Regulatory capital funds and risk-sharing behavior in distressed financial conditions: An empirical analysis on Islamic banks in Malaysia

Abstract - This paper attempts to investigate on adequacy of regulatory capital funds through loss provisioning policies due to worsening credit quality associated with distressed financial conditions. A financial distress occurs when banks have difficulty in honoring financial commitments. This paper is expected to unveil how the provisioning mechanisms can address concerns associated with pro cyclicality of regulatory capital funds requirements, and how the banks behave in distressed financial conditions to share risks. The pro cyclicality of regulatory capital funds is the effect of various components of the financial system that aggravates the economic cycle such as during the expansion of the economy when banks are able to provide more loans and meet regulatory capital requirements with ease, while during the contraction of the economic cycle, can lead to deterioration of asset quality, and the resultant need to make loss provisions and recognize impairment. In turn, the situation puts further pressures on the capital requirements held by banks, and their risk-sharing behavior. The paper analyses on a sample of Islamic banks in Malaysia.

Purpose - The paper is expected to unveil how the provisioning policies can address concerns associated with pro cyclicality of regulatory capital funds requirements, and how the banks behave to share risks in the distressed financial conditions.

Design/methodology/approach - By estimating credit risk-related information through loss provisioning policies, the paper employs an unbalanced panel data on all Islamic banks in the Association of Islamic Banking Institutions Malaysia (AIBIM) over the period of 2003 to 2014. The association consists of full-fledged Islamic banks and several foreign-owned entities.

Findings - The paper find support that Islamic banks during observed period of distressed financial conditions were less discouraged to increase their regulatory capital funds to share risks. Intuitively, they were more encouraged to engage in risk-shifting behavior. Also, the risk-shifting behavior was found to have a significantly high potential in foreign-owned Islamic banks than in domestic Islamic banks.

Research limitations/implications - Although the study is based on a sample of Islamic banks in Malaysia, the findings suggest targeted interventions aimed at discouraging risk-shifting or transfer of risks in an interest-free Islamic financing.

Practical implications - The outcome of this paper has practical implications for Islamic banks to build a buffer of capital funds to face downward pressures during heightened financial uncertainties while serving as protection to depositors. Moreover, for shareholders to avail themselves the benefits of high investment accounts financing. The Islamic banks can continue to play their role in promoting inclusive growth, reducing inequality and accelerating poverty reduction.

Originality/value – This paper is the first that investigate on adequacy of regulatory capital funds of Islamic banks through loss provisioning policies.

Keywords - Regulatory capital funds, risk-sharing behavior, loss provisioning mechanisms

Paper type Research paper

1. Introduction

The role of regulatory capital funds for banks is to protect the safety and soundness of banks of negative externalities caused by bank defaults according to Berger, Herring and Szego (1995). It's one of regulators' key measures as a buffer against credit risk Abdel Karim (1996) points out. In a recent study which set out to examine the nature of risk management practices of Islamic banks internationally, Rosman and Abdul Rahman (2015) reveal of a current set of guidelines by the International Financial Services Board (IFSB). The purpose of the guidelines is to measure unique risks in Islamic finance. In the study, the authors subscribed to the belief that the spirit of profit-sharing mode reflects how risks should be handled in Islamic finance not only in sources of funds, but also in financing and investment activities. In a recent study using data on Islamic banks in Malaysia, Mohd Isa and Abdul Rashid (2017) document that deposits, financing and investment accounts exhibit co-integration behavior over the long run. The protection of banks' safety and soundness is important because bank defaults could set off a chain

reaction that may undermine the stability of the whole financial system. Earlier Marcus (1984) demonstrated that incentives to risk-taking intensify when a bank falls into financial distress. This leads to higher incidences of insolvency of banks. The major concern is systemic risk of contagious collapses of one bank's failure can trigger a series of others. The regulatory capital funds are different from a market-based capital requirement which is the capital ratio that maximizes the value of the bank in the absence of the regulatory capital requirement. The regulatory capital funds on the other hand, are generally tools or standards which respond only minimally to perceived differences in risk as documented by Berger, Herring and Szego (1995). Freeland and Friedman (2007) in their writings on Islamic finance challenges to regulatory capital funds go on to suggest that regulatory capital can evaporate rapidly if only a small proportion of the loans are impaired or turn out to be irrecoverable. In this context, a recent study on non-performing loans effect of regulatory capital fund in Ghana by Osei-Assibey and Kwadwo Asenso (2015) find evidence the higher regulatory capital funds the higher risk-taking activities of the banks. Thus, the higher regulatory capital is associated with higher non-performing loans, the authors conclude.

In practice, the regulatory capital funds and loan loss provisions for banks can be viewed as two substitutable forms of protection against insolvency risk. While loan loss provisions are meant to cover "expected losses" associated with worsening credit quality, "unexpected losses" are to be covered by regulatory capital funds. Because loss provisioning policies and adequacy of regulatory capital funds are linked together through the coverage of credit risk, the ongoing distressed financial conditions often associated with risk-shifting behavior according to Hovakimian and Kane (2000), and Duran and Lozano-Vivas (2014) as well as reformed in financial rules have highlighted the role of loan loss provisions in determining the pro cyclical nature of regulatory capital funds.

However, a previous study of Daher, Masih and Ibrahim (2015) on risk exposures due to displaced-commercial risk and rate-of-return risk on capital funds has not dealt with the impact of non-performing finance on capital buffers despite the acknowledgment that banks' capital behave in a pro cyclical manner. Hovakimian and Kane (2000) in their paper that examined risk-shifting incentives of commercial banks in the United States from 1985 through 1994 reveal weaknesses in capital supervision This has led banks to intensify their risk-taking behavior, the authors' claim.

The loan loss provisioning policies can reduce the pro cyclical nature of regulatory capital funds because banks can increase reserve funds by making more loan loss provisions during an economic expansion while they can draw from the reserve funds when credit losses become higher during distressed financial conditions. Fonseca and Gonzalez (2008) in their study on income smoothing by managing loan loss provisions however showed that the impact of a financial crisis cannot be defined a priori; on the one hand, financial crisis could have severely constrained the discretional use of loan loss provisions to manage regulatory capital funds; on the other hand it could also encouraged risk-shifting through loan loss provisions.

This paper attempts to investigate on adequacy of regulatory capital funds of Islamic banks through loss provisioning policies associated with distressed financial conditions.

The Malaysian Ringgit had depreciated due to the strengthening of the US dollar, which was driven by the expectations of interest rate normalization by the Federal Reserve amid the recovery in the US economy. Therefore, fundamentally the weakening of the Malaysian currency was attributed more by the developments in the advanced economies than by any specific country-related factors. The Bank Negara Malaysia (BNM) reports in 2014 the currency depreciated by 6.1% to end the year at RM3.495 against the US dollar (Bank Negara Malaysia (BNM) Annual Report 2014, pp. 45). Between 1 January 2015 and 10 February 2015, the Malaysian currency depreciated against the US dollar by 2.4% according to the Bank Negara Malaysia's (BNM) Economic and Financial Developments Report dated 12 February 2015.

