RISKS AND BANK PERFORMANCE IN JORDAN

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ABSTRACT

The purpose of the paper is to investigate the impact of operational risk, credit risk, and liquidity risk on bank performance in Jordan. The study utilizes a sample of 15 listed banks in the Amman Stock Exchange (ASE) and the period of study is confined between 2010 and 2014. The dependent variable of the study is bank performance based on Return on Assets (ROA), while risks' variables are operational risk, credit risk, and liquidity risk. The results show that operational and credit risks have a significant negative relationship with ROA while liquidity risk is found to have an insignificant positive relationship with ROA. Also, the study discovers that the relationship between firm size and ROA is negatively significant while the relationship between bank age and ROA is found to be positively significant. Finally, the result of the relationship between management change and ROA is positively insignificant. In addition, the results are important to the practitioners by showing the factors that affect bank performance and enables them to improve their risk management practice. Besides, it also provides valuable information as well as guidance for banking institutions to improve their performance in the future.

Keywords: Operational Risk, Credit Risk, Liquidity Risk, Return on Assets, Bank Institution.

INTRODUCTION

Risks and its impact on bank performance are very important to the banking industry. In addition, banks in Jordan are not able to avoid different types of risks (Grassa, 2012). Therefore, the purpose of the study is to investigate such types of risk with bank performance in Jordan. Further, the banking sector is the backbone and major component of the financial system. Thus, it will give impact to the stability of an economy. Any problem and interference that happens in the banking system will give implications for the economic conditions of a country. It means the good economic conditions have been resulted from good strategies and good management in handling and controlling any problems that occur around the country.

Since the bank is a very important component between surplus and deficit units in the economy, it needs to maintain and perform its services efficiently (Iqbal & Molyneux, 2016). Banks with efficient performance can attract many customers to maintain the economic condition in the country (Iqbal & Molyneux, 2016).

The financial system of Jordan is based on the banks, for which the economic activities are financed by the bank, therefore, banks play a great role in the Jordanian economy (Zeitun & Benjelloun, 2013). Jordan has a unique banking system because it is following two types of banking systems which included the Islamic banking system and conventional or commercial banking systems. Moreover, the Islamic banking system follows the Shari'a or Islamic laws for the services and financing.

The banking sector of Jordan is controlled by the central bank of Jordan; it handles both Islamic and conventional banks. Jordan established the central bank in 1964, it is an independent institution, and it works on behalf of the government for fiscal responsibilities. Moreover, the

central bank is not only regulating the banks, but it also introduces and sponsors new financial institutions (Khamis, 2003).

Meanwhile, risk plays a vital role in the banking institutions. In running their services and financial activities, banks are also exposed to risks. Risk is one of the factors that affect the efficiency of the bank (Van Greuning & Iqbal, 2007). In addition, the bank also faces several risks in their operation such as operational risk, credit risk, and liquidity risk. All these risks will affect the efficiency of the banking sector. According to Abu Hussain & Al-Ajmi (2012), the most important risks facing both Islamic and conventional banks are operational risk, credit risk, and liquidity risk.

Additionally, the Arab Spring has shown an asymmetric effect. Some countries were obstructed very minimally or suffered zero impact while some others received severe waves. In Tunisia, the epicentre of the crisis, for example, a massive weakening in mining with 40% value added were reported. Oil production also experienced a decline. This was led by labour unrest. As a result, bank profitability was badly impacted seeing a decrease in the growth of credit, which resulted to an increase in inflation. Two popular destinations, often visited by tourists, Egypt and Tunisia were hot hard, witnessing a real falling in the GDP growth to a decade low, which was a total opposite from the previous years. The currencies in the region also received a substantial weakening with the total forex reserves of the oil-importing countries experienced a sink by a quarter between early 2011 and mid-2012. For instance, the reserves in Jordan was USD 7 billion at the end of December 2012, an obvious decrease from what it was in the early 2011, which was nearly halved from USD 12 billion. In fact, the stock market was also battered with Egypt, Tunisia, Morocco and Lebanon-the four giant countries in market capitalization in the region, underwent a lost in the range of 8-15% in the duration of the period (Ghosh, 2016).

Moreover, the Jordanian economy had been affected by many external and internal shocks such as crisis and regional instability risks such as the financial crisis of 1989, the first and second Gulf war's 1990-1991 and 2003 respectively. These crises left negative effects on Jordan, the tourism and foreign investment badly was affected by these crises. Besides, in 2011, the political instability in Arab countries on regional basis had started in Iraq, Egypt, Syria, Libya, Tunisia, and Palestine (Zeitun & Benjelloun, 2013). In addition, Khasawneh (2017) mentioned that Jordan is suffering from a severe economic crisis. Unemployment, public debt and general budget deficits are increasing, lead to increase risks in banks and affecting the performance of Jordanian banks. Therefore, the study is still important in the present time.

