (refer Table 1) with an Islamic banking system have set up an Islamic DI system with different year of establishment (International Association of Deposit Insurance, 2010)³. However, among these

¹ Deposit insurance as a tool for depositor protection has become an important feature of most banking systems that includes to provide stability, minimize the probability of crisis and increased financial intermediation.

² Demirguc-Kunt & Huizinga, 2004; Hadad, Agusman, Monroe, Gasbarro, & Zumwalt, 2011) concluded that the deposit insurance system inevitably increases the moral hazard problem by way of banks' increase risk taking. Whilst few, Gropp and Vesala (2004) study shows that post-DI the banks' risk taking reduce significantly.

³ Bank for International Settlements and International Association of Deposit Insurers (2010), *Survey on Islamic Deposit Insurance: Results*.

http://www.iadi.org/docs/Survey_on_Islamic_DI.pdf [Accessed 20.4.2011]

10 countries only Malaysia administered the Islamic deposit funds separately, operated by a government owned deposit insurer and is regulated under specific legislation. Consequently, Malaysia, Indonesia and Turkey implemented their Islamic DI in 2005 (Table 2).

Today, the growth of Islamic banking is not only consumed by the world's 1.6 billion Muslims but also by consumer of another faith. Added to that, only Malaysia has established a separate system for its IDI, with a separate Islamic DI fund managed in accordance with Shariah principles. The remaining 8 countries operate their IDI scheme as part of a single DI fund. Given this unique feature of Malaysia, a study employing Malaysia as a sample for an Islamic banking system could provide in-depth analysis. This unique difference for Malaysia appears to justify the expected findings for the Islamic banks in the Malaysian context and adds to the Islamic banking body of literature. At the end of 2011, Islamic banking assets accounted for 22.4% of total banking system assets in the country(Bank Negara Malaysia, 2011).

Table 1: List of Islamic banking system with Islamic Deposit Insurance

Country	Organization & Implementation Date	Country	Organization & Implementation Date
1.Indonesia	Indonesia Deposit Insurance Corporation (22 Sept 2005)	6.Bahrain	Central Bank of Bahrain (1993)
2.Malaysia	Malaysia Deposit Insurance Corporation (1 Sept 2005)	7.Jordan	Jordan Deposit Insurance Corporation (2000)
3.Turkey	Savings Deposit Insurance Fund (December 2005)	8.Bosnia	Deposit Insurance Agency (2002)
4.Singapore	Singapore Deposit Insurance Corporation (April 2006)	9.Kuwait	Central Bank of Kuwait (2008)
5.United Kingdom	Financial Services Compensation Scheme (2001)	10.Sudan	Bank Deposit Security Fund (1996)

Table 2: List of Islamic Banks in countries with similar year implementation of Islamic Deposit Insurance

Country	Organization & Implementation Date	List of Islamic Banks			Complete 2002-2010 Financial information available in Bankscope (Yes/No)
1.Indonesia	Indonesia Deposit Insurance Corporation (22 Sept 2005)	1. PT Bank BRI Syariah 2. PT Bank, Muamalat Indonesia Tbk	3.PT Bank Syariah Bukopin 4. PT Bank Syariah Mandiri	5. PT Bank Syariah Mega Indonesia	*No.
2.Malaysia	Malaysia Deposit Insurance Corporation (1 Sept 2005)	1. Affin Islamic Bank 2. Alliance Islamic Bank 3.AM Islamic Bank 4. Bank Islam (M) Bhd 5. Bank Muamalat 6. CIMB-Islamic 7. EONCap Islamic 8. Hong Leong Islamic 9. Maybank Islamic	10. Public Islamic 11. RHB Islamic 12. Al-Rajhi Bank 13. Asian Finance Bank 14. HSBC Amanah House 15. Kuwait Finance 16. OCBC Islamic	17. Standard Chartered Islamic (Islamic window) 18. Citibank (Islamic window) 19. Deutsche Bank (Islamic window)	No. But can be sourced from the banks' annual report.
#In terms of Islamic banking asset world rank by asset, Malaysian Islamic banks ranks higher in the world than its peers in Indonesia, Singapore, Turkey & UK (Bankscope).					
3.Turkey	Savings Deposit Insurance Fund (December 2005)	1.Asya Katilim Bankasi AS-Bank Asya 2. Turkiye Finans Katilim Bankasi AS	3. Kuveyt Turk Katilim Bankasi A.S.-Kuwait Turkish Participation Bank Inc	4. Albaraka Turk Participation Bank-Albaraka Turk Katilim Bankasi AS)	*No.