In this paper, we expect in the post-2014 periods in view of the volatility of the Malaysian currency which pose a higher insolvency risk, Islamic banks to have stronger incentive to engage in risk-shifting. To the best of our knowledge this paper is the first attempt to investigate on adequacy of regulatory capital funds of Islamic banks through loss provisioning policies. To accomplish this objective, we employ an unbalanced panel data on all Islamic banks in the Association of Islamic Banking Institutions Malaysia (AIBIM) consisting of full-fledged Islamic banks and several foreign-owned entities over the period 2003 to 2014.

The remainder of the paper is organized as follows: In Section 2 is a review of literature and development of hypothesis. Section 3 discusses the methodology adopted in the analysis and Section 4 presents and discusses the empirical evidences. The section also includes a discussion on the most appropriate model with efficient parameter estimates. Section 5 concludes the paper**.**

2. Literature review and hypotheses development

Curcio, Dyer, Gallo and Gianfrancesco (2014) describe how loan loss provisioning policies may have caused counterintuitive results. The authors tested for capital management hypothesis in the Chinese banking sector during the global financial crisis, but it might have been far more convincing if they showed concrete distinctions between loan loss provisions and reserve funds. The authors single out a previous study by Ng and Roychowdhury (2011) that find a positive association between regulatory capital funds and bank failures but make no attempt to differentiate between various types of capital funds. Also in regards to conventional banking, in the paper Curcio, Dyer, Gallo and Gianfrancesco (2014) referred to Fonseca and Gonzalez (2008). The latter were of the view loss provisions practice in the conventional banking as one form of risk-shifting behavior. Taking into account the behavior, Mokni, Rajhi and Rachdi (2016) explain certain features inherent in Profit and loss sharing (PLS) contracts make Islamic banks to shift risk to investment depositors. This is among differences in risk sharing and risk shifting in conventional banks from Islamic banks. In order to qualify as regulatory capital funds Berger, Herring and Szego (1995) include capital that should reduce bank's moral hazard incentives to excessive risk-shifting. In this aspect, the Malaysia's Islamic Financial Services Act 2013 section 12 (4) published on 22 March 2013 defines capital funds or surplus of assets over liabilities to be paid-up capital and reserves. Nevertheless it is interesting to note that Daher, Masih and Ibrahim (2015) from a study on Islamic banks' regulatory capital buffers fully acknowledge inconsistency across jurisdictions in calculations of the capital. In their estimation model to measure the overall susceptibilities of the banks' regulatory capital funds, they account for bank specific control variables by including variables such as non-performing loans and loan loss provisions.

In a study on impact of banking regulations on risk-taking behavior in Islamic banking, Alam (2013) suggests giving more emphasis to provide regular and accurate information to regulators and market participants. It aims to reduce the level of riskiness of Islamic banks. The author concludes a higher regulatory capital requirements encourage less risk-taking behavior in Islamic banks. The research to date has tended to focus on commercial banks. For instance, in Ghana, Osei-Assibey and Kwadwo Asenso (2015) discover a positive association of regulatory capital with non-performing loans. The authors establish that excess capital increases risk-taking activities of the banks. However, these studies might have been far more useful if they had extended on how regulators can impose higher capital requirements so that risks can be shared in order to achieve greater prosperity. Through this way, Islamic banks can continue to play an effective role to promote inclusive growth, reduce inequality and accelerate poverty reduction through allocating and mobilizing resources to more productive ventures apart from serving as protections to depositors from undue risks.

This paper is different from the study by Duran and Lozano-Vivas (2014) on risk-shifting behavior in the US banking system from 1998-2011. Instead of risk-shifting, that is a conflicting moral hazard problem between banks and creditors due to misalignment of their interests, this paper analyzes the concept of risk-sharing in financial contracts, one of the unique features of Islamic finance. In a more recent study on risk management practices of Islamic banks internationally, Rosman and Abdul Rahman (2015) indicate the prudential guiding principles on risk management set out by the Islamic Financial Services Board (IFSB). The authors also stress the overarching spirit of sharing in Islamic intermediation that includes the ways risks should be managed.

In their study, Duran and Lozano-Vivas (2014) fully acknowledged that risk-shifting is more severe in banks than in other firms due to the relative ease with which banks can change financial risks without being closely monitored by creditors. The nature of the banking industry that is highly leveraged is another reason for severity of risk-shifting in banks. Pratomo and Ismail (2006) in their study on Islamic bank performance and capital structure showed agency costs may be high in banks attributed to the setting of minimum regulatory capital by regulators. Orhan Astrom (2013) in his paper on a new approach for credit risk management in Islamic banks proposes that Islamic banks should inform their investment

depositors at regular periods about how their capital was being used. His paper would have been far more interesting if he had discussed on how increased capital adequacy will allow Islamic banks to play a role in promoting inclusive growth, reducing inequality and accelerating poverty reduction. This would be in tune with explanation of Askari, Iqbal, Krichene and Mirakhor (2012) on how risk-sharing would addressed agency problem through complete sharing of information, and for the agents to behave in a way that maximizes rewards for the principal. Further the authors elaborate that risk-sharing finance is trust-intensive because it discourages risk-shifting or transfer of risks that is a common feature in an interest-based debt financing. In his notes on risk-sharing in Islamic banking Rosly (2015) highlights that in contrast to conventional banking (that practices shifting of risks), in Islamic banking, impairment losses too are charged or shared by both shareholders and depositors. The author further suggests that the rewards to the depositors could be higher than the deposit rates.

The concept of risks sharing in Islamic finance removes biases against equity financing or direct asset financing, argues Askari, Iqbal, Krichene and Mirakhor (2012). The authors too observe differences between conventional and Islamic securitized securities, and the differences are to be given in Table 2.1 below.

Table 2.1: Comparisons of conventional and Islamic securitized securities

	Conventional Asset-backed Security	Islamic Asset-linked security
Ownership	Security holder does not own the asset, but owns a security against the asset.	Security holder has ownership interest in the underlying asset
Recourse	Security holder does not have recourse to the asset in the event of distress	Security holder has recourse to the underlying asset in the event of distress
Risk shifting	Risk transfer where risks are transferred to a 3rd party in the event of default because of multi layer originator and credit enhancements	Risks sharing where investors will share in the loss

Source: Hossein Askari, Zamir Iqbal, Noureddine, Krichene and Abbas Mirakhor (2012), "*Risk Sharing in Finance. The Islamic Finance Alternative*", pp. 128

This paper is different from a seminal paper by Berger, Herring and Szego (1995) which described the central role of regulatory capital in financial institutions. In that paper, the authors identified two unintended effects of regulatory capital on bank portfolio risk. They are explosive growth of securitization and inefficiencies in allocating loan portfolios. However, in this paper we examine how loss provisioning policies can reduce the pro cyclical nature of regulatory capital funds because the banks can draw from reserve funds when credit losses increase as documented by Fonseca and Gonzalez (2008).