The banking sector in Jordan did not have a credit risk management system, which is the most important point of banking business to read and anticipate any future risks that may affect the projects and investments with any banking institution in Jordanian banks. This resulted the Jordanian banks will not being able to avoid risk and preserve shareholders and customers investments (Grassa, 2012). To illustrate, the practicality of the problem of poor risk management in Jordanian banks is obviously seen in the Housing Bank. The bank is the largest bank in the country that suffered heavy losses exceeding 70 million dinars in 2012 when subsidiaries in neighbouring countries such as Syria collapsed. Banking sources confirmed that the losses were resulted from a miscalculation by the bank's board to the repercussions of the Syrian crisis on the branches of the Housing Bank which was established in several cities and provinces in Syria.

Further, the Housing Bank was responsible for the heavy loss incurred as a result of the lack of bank and clear mechanisms to keep track of risks and avoided preserving the money of shareholders and customers (Grassa, 2012). In addition, empirical results for a study done in Jordan confirmed that the majority of the Jordanian banks are inefficient in managing their inputs (financial resources), thereby signifying high risk (Zeitun & Benjelloun, 2013).

Although there are ample studies on risk and performance, the results are inconsistent. Thus, the inconsistent results of the previous studies created a gap in the study of bank performance; hence there is a need for more studies in order to minimize the inconsistency of the results (Allen et al., 2004). In addition, most studies on risk and performance focused on listed companies and very few were done on banking institutions (Sun & Chang, 2011). Therefore, there is a need for more studies on risk to focus on banking institutions due to the vast growth and importance of banking institutions in the economy.

Moreover, the focus of banking studies has long been the financial institution's profitability (Musyoki & Kadubo, 2011; Sun & Chang, 2011). Previous findings have clear effects on bank management in which to enhance performance and also for decision and policymakers that are concerned with bank soundness, bank safety, and bank competitiveness (Sun & Chang, 2011). Numerous studies on the association between various kinds of risk and performance have been done in developed countries, but very limited have been done in emerging countries such as Jordan. This creates a research gap in the study of bank performance as differences in the characteristics of developing countries (i.e. political environment, culture, economy) limit the applicability of the findings of developed countries to the developing countries (Aebi et al., 2012; Sun & Chang, 2011).

In addition, studies have less focus on banks performance in the Middle East countries. Thus, there is a need to conduct research on banking sector performance in Arab countries especially in Jordan due to the strong economy of a country is based on banking system (Zeitun & Benjelloun, 2013). According to Hashem et al. (2015), banks' performance in Jordan are weak and facing different challenges and difficulties due to the numerous socio-political-economic factors including the political upheavals in the region, rising unemployment rates, and major dependency on the remittances from the Gulf countries.

This study has the following contributions, which have significant implications for researchers, investors and regulators. First, the results of this study are important to other researchers. It is useful because of its contribution to the body of knowledge specifically on the relationship between risk and bank performance. Also, this will be useful to future researchers who are interested in conducting the same type of research in this field of study. Also, this study provides evidence of the relationship between operational risk, credit risk and liquidity risk with the performance of Jordanian banks.

Second, the result of this study is important to the policymakers because it will facilitate the formulation of policies regarding risk in banking through enforcing the implementation of an effective risk on banks for the creation of measures and prevention against any possible threat of financial crisis on the economy. Finally, the result is important to practitioners as it shows the factors that affect bank performance and enables them to improve their risk management practices.

Further, the methodology proposed in this study is well-established model and panel data analyses that used by the previous studies such as Aruwa & Musa (2014) in investigating the risk variables and bank performance. The remainder of the paper is organized as follows. The second section reviews the relevant literature and hypotheses development. The third section presents the methodology and discusses the sample. The fourth section presents an analysis of the main empirical results. The fifth section is the discussion of the findings. The last section provides the conclusion and limitations.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

In the banking sector such as in Jordan, banks acknowledge the requirement of a comprehensive manner to manage compliance, financial, hazard, operational and also strategic risks. Besides, the banks need to align these activities hence they can closely meet the objectives of the enterprise and risk appetite (Zeitun & Benjelloun, 2013). Based on conventional definition, risk management often refers to "*a process of identifying, assessing, and prioritizing risks of different kinds*". Risk managers will eventually establish a plan whether to minimize or eliminate the impact of negative events upon the identification of the risks.

The Jordanian economy had been left tarnished following the impacts of many external and internal shocks and crises (Zeitun & Benjelloun, 2013). Despite its low risk management system, it is vital for the banking business to read and anticipate any future risks that may influence projects and investments made by banking institutions. The Jordanian banks have been seen as have not been able to avoid risks and protect investments from the customers and shareholders. Further, operational, credit and liquidity risks suggested having an impact on bank performance in Jordan (Grassa, 2012).

In addition, a robust correlation between risk management and bank performance in the banking sector is not anything strange. In fact, the major objectives of bank management are to increase bank return and to upgrade performance. These objectives could not be accomplished unless the bank has a very strong risk management team who are able to manage and mitigate the risks to an acