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A Study of Risk Management in Iranian Banks

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Abstract

This study, investigates the relationship between some banking ratios such as cash to asset ratio, size of bank, capital adequacy and debt to equity with liquidity, operational and credit risks. Financial data was collected from 10 Iranian banks from 2006 to 2011. Regression methods for data analyzing was used and the results shown that capital adequacy had a inverse relationship and debt to equity ratio had an positive relationship with credit risk that there weren't any relation between another variables with credit risk. The capital adequacy had a positive relationship with liquidity risk , as well as the cash to asset ratio, sizes of banks and debt to equity ratio had an inverse relationship with liquidity risk .On the other hand, the cash to asset ratio, sizes of banks and capital adequacy had a inverse statistically significant relationship with operational risk. The regression results reports that there weren't any relation between the debts to equity ratio and operational risk.

Keywords: Risk management, liquidity risk, credit risk, operational risk, banking ratios.

Introduction

Peter Drucker says that economic activity means: utilizing existing resources for an uncertain future. His studies shows achieve better economic performance has always been associated with more uncertainty or on other word: more risk acceptance[1]. increasingly complicated business environment, the globalization of markets, the intensification of competition, progress, technology, information and communication technologies, modern methods of supply of goods and services, increasing the importance of intangible assets and intellectual capital are among the factors that have led to organizations risks and unforeseen hazards are encountered. In finance literature, in order to reduce risk and compensation for losses resulting from the discussion under the heading of risk management has been considered[2]. Become increasingly complicated business environment, the globalization of markets, the intensification of competition, progress, technology, information and communication technologies, modern methods of supply of goods and services, increasing the importance of intangible assets and intellectual capital are among the factors that have led to organizations risks and unforeseen hazards are encountered. In finance literature, in order to reduce risk and compensation for losses resulting from the discussion under the heading of risk management has been considered. The country's major banks as well as financial institutions are faced with the risks of the product market and capital market. Due to constant changes in environmental factors and economic systems every day different risks affect the financial structure of banks. Studies show that Bank' crises led to stop economic activities such as reduced access to bank credit and the monetary policy has being led passive monetary policy. Hence, in recent years the main focus of attention has been paid to the banks to manage emerging risks. The risk refers to any adverse fluctuations in future returns, in this view, the only negative fluctuations in future returns are considered. Risk management is the process of evaluation and assessment and then presentation and discussion for managing risk.

Material and Methods

Hull[3] studied that the banking business practiced rigid rivalry with banks and with financial institutions to catch the attention of probable customers. Hoyt and Liebenberg[4] wanted to measure the influence of enterprise risk management on business value. In the study they evaluated 125 companies and they found a statistically significant positive and linear correlation between the business value and enterprise risk management. Pagach and Warr[5], in their study where they employed Hazard model reached the conclusion that it was more probable for the large and institutionalized companies with highly volatile assets to adopt enterprise risk management. In another study, Pagach and Warr[6] searched for the effects of enterprise risk management on long term business performance. They found that enterprise risk management applications decrease stock price volatility of businesses and it has negative correlation with market/book values rate changes in profit fluctuations. They also determined that leverage of the banks increased after enterprise risk management applications. In their multivariate analysis, Beasley et al.[7] searched for the cost and benefits of enterprise risk management. In this study 120 samples belonging to the years 1992-2003 were used. The

results of the analysis revealed that cost and benefits of enterprise risk management are unique for each business. The main goal of banks today is to maintain stability and make sure they are impervious to external shocks while at the same time being internally sound and sensible[8]. Mounira[9] (2008) found financial institutions based on Islamic Shariah principles area of modern academic and of policy significance. It is also accounted that due to the superior levels of customer satisfaction and enhanced service quality, Islamic banking is more attractive and pleasing than conventional banking[10]. Particularly, Islamic banks with their exclusive values and operations precisely recognized the deposit characteristics, their investment pattern and prospect to successfully administer their liquidity[11]. Aggarwal Vijender et al[12] evaluated micro finance and risk management for Poor in India. Also, Serife onder, Huseyin Ergin[13] also examined enterprise risk management applications in Turkey and they had an empirical study with logistic regression model on the companies included in ISE (Istanbul Stock Exchange). Sunitha Kumaran[14] also examined the relationship between risk management and mitigation techniques in Islamic finance. To facilitate a significant number of stakeholders, Islamic banks execute numerous functions. This incorporates the pool of funds through the recognition of deposits. These funds are therefore forwarded to entrepreneurs or firms for dynamic and fruitful ventures to breed profits. In addition Islamic banks offers interest free products to dish up the diverse economy segments in compliance with Shariah principles. Moreover the Islamic bank is to endorse and encourage trade behavior as a dynamic interaction of the economy[15].