This paper contributes to the existing literature on adequacy of regulatory capital funds and risks behavior in Islamic banks in four ways. First, it investigates on adequacy of regulatory capital funds of Islamic banks through loss provisioning policies. In this aspect, the actual regulatory capital funds is prescribed in the Malaysia's Islamic Financial Services Act 2013, section 12 (4) as paid-up capital and reserves. Berger, Herring and Szego (1995) published a paper on the role of capital in financial institutions in which they described the regulatory capital requirements are to be set at the level that the probability of default is negligible. The minimum regulatory capital funds requirements for banking institutions in Malaysia is 7%. It is the capital conservation buffer ("conservation buffer is a buffer that can be run down during periods of market distress, without hitting the regulatory reserve, thus preserving the bank as a going concern" as Choudhry (2012), pp. 118 concludes) at 2.5%, plus the minimum core Tier 1 capital at 4.5%, totaling a percentage of 7%. It is in line with the Basel III framework that will be phased in from 2016, and will be fully effective in January 2019 which the Bank Negara Malaysia (BNM) supports its implementation to strengthen the quality of capital for banks in Malaysia. Beatty, Chamberlain and Magliolo (1995), and Leventis, Dimitropoulos and Anandarajan (2011) tested the actual regulatory capital funds in calculating the minimum required regulatory capital funds as revealed by Curcio, Dyer, Gallo and Gianfrancesco (2014) in their paper.

Second, this paper contributes to the existing literature by analyzing the concept of risk-sharing in Islamic financial contracts, one of the unique features of Islamic finance, not risk-shifting that is a

common feature in the conventional banking industry. Hussain and Al Ajmi (2012) comparative study of risk management practices of conventional and Islamic banks found that conventional banks shift the entire risk to borrower when they provide loans which are fully backed against borrower's assets. On the other hand Islamic banks' products such as, mudharabah and musharakah are sutructured so that the banks share the risk with the clients. The authors went on to postulate because of principles of risk sharing in Islamic banking, Islamic banks tend to face significantly higher levels of overall risk than their conventional counterparts. Recently Mohd Isa and Abdul Rashid (2017) highlighted too little attention has been given by Islamic banks to the intermediation of deposits to equity-based transactions such that the banks come under pressure including from shariah boards. They pursued the banks to evolve to risk-sharing transactions from debt instruments. Onagun (2012) in his article on the principle of risk-sharing in Islamic banks point out that the risk-sharing principle can be applied through diversification of assets portfolio. Furthermore, the principle allows owners of capital to share the profits made by the entrepreneur. Through this way, the Islamic banks can compete with their conventional counterparts, the authors argue.. In the case of the conventional banks, Hovakimian and Kane (2000) provide evidence that capital requirement had little influence to control risk-shifting incentives. The authors used the sample of US commercial banks from 1985 to 1994 to show that risk-shifting to have a significantly high potential due to weaknesses in the administration of deposit insurance scheme. Intuitively they documented that capital requirement did not prevent the banks from shifting risk on the the safety net .

Third, the paper estimates the extent of the risk of finance originating in time *t* that will only be reflected in time *t+1*. Fourth, the paper measures the extent of risk-sharing among Islamic banks based on differences in ownership structure whether domestic or foreign, and of secondary interest the paper assesses the extent of Islamic banks towards reformed measures to correct deficiencies still existing in the current capital framework. Considered in this light, Awdeh and Hamadi (2011) in their analysis on determinants of bank capital in Lebanese market suggest a framework that reduces the pro cyclicality of capital adequacy requirements, and that creates a counter-cyclical capital buffers.

The null hypotheses in this paper are stated as follows:

Ho $_1$: The relationship between loss provisions (LP) and regulatory capital funds (CAP) will be significantly positive in Islamic banks during the distressed financial conditions.

Ho $_2$: The extent of risk transfer will be significantly deserved to be encouraged in foreign-owned Islamic banks than domestic Islamic banks.

3. Methodology

3.1 Methodology adopted in the analysis

In order to extend from a past research by Curcio, Dyer, Gallo and Gianfrancesco (2014) on determinants of banks' provisioning policies during a financial crisis in the Chinese banking system, this paper investigates on adequacy of regulatory capital funds through loss provisioning policies. It focuses on estimating of credit risk-related information as provided by Non-Performing Finance (NPF). It's a similar approach as adopted by Curcio and Hasan (2013), and Packer and Zhu (2012). The following equation is to test hypothesis Ho $_1$ that relationship between loss provisions and regulatory capital funds will be significantly positive in Islamic banks during distressed financial conditions

$$Logged\ LP_{i,,t} = \alpha_0 + \alpha_1\ Logged\ NPF_{i,t} + \alpha_2\ Logged\ FIN_{i,t} + \alpha_3\ Logged\ CAP_{i\,t} + \alpha_4\ Logged\ TA_{i,t} + \alpha_5\ Logged\ GDP_{i,t} + \varepsilon_t$$

The dependent variable is Loss Provision (LP $_{i,\,t}$) at time t for bank i. On the other hand, the five predictor or explanatory variables as have been applied in many investigational studies on determinants of loss provisions are; Non-Performing Finance (NPF), Total Finance and Advances (FIN), Regulatory Capital Funds (CAP), Total Assets (TA), and the growth rate of the Gross Domestic Product (GDP).

The Non-Performing Finance (NPF $_{i,t}$) tests for management of regulatory capital funds by estimating the credit risk-related information that is provided by Non-Performing Finance (NPF). The NPF $_{i,t}$ is the Non-Performing Finance (NPF) for bank $_i$ at time $_t$. It was decided that the best method to adopt for this investigation was to represent specific component of Non-Performing Finance (NPF) that captures the current level and the dynamics of losses within the finance and advances portfolio. The same approach

was estimated by among others, Ahmed, Takeda and Thomas (1999); Bouvatier and Lepetit (2008), and Packer and Zhu (2012). In a more recent study by Osei-Assibey and Kwadwo Asenso (2015), the authors also states that the variable NPF serves as an indicator of risk taking incentives. The Loss Provisions (LP) is expected to be positively related to the Non-Performing Finance (NPF).

The total finance, advances and others ($FIN_{i,t}$) is the amount of total finance, advances and others at time *t* for bank *i*. It captures general Loss Provisions (LP) based on the size of an Islamic bank's portfolio of finance and advances. The variable accounts for year-on-year changes that may reflect the level of risk being taken on by the banks. It is expected that total finance, advances and others (FIN) to be positively related to the Loss Provisions (LP).

The regulatory capital funds ($CAP_{i,t}$) is the regulatory capital funds at time *t* for an Islamic bank *i*. The relationship of higher regulatory capital requirement on risk-taking behavior is the central focus of study by Miah and Sharmeen (2014). The regulatory capital funds management hypothesis is supported if the coefficient of the variable $CAP_{i,t}$ is positively related to the Loss Provisions (LP). A positive relationship between the regulatory capital funds (CAP) and the Loss Provisions (LP) implies the risk-sharing in the Islamic banks to have a significantly high potential, that is, they set aside loss provisions to increase regulatory capital funds to share risk, and vice-versa.

The Total Assets (TA_{it}) is included as one of the predictor variables to control for an Islamic bank's size where larger banks can take advantage to diversify both their assets and financial structure according to Stiroh (2010) to achieve greater diversification benefits. A positive relationship between Total Assets (TA) and Loss Provisions (LP) would constitute risk-sharing behavior, implying that the banks that provision their losses more increase their regulatory capital funds through reserves, also encourage risk sharing and vice versa.

The annual growth rate of the Gross Domestic Product ($GDP_{i,t}$) is the annual growth rate of the Gross Domestic Product (GDP) at constant prices for year $_t$. The variable captures the effect of macroeconomic conditions. A negative coefficient would be consistent with the pro cyclical nature of Loss Provisions (LP) to imply the banks reduce their loss provisions to raise their capital funds in the event of distressed financial conditions. The Gross Domestic Product (GDP) of Malaysia for the period 2003 to 2014 is to be given in Table 3.1 below.

Table 3.1 The Gross Domestic Product (GDP) of Malaysia 2003 - 2014

No.	Year	Gross Domestic Product (GDP)	No.	Year	Gross Domestic Product (GDP)
1.	2003	5.2%	8.	2010	7.2%
2.	2004	7.1%	9.	2011	5.1%
3.	2005	5.3%	10.	2012*	5.6%
4.	2006	5.9%		**Beginning 2012, real GDP is based on 2005 prices*	
5.	2007	6.3%			
6.	2008	4.6%	11.	2013	4.7%
7.	2009	3.0%	12.	2014	6.0%

Source: Bank Negara Malaysia (BNM)

3.1.1 Testing the effect of the risks originating in time t to be reflected in time t+1

Further, in a similar manner as tested by Shrieves and Dahl (1992), the Non-Performing Finance (NPF) is lagged forward by one period to estimate the effect of the risk from finance and advances originating from time *t* that will only be reflected in time *t+1*. To accomplish this, the variable $NPF_{i,t+1}$ is added in the equation.

$$Logged\ LP_{i,,t} = \alpha_0 + \alpha_1\ Logged\ NPF_{i,t} + \alpha_2\ Logged\ FIN_{i,t} + \alpha_3\ Logged\ CAP_{i\,t} + \alpha_4\ Logged\ TA_{i,t} + \alpha_5\ Logged\ GDP_{i,t} + \alpha_6\ Logged\ NPF_{i,t+1} + \varepsilon_t$$

3.1.2 Testing the risk behavior of Islamic banks based on differences in ownership structure

Also, the paper investigates the risk behavior of Islamic banks based on differences in ownership structure whether the banks are domestic or foreign Islamic banks. It is to test hypothesis Ho_2 on the extent of risk-shifting whether will be significantly deserved to be encouraged in foreign-owned Islamic banks than domestic Islamic banks or vice versa. In the work of Duran and Lozano-Vivas (2014), they discovered the incentives to engage in the behavior are weaker if the ownership structure or stake in the bank is higher. This is so as the owners have more to lose if the risk-shifting strategy fails.

3.2 Sample and Data

The data are extracted from the published annual reports of the banks, and the data are reported in thousands of Ringgit Malaysia (RM'000). The Islamic banks included in the analysis are to be given in Table 3.2 below.

Table 3.2: Islamic banks included the analysis

No	Association of Islamic Banking Institutions Malaysia (AIBIM)	Years of the analysis
	Domestic Banks	
1.	Affin Islamic Bank (Malaysia) Berhad	31/12/2007 - 31/12/2014
2.	Alliance Islamic Bank (Malaysia) Berhad	31/3/2008 - 31/3/2014
3.	AmIslamic Bank (Malaysia) Berhad	31/3/2006 - 31/3/2014
4.	Bank Islam (Malaysia) Berhad	31/12/2004 - 31/12/2014
5.	Bank Muamalat (Malaysia) Berhad	31/3/2004 - 31/3/2014
6.	CIMB Islamic Bank (Malaysia) Berhad	31/5/2005 - 31/12/2014
7.	Hong Leong Islamic Bank (Malaysia) Berhad	30/6/2006 - 31/12/2014 - unaudited as at 31/12/2014
8.	Maybank Islamic Bank (Malaysia) Berhad	30/6/2008 - 31/12/2014
9.	Public Islamic Bank (Malaysia) Berhad	31/12/2007 - 31/12/2014
10.	RHB Islamic Bank (Malaysia) Berhad	31/12/2005 - 30/9/2014 - unaudited 9 months ended 30/9/2014
Domestic Development Financial Institutions		
1.	Bank Kerjasama Rakyat (Malaysia) Berhad	31/12/2007 - 31/12/2013
2.	Bank Simpanan Nasional (BSN) (Operations of Islamic Banking)	31/12/2006 - 31/12/2013
3.	MBSB (Malaysia) Berhad (Operations of Islamic Banking)	31/12/2003 - 31/12/2014
4.	Agrobank (Malaysia) Berhad	31/12/2012 - 31/12/2013
Locally Incorporated Foreign banks		
1.	Al-Rajhi Banking & Investment Corporation (Malaysia) Berhad	31/12/2006 - 30/9/2014 - interim unaudited ended 30/9/2014
2.	Asian Finance Bank Berhad	31/12/2007 - 30/9/2014

		- interim 9-months ended 30/9/2014
3.	BNP Paribas Malaysia Berhad (Islamic Banking Operations)	Its Islamic Banking Operations started on 4 June 2012. Excluded from the analysis.
4.	Bank of Tokyo-Mitsubishi UFJ (M) Bhd	Excluded from the analysis
5.	Citibank (M) Berhad (The Operations of Islamic Banking)	31/12/2006 - 3rd quarter 2014 unaudited
6.	HSBC Amanah (M) Berhad	31/12/2009 - 31/12/2014
7.	Kuwait Finance House (Malaysia) Berhad	31/12/2006 - 31/12/2014
8.	OCBC Al-Amin Bank Berhad	31/12/2009 - 30/9/2014 - unaudited financial period ended 30/9/14
9.	Standard Chartered Saadiq Berhad	31/12/2008 - 30/9/2014 - nine months ended 30/9/2014
International Financial Institutions		
1.	Alkhair International Islamic Bank Berhad	Excluded from the analysis
2.	PT bank Muamalat Indonesia Tbk	Excluded from the analysis

4. Empirical results

4.1 Descriptive statistics

The descriptive statistics for the variables are to be given in Table 4.1 below

Table: 4.1Descriptive statistics

Variable		Mean	Std. Dev.	Min.	Max	Observations
LP	overall	83517.09	161011.2	-27611	1325478	N = 173
	between		121208.2	- 186.2222		
	within		114424.3		557087.9	n= 21
				- 247048.8		
					1176957	T-bar=8.2381
NPF	overall	315444.1	411800.5	0	2327151	N= 173
	between		348280.3	9934	1321920	n= 21
	within		241346.1	- 357834.9	1684014	T-bar=8.2381
FIN	overall	1.09e+07	1.51e+07	0	1.08e+08	N= 173
	between		1.35e+07	369193.3	5.52e+07	n= 21
	within		8586813	- 2.33e+07	6.35e+07	T-bar=8.2381
CAP	overall	1334551	1682016	- 277840	11,283,224	N= 173
	between		1579480	203716.8	7106287	n= 21
	within		853913.6	- 1807642	5511489	T-bar=8.2381
TA	overall	1.73e+07	2.12e+07	9689	1.46e+08	N= 173
	between		1.90e+07	1472593	7.76e+07	
	within		1.20e+07	-3.34e+07	8.61e+07	n= 21
						T-bar=8.2381
GDP	overall	5.349711	1.16677	3	7.2	N= 173
	between		0.1122414	5.15	5.527273	n= 21
	within		1.161727	2.822438	7.378282	T-bar=8.2381
Islamic bank	overall	10.50867	5.971462	1	21	N= 173
	between		6.204837	1	21	n= 21
	within		0	10.50867	10.50867	T-bar=8.2381
year	overall	2010.012	2.712993	2003	2014	N= 173
	between		0.9568052	2008.5	2012.5	n= 21

within		2.578421	2004.512	2015.512	T-bar=8.2381

Note; LP = Loss Provisions, NPF = Non-Performing Finance, FIN = Finance, Advances and Others, CAP = Regulatory Capital Funds, TA = Total Assets, and GDP = Gross Domestic Products

By construction the panel identifier, Islamic bank does not vary within the panels, i.e. it is time-invariant, therefore the within standard deviation was reported as zero.

In the above results from 2003 to 2014 the Loss Provisions (LP) has a mean of RM83,517.09 for the 21 Islamic banks in the study. The highest loss provisions of RM1,325,478 was reported by Bank Islam for the financial year ended 30/6/2006 mainly attributed to the specific allowance of RM1,237,296 made during the financial year for bad and doubtful financing. While the lowest loss provisions of - RM27,611 was reported by Maybank Islamic in 2012 attributed by bad financing recovered of RM102,352 during the financial year.

The regulatory capital funds consisting of paid-up capital and reserves has a mean of RM1,334,551. The negative regulatory capital funds of - RM277,840 was reported by Bank Islam for the financial year ended 30/6/2006 in light of net losses amounting to RM1,296,789 in the financial year.

4.2 Pooled Ordinary Least Squares (OLS)

If the individual effect of the banks does not exist, the model produces efficient and consistent parameters estimates. The results of the Pooled OLS are to be given in Table 4.2 below.

Table 4.2 Pooled OLS

Source	SS	df	MS		Number of obs = 151
Model	150.682675	5	30.1365349		F (5,145) = 17.47
Residual	250.061282	145	1.72456057		Prob > F = 0.0000
Total	400.743957	150	2.67162638		R-squared = 0.3760
					Adj R-squared = 0.3545
					Root MSE = 1.3132

LP	Coef.	Std. Err.	t	P> [t]	[95% Conf. Interval]	
NPF	0.1724935	0.106081	1.63	0.106	- 0.0371713	0.3821584
FIN	1.111264	0.3506142	3.17	0.002	0.4182895	1.804239
CAP	- 0.0540848	0.1717674	- 0.31	0.753	- 0.3935762	0.2854065
TA	- 0.4986698	0.452472	- 1.10	0.272	- 1.392962	0.3956228
GDP	- 0.499306	0.422988	- 1.18	0.240	- 1.335325	0.3367127
_cons	0.6816654	2.058666	0.33	0.741	- 3.387206	4.750536

Note: LP =Logged Loss Provisions, NPF = Logged Non-Performing Finance, FIN = Logged Finance, Advances and Others, CAP = Logged Regulatory Capital Funds, TA = Logged Total Assets, and Logged GDP = Gross Domestic Products

In the above results, the prediction equation is LP = 0.1724935 (NPF) + 1.111264 (FIN) – 0.0540848 (CAP) - 0.4986698 (TA) – 0.499306 (GDP) + 0.6816654, indicating the loss provisions is predicted to increase by RM0.1724935 when the non-performing finance goes up by RM1,000, increase by RM1.111264 when finance and advances goes up by RM1,000, decrease by RM0.0540848 when regulatory capital funds goes up by RM1,000, and decrease by RM0.4986698 when total assets goes up by RM1,000. The loss provision is predicted to be RM0.6816654 when non-performing finance, finance and advances, regulatory capital funds, total assets, and the Gross Domestic Products (GDP) are zero.

Also, since the overall significance F test for the regression as a whole is Prob>F=0.0000, each individual explanatory variable has some correlation with the loss provisions. As expected the Loss

Provisions (LP) was positively related to the Non-Performing Finance (NPF). Also, as expected the total finance, advances and others (FIN) was positively related to the Loss Provisions (LP).

However, the regulatory capital funds management hypothesis (Ho $_1$) is not supported as the coefficient of the regulatory capital funds (CAP $_{i,t}$) is negatively related to the Loss Provisions (LP). The results provide an empirical evidence to indicate during the distressed financial conditions, risk-shifting was found to have a significantly high potential to incentivize among the Islamic banks.. A negative relationship is also consistent with the risk absorbent features of regulatory capital funds as put forth by Daher, Masih and Ibrahim (2015) The negative coefficient between Total Assets (TA) and Loss Provisions (LP)indicates lesser risk-sharing behavior, implying the banks that provision their losses more, however reduces their regulatory capital funds so that they reduce risk-sharing as well. This finding corroborates with Daher, Masih and Ibrahim (2015) who suggested the presence of regulatory forbearance during the crisis periods. The authors conclude that Islamic banks are more likely to dis-intermediate during the crisis periods.. It is apparent also that risk is influenced by the level of capital. In line with the explanation of Miah and Sharmeen (2015), the results show the rise in the level of capital provides cushion to safeguard the banks from excessive risk-taking; however, the negative coeeficient of the regulatory capital funds ($CAP_{i,t}$) shows risk-shifting was found to have a significantly high potential in the Islamic banks .

4.3 NPF $_{i, t+1}$

The Non-Performing Finance (NPF) is lagged forward by one period to estimate the effect of the risk from finance and advances originating from time *t* that will only be reflected in time *t+1*. The results are to be given in Table 4.3 below.

Table 4.3 NPF $_{i, t+1}$

Source	SS	df	MS		Number of obs = 131
Model	114.415407	6	19.0692345		F (6,124) = 11.16
Residual	211.806067	124	1.70811345		Prob > F = 0.0000
Total	326.221475	130	2.50939596		R-squared = 0.3507
					Adj R-squared = 0.3193
					Root MSE = 1.3069

LP	Coef.	Std. Err.	t	P> [t]	[95% Conf. Interval]	
NPF	0.3897569	0.1564658	2.49	0.014	0.0800671	0.6994466
NPF $_{i, t+1}$	- 0.2108944	0.0959839	- 2.20	0.030	- 0.4008734	- 0.0209154
FIN	1.104234	0.4695654	2.35	0.020	0.1748324	2.033635
CAP	- 0.1385672	0.1851072	- 0.75	0.456	- 0.5049461	0.2278118
TA	- 0.3742722	0.5859612	- 0.64	0.524	- 1.534053	0.7855091
GDP	- 0.7542875	0.4551532	- 1.66	0.100	- 1.655163	0.146882
_cons	0.1624696	2.320406	0.07	0.944	- 4.429264	4.756203

Note: LP = Logged Loss Provisions, NPF = Logged Non-Performing Finance, **NPF $_{i, t+1}$ = Logged Non-Performing Finance is lagged forward by one period to time t+1**, FIN = Logged Finance, Advances and Others, CAP = Logged Regulatory Capital Funds, TA = Logged Total Assets, and GDP = Logged Gross Domestic Products

The rationale of a negative association between the lagged-forward Non-Performing Finance (NPF $_{i, t+1}$) and the Loss Provisions (LP) was due to the additional recovery of bad financing afforded by the extended time t + 1. In the same tune with the findings by Satyajit and Avijit (2015), the management of bad financing as afforded by the additional time becomes crucial to prevent reduction in capital. If we now turn to a related study, Gopal Maji and Kumar De (2015) find positive association of human capital efficiency with the management of credit risk. The authors conclude that skilled human resources as very

crucial in the management of credit risk. Therefore, through utilizing the human resources more efficiently in the extended time, a bank can improve recovery of bad financing. Turning now to the t-statistic for the variable $NPF_{i, t+1}$ at - 2.20 was still considered significant at 95% confidence level to reject the null hypothesis with 95% confidence. Intuitively, the lagged-forward Non-Performing Finance ($NPF_{i, t+1}$) has a significant effect on the Loss Provisions (LP).

4.4 Risk-shifting behavior in foreign-owned Islamic banks versus domestic Islamic banks

Further, the paper measures the extent of risk-sharing behavior among Islamic banks based on differences in ownership structure whether foreign-owned or domestic. The results of computations of the domestic Islamic banks and foreign-owned Islamic banks are to be given in Table 4.4 (i) and Table 4.4 (ii) respectively.

Table 4.4(i) Domestic Islamic banks

Source	SS	df	MS		Number of obs = 105	
Model	108.5295566	5	21.7059112		F (5,99) = 14.70	
Residual	146.167941	99	1.47644385		Prob > F = 0.0000	
Total	254.697497	104	2.4490144		R-squared = 0.4261	
					Adj R-squared = 0.3971	
					Root MSE = 1.2151	
LP	Coef.	Std. Err.	t	P> [t]	[95% Conf. Interval]	
NPF	0.7562789	0.1562588	4.84	0.000	0.4462275	1.06633
FIN	0.7397485	0.4572711	1.62	0.109	- 0.1675766	1.647074
CAP	- 0.0106020	0.2013587	- 0.05	0.958	- 0.4101413	0.3889372
TA	- 0.7080522	0.5681874	- 1.25	0.216	- 1.835459	0.4193548
GDP	-0.5442515	0.473183	- 1.15	0.253	- 1.483149	0.3946462
_cons	2.304179	2.361528	0.98	0.332	- 2.381606	6.989963

Note: LP = Logged Loss Provisions, NPF = Logged Non-Performing Finance, FIN = Logged Finance, Advances and Others, CAP = Logged Regulatory Capital Funds, TA = Logged Total Assets, and GDP = Logged Gross Domestic Products

Table 4.4(ii) Foreign-owned Islamic banks

Source	SS	df	MS		Number of obs = 46	
Model	61.6907078	5	12.3381416		F (5,40) = 8.00	
Residual	61.6739808	40	1.54184952		Prob > F = 0.0000	
Total	123.364689	45	2.74143752		R-squared = 0.5001	
					Adj R-squared = 0.4376	
					Root MSE = 1.2417	
LP	Coef.	Std. Err.	t	P> [t]	[95% Conf. Interval]	
NPF	- 0.251524	0.1516119	- 1.66	0.105	- 0.5579431	0.0548951
FIN	1.88833	0.6670842	2.83	0.007	0.5401025	3.236558
CAP	- 0.2104783	0.4783461	- 0.44	0.662	- 1.177252	0.7562952
TA	- 0.68393	0.970122	- 0.70	0.485	- 2.64462	1.27676
GDP	- 0.4363687	0.7198101	- 0.61	0.548	- 1.891159	1.018422
_cons	- 1.30306878	7.263733	- 0.18	0.858	- 15.98743	13.37367

Note: LP = Logged Loss Provisions, NPF = Logged Non-Performing Finance, FIN = Logged Finance, Advances and Others, CAP = Logged Regulatory Capital Funds, TA = Logged Total Assets, and GDP = Logged Gross Domestic Products

While in both cases - domestic Islamic banks and foreign-owned Islamic banks - the regulatory capital funds management hypothesis (Ho $_1$) was not supported, indicating risk shifting to have high potential in distressed financial conditions, (because the coefficients of the regulatory capital funds (CAP) in both the cases are negatively related to the Loss Provisions (LP)), the extent of risk-shifting was more encouraged in foreign-owned Islamic banks than domestic Islamic banks In calculating how much of the regulatory capital funds (CAP) will decline if the Loss Provisions (LP) increases by one standard deviations? In other words, if the Loss Provisions (LP) increases by 1.800533 *(note: the standard deviation of logged Loss Provisions (LP) was 1.800533),* how much is the effect on the regulatory capital funds (CAP)?

In the case of the domestic Islamic banks, the predicted effect is a decline by 1.800533 (0.010602) = 0.01908925 in the regulatory capital funds. Is the decline large enough? The decline constitutes 0.01908925/1.318829 = 0.0145 of the standard deviation of the regulatory capital funds.

By contrast, in the case of the foreign-owned Islamic banks, the predicted effect is a decline by 1.800533(0.2104783) = 0.378973124 in the regulatory capital funds. The decline in the foreign-owned Islamic banks constitutes 0.378973124/1.318829 = 0.287 of the standard deviation of the regulatory capital funds. As such, the decline in the regulatory capital funds in the foreign-owned Islamic banks was higher than that in the domestic Islamic banks. This provides empirical evidence the extent of risk-shifting was significantly more encouraged in the foreign-owned Islamic banks than in the domestic Islamic banks. This information can be used to develop targeted interventions aimed at discouraging risk-shifting among the foreign-owned Islamic banks whose the behavior can affect the stability of the banking system. Intuitively, in the distressed financial conditions the banks become more cautious not to finance risky ventures and are encouraged to transfer their overall risks.

4.5 To determine the most appropriate model with efficient parameter estimates

For the presence of individual bank effects, it can be either fixed or random effects. The Least Square Dummy Variable (LSDV) fixed effects estimators use a dummy variable where each bank or year has its own different loss provisions (LP) equation, and/or y-intercept that is significantly different from those of other banks, and/or years. How different each bank, and/or year from other banks, and/or years?

4.5(i) The Least Square Dummy Variable (LSDV) fixed effects (*i=bank*)

In this model, it treats Islamic bank no. 1 as a dummy variable in the computation (i.e. Islamic bank no. 1 is Affin Islamic Bank). The LSDV fixed effects (*i=bank*) results are to be given in Table 4.5 (i) below.

Table 4.5 (i) Least Square Dummy Variable (LSDV) fixed effects (*i=bank*)

Source	SS	df	MS	Number of obs = 151
Model	230.314096	25	9.21256385	F (25,125) = 6.76
Residual	170.42986	125	1.36343888	Prob > F = 0.0000
Total	400.743957	150	2.67162638	R-squared = 0.5747
				Adj R-squared = 0.4897
				Root MSE = 1.1677

LP	Coef.	Std. Err.	t	P>[t]	[95% Conf. Interval]	
NPF	0.0520846	0.1147144	0.45	0.651	-0.1749495	0.2791188
FIN	0.7950378	0.521587	1.52	0.130	-0.2372475	1.827323
CAP	-0.1380338	0.289654	-0.48	0.635	-0.7112951	0.4352274
TA	-0.2260022	0.5992731	-0.38	0.707	-1.412038	0.9600336
GDP	-0.5780177	0.378515	-1.35	0.129	-1.327146	0.1711104

Islamic bank						
1.AffinIslamic	a dummy variable/bank					
2.AllianceIslamic	0.20145	0.7219066	0.28	0.781	-1.227293	1.630193
3.Amlslamic	1.618547	0.672726	2.41	0.018	0.2871387	2.949955
4.BankIslam	0.7227835	0.656983	1.10	0.273	-0.5774674	2.023034
5.BankMuamalat	1.334755	0.6382887	2.09	0.039	0.0715027	2.598008
6.CIMBIslamic	1.021718	0.6686289	1.53	0.129	-0.3015813	2.345018
7.HLeongIslamic	-0.7191734	0.6487363	-1.11	0.270	-2.003103	0.5647562
8.MaybankIslamic	-0.0515645	0.7705308	-0.07	0.947	-1.576541	1.473412
9.PublicIslamic	0.4633549	0.7066739	0.66	0.513	-0.9352405	1.86195
10.RHBIslamic	0.3280966	0.6477227	0.51	0.613	-0.9538271	1.61002
11.BankRakyat	2.27844	0.7671089	2.97	0.004	0.760236	3.796643
12.BSN	-0.3399122	0.7001022	-0.49	0.628	-1.725501	1.045677
13.MBSB	0.2430252	0.7899183	0.31	0.759	-1.320321	1.806372
14.Agrobank	1.783517	1.009493	1.77	0.080	-0.2143963	3.781429
15.AlRajhi	0.7647268	0.703456	1.09	0.279	-0.6275	2.156954
16.AsianFinance	0.3981258	0.7643822	0.52	0.603	-1.114681	1.910933
17.Citibank	-1.788745	0.8843633	-2.02	0.045	-3.53901	-0.384804
18.HSBCAmanah	1.279416	0.7264145	1.76	0.081	-0.158249	2.71708
19.KuwaitFinance	-0.2187318	0.719209	-0.30	0.762	-1.642136	1.204672
20.OCBCAlAmin	0.7235939	0.6945615	1.04	0.300	-0.6510295	2.098217
21.StandardCharted	1.03076	0.6724215	1.53	0.128	-0.3000458	2.361565
_cons	3.358716	2.957189	1.14	0.258	-2.493928	9.211361

Note: LP = Logged Loss Provisions, NPF = Logged Non-Performing Finance, FIN = Logged Finance, Advances and Others, CAP = Logged Regulatory Capital Funds, TA = Logged Total Assets, and GDP = Logged Gross Domestic Products

In the above results, deviations of Maybank Islamic Bank from Affin Islamic Bank as - 0.0515645 and deviations of Public Islamic Bank from Affin Islamic Bank as 0.4633549.

4.5(ii) The Least Square Dummy Variable (LSDV) fixed effects ***(i = year)***

In this model, it treats the first year as a dummy variable/year in the computation (i.e. year 2004). The LSDV fixed effects (*i=year*) results are to be given in Table 4.5 (ii) below.

Table 4.5 (ii) Least Square Dummy Variable (LSDV) fixed effects (***i=year***)

Source	SS	df	MS	Number of obs = 151
Model	180.716415	14	12.9083154	F (14, 136) = 7.98
Residual	220.027541	136	1.61784957	Prob > F = 0.0000
Total	400.743957	150	2.67162638	R-squared = 0.4510
				Adj R-squared = 0.3944
				Root MSE = 1.2719

LP	Coef.	Std. Err.	t	P>[t]	[95% Conf. Interval]	
NPF	0.1190337	0.1071778	1.11	0.269	-0.0929168	0.3309842
FIN	1.394933	0.3557551	3.92	0.000	0.6914059	2.098461
CAP	0.0456111	0.1718688	0.27	0.791	-0.2942699	0.3854922
TA	-0.7088406	0.4513167	-1.57	0.119	-0.1601347	0.1836656
GDP	9.502497	5.02959	1.89	0.061	-0.4438232	19.44882
Year						

2004	a dummy variable/year					
2005	2.361311	1.109538	2.13	0.035	0.1671326	4.555489
2006	1.129506	0.6563846	1.72	0.088	-0.168534	2.427547
2007	0.9450283	0.4930742	1.92	0.057	-0.0300558	1.920112
2008	3.652026	1.560927	2.34	0.021	0.5651988	6.738853
2009	8.078063	3.666676	2.20	0.029	0.8269882	15.32914
2010	-0.7078649	0.8725084	-0.81	0.419	-2.433303	1.017574
2011	2.325459	1.051332	2.21	0.029	0.2463866	4.404531
2012	1.399478	0.649172	2.16	0.033	0.1157005	2.683255
2013	2.393518	1.427858	1.68	0.096	-0.4301578	5.217193
2014	0 (omitted)					
_cons	-19.77246	9.86382	-2.00	0.047	-39.27876	-0.2661561

Note: LP = Logged Loss Provisions, NPF = Logged Non-Performing Finance, FIN = Logged Finance, Advances and Others, CAP = Logged Regulatory Capital Funds, TA = Logged Total Assets, and GDP = Logged Gross Domestic Products

In the above results, deviations of year 2010 from year 2004 as - 0.7078649 while deviations of year 2013 from year 2004 as 2.393518

4.6 Fixed-effects (within) regression

The Fixed-effects model examines if intercepts vary across the banks or time periods. Further, unlike the LSDV model in the above calculations that uses dummy variables; the Fixed-effects "within" does not use or need dummy variables in its computations. The Fixed-effects "within" estimation uses variations within each individual bank. The Fixed-effects (within) regression results are to be given in Table 4.6 below.