Note: *Available only for Bank Syariah Mandiri and Albaraka Turk for banks in Indonesia and Turkey respectively.

Islamic banking is just another way of financial intermediation without interest. Like other banks, they are profit seeking businesses. The establishment of Bank Islam Malaysia Berhad in July 1983 marks the beginning of Islamic banking in Malaysia. To date, there are 19 Islamic banks operating in Malaysia including two foreign banks with Islamic window as listed in Table 2. In Malaysia, DI system was initially proposed in 2001 as part of the Financial Sector Master Plan. The explicit DI system is mandated by law and administered by Malaysia Deposit Insurer Corporation, a statutory body established in September 2005. All Islamic banks in Malaysia are a mandatory member of the DI system. The DI protection limit was then RM60,000 (principal and interest or return) per depositor per member bank and was later increased to RM250,000 effective January 2011. In the early years of the establishment of DI system, the insurance premium paid was based on a flat rate method. Subsequently in 2008, the risk-based premium which is based on member bank's risk profile is adopted until today

Our paper analyzes the impact of DI on the Islamic banks. We aim to evaluate the risk taking behavior (both in financial risk and operational risk) of Islamic banks before and after the introduction of DI system. While management of financial risk is important to the Islamic banks, managing of operational risk is also pertinent. The distinct differences between the two are that operational risk involves with how bank management and staff operates which implies even before financing is extended to borrowers (Moosa I. A., 2007). Islamic banks are perceived to have higher operational risk exposures that include the non-compliance of Shariah principle risk. Shariah non-compliance conduct by the bank management and staff may lead to declining profitability (Tiby, 2011) as income from the Shariah non-compliance must be removed from the bank's profit in the form of zakat.

The rest of the paper proceeds as follows. Section 2 discusses the methodology and the empirical results are reported under Section 3. Finally, Section 4 concludes.

2. METHODOLOGY

2.1 Data

We obtain yearly data of all 18 Islamic banks which covers all the mandatory member banks under the DI system from 2002 through 2010. Hence, the sample consists of 9 years and covers before and after the period of DI implementation. The panel is unbalanced and consist of 147 banks-years observations. Both the annual report and BANKSCOPE are used to gather the data due to limited data in

the BANKSCOPE. Most of the Islamic banks in Malaysia become a stand-alone subsidiaries after 2005 and 2008 except for the two standalone local Islamic banks namely Bank Islam Malaysia Bhd and Bank Muamalat Berhad. Prior to becoming a stand-alone subsidiary, these Islamic banks operate under the Islamic banking window of the conventional banks and their balance sheet information are reported in the notes to the balance sheet of the conventional banks. Table 3 reports the descriptive statistics for our sample bank characteristics. The median Islamic bank has RM5.37 billion of total assets. The median Islamic bank in the sample has a ratio of non-performing financing to gross loan of 2.27%, a ratio of non-performing financing to asset of 1.18%, a ratio of equity to total assets of 7.68%, a ratio of overhead to asset of 0.91% and a median of risk-weighted capital ratio of 14.5%. By ownership, 65% of our observations are local Islamic banks and 35% are foreign-owned bank incorporated in Malaysia.

2.2 Dependent and Independent Variables

The accounting-based measures of bank risk namely financial risk and operational risk are used as the dependent variable in the model. Credit risk is selected as a proxy for financial risk as it is the most dominant bank risk while operational risk is a risk that is presence even before any financing is extended to a customer. Following the existing literature, this study uses the non-performing financing to loan ratio and the non-performing financing to asset ratio to measure financial risk. An increase in these two ratios signals a deterioration of the bank's asset quality by taking higher risk. We define operational risk⁴ as equity to asset ratio (Demirguc-Kunt & Huizinga, 2004; Lei & Tzu-Pu; 2011). We also introduce management efficiency (overhead to asset ratio) as an alternative measure for operational risk. Increased in operational risk is evidenced by increased in equity to asset ratio as banks with higher risk hold higher capital while a high ratio of overhead to asset may indicate management deficiencies.

⁴ The operational risk definition by Islamic Financial Services Board is similar to the Basel II definition but further includes the non-compliance of Shari'ah principle risk. Basel II defined operational risk as "the risk of loss resulting from inadequate or failed internal processes, people or systems or from external events".

Table 3: Descriptive Statistics on Sample Banks' Characteristics

	Observation	Mean	Median	Std. Dev.
Deposit insurance period dummy	147 (Pred-DI=57; Post-DI=90)			
Assets (RM million)	147	7899.9	5373.3	7993.2
Ratio of non-performing financing to gross loans (Financial risk)	147	4.67%	2.27%	5.78%
Ratio of non-performing financing to asset (Financial risk)	147	2.47%	1.18%	3.01%
Ratio of equity to total assets (Operational risk)	147	10.87%	7.68%	12.06%
Ratio of overhead to asset (Operational risk)	147	1.23%	0.91%	2.51%
Risk weighted capital ratio	147	22.92%	14.5	30.06
Bank Ownership dummy	147 (Foreign=52; Local=95)			
Insurance premium method dummy	90 (Risk-based=54; Flat-rate=36)			

The independent variable is a dummy DI period and dummy insurance premium assessment method. Following previous studies, the other variables namely ownership, bank size and risk-weighted capital ratio is controlled for. We also control management quality defined by overhead to asset ratio and non-performing financing to asset ratio in our Model 1 and 2 respectively. If too-big to fail guarantees exist in the Islamic banks one would expect large banks taking more risk than smaller banks. On the other hand, foreign banks may employ more sophisticated risk management tool and a better internal control system that makes them to have fewer incentives to increase their risk taking behavior in the presence of DI protection. Elsewhere, quality management team may indicate that the Islamic banks are operating efficiently with prudent risk taking. Risk-weighted capital ratio has a positive correlation with banks' risk taking. High capital ratio indicates higher risk.

2.3 Empirical Model

Based on the discussions of the dependent and independent variables, we test the following general model:

$$Risk_{i,t(Flat)} = \beta_0 + \beta_1(DI_{i,t}) + \beta_j(Control_{i,t}) + \epsilon_{i,t} \quad (\text{Model 1})$$

$$Risk_{i,t(Post-DI)} = \beta_0 + \beta_1(Riskbased_{i,t}) + \beta_j(Control_{i,t}) + \epsilon_{i,t} \quad (\text{Model 2})$$

We run two separate sets of regression for both models above using two measurements for financial risk and operational risk. To examine the impact of annual premium calculation method on deposit insurance, we employ only the post-DI sample for Model 2. In the above model, Risk_{i,t} is financial and

operational risk; $DI_{i,t}$ is a DI period dummy variable that is equal to one for post DI period (2006-2010) and zero for pre-DI period (2002-2005), Riskbased is a dummy variable for annual premium method that is equal to one for riskbased method (2006-2007) and zero for flat-rate method(2008-2010); $Foreign_{i,t}$, $Size_{i,t}$, $Capital_{i,t}$, $Management_{i,t}$ and $NPL_{i,t}$ (non-performing financing to asset ratio) is control variables for bank i.

3. EMPIRICAL RESULTS

3.1 Random Effect Estimation

We evaluate the risk taking behavior (both in financial risk and operational risk) for Islamic banks before and after the introduction of the DI system by employing random effect estimation. The random effect model allows us to estimate the time-invariant bank characteristic such as ownership as opposed to the fixed effect model (Greene, 2012). Table 4 reports the result of a random effect model with robust standard error. The estimated coefficients of DI are always negative for financial risk, suggesting that an effective design feature⁵ of DI system has deterred the Islamic banks from increasing their financial risk taking after the introduction of DI, although with limited evidence,. The reform of DI design features in Malaysia includes the introduction of risk-based premium method in 2008. With respect to the control variables, foreign bank has a negative and statistically significant coefficient implying that perhaps the introduction of DI promotes sound financial risk management practices amongst the foreign Islamic banks.

In Column II of Table 4, we report the results of DI impact on operational risk for the Islamic banks. Although the adherence to Shariah principle acts as a deterrent from increase risk, operational risk in terms of management efficiency can be acute in Islamic banks as the banks' management must ensure that the operations of the Islamic banks are Shariah compliance at all times. Since the Islamic banks are relatively new, the banks have an inferior qualified professional to oversee the operations of Islamic banking.

⁵ Amongst the common design features of DI system is the membership, funding type, sources of fund, insurance premium system, coverage limit and co-insurance (International Association of Deposit Insurers, 2009).

Table 4: Random Effect Model for Robust Standard Error

Sample Period Variables	2002-2010 (Main Model)				2002-2010 (2005 omitted)			
	Financial risk (controlling for ratio of overhead to asset)		Operational risk (controlling for ratio of non-performing financing to asset)		Financial risk (controlling for ratio of overhead to asset)		Operational risk (controlling for ratio of non-performing financing to asset)	
	I		II		III		IV	
	Non-performing financing to gross loan	Non-performing financing to asset	Equity to asset ratio	Overhead to asset ratio	Non-performing financing to gross loan	Non-performing financing to asset	Equity to asset ratio	Overhead to asset ratio
Constant	10.354 (0.30)	5.163 (0.39)	14.903 (0.24)	2.966 (0.26)	10.753 (0.37)	5.702 (0.40)	19.165 (0.12)	3.817 (0.32)
Deposit insurance dummy	-1.436 (0.49)	-0.635 (0.48)	1.278 (0.46)	1.102 (0.02)**	-2.174 (0.389)	-0.745 (0.49)	2.956 (0.13)	1.348 (0.04)**
Foreign bank	-4.350 (0.03)**	-2.323 (0.05)**	-0.165 (0.94)	-0.635 (0.17)	-4.271 (0.06)*	-2.309 (0.08)*	-0.470 (0.84)	-0.781 (0.27)
Risk weighted capital ratio	0.009 (0.74)	-0.006 (0.61)	0.235 (0.004)***	0.042 (0.20)	0.017 (0.54)	-0.004 (0.7)	0.193 (0.01)***	0.044 (0.23)
Log of bank asset	-0.378 (0.75)	-0.153 (0.81)	-1.276 (0.37)	-0.365 (0.27)	-0.371 (0.79)	-0.211 (0.78)	-1.841 (0.20)	-0.489 (0.31)
Ratio of overhead to asset	-0.186 (0.25)	-0.015 (0.83)	-	-	-0.165 (0.28)	-0.008 (0.91)	-	-
Ratio of non-performing financing to asset	-	-	0.017 (0.9)	-0.006 (0.89)	-	-	0.113 (0.61)	-0.016 (0.78)
Prob>chi ²	0.0725	0.0001	0.0004	0.1400	0.0904	0.0253	0.0142	0.0821
Observation	147				131			

p-value appears in parentheses below coefficients. *, ** and *** indicates significant at the 10%, 5% and 1% level respectively.
 (Stata xtreg, robust command)

However, with the introduction of DI, these unqualified professionals will leverage on the DI to extend higher financing. This view is supported by the estimated coefficient of DI that is positive and statistically significant for operational risk measure by overhead to total asset ratio (management efficiency). We also conclude that too-big to fail guarantees does not exist among the Islamic banks as the sign of the estimated coefficient for log of bank asset is consistently negative for all the model in Table 4, but with limited evidence. Rather, the ownership of banks is statistically significant with the quality of asset in Islamic banks. Post-DI, the foreign Islamic banks' financial risk reduce significantly. Reflecting the results in Table 5, during post-DI period we found that operational risk has a positive and significant relationship with the risk-based premium method. However, if an Islamic bank takes higher operational risk post-DI, the said banks will be penalized with higher annual insurance premium under the risk-based premium method. Thus, the risk-based premium can act as a control mechanism to mitigate the moral hazard problem particularly operational risk taking for the Islamic banks in a deposit insurance system.

3.2 Robustness

We report results under column III and IV in Table 4 for a different sample periods as a robustness check. The sample period is now 2002-2010 and 2005 excluded. The period 2005 is omitted as it is treated as a base year for the implementation of DI. The DI dummy takes the value of 1 for 2006-2010(post-DI) and 0 if 2002-2004(pre-DI). The results are consistent with the results of the original period presented under column I and II in Table 4. The DI coefficient continues to have statistically significant greater positive association with operational risk confirming the result that Islamic banks have significantly more operational risk after the introduction of DI. We also check our results by employing the Breusch Pagan test. The regression result (not reported) indicates that our time-invariant variable (ownership) is important in our model which favors the Random Effect over the Pooled Ordinary Least Squared Model. On the other hand, the Fixed Effect Model omits our time-invariant coefficient.

4. CONCLUSION

We demonstrate empirically the implication of a DI system on the Islamic banks and how the risk-based premium method mitigates the moral hazard problem. Malaysia is chosen as a sampling analysis due to data availability and being the most advance country in the Islamic banking system. Our novel findings indicate

that Islamic banks have significantly higher operational risk after the introduction of DI. Post-DI we found that if the bank undertakes higher bank risk then they will be penalized with higher annual insurance premium. We also found that management efficiency can be an alternative measure of operational risk. Our result also suggests that an effective DI system that includes the introduction

Table 5: Random Effect Model for Robust Standard Error(Post-DI sample)

Sample Period	2006-2010			
Variables	Financial risk (controlling for ratio of overhead to asset)		Operational risk (controlling for ratio of non-performing financing to asset)	
	I		II	
	Non-performing financing to gross loan	Non-performing financing to asset	Equity to asset ratio	Overhead to asset ratio
Constant	7.070 (0.69)	-1.350 (0.85)	46.744 (0.04)**	9.596 (0.29)
Risk-based premium method dummy	-0.459 (0.62)	-0.480 (0.5)	2.256 (0.02)**	0.613 (0.05)*
Foreign bank	-3.042 (0.21)	-1.114 (0.26)	-4.405 (0.28)	-1.146 (0.29)
Risk weighted capital ratio	-0.021 (0.21)	-0.014 (0.35)	0.204 (0.03)**	0.058 (0.24)
Log of bank asset	-0.157 (0.93)	0.490 (0.52)	-4.638 (0.06)*	-1.098 (0.26)
Ratio of overhead to asset	0.074 (0.65)	0.113 (0.31)	-	-
Ratio of non-performing financing to asset	-	-	0.121 (0.72)	0.173 (0.01)**
Prob>chi ²	0.0281	0.0441	0.0047	0.2357
Observation	90			

p-value appears in parentheses below coefficients. *, **and *** indicates significant at the 10%, 5% and 1% level respectively. (Stata xtreg, robust command)

of risk-based premium can promote prudential risk management amongst the Islamic banks as the premium penalty deters banks to have incentives for higher risk taking. Reminiscence of our result, the scrutiny of international regulations such as the Accounting and Auditing Organization for Islamic Financial Institution and Islamic Financial Services Board on the Islamic banks would overcome this moral hazard problem and place them at par with their conventional counterparts.

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