When discussing the challenges faced by financial institutions in managing risk, it is important to have a consistent definition of the term 'risk'[16] .For the purposes of this paper, risk is defined as the volatility of a corporation's market value. The definition that has been selected is as broad as possible. What are of interest are all decisions that may impact on a change in market value. This is consistent with the view that risk management is about optimizing the risk-reward tradeoff not about minimizing the absolute level of risk[17]. In practice, banks' exposures are asymmetric. This is particularly true for credit risk, where the upside consists of a small positive yield, and the downside consists of a loss that could range from zero to more than hundred percent of the exposure. Given the importance of this downside risk, banks tend to focus their energies on understanding and managing the key drivers that determine financial loss. In doing this, they generally distinguish between three main types of risk; credit risk, liquidity risk, operational risk.

In this study we intend to investigate the three types of risk in Islamic banks. Thus, in the following text, you will see the definition of any of the risks and then previous research by researchers.

Liquidity Risk: Liquidity risk is the risk due to lack of sufficient liquidity to cover short-term obligations and unexpected outflow of funds .This risk Includes both asset liquidity and funding liquidity risk. Funding liquidity risk due to the inability to pay debts and short-term obligations asset liquidity risk arises when dealing with assets owned real prices do not. Liquidity risk is due to the inability to pay debts and obligations, that arises when an asset can quickly and any time prices prevailing in the market to cash. Kim and Santomero[18] examined the responsibility of bank capital regulation in controlling solvency risk. By employing mean-variance model, they found capital ratios unproductive way to restrict bank's insolvency risk[19]. Regulatory restrictions, debt ratio, volatility of risky assets, size of liquidation costs and spread between deposit rate and riskless interest rate are the significant constraints that compel bank's hedging decisions. Davis and Lischka[20], Andersen and Buffum[21], Albanese and Chen[22], Linetsky[23], Atlan and Leblanc[24] and Carr and Madan[25] that allows in particular for linkages between co movements in the underlying asset price and the probability of the credit event. In this paper that is an initial foray into jointly modeling both credit and liquidity risk we take a first order approach to credit risk by allowing for its mere existence but ignoring issues of comovements that may now exist in principle in all the three dimensions of market, credit and liquidity. Siddiqui[26] found that Islamic banks in Pakistan were more liable towards considering projects with long-term financing and better performance in terms of assets and return established improved risk management with keeping safe liquidity. Van den End[27] simulated the effect of funding and market liquidity risk for the Dutch banking system. Sensarma and Jayadev[28] investigated the risk management of public and domestic private banks of India for the period 1998 to 2006. They found an enhancement on risk management aptitude of the banks. Akhtar et al.[29] established better performance in elements of assets and return which recognized that conventional banks had improved liquidity risk management than Islamic banks in Pakistan. As well, Sujit Kapadia et al.[30] studied Liquidity risk in banks of England. Hidayat[31] et al. Surveyed on the Level of Effectiveness of Liquidity Risk Management of Bahrain Islamic Banks.

Credit Risk: The potential financial loss resulting from the failure of customers to honor fully the terms of a loan or contract. Credit risk of losses resulting from the inability or unwillingness to fulfill its obligations to the bank's customers. Increasingly, this definition is being expanded to include the risk of loss in portfolio value as a result of migration from a higher risk grade to a lower one**.** Wilson Summers and Hope[32] stated that the inclusion of non-financial data and prototype of payment behavior in business failure can improve the certainty to manage credit in more appropriate manner. Barnhill, Papapanagiotou and Schumacher[33] found credit value of portfolio of a bank's the most important risk factor. Brown and Wang[34] studied on the credit risk in Australia and the results showed the arrangement of hedging duration and credit spread. Peter and Peter[35] reported statistically momentous impact of loan-to-value ratio and negative equity risk as drivers of default credit risk. Fatemi and Fooladi[36] stated the solitary most vital

fundamental principle of credit risk models it to be acquainted with default risk of counterparty. OeNB[37] and Elsinger et al[38] integrated balance-sheet based models of credit and market risk with a network model to evaluate the probability of bank default in Austria. Demirovic and Thomas[39] concentrated on the measurement of credit risk in United Kingdom. Mounira[9] established Islamic banks to be riskier that conventional banks, and argued to strengthen and support risk management practices for Islamic banks as they have less risk hedging gears accessible in the market. Ho and Yusoff[40] focused on credit risk management in Malaysia financial institutions. Hassan[41] persuaded risk identification and risk assessment and analysis were fairly competent in risk management practices. Ali et al[43] concentrated on commercial banks of Pakistan with a sample of 28 banks from the time period of 2006 to 2009 and their results showed that the bank size has positive and significant association with credit risk and operational risk. Muhammad Naveed et al[43] had A Study of Leasing and Insurance Companies of Pakistan and Evaluated Credit Risk on Financial Markets in Pakistan.