Table 4.6 Fixed-effects (within) regression

Fixed-effects (within) regression		Number of ob = 151
Group variable: Islamic bank		Number of groups = 21
		Obs per group min = 2
R-sq within = 0.1200		avg = 7.2
between = 0.6633		max = 11
overall = 0.3657		F(5, 12) = 3.41
corr(u_i, Xb) = 0.3896		Prob > F = 0.0064

LP	Coef.	Std. Err.	t	P[t]	[95% Conf.	Interval]
NPF	0.0520846	0.1147144	0.45	0.651	-0.1749495	0.2791188
FIN	0.7950378	0.521587	1.52	0.130	-0.2372475	1.827323
CAP	-0.1380338	0.289654	-0.48	0.635	-0.7112951	0.4352274
TA	-0.2260022	0.5992731	-0.38	0.707	-1.412038	0.9600336
GDP	-0.5780177	0.378515	-1.53	0.129	-1.327146	0.1711104
_cons	3.900739	2.889937	1.35	0.180	-1.818804	9.620283
sigma_u	0.91572506					
sigma_e	1.1676639					
rho	0.38081549	(fraction of variance due to u_i				

F test that all u_i=0 F (20,125) =2.92 Prob > F=0.0001

Note: LP = Logged Loss Provisions, NPF = Logged Non-Performing Finance, FIN = Logged Finance, Advances and Others, CAP = Logged Regulatory Capital Funds, TA = Logged Total Assets, and GDP = Logged Gross Domestic Products

In the above results, the rho = 0.38081549 indicating 38.08% of the variance is due to differences across panels. The Prob > F = 0.0064 which is less than 0.05 indicates all the coefficients in the model are different than zero.

4.7 Random-effects GLS regression

This model explores differences in error variance components across the individual banks or time periods. The Random-effects GLS regression results are to be given in Table 4.7 below.

Table 4.7 Random-effects GLS regression

Random-effects GLS regression		Number of ob = 151
Group variable: Islamic bank		Number of groups = 21
		Obs per group min = 2
R-sq within = 0.1173		avg = 7.2
between = 0.6878		max = 11
overall = 0.3742		Wald chi2 (5) = 49.21
corr (u_i, X) = 0 (assumed)		Prob > chi2 = 0.0000

LP	Coef.	Std. Err.	z	P>[z]	[95% Conf.	Interval]
NPF	0.1189621	0.1071091	1.11	0.267	-0.0909678	0.3288921
FIN	1.072653	0.4111002	2.61	0.009	0.2669119	1.878395
CAP	-0.1040166	0.2195011	-0.47	0.636	-0.5342308	0.3261977
TA	-0.4506508	0.5085587	-0.89	0.376	-1.447408	0.5461059
GDP	-0.543311	0.3803269	-1.43	0.153	-1.288738	0.202116
_cons	1.881873	2.362699	0.80	0.426	-2.748933	6.512678
sigma_u	0.63325265					
sigma_e	1.1676639					
rho	0.22727162	(fraction of variance due to u_i				

Note: LP = Logged Loss Provisions, NPF = Logged Non-Performing Finance, FIN = Logged Finance, Advances and Others, CAP = Logged Regulatory Capital Funds, TA = Logged Total Assets, and GDP = Logged Gross Domestic Products

Breusch and Pagan Lagrangian multiplier test for random effects

Loss Provisions (Islamic bank, t) = Xb + u (Islamic bank) + e (Islamic bank, t)		
Estimated results:		
	Var	sd = sqrt (Var)
Loss Provisions	2.671626	1.634511
e	1.363439	1.167664
u	0.4010089	0.6332526
Test: var (u) = 0		
		chibar2 (01) = 11.80
		Prob > chibar2 = 0.0003

hausman test
- Coefficient -

	(b) fixed	(B)	(b-B) Difference	sqrt (diag (V_b_V_B)) S.E.
NPF	0.0520846	0.1189621	-0.0668775	0.0410737
FIN	0.7950378	1.072653	-0.2776156	0.3210134
CAP	-0.1380338	-0.1040166	-0.0340173	0.1889939
TA	-0.2260022	-0.4506508	0.2246486	0.3170115
GDP	-0.5780177	-0.543311	-0.0347067	
b= consistent under Ho and Ha: obtained from xtreg				
B= inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2 (5) = (b_B)' [(V_b_V_B) ^ (-1)] (b-B)				
= 5.71				
Prob > chi2 = 0.3358				
(V_b-V_B is not positive definite)				

Note: LP = Logged Loss Provisions, NPF = Logged Non-Performing Finance, FIN = Logged Finance, Advances and Others, CAP = Logged Regulatory Capital Funds, TA = Logged Total Assets, and GDP = Logged Gross Domestic Products

The above results indicate the more preferred model is the Random-effects model that is more efficient and consistent. The results also indicate there are higher error variances measured across the banks than within time periods. The variations across in their regulatory capital funds are attributed to different practices in risk management. This further support for a development of an integrated framework, as Rosman and Abdul Rahman (2015) establish, its importance is without a question. In the same vein, different capital structures across the banks over the observed periods can also cause the variations. In this respect, Lama Tarek, Syed Mohd Zain and Duasa (2014) carried out an investigation on the effect of capital structure on performance of Islamic bank and found that capital structure decision is relevant to the banks' performance.

5. Conclusions

The most obvious finding to emerge from this analysis is that during distressed financial conditions, risk shifting was found to have a significantly high potential to incentivize in foreign owned Islamic banks than in domestic Islamic banks. Although the current study is based on a sample of Islamic banks in Malaysia, the finding suggests the extent of this behaviour deserve to be encouraged in the foreign-owned Islamic banks than the domestic Islamic banks. The possible explanation is despite their global expertise compared to the domestic Islamic banks, it is the domestic Islamic banks that better respond and understand the local distreed conditions. This information can be used to develop targeted interventions such as a higher regulatory capital requirements imposed on foreigh-owned Islamic banks than on domestic Islamic banks. It is aimed at discouraging risk-shifting or transfer of risks in an interest-free Islamic financing. It goes a long way towards reducing overall risks in Islamic banks as Salma, Awatef and Younes (2016) in their study on the binding relationship of risk-capital-efficiency document. In their paper, the authors referred to a previous work by Pellegrina (2007) who showed the risk-sharing principle reduces the overall risk of Islamic banks. Further research might explore the adequacy of regulatory capital funds due to differences in capital structure between debt and equity financing. It may uncover how provisioning mechanisms can address issues associated with the regulatory capital funds provided by rabb al-mal (capital owner/principal). Further, this research may be extended to dissect differences due to

risks characteristics of Islamic banks' assets resulted from financing mode on a profit-sharing basis between mudarabah profit-sharing and loss-bearing, and musharakah profit and loss sharing.

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