

**CONTINGENCY THEORY APPROACH TO RISK  
MANAGEMENT PRACTICES IN ISLAMIC BANKS: A CASE  
STUDY ON KAZAKHSTAN**

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This study explores the contingency theory to explain the risk management practices in Islamic and conventional banks in Kazakhstan, an emerging Islamic banking hub of the Central Asia. The outcome of this study helps identify the contingency variables that explain the risk management challenges faced by Islamic bankers in Kazakhstan with respect to other Islamic markets, such as Indonesia and Malaysia. In order to explore the contingency variables influencing the risk management process and performance, this study utilised multiple layers and sources of information. Firstly, using semi-structured protocols, we interviewed top, middle and operation-level risk managers from large and small Islamic and conventional banks of Kazakhstan. We extended the surveys to Indonesia and Malaysia to learn from already established risk management system. Secondly, we find that several risk related financial ratios to strengthen our findings. Risk management system is influenced by the type of risks and a number of contingency variables. Credit, operational and market risks are the three major risks for Islamic banks in Kazakhstan. Limited know-how of risk management and limited use of technology are the two most important firm specific contingency variables. Limited secondary market, limited regulatory assistance, and limited use of derivatives are the three most important industry specific contingency variables that have great influence on the risk management of Islamic banks. The influence of industry-

specific factors is apparently bolder than the influence of firm-specification limitations. We also find that the size of the market influences all the stages of enterprise risk management, which has been identified as a contingent variable by previous studies on non-financial sector. The results are vitally important for Kazakhstan as the country is planning to turn the economy into a hub of Islamic finance in the Central Asia. Management of Islamic banks that are planning to invest in Kazakhstan can learn from the challenges and gaps explained in this study. The Central Bank of Kazakhstan may take an active role in establishing prudential regulations to ensure investment in human capital, technology- and customer-centric banking operation, and innovation to tackle risk management challenges. This study is one of the preliminary studies that discusses about risk management of Islamic bank in Kazakhstan, and compares the risk management practices and performance with established banks from other countries. We have redrawn the contingency framework for risk management in Islamic banks.

**Keywords** – Contingency Theory, Kazakhstan; Islamic banks; Risk management; Malaysia; Indonesia. **JEL Classification:** G21, G32

## INTRODUCTION

Islamic finance started its journey as an alternative mode of financing from the early 70s'. According to MIFC (2014) Insight Report, total assets of the Islamic finance industry globally has reached USD 2 trillion with an average compounded growth rate of 17.3%. In recent days, Islamic banking covers beyond simple profit and loss share (PLS) financing schemes, saving accounts and investment products, and was transformed and currently represented by hedge funds, Islamic bonds (*Sukuk*), and derivatives.

The differences of Islamic and conventional banks can be traced from the use of *Riba* (charging interest), the presence of *Gharar* (uncertainty and imperfect information), practice of *Maysir* (gambling), and production and marketing of alcohol, pork, and other non-permissible activities. Two major and gradually evolving principles that determine Islamic banking activities are (1) the profit and loss (PLS) sharing using *Musharakah* (partnership) and *Mudarabah* (venture capital) principles, and (2) the markup based financing using *Murabahah* (selling an asset with pre-agreed profit), *Salam* (forward selling contract), *Ijarah* (financial leasing) principles (Hassan, 2009). Islamic banking activities are directly connected to entrepreneurship creation, production opportunities, and overall health of the

economy in a *shari'ah* compliant way. As a result, Islamic banks manage a motley of risks vis-à-vis conventional banks.

An effective risk management system is vital to wield a sustainable risk management atmosphere that in general features three primary stages: (1) risk identification, (2) risk measurement, (3) risk control (Al-Tamimi, 2002). Market risk, profit rate risk, operational risk, credit risk, exchange rate risk and compliance risks are some of the common risks facing Islamic banks (Abdou et al., 2014; Al-Tamimi and Mazrooei, 2007). Islamic banks deal with their clients as partners through various partnership-based financial contracts. Hence, the performance of Islamic banks and their risk management activities are essentially integrated into a single 'client-management' framework. This is particularly challenging for an emerging Islamic and, for that matter for, a transition economy with limited regulatory setting (Iqbal and Mirakhor, 2007).

Risk management is an integral part of the corporate strategic decision. These decisions are often futuristic, and the successful implementation of an efficient risk management system is contingent upon a number of variables. Since finding "perfect measurement tools" for efficient risk management is complex (Mikes and Kaplan, 2014), organisations should look into building a "minimum necessary contingency" model to understand the enterprise risk management process (Otley, 1980). As Mikes and Kaplan (2014) have stated, "...academic studies of ERM (Enterprise risk management) have started to explore the dependence of ERM performance outcomes on organisational context, however, they fall short of putting forward a contingency theory of ERM", this study intends to explore a contingency theory for risk management in banking institutions.

Studies on ERM adoption has been a frequent phenomenon among the academicians. In recent years, several studies have identified *having an efficient risk management expert* (Pappe and Spekle, 2012), *institutions' perceived riskiness* (Pagach and Warr, 2011), *firm size* (Pagach and Warr, 2011), *types of risks* (Mikes, 2011), and *an overall uncertainty with corporate strategy* (Power, Ashby and Palermo, 2013) as some of the variables that have controlled the motives and success of ERM adoption in organisations. However, neither most of these past studies reflect adequately on contingency framework of risk management, nor these studies cover a wider variety risk related issues outside of the private organisations (Woods, 2009). Banks are risk management institutes. Islamic banks face few emerging risks since they have to comply with Islamic principles. Hence, there is a clear gap in the literature to address that can be fulfilled by the development of a contingency theory based risk management framework for Islamic banks. Appendix D shows the minimum necessary contingency framework for ERM by Mikes and Kaplan (2014).

Since the post-Soviet era until the era of state-driven modernization, cross-border development and ensuring financial inclusion for the people, Kazakhstan took conspicuous initiatives to gradually transform the economy towards a *shari'ah* compliant one, an economy that posits opportunities for the financial and real sectors of the country, and beyond (Shahin, 2011). The banking sector in Kazakhstan is primarily dominated by conventional banks. By the year 2014, there was only one Islamic bank to offer *shari'ah* compliant banking services. Given the emerging trend in this context, this study explores the financial performance and risk management practices of the Islamic bank, and presents a comparison of the same with a set of conventional banks operating in Kazakhstan. In addition, we compare and analyse the risk management practices of Islamic bank from Kazakhstan with other Islamic banks from Indonesia and Malaysia to construe the disparity of risk management practices of Kazakhstan with the ideal premise of already established *shari'ah*-compliant markets. Multiple sources of evidence and multi-stage in-depth interviews were employed using case study methodology to strengthen the validity of the study. The outcomes of our analyses help us explore the possibility of a contingency theory based risk management approach for Islamic banking. The model proposed in this study has great potential to be used in future studies on risk management of Islamic finance industry. Section II discusses relevant literature, section III discusses the data and methodology applied in this study, section IV reports the results, and section V discusses the implications of the study.

## RELEVANT STUDIES

### Risk management in Islamic banks

Risk is defined as the exposure to “danger or hazard”, an “opportunity”, and the “volatility of expected results” (Howells and Bain, 1999; Jorion and Khoury, 1996). Risk managers are responsible to identify, measure and manage risks that influence the performance of the banks and impacts the value of the shareholders (Pyle, 1997; Anderson and Terp, 2006). This task warrants a decent understanding of the categories of risks and the risk management techniques of banks (Hassan and Dicle, 2005).

Due to the unconventional nature of the operation, Islamic banks have to manage a number risks that are in principle different than that of the conventional risks. Some of these risks are (1) Sharia compliance risk, (2) commodity price risk, (3) equity risk, (4) displaced commercial risk and (5) reputation risk (Abdou, Muslem and Ismail, 2014). Islamic financial institution (IFIs), Islamic banks, in particular, face credit risk when the partners in loan

contracts fail to fulfil their contractual obligations in paying back the loan to the bank (IFSB, 2005; Murphy, 2008; Akkizidis and Khandelwal, 2008). According to Abdou (2014), impact and reasons of one risk cannot be separated from another. For instance, the credit and market risk may lead to liquidity or operational risks, and vice versa. Islamic banks do not charge penalties in case of default by the counterparty (Iqbal and Mirakhor, 2007). Hence, credit risk cannot be isolated from other types of risks.

Islamic banks are exposed to equity investment risk when they are holding equity instruments under *Musharakah* and *Mudarabah* principles for investment purposes. This holding may lead to market risk and credit risk if the investment is made under *Musharakah* and *Mudarabah* principles (Khan and Ahmed 2001; IFSB 2005; Rosman 2009). Islamic banks face liquidity risk as they do not have access to strong *shari'ah*-compliant secondary markets. How et al. (2005) maintained that Malaysian Islamic banks experienced low liquidity risk as they can take advantage of the Central Bank resources.

Khan and Ahmed (2001) included seven areas of risk management system: (1) establishing a risk-management environment, (2) risk-reporting system, (3) internal rating system, (4) risk-based information system, (5) establishment supporting institutes, (6) setting up standards compliant to the international standards and laws, and (7) research and training on risk management and mitigation. Their study concluded that risk reporting has been the weakest side of the overall risk management system in Islamic banks. In Table 1, we briefly discuss studies and findings from different regions involving Islamic banks and their risk management practices.

Table 1: Risk management of banks in various countries

Author (year)	Context	Major findings
Al-Tamimi (2002)	UAE	<ul style="list-style-type: none"> <li>Employed the most sophisticated risk management techniques.</li> <li>The common approaches of risk identification were an analysis of financial statement and regular control of branch managers' performance.</li> </ul>
Al-Tamimi and Al-Mazrooei (2007)	UAE	<ul style="list-style-type: none"> <li>A Proper understanding of risk management.</li> <li>Big difference between local and foreign banks in managing risk.</li> </ul>
Al-Tamimi (2008)	UAE	<ul style="list-style-type: none"> <li>Understood pros and cons of Basel II implementation.</li> </ul>

		<ul style="list-style-type: none"> <li>• Staffs were well educated and informed about upcoming challenges.</li> </ul>
Siddiqui (2008)	Pakistan	<ul style="list-style-type: none"> <li>• 90% of financing from deposits, more than 82% of financing by trade financing non-PLS operations.</li> <li>• Prefers short-term financing</li> <li>• Banks had a higher return on assets and equity, met the capital adequacy requirements and maintained adequate liquidity.</li> </ul>
Hassan (2009)	Brunei Darussalam	<ul style="list-style-type: none"> <li>• The relevant risks in Islamic banks of Brunei Darussalam were foreign exchange rate risk, credit risk and operational.</li> <li>• Risk identification (RI) methods were conducted by executive and senior staff as well as by auditing and physical control, analysis of financial statement and regular risk survey.</li> <li>• Similar to UAE case, the study demonstrated a high level of risk management understanding among Islamic banks employees in Brunei Darussalam.</li> </ul>
Abdou, Muslem and Ismail (2014)	Yemen	<ul style="list-style-type: none"> <li>• General understanding of risk management practices within the financial system. However, there was a lack of skills and experiences.</li> <li>• A big difference in risk management practices among Islamic, conventional, local and foreign banks</li> <li>• Risk identification methods include audit and physical inspection, analysis of financial statement and stress-testing</li> <li>• The most significant risks that Islamic banks faced with in Yemen are foreign exchange rate, credit risk and liquidity risk.</li> </ul>

### **Performance of Islamic banks**

Existing studies have reported a mixed bag of results on the determinants of bank performance. Studies found gross domestic product (GDP) as an influential determinant of

bank profitability (Verdin and Warne, 1991; Chua, 2013). Quite surprisingly, studies found a positive connection between overhead expenses and profitability (Hassan and Bashir, 2003; Sufian and Habibullah, 2009). Higher loan to asset ratio, larger capital base and lower tax support banks becoming financially stronger (Hassan and Bashir, 2003). Shen et al. (2009) found that higher net interest margin connects positively to higher profitability. Sundararajan and Errico (2002) explained that having profit and loss sharing contracts may increase credit risk for Islamic banks. More importantly, Chua et al. (2007) found that having a stronger corporate governance mechanism will boost efficiency and risk management capabilities of the banks. Further to this, Chen and Chen (2010) argued that a properly diversified bank can improve their performance faster than a poorly diversified bank. However, diversification works better when it is long-term in nature (Adegaju and Olokoyo, 2008).

The relationship between the size of the banks and their overall performance was mixed as well. While Shepherd (1975), and Athanasoglou, Brissimis and Delis (2008) agree that size has a positive connection with profitability, Tarawneh (2006) find no significant connection between the size of the banks and their profitability. Adrian and Shin (2010) demonstrate a connection between bank's leverage and performance. Given the limited history of Islamic banks in the countries where Islamic banking is dominant, there are two important implications of Islamic bank performance for this study. Firstly, bank performance analysis for Kazakhstan can be used to understand banking operation and efficiency in an emerging economy. Secondly, performance indicators with respect to the risk and return of the banks can be used to explain risk management practices and performance of the Islamic banks.

## **METHODOLOGY**

### **Study Setting and Research Process**

Kazakhstan wants to become the hub of Islamic finance in Central Asia. In 2009, it established Islamic finance operational rules that set the stone for the first foreign-owned Islamic bank. In May 2014, Islamic Development Bank (IDB) and the Government of Kazakhstan signed an agreement to allocate USD 2 billion to enhance cooperation between the IDB Group and the Republic of Kazakhstan for three years (2015-2017). Consequently, Standard & Poor's (2014) reported vast prospect for Islamic investors to capitalise from a growing market in Kazakhstan. At this moment, for helping Kazakhstan understand the future challenges, it is important to understand the key performance indicators of the banks in Kazakhstan and the risk management readiness of the Islamic bank in the country. Case study methodology has been employed in this study to present a detailed description of these phenomena (Yin, 1994; Merriam, 1988).

At the time of collecting data, there was only one Islamic bank operating in Kazakhstan. The internal validity of the data collected from a single case study can be strengthened if there are multiple stages in data collection (Yin 1994). For instance, this study included at least three layers in a single case. Since risk management issues are best known to the risk managers, this study interviewed top, middle and operational level risk managers using semi-structured interview protocols. External validity that is related to the generalisability of the study has not been an issue for exploratory studies as the objective in the exploratory case study is to achieve theoretical generalisability as opposed to the population generalisability (Eisenhardt, 1989). Besides, the study extended the survey into conventional banks to horizontally compare the risk management processes of the two competing financial systems: Islamic and conventional. The risk management practices of the Islamic bank of Kazakhstan were compared vertically to the risk management practices of the Islamic banks from Malaysia and Indonesia to strengthen the findings of the study. The data collection and research process employed in this study are demonstrated below in Figure 1.

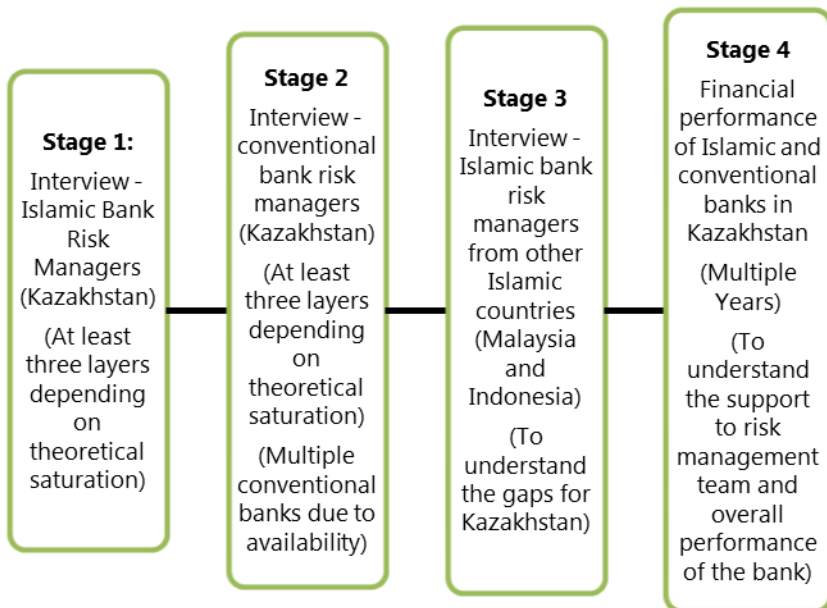


Figure 1: Research Process

In the first stage, we interviewed the risk managers from Islamic bank in Kazakhstan. In the second stage, we used a modified interview protocol to conduct interviews on the risk management processes of the conventional banks in the second stage.