Operational Risk: The potential financial loss as a result of a breakdown in day-to-day operational processes. Operational risk can arise from failure to comply with policies, laws and regulations, from fraud or forgery, or from a breakdown in the availability or integrity of services, systems or information. When a bank's credit to be confronted with the risk arising from inadequate controls, operational risk there are. This risk is as the risk processes, people and Inadequate or failed systems or from external events defined. Al-Tamimi and Al-Mazrooei[44] and Hassan[41] argued that Islamic banks of UAE and Brunei Darussalam faced the credit and operational risk more severely than other types of risks. Ray and Cashman[45] reported that operational risk influence decision making in numerous ways. Blacker[46] stated how mitigation of operational risk is being detained by British retail banks and found responsibility for operation risk lies with business unit management. Allen and Bali[47] found significant affect of business cyclical factors in measuring operational risk, while studying the affect of operational risk management on profitability of banks through risk adjusted return on capital (RAROC). Chapelle et al.[48] found that far-reaching funds can be conquered through energetic risk management techniques. In addition, the inclusion of innovative products in the financial businesses found to have huge cross-correlation with increasing operational risk[49].

The study aims to testing the following hypothesis: H 0: There is no relationship of firm's level characteristics with credit risk, liquidity risk and operational risk. H 1: There is a relationship between cash to asset ratio and credit risk. H 2: There is a relationship between sizes of the banks with credit risk. H 3: There is a relationship between capital adequacy ratio and credit risk. H 4: There is a relationship between debt to equity ratio and credit risk. H 5: There is a relationship between cash to asset ratio and liquidity risk. H 6: There is a relationship between sizes of the banks with liquidity risk. H 7: There is a relationship between capital adequacy ratio and liquidity risk. H 8: There is a relationship between debt to equity ratio and liquidity risk. H 9: There is a relationship between cash to asset ratio and operational risk. H 10: There is a relationship between sizes of the banks with operational risk. H 11: There is a relationship between capital adequacy ratio and operational risk. H 12: There is a relationship between debt to equity ratio and operational risk.

To attain the above mentioned research objectives, we used a sample of 10 banks. Data was collected from the bank's annual reports over the period 2006 to 2011. Financial data from these annual reports was used to calculate and to evaluate the credit, liquidity and operational risk management of Islamic banks in Iran. The list of Islamic banks which are included in this study is reported in table 1.

Table-1
List of Banks included in this study

Sr. No	Islamic Banks
1	Saderat bank
2	Meli bank
3	Tajarat bank
4	Mellat bank
5	Sanaat o madan bank
6	Karafarin bank
7	Pasargad bank
8	Sina bank
9	Parsiyan bank
10	Eghtesade novin bank

Below you can see three linear regression models of this study and all variables calculated Explanation in table 2:

Model (A): Credit Risk = $\beta 0 + X1\beta 1 + X2\beta 2 + X3\beta 3 + X4\beta 4 + \varepsilon$

Model (B) : Liquidity Risk = $\beta 0 + X1\beta 1 + X2\beta 2 + X3\beta 3 + X4\beta 4 + \varepsilon$

Model (C) : Operational Risk = $\beta 0 + X1\beta 1 + X2\beta 2 + X3\beta 3 + X4\beta 4 + \varepsilon$

Table-2
Variable and their proxies

Variables	Proxies
Credit Risk	Ratio of Total Debt to Total Assets
Liquidity Risk	Capital to Total Assets
Operational Risk	Return on Total Assets
Explanatory Variables	
cash to asset ratio	Cash / Total Assets
Bank's Size	Logarithm of Total Assets
Capital Adequacy	Tier 1 Capital + Tier 2 Capital / Risk Weighted Assets
Debt to equity ratio	Total debts / equity

Results and Discussion

To test the hypotheses of this study, we used linear regression to find the relationship between the variables. On the other hand,

linear regression assumes a normal distribution of the dependent variables. In this study we have examined this subject and Findings showed that dependent variables were not normal. Thus, the conversion BOX-COX method was used for normalization in this study and then with Using the skewness coefficient and Q-Q charts and histograms, we re-tested Normalized results (you can see figure 1). By doing the above items, the coefficient of skewness became zero for all three research dependent variable.

To investigate the relationship between the dependent and independent variables in five consecutive years, the variable "Year" is an interfering variable. That may affect the relationship between variables, and can affect the research results. Thus, to ensure the consideration of interfering variables, we enter the variable "year" as an independent variable to our regression models (for the years 2006-2011, we used the numbers 1 to 5). Thus, from the next step in the statistical calculations, you will see the independent variable "Year".

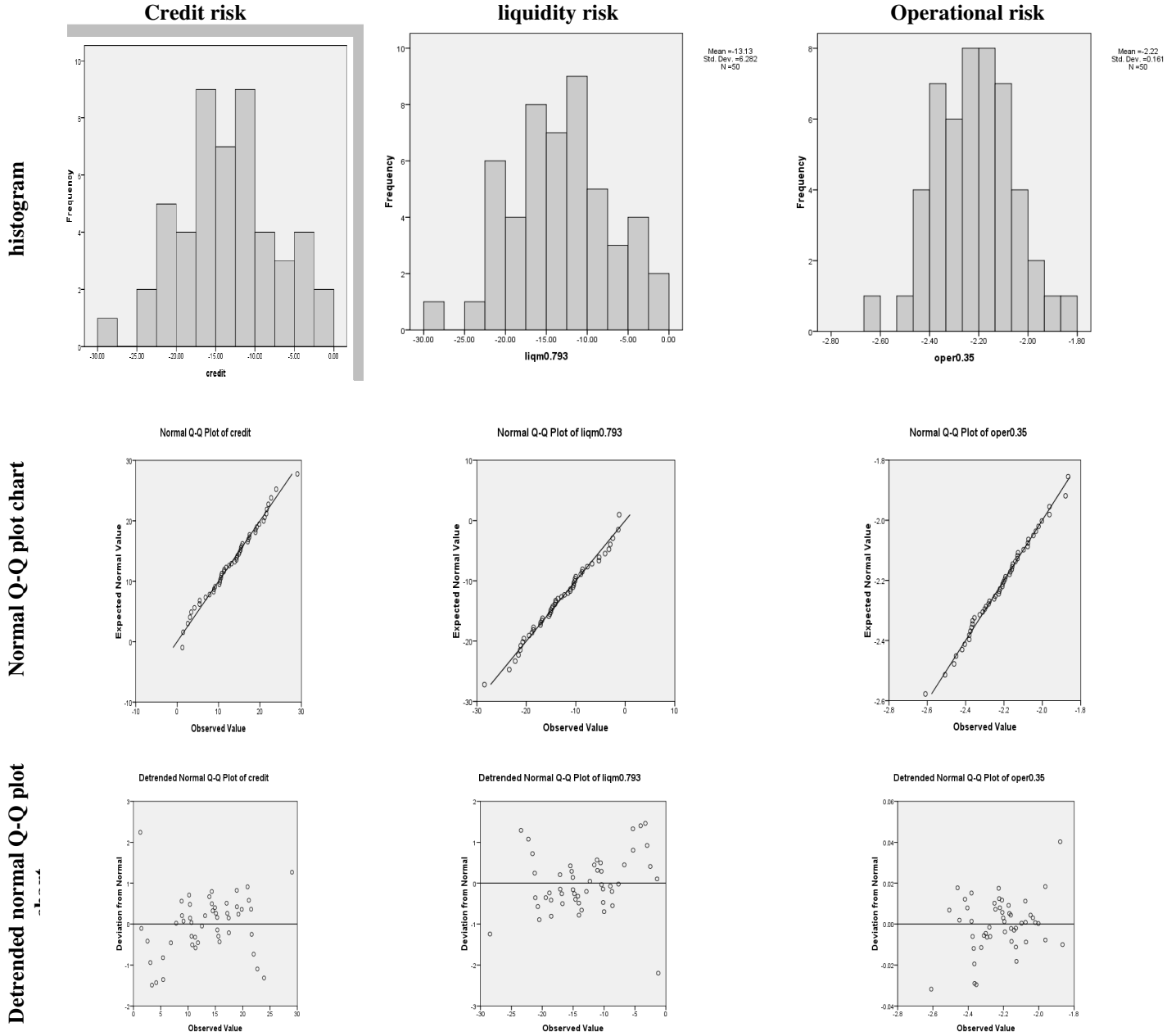

Figure-1
Summary of results of the normalized dependent variables

Descriptive Statistics: Descriptive statistics containing values of means and standard deviation are reported in table 3. The variables Credit risk, liquidity risk and operational risk are dependent variables, while the rest of them are independent variables.

Table-3
Descriptive Statistics

Variables	N	Mean	Std. Deviation
Credit risk	50	.900996334	.1178988709
Operational risk	50	.016253413	.0109137210
Liquidity risk	50	.075698964	.0840070023
Cash to asset	50	.009935426	.0106366345
size	50	8.113518483	.4817694358
Capital adequacy	50	.130402888	.0921989825
Debt to equity	50	20.889513403	11.6298866642
year	50	3.000	1.4286

Regression Results: Table 4, 5 and 6 reports the regression results of model (A), (B) and (C). The models (A), (B) and (C) respectively use credit, liquidity and operational risks as dependent variables.

Credit Risk: The credit risk is a big threat for banks as the value of any organization measures by its credit worthiness. The capital adequacy and debt equity ratio found to have statistically significant relationship in 95% confidence level (model A, table 4). The capital adequacy had an inverse relationship and debt to equity ratio had a positive relationship with credit risk. Thus, this study accepts H 3 and H 4. The regression results reports that there weren't any relation between another variables with credit risk, so H 1 and H 2 were rejected. Finally, credit risk model for Islamic banks is as follows:

Credit risk= - 0.726 capital adequacy + 0.002 debt to equity ratio.

Liquidity Risk: According to the statistical results based on Model B, the capital adequacy had a positive statistically significant relationship with liquidity risk, as well as the cash to asset ratio, sizes of banks and debt to equity ratio had an inverse relationship with liquidity risk in 95% confidence level (table 5). Thus, All hypotheses relating to liquidity risk is accepted, Means; H 5 to H 8. Finally, liquidity risk model for Islamic banks is as follows:

Liquidity risk = -20.076 cash to asset ratio – 0.823 size + 5.901 capital adequacy – 0.481 debt to equity ratio.

Operational Risk: The results of Model C expresses that; the cash to asset ratio, sizes of banks and capital adequacy had a inverse statistically significant relationship with operational risk in 95% confidence level ,so this study accepts H9 , H10 and H11. The regression results reports that there weren't any relation between the debts to equity ratio and operational risk, so H12 was rejected (table 6). As you can see in table 6, the variable "year" had a positive relationship with operational risk. Finally, operational risk model for Islamic banks is as follows:

Operational risk = -3.498 cash to asset ratio – 0.233 size – 0.682 capital adequacy + 0.04 year

Table-4
Coefficients for credit risk

Model A		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.214	.156		1.366	.179		
	Cash to asset	-.293	.853	-.030	-.343	.733	.891	1.123
	size	-.030	.020	-.141	-1.478	.146	.756	1.323
	Capital adequacy	-.726	.136	-.650	-5.330	.000	.465	2.149
	year	-.004	.006	-.052	-.597	.553	.905	1.105
	Debt to equity	.002	.001	.275	2.042	.047	.382	2.618
a. Dependent Variable: credit risk								

Table-5
Coefficients for liquidity risk

Model B		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.183	1.751		1.818	.076		
	Cash to asset	-20.076	9.550	-.034	-2.102	.041	.891	1.123
	size	-.823	.229	-.063	-3.597	.001	.756	1.323
	Capital adequacy	5.901	1.524	.087	3.871	.000	.465	2.149
	year	-.048	.071	-.011	-.683	.498	.905	1.105
	Debt to equity	-.481	.013	-.891	-36.085	.000	.382	2.618
a. Dependent Variable: liquidity risk								

Table-6
Coefficients for operational risk

Model C		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.269	.288		-.932	.357		
	Cash to asset	-3.498	1.573	-.231	-2.224	.031	.891	1.123
	size	-.233	.038	-.698	-6.191	.000	.756	1.323
	Capital adequacy	-.682	.251	-.390	-2.716	.009	.465	2.149
	year	.040	.012	.353	3.430	.001	.905	1.105
	Debt to equity	-.002	.002	-.173	-1.090	.282	.382	2.618
a. Dependent Variable: operational risk								

Conclusion

This study aims to investigate the firm's level factors which significantly influencing the risk management practices in Iranian banks for the period 2006 - 2011. This study employed credit, liquidity and operational risk as dependent variables to evaluate the risk management practices in Iranian banks. Empirical results reported that all above risks have positive relationship with capital adequacy and leverages (debt), thus Ball (2) requirements about them are mandatory For credit risk, quality of assets and size of bank is not influence items but for liquidity and credit risks, these items have a key roll . Finally, if the banks want to adverse or reduce of risks, then they have to attend on portfolio of assets and capital structure.

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