In the third stage, we conducted interviews on the managers of Islamic banks from Malaysia and Indonesia. Three Islamic banks from Malaysia and four Islamic banks from Indonesia were chosen using snowball technique. In the final stage, we analysed key risk and return ratios for Islamic and conventional banks in Kazakhstan to provide support to explain risk management efficiency and overall performance.

### **In-depth interview, interviewee and protocol**

There are two stages in the data collection: interview of the risk managers on the risk management in banks, and the financial ratio analysis. We used semi-structured interview protocol to conduct in-depth interviews on the risk managers. The interviews were conducted for getting an apprehension of the risk management practices in banks of selected countries. The interview protocol is modified from the survey questionnaire of Khan and Ahmed (2001), one of the highly cited papers on risk management of Islamic banks. The procedure in Khan and Ahmed (2001) was rigorous and covered the objectives of this study.

Table 2: Sample Banks in Malaysia and Indonesia

<b>SL</b>	<b>Banks from Malaysia</b>	<b>Banks from Indonesia</b>
1.	Bank Islam Malaysia	BCA Syariah
2.	Bank Muamalat	Maybank Indonesia Syariah
3.	CIMB Islamic	Bank Syariah Mandiri
4.	---	Bank Syariah BRI

For the in-depth interviews as respondents, we chose risk management department staffs on three organizational levels: (1) top-managers, (2) senior managers, and (3) operational managers. They held extensive risk management expertise. We are disclosing the names of banks, or the same for the respondents, because of the anonymity promised during the interview. The banks in Malaysia and Indonesia are listed in Table 2. We used acronyms to refer to banks in Kazakhstan: IB is used for Islamic Bank, LCB is used for the large conventional bank, and SCB is used to refer to the small conventional bank. The language of the interviews was Russian for Kazakhstan, and English for Malaysia and Indonesia. Table 3 shows information on the participants from Kazakhstan.

Table 3: Information about the number of participants

<b>Organizational level</b>	<b>Islamic Bank (IB)</b>	<b>Large Conv. Bank (LCB)</b>	<b>Small Conv. Bank (SCB)</b>
Head of RMD	1	1	1
Senior manager	1	1	1
Operational Manager	1	1	1

**Total** **3** **3** **3**

Note: RMD Stands for Risk Management Division. Conv. = Conventional

### Interview protocol and the questions

We used a semi-structured interview protocol. There was a number of open-ended questions that allowed adequate room for the interviewees in sharing their opinions. The protocol was divided into seven sections. Seven parts of the protocol included perceptions of the risk managers on (1) various types of risks, (2) risk management environment of the banks, (3) risk reporting system of banks, (4) risk measuring and management techniques, (5) risk monitoring system, (6) the internal control, and (7) other important risk-related areas.

### Measuring performance of the banks

In order to support the risk management practices and to examine overall financial standings of the banks, we calculated a number of financial ratios only for the banks from Kazakhstan. The ratios were calculated from the annual reports published on the official site of the Central Bank of Kazakhstan (<http://www.nationalbank.kz>). Table 4 lists the financial ratios. The ratios were presented for the year 2012, and compared with the industry average.

Table 4: Financial Ratios to measure performance

<b>Ratio</b>	<b>Definition</b>
<b>Capital adequacy</b>	
Capital/RWA	Equity capital as a percentage of total risk-weighted asset.
Net worth/total assets	Equity capital as a percentage of total assets.
<b>Asset composition</b>	
NPL/gross loans	Non-performing loans as a percentage of total loans.
NPL/capital	Non-performing loans as a percentage of equity capital.
<b>Earning and profitability</b>	
ROA	Net income as a percentage of total assets.
ROE	Net income as a percentage of total equity.
<b>Liquidity</b>	
Cash/deposit ratio	Cash as a percentage of total deposit.
Liquid assets/total assets	Total liquid assets as a percentage of total assets.
Liquid assets/total deposits	Total liquid assets as a percentage of total deposits.

## RESULTS

### **The context and the profile of the banks from Kazakhstan**

In 2009, the President of Kazakhstan, Nursultan Nazarbayev, proclaimed transforming Kazakhstan Economy to accommodate Islamic finance by signing a law on “about modification and additions in some Acts concerning the organization and activity of Islamic banks and the organizations of Islamic financing”. In his annual speech in 2010, the President mentioned that

*“... it is necessary to activate domestic stock market, which by 2020 has to become the regional centre of Islamic banking in Central Asia and enter ten leading financial centres of Asia”.*

#### *(i) Islamic banks (IB)*

The Islamic Bank (IB), which is the subsidiary of an internationally represented Islamic bank having its head office in Abu Dhabi (UAE), started its operation in Kazakhstan from the beginning of 2010. With a vision to “set new standards that redefine the Islamic banking”, IB has building its business in the corporate banking sector. Its primary customers are the government companies and their subsidiaries that have access to new alternative sources of financing large infrastructure projects. IB has two regional outlets. Even though IB managed to attract the attention of various quarters, the CEO of IB, however, found the *shari’ah* operation procedure more complicated that “required approval from the head office” and eventually delayed the workflow.

In March 2012, the IB and KazPost JSC signed an agreement to allocate *Wakala* deposit worth of 1.5 billion KZT (Kazakhstan Tenge), which was equal to 101.5 million USD (exchange rate 1 USD = 147.8 KZT). In November 2013, international ratings were assigned for head office - Fitch Ratings assigned “A+” rating with a stable outlook, while Moody's assigned “A1/P-1” rating. Only two Islamic banks in the world achieved such high ratings given by Fitch Ratings. The main branch that is located in the UAE is one of the fastest-growing banks in the UAE. Since its establishment in 2008, the bank has been awarded a variety of local and international awards, including the Islamic Business & Finance Awards for Excellence in Retail Banking. The bank currently owns 25 branches and 116 ATMs in the UAE, as well as subsidiaries in the Republic of Kazakhstan.

#### *(ii) Large conventional bank (LCB)*

Large conventional bank (hereinafter LCB) started its operation in 1995, four years after the independence of Kazakhstan. In 1997, National Bank of Kazakhstan included LCB in the list

of banks that operated under international standards. Since 1997, LCB started to issue VISA and MasterCard credit cards with their own logo. In 2005, LCB acquired local banks in Kyrgyzstan and Russia, and in 2006 in Tajikistan. In 2005, Euromoney rated LCB as the best bank for financing Small and Medium Enterprises (SMEs) in Kazakhstan. In 2006, the LCB was recognized as having the best “Corporate Governance” practices.

The key milestone in the history of LCB was that the Bank Austria-Creditanstalt AG (BaCa), a UniCredit Group’s member performing commercial bank operations in the Central and Eastern Europe, acquired 91.81% of the total issued capital of LCB. The approximate transaction amount was US\$ 2.117 million (about EUR 1.452 million). LCB was part of the UniCredit Group in Kazakhstan for 6 years. In May 2013, Kazakhstan local company KazNitrogenGaz and UniCredit Bank Austria signed an agreement about purchasing 99.75% of LCB’s shares. The price was equal to the net equity of the LCB. LCB owned a range of subsidiaries and fourteen regional outlets.

Table 5: Kazakhstan bank assets and equity

Rank	Name of the bank	ASSETS	Equity
		USD	USD
1	KazKommertzBank JSC	16,975,747	3,069,173
2	Halyk Bank JSC	15,555,510	2,013,463
3	BTA Bank JSC	10,096,244	1,395,525
4	Bank Center Credit	7,066,561	554,246
<b>5</b>	<b>LCB (<i>large conventional bank</i>)</b>	<b>5,662,471</b>	<b>473,699</b>
6	Alliance Bank JSC	3,980,613	242,337
7	SberBank Russia JSC	4,869,640	586,744
8	Tsesna Bank JSC	4,109,200	337,339
9	<b>AO</b> Kaspi Bank	3,912,371	440,800
10	Eurasian Bank JSC	3,096,643	315,838
<b>34</b>	<b>IB (<i>Islamic Bank</i>)</b>	<b>79,932</b>	<b>69,878</b>
<b>35</b>	<b>SCB (<i>Small conventional bank</i>)</b>	<b>88,154</b>	<b>41,963</b>
36	Taib Kazakh Bank JSC	37,068	23,199
37	NB of Pakistan	35,883	29,026
38	Zaman Bank JSC	130,266	71,113
<b>Total (for 38 banks)</b>		<b>92,222,998</b>	<b>13,282,137</b>

Note: 1USD = 150.4 KZT. Figures are in ‘000. Selected banks and equity as of 01/01/2013.

Source: Central Bank of Kazakhstan

*(iii) Small conventional bank (SCB)*

The Small conventional bank (SCB) was founded in 1993. By the year 2000, SCB became an agent for SWIFT and the Western Union transfer systems in Kazakhstan. SCB is a universal bank, which provides services for all kind of customers – retail banking, SME and corporate sector financing. SCB has a network of seven outlets in regions and eleven banking units. Table 5 offers a summary of the statistics of the banks. IB is the 34th of 38 commercial banks that operate in Kazakhstan (see Table 5) when ranked by assets having a total asset value of USD 79.9 million. From this view, the IB is relatively smaller and holds only 0.09% of the banking sector of Kazakhstan. The SCB is another smaller member of this analysis with an asset value of USD 88.2 million that controlled only 0.1% of the aggregate industry assets. Total assets of LCB, the larger bank selected for this study, was USD 5.6 billion, and the bank held 6.14% of all industry assets. Top ten banks held 82% of the industry assets.

## **Risk perception**

*(i) Top three risks: Credit, operational and liquidity risks*

“... when we are talking, there is no (better) dynamism than risk management in financial sector”, - the senior manager of one of the Islamic banks in Malaysia stated while putting his thoughts on the risk that banks face. We started with the most important risk among all types of banks. We asked the interviewees to rate the top three types of risks, namely credit risk, liquidity risk and operational risk, using ‘5’ (‘1’) when they found the type of risks critically important (critically unimportant). The respondents did not surprise the existing findings when they selected credit risk being the most important risk, which is followed by operation risk and liquidity risk. Figure 2 illustrates the top three types of risks by types of banks and participants. Our findings also show that while credit risk is more important for large conventional banks, both credit and operational risks are equally important for Islamic banks. Smaller conventional banks found all three types of risks almost equally challenging. It is not surprising why liquidity risk was less important for the Islamic bank in Kazakhstan as the financing needs of the bank was mostly supplied (using equity) by the Headquarter located in the UAE.

In addition, Islamic banks in Malaysia and Indonesia found all types of risks almost equally challenging. In fact, liquidity and operational risks were more important for Islamic banks from Malaysia and Indonesia when compared to credit risk for the same banks. As the Islamic bank in Kazakhstan plans to expand their operation, and the Government of Kazakhstan plans to permit new banks to operate under *shari’ah* principles, there must be stronger support for operational and structural efficiency. Markets must provide an adequate

supply of *shari'ah* compliant funds for the Islamic banks to grow. Borrowing the experience from Indonesia and Malaysia, Government of Kazakhstan should also build legislative support for Islamic banks in near future.

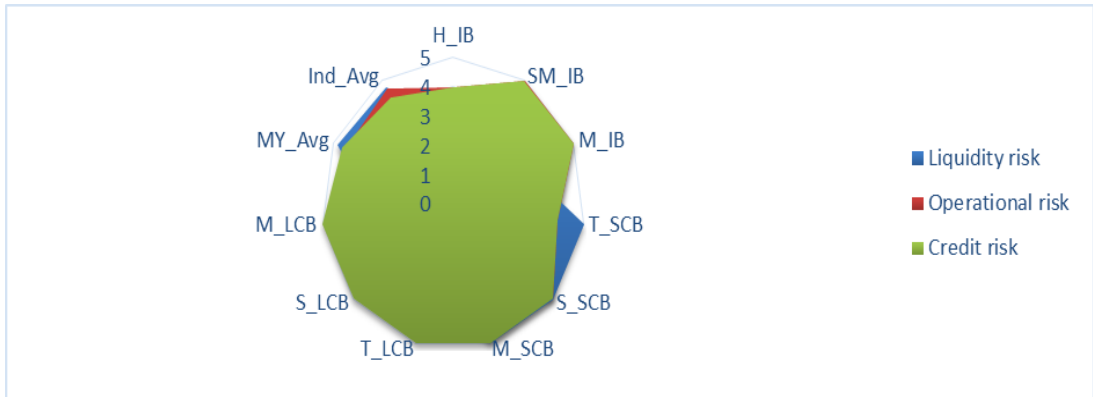


Figure 2: Top three risks by various banks and groups of participants

Note: H\_IF = Head of IB, SM\_IB = Senior Manager IB, M\_IB = Manager IB, T\_SCB = Top level manager SCB, S\_SCB = Senior manager SCB, M\_SCB = Manager SCB, T\_LCB = Top level manager LCB, S\_LCB = Senior manager LCB, M\_LCB = Manager LCB, MY\_Avg = Malaysia Average, and Ind\_Avg = Indonesia Average. '5' refers to 'Critically Important' and '1' stands for 'Critically Unimportant'.

*"... perhaps it is difficult to manage partners than to manage customers. Islamic banks consider their customers as partners (using PLS-based contracts)" – Senior Risk Manager of a Malaysian Islamic Bank.*

The above statement clarifies one of the biggest mysteries of recent days. Global data show that Islamic banks are gradually moving away from the partnership-based profit and loss sharing contracts towards non-partnership-based contract (Rashid, Hassan, Shi Min and Ullah, 2015). Figure 3 shows that Islamic banks found it quite challenging to manage credit and operational risks in partnership contracts, such as the *musharakah* and *mudarabah*. Credit and operational risks are relatively less challenging for non-partnership contracts, such as the *Ijtisna*, *Ijarah* and *Salam*. However, *murabahah* contracts that are typically non-partnership contracts did not support this result.

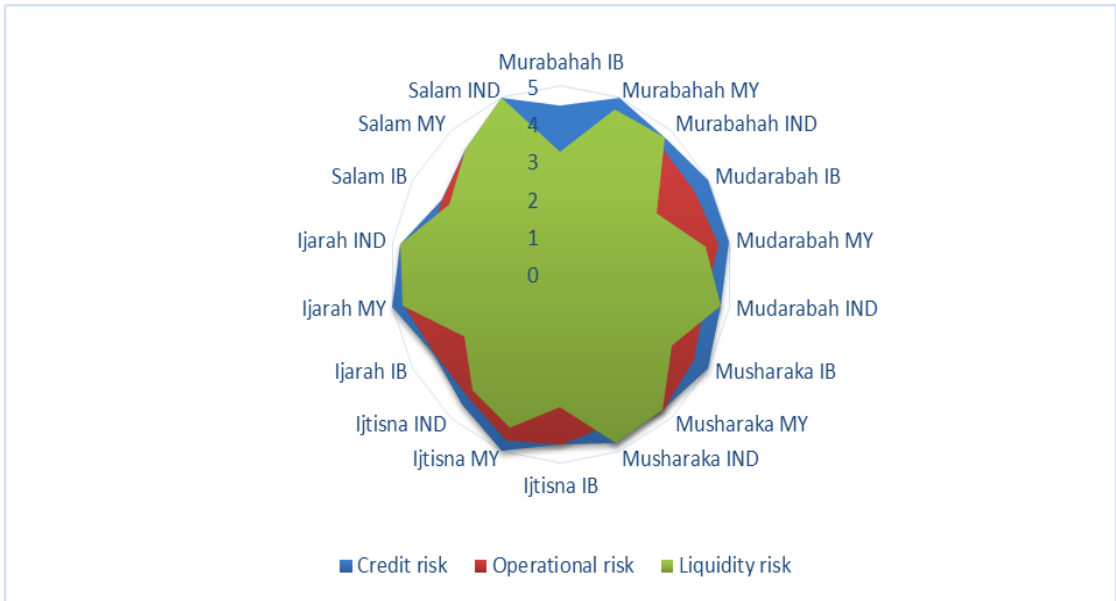


Figure 3: Top three risks in various types of contracts in Islamic banks

Note: IB = Islamic Bank from Kazakhstan, MY = Islamic banks from Malaysia, IND = Islamic banks from Indonesia.

Credit and liquidity risks are also important for conventional banks. Both the large as well as small conventional banks face these risks. It is, however, noteworthy that conventional banks found currency risk more important than the operational risks. The value of Kazakhstan currency has been depreciated against the dollar in the year 2013-2014. “... we are yet to consider the full potential of the markets, but first the global crisis and now the currency adjustments would be painful” – pointed out by one of the managers from Kazakhstan. Islamic banks may also be exposed to currency problem in future as the subsidiary of Islamic banks that are planning to operate in Kazakhstan may face currency turmoil. Table 6 lists the top three risks for conventional banks in Kazakhstan.

Table 6: Top three risks for conventional banks

	LCB			SCB		
	SME	Corporate	Retail	SME	Corporate	Retail
Credit risk	↑	↑	↑	↑	↑	↑
Liquidity risk	↑	↑	↔	↑	↑	↑

Currency risk



Notes: ↑ = An important risk, ↓ = not that critical risk, and ↔ = average level of importance.

### (ii) Major challenges to overall risk management

Islamic banks experienced a mixed bag of challenges while managing overall riskiness. Islamic bank in Kazakhstan found the limited use of hedging tools, limited regulatory assistance, and lack of understanding as of above average importance. It is understood from Figure 4 that government needs to invest in developing effective *shari'ah* legal systems and efficient human capital.

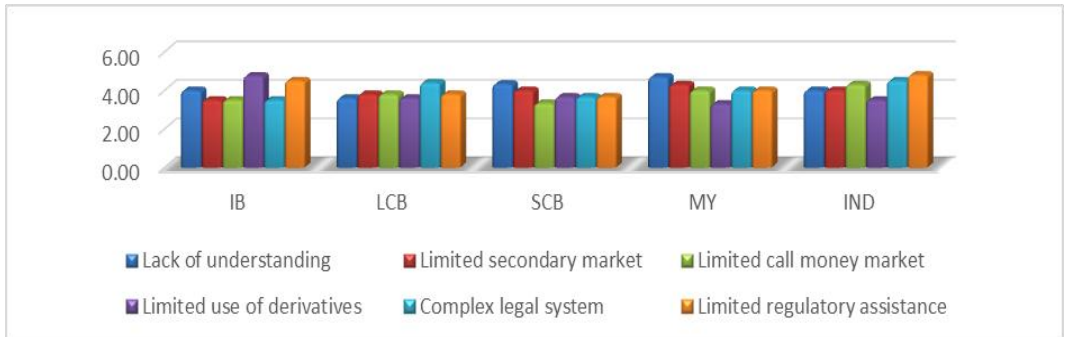


Figure 4: Major challenges in overall risk management

Notes: IB = Islamic bank in Kazakhstan, LCB = Large conventional bank, SCB = Small conventional bank, MY = Average of Malaysian Islam banks, IND = Average of Indonesian Islamic banks. '5' = critically important, '1' = critically unimportant.

## Risk management environment

### (i) Risk management environment in established Islamic markets – cases of Malaysia and Indonesia

Malaysia is considered to be the hub of Islamic finance in Southeast Asia, and one of the largest Islamic finance marketplaces in the world. According to Ernst and Young (2013) report, Malaysia is the third largest Islamic market globally that promotes Islamic education, establishes adequate Islamic regulations, and earned the capacity to become a global leader of Islamic finance. Indonesia has the largest consumer market for Islamic finance and is considered to be one of the high growth emerging Islamic finance markets in the world. These countries have already taken initiatives to strengthen their contribution to Islamic finance. Figure 5 demonstrates a SWOT analysis of the risk management environment of the



Islamic banks in Malaysia and Indonesia. The height of the bar shows strength in fifteen selected areas.

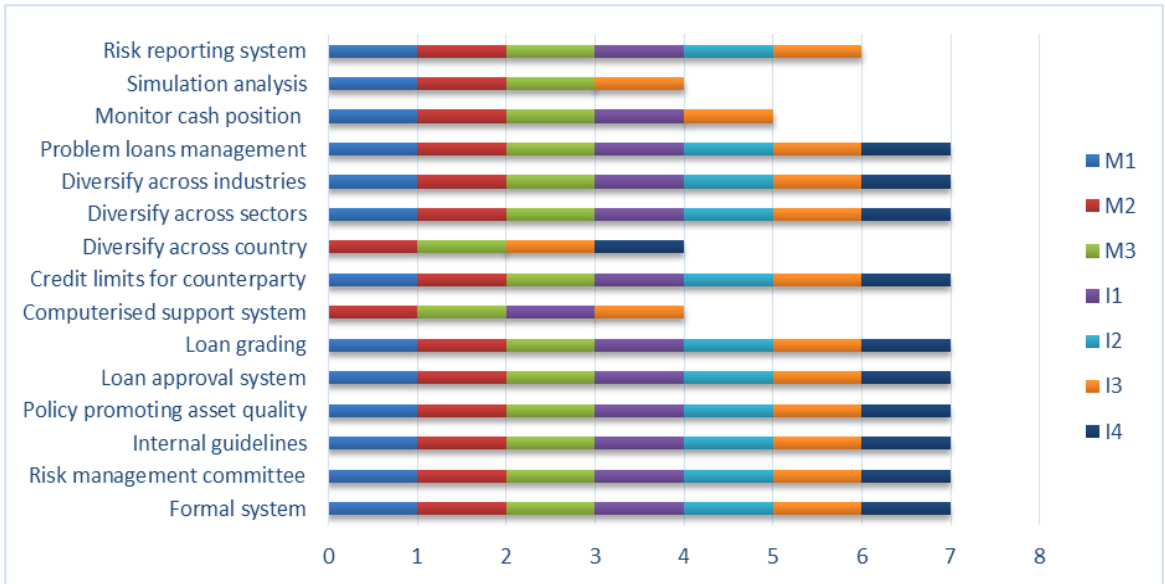


Figure 5: Risk management environment in Malaysia and Indonesia

Notes: M1, M2, M3 = are the three Malaysian banks, I1, I2, I3, and I4 = are the four Indonesian Banks

The risk managers from these banks identified five major issues while establishing an adequate risk management environment. Two of these issues, computerisation and simulation analysis, are connected to the use of technology in risk management. Another two issues, monitories cash positions and risk reporting systems, can be related to the internal control system and regulations. The fifth issue is about diversification of risk while investing in other countries. Islamic banks were less diversified across countries before the financial crisis. In the post-crisis era, because of having integrated risk management tools in the contracts, Islamic banking is now a global phenomenon with an average annual growth rate of 17%. Hence, computerisation, simulation analysis, and internal policies and procedures are largely connected to developing efficient human capital for the Islamic finance industry.

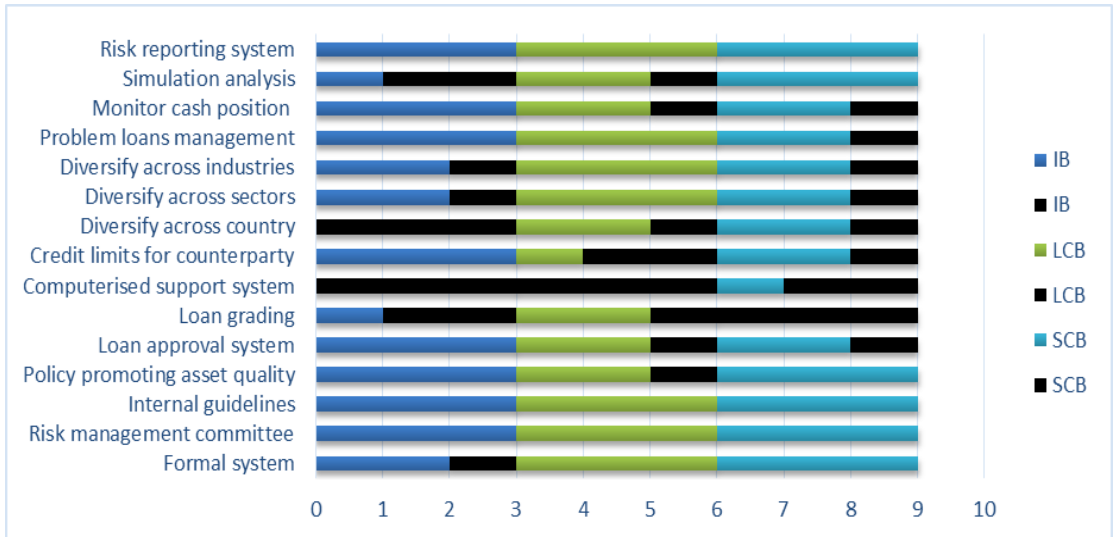


Figure 6: Risk management the environment in IB, LCB and SCB

Notes: Yes = presence of facility, No = absence of facility. Black shaded areas represent absence.

Banks from Kazakhstan reported similar experience when compared to Islamic banks from Malaysia and Indonesia. Computerisation, simulation, loan grading, and diversification across countries are the issues of concern for banks in Kazakhstan. The fears became real in the expression of an operational manager from Kazakhstan.

*“... we have the most updated computer systems working with the best software that can help us compete with other banks. However, we do not always have the right person for the job. We do not have good education on Islamic finance. We even had to change the risk operating procedure after the financial crisis. ... we are in need of people who understand the Islamic (financial) system and can lead us to present the benefits of this system to the people.”*

### Risk reporting system

*“... we do not prepare country reports. I am not sure whether we have to report commodity prices. We have reports of (aggregate) market prices but we typically do not report them .... We report capital position, credit risk, interest rate risk, liquidity position, foreign exchange exposure and operational risks.”* – stated by one of the risk managers of Islamic bank of

Kazakhstan.

We found an extreme similarity of these statements with the risk reporting practices of other conventional banks from Kazakhstan, and Islamic banks from Malaysia and Indonesia. Most of the banks use a combination of international and local reporting systems while reporting the risks using annual reports. For instance, most of the Islamic banks in Malaysia have utilised a modified version of AAOIFI reporting practices that combined the directives from AAOIFI and Bank Negara Malaysia.

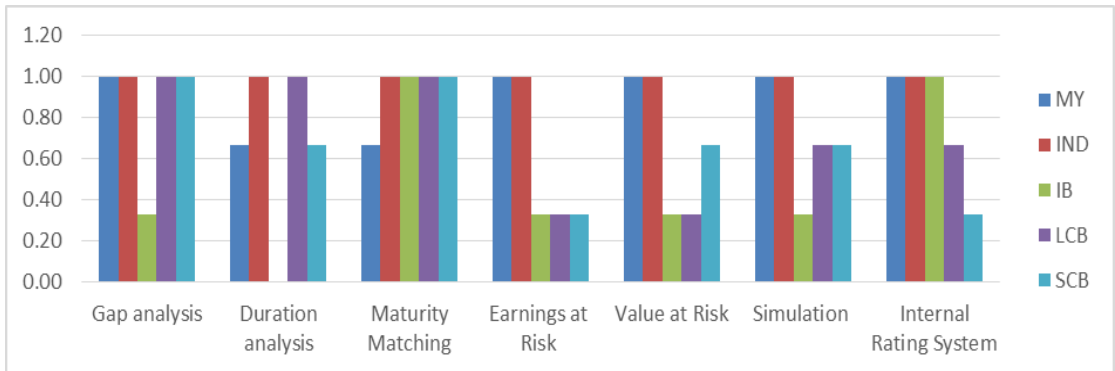


Figure 7: Risk measurement techniques

### Risk measurement techniques

We converted the agreement and disagreement of the interviewees about the risk measurement techniques. We coded the acceptance with ‘1’ and the rejection with ‘0’. Later we calculated an average of the opinion. It is evident that the banks in Kazakhstan did not have in place a number of methods that are commonly employed at other banks. Perhaps, the limited ability with computerised technologies might have been the key issue behind such absence of risk measurement tools. The limited use of risk measurement tools will eventually be the biggest shortcoming of the risk management team. This has already been evident from the argument of a senior risk manager – *“I think we failed in many occasions primarily not because of our attitude towards risk, but because of not properly identifying the type of risks”*.

**Risk monitoring**

Table 7: How often risk is monitored

	IB			LCB			SCB			MY	IND
	Never	Occasionally	Regularly	Never	Occasionally	Regularly	Never	Occasionally	Regularly	Average	Average
Periodically reappraise collateral	0	0	3	0	1	2	0	2	1	3	2
Confirm a guarantor’s intention	0	1	2	0	1	2	1	0	2	3	2
Review country ratings for loans	.....n/a.....			0	1	2	0	1	2	3	2
Monitor borrower’s performance	0	0	3	0	1	2	0	1	2	3	2

Notes: For banks in Kazakhstan (IB, LCB and SCB), the total number of respondent was 3. So, ‘1’ response means that only one respondent agreed with that condition. For banks in Malaysia and Indonesia: coded as ‘1’ for ‘never’, ‘2’ for occasionally, and ‘3’ for regularly. Due to a number of banks, and homogenous responses, we calculated an average of the responses for banks in Malaysia and Indonesia.

Risk monitoring is extremely important for Islamic banks. As the banks are dealing with a number of contracts, monitoring of risks becomes challenging. Managers have to have a clear plan on how to monitor various types of assets and liabilities in order to reduce exposure. We asked our respondents on how often they monitor four important risk components: collateral, guarantor’s intention, country ratings, and borrower’s performance. While Islamic banks consider ‘occasional’ monitoring of risks, Malaysian banks do that regularly. “... by regular monitoring we mean typically monitoring weekly basis; occasionally would then refer to a ‘monthly’ monitoring horizon” – manager of one of the Islamic banks in Malaysia argued on the timeframe of monitoring. Results are significantly different for an Islamic bank in Kazakhstan. It does not monitor country ratings at all. For other cases, almost all respondents argued that their bank monitor risks on a regular basis. These results are significantly different from conventional banks. The conventional banks in Kazakhstan divided their frequency of monitoring between weekly and monthly timeframes. “... Large customers are monitored frequently” – when the manager of a Kazakh bank was concerned with the exposure level while they are also concerned about the “technology and cost” involved in monitoring.

**Readiness for future**

“... there is always room for improvement. After the financial crisis, the board of directors are actively engaged in risk management efforts. Shari’ah board is more cautious in approving products that may lead to significant exposure for banks. On the other hand, the bank is investing a significant amount of capital in buying new risk management superstructures. We are organising training for our staffs, not only in the risk management division but also from other key divisions, on how to measure and deal with risks. One of the key components of the overall change is to follow Basel regulations. We can assure (you) that our attitude towards risk has changed as well. We now consider risk as a process, rather than an outcome” – Risk Manager (Islamic bank of Kazakhstan).

Table 8: Readiness for future

	MY	IND	IB	LCB	SCB
Internal control system for sudden change	√	√	↔	↔	↔
Separation of duties among risk managers	√	√	√	√	√
Have contingency plans	√	√	√	↔	√
Internal auditing system	√	√	√	√	√
Backups of software and data	√	√	√	√	X
Actively engage in research	√	√	√	↔	↔
Board’s involvement in new product introduction	√	√	√	↔	↔
Securitization to raise funds	√	↔	X	X	↔
Reserve to increase profit in low performing time	√	√	↔	X	X
Basel regulations are followed	√	√	√	↔	√

Notes: ‘√’ – already in place, ‘↔’ – inconclusive response (need to improve), ‘X’ – need to introduce (not in place).

Banks in Kazakhstan need to invest a significant amount of resources in building up the internal control system. It is a requirement from the mother company from UAE that the Kazakhstan branch of the Islamic bank should involve in active research. IB did not use any securitisation process to raise funds. The respondents in IB gave an inconclusive opinion about deposit-risk reserve (or often called investment risk reserve). Both investment risk reserve and the securitisation process to raise new funds partially depend on the market structure and regulation for Islamic banks in a country. Indonesian Islamic banks were also facing some challenges over the securitisation of funds. This will go a long way until the

Government in Kazakhstan can place prudent rules and regulations, and can build an efficient market microstructure for Islamic banks.

### Financial performance – ratio analysis

In order to support the findings of the risk perception, and to understand the overall performance of the banks in Kazakhstan, we calculated a number of ratios. Table 9 shows the comparative financial performance of the Islamic and conventional banks for the year 2012. Four categories of ratios were calculated. The capital adequacy ratio shows that the smaller banks that are the Islamic bank and the small conventional bank are highly capitalised when compared to the amount of risky investment. The large conventional bank had a capital to risk-weighted asset ratio just close to Basel requirement. The percentage of equity capital with the smaller banks was much higher than an industry average. Only 1% of the loans of the smaller banks were non-performing whereas the industry average was much higher (37%). Profitability of the smaller banks was much better than the larger bank and the industry average. Particularly, the return on asset and return on equity of the Islamic bank was significantly higher than the rest of the sample. Islamic bank could increase it to a higher level if it could reinvest the cash holdings. It is also worth noticing that the Islamic bank has been primarily running its operation using equity capital. IB gave very less attention to deposit collection. This eventually is not an example of an efficient financial intermediary. In order to get a deeper look at the key financial indicators, we have common-sized the financial statements to see how different financial variables in the balance sheet and income statement stood against the largest figure in each financial statement – “profit earned” in the income statement and “total asset” in the balance sheet. These variables were compared for three years from 2010 to 2012. The common-size statements are provided in appendices.

Table 9 Financial performance of banks in Kazakhstan

	IB	LCB	SCB	Industry
<b>Capital adequacy</b>				
Capital/RWA	75%	20%	-	12.5%
Net worth/total assets	88%	13%	57%	14%
<b>Asset composition</b>				
NPL/gross loans	0%	41%	1%	37%
NPL/capital	0%	429%	1%	214%
<b>Earning and profitability</b>				
ROA	3%	-1%	0.14%	-1%
ROE	3%	-12%	0.24%	-10%

**Liquidity**

Cash to deposit ratio	191%	23%	25%	26%
Liquid assets/total assets	10%	16%	13%	16%
Liquid assets/total deposits	164%	24%	25%	26%

Notes: NPL – non-performing loans, RWA – risk-weighted assets.

Appendix A shows that the Islamic bank has no involvement in profit and loss sharing contracts at all. A major portion of their assets were financed using *Murabahah* contracts. Hence, the Islamic bank is exposed to a greater amount of risk as it did not consider the built-in risk sharing tools. A major portion of the fund is collected from equity capital. This will expose the bank to capital risk. Appendix B shows that conventional banks are financed most of their assets with a mixture of capital structure that was primarily dominated by customer deposit. A major portion of the conventional loans were deployed into the corporate sector, followed by SME and other retail sectors. This information indicates that the Islamic bank will face stiff competition while competing for customer deposits. Finally, appendix C shows that Islamic bank is financed mostly with long-term funds whereas the conventional banks are financed with almost an equal mix of short- and long-term capital structure. Islamic bank should be careful dealing with the long-term fund as this may increase the cost of capital in the coming future. Moreover, relying too much on the equity fund will reduce the growth potential of an Islamic bank.

## CONCLUSION AND IMPLICATIONS

Kazakhstan wants to establish itself as an Islamic finance hub of the Central Asia. The Government of Kazakhstan already introduced a number of changes in the financial market regulations to accommodate Islamic financial activities. A branch of a UAE-based Islamic bank is already operational in Kazakhstan. Few other Islamic banks are waiting in line for entry. This study has been undertaken to explore risk management practices and financial performance of the Islamic bank of Kazakhstan. Since there was only one Islamic bank, in order to increase the validity of the study, we compared the results with two conventional banks from Kazakhstan, three Islamic banks from Malaysia and four Islamic banks from Indonesia. We utilised a modified interview protocol to conduct in-depth interviews on different levels of risk managers of an Islamic bank and conventional banks from Kazakhstan. In the second stage, we analysed important financial ratios that can support risk management practices and performance of the Islamic and conventional banks of Kazakhstan. The study has a number of implications for Islamic banks in Kazakhstan. The findings and the implications are summarized below:

## **Implications for the study**

### *(i) Develop operational efficiency and shari'ah governance*

Operational risk is the second most important risk for an Islamic bank in Kazakhstan. In fact, Islamic banks globally listed operating risk as one of their most important challenges. Particularly, the middle and the operational managers indicated operational risk as the most relevant risk. Identifying risk and taking the quickest decisions necessitate investment in people, system and technology. We recommend the Islamic bank to invest more in technology and people to build operational efficiency. Regular training and development should be an integral part of this process. While operational efficiency helps in identifying the right type of risks, *shari'ah* governance adds another layer to effective risk management process of the Islamic bank. Internal audit can be used to strengthen the risk management functions of the bank. Operational efficiency will help the Islamic bank developing a proactive system of risk management.

### *(ii) Diversify financing base – be customer-centric*

Islamic bank in Kazakhstan primarily used equity capital to finance loans. The equity fund was long-term in nature. In recent years, the non-performing loans were not creating any problem for an Islamic bank. However, in the long-run non-performing loans will suppress equity capital. Hence, it is recommended that Islamic bank should engage into marketing activities to attract deposits from customers. As long as there are a steady customer deposit flows into the bank, liquidity risk can be managed more efficiently.

### *(iii) International investments*

Islamic banks, both in Kazakhstan and the rest of the world, have been extremely domestic in investment. Alongside the smaller size of the Islamic banks, harmonisation of the Islamic finance rules across the border has been a challenge to international diversification of Islamic banks. One of the proactive mechanisms to reduce risk would be to expand operations to other regions. Islamic bank in Kazakhstan may consider expanding to neighbouring regions that share similar culture and heritage. International investment to high growth foreign markets will help Islamic bank realising a better profit.

### *(iv) Back to the basic – Profit and loss sharing*

Islamic bank of Kazakhstan was involved only in two kinds of financing modes – *Murabahah* and *Ijarah*. Profit and loss sharing contracts were not exercised at all. This is perhaps the reason why Islamic bank finds credit risk as more influential than operational



risk. The premier principle of Islamic banking, and also one of the most important tools to reduce risk, is profit-and-loss sharing. Under this principle, the customers, those are basically partners of Islamic banks based on one of the partnership contracts, and banks work together to reduce financial risk. Unless the Islamic bank reusing the PLS method, it may lose its financial as well as ethical edges.

*(v) Regulate the markets, institutions and instruments*

An important challenge to risk management in Kazakhstan is the lack of a regulatory framework for banks. Small banks (including the sample Islamic bank) had a severe lack of understanding of the risk management process and tools. The government of Kazakhstan needs to introduce its own Islamic banking regulation and prepare the market for application of such regulation. The government must offer incentives for new banks to start operation in Kazakhstan. Some regulatory initiatives are needed to handle non-performing loans that may eventually affect Islamic finance industry. Islamic banks from Malaysia and Indonesia, and also from the Middle East, follow structured Islamic finance rules for banking, asset management, and, particularly, for the Islamic accounting standards.

### **Towards a contingency theory of risk management in Islamic banks**

Based on Mikes and Kaplan (2014), there are three major categories of contingent variables – risk types, firm variables, and industry variables. Alongside the contingency variables, we will also shed light on some interrelated factors in the ERM framework. According to the minimum necessary contingency framework of ERM, these interrelated factors are ERM mix, intervening variables, and organisational effectiveness.

*(i) Contingent variables: types of risks, firm and industry variables*

This study finds that the credit, operational and liquidity are the three major risks that Islamic banks face. From the analyses on various contracts and of the perceptions of the managers, liquidity risk is apparently less important than the remaining two. Credit and operational risks are more *strategic* in nature, whereas the management of liquidity risk depends on *external* factors. For instance, Islamic markets do not offer a complete liquidity management solution for the Islamic banks. Hence, Islamic banks engage into contracts that do not expose them to too much of liquidity problem, as such the objective is to keep the liquidity risk to a *preventable* level. *Limited know-how of risk management and limited use of technology* are the two most important firm specific contingency variables that influenced the risk management practices of the Islamic banks. *Limited secondary market, limited regulatory assistance, and limited use of derivatives* are the three most important industry specific contingency variables that have great influence on the risk management of the

Islamic banks. The influence of industry-specific factors is apparently bolder than the influence of firm-specification limitations. It is worth noticing that the developed Islamic finance markets, such as Malaysia and Indonesia, are relatively more efficient in risk management than their developing counterparts, Kazakhstan in this case. Hence, *size of the market* is an important contingency variable for risk management of Islamic banks. We find that the *size of the market* is rather an important variable that influence all the stages of ERM, which has been identified as a contingent variable by previous study (Pagach and Warr, 2011).

*(ii) ERM mix: design, risk identification process, tools*

Islamic banks have already established a relatively stronger risk measurement and management system when compared to many conventional banks. *Gap analysis, maturity matching, internal rating based approaches* are common risk measurement techniques being used in the selected banks. Islamic banks *regularly appraise collateral, review borrowers' performance, and confirm guarantor's intention*. Islamic banks in the new market (Kazakhstan) is yet to develop an *internal control system* to quickly respond to sudden changes. These banks are *less involved in new product development* and *less engaged in research*. These limitations appear primarily in developing Islamic markets, which makes the *size of the market* another influential factor. It seems true that the investment in risk management is demand driven. If the market is not large, Islamic banks do not find it profitable to investment heavily even in basic risk management set-up.

*(iii) Intervening variables: managerial satisfaction, size of the market*

Managers in Islamic banks are happy with the *risk reporting system, internal guidelines, risk management committee*, and no so happy with the *computerised support system, loan grading mechanism, diversification practices, and simulation analysis*. Managerial satisfaction intervenes in the efficient risk management.

*(iv) Organisational effectiveness*

The findings indicate that the organisations are not prepared internally and externally to bring the best of the risk management initiatives taken by the Islamic banks. Even though Islamic banks have already established internal policies and procedures to identify and manage risks, organisational effectiveness in Islamic banks to identify various types of risks, measure them properly, and take proactive initiatives to manage risks is still at the embryonic stage. Figure 8 shows the modified minimum necessary contingency framework.

*Size of the bank*

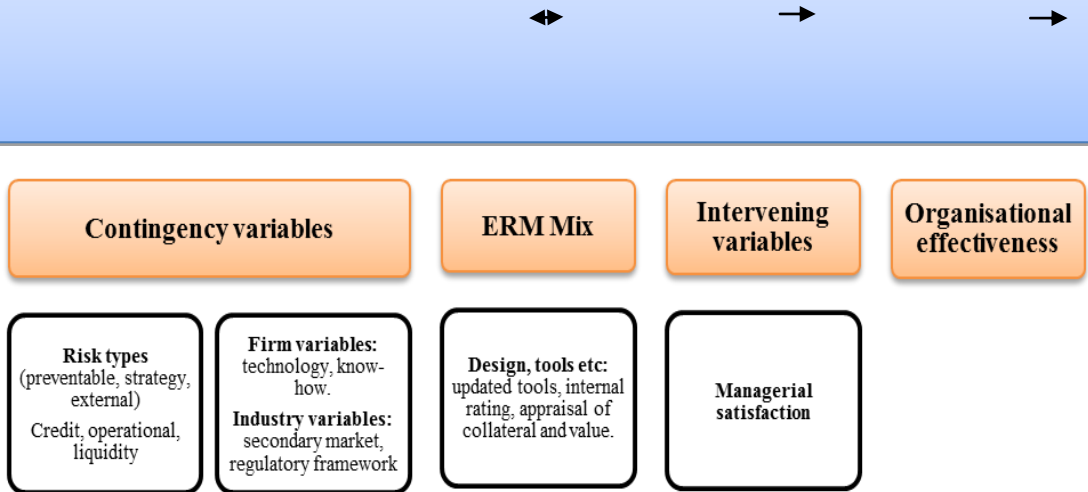


Figure 8: Modified minimum necessary contingency framework

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**Appendix A: Selected financial indicators for Islamic bank**

	<b>2010</b>	<b>2011</b>	<b>2012</b>
	%	%	%
<i>Sources of funds</i>			
Wakala Deposit from Shareholder	0.80%	0.00%	0.90%
Customers current accounts	3.70%	5.10%	5.30%
Customers deposits	0.20%	0.00%	0.00%
Unamortized commission income	0.10%	0.30%	0.50%
Islamic derivative Financial Instruments	0.00%	0.00%	0.30%
Other obligations	1.60%	0.70%	0.90%
Equity	93.50%	93.90%	92.00%
Total	100%	100.00%	100%
<i>Funds distribution</i>			
Financing	7%	38%	77%
Wakala Investment deposits	0%	0%	9%
Cash, bank balance and other placements	89%	57%	10%
Other assets	4%	5%	4%
Total	100%	100%	100%
<i>Modes of financing</i>			
Mudarabah and Musharaka	0%	0%	0%
Murabahah	100%	60%	84%
Salam	0%	0%	0%
Ijtisna	0%	0%	0%
Ijarah	0%	40%	16%
Others	0%	0%	0%
Total	100%	100%	100%

**Appendix B: Selected financial indicators for LCB and SCB**

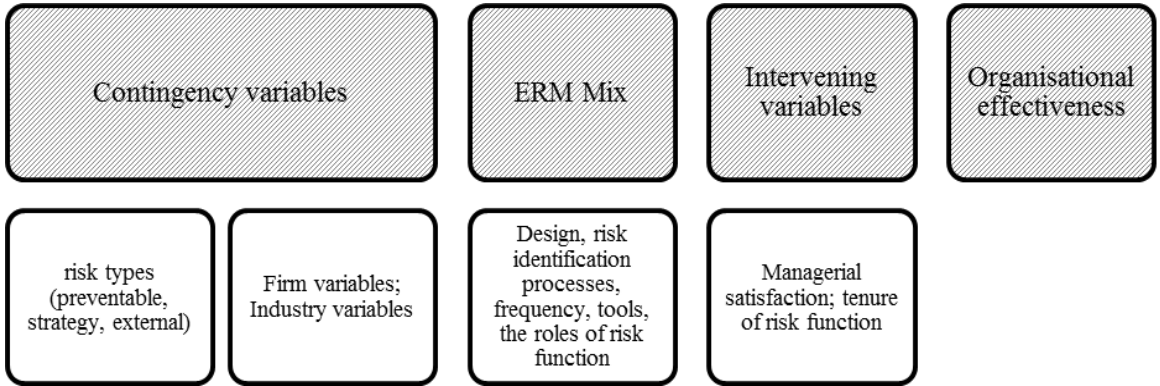
	LCB			SCB		
	2010	2011	2012	2010	2011	2012
<i>Sources of funds</i>						
Deposits and balances from banks	3.90%	5.10%	4.50%	0.00%	0.00%	0.00%
Current accounts	53.10%	55.00%	59.60%	59.50%	58.70%	51.50%
deferred tax liability	0.00%	0.00%	0.00%	0.00%	0.10%	0.10%
subordinated borrowings	6.60%	6.40%	6.00%	0.00%	0.00%	0.00%
Other borrowed funds	32.50%	26.20%	20.40%	0.00%	0.20%	0.50%
Other liabilities	0.30%	0.50%	1.00%	0.50%	0.40%	0.20%
Equity	3.60%	6.70%	8.60%	40.00%	40.50%	47.60%
Total	100%	100%	100%	100%	100%	100%
<i>Uses of funds</i>						
Loans to banks	3.70%	4.10%	1.60%	11%	0.00%	0.00%
Loans to customers	75.40%	68.50%	67.80%	56%	47%	56.70%
Cash, bank balance and other	10.30%	12.60%	14.00%	6.20%	14.70%	13.00%
Other assets	10.70%	14.80%	16.70%	26.00%	38.50%	30.40%
Total	100%	100%	100%	100%	100%	100%
<i>Modes of financing</i>						
SME	23%	24%	24%	61%	50%	21.00%
Corporate	61%	61%	59%	23%	37%	74.10%
Retail	16%	15%	18%	15.70%	13%	4.90%
Total	100%	100%	100%	100%	100%	100%
Impairment allowance	-22.70%	-27%	-32%	-1.70%	-0.40%	-0.20%
Net Loans to customers	77.30%	73%	68%	98%	100%	99.80%

**Appendix C: Financial by the maturity of IB, LCB and SCB**

	IB			LCB			SCB		
	2010	2011	2012	2010	2011	2012	2010	2011	2012
	%	%	%	%	%	%	%	%	%
Long-term	85%	55%	68%	45%	49%	49%	26%	56%	50%
Short-term	15%	45%	32%	55%	51%	51%	74%	44%	50%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%

**Appendix D: Minimum necessary contingency framework**





Source: Mikes and Kaplan (2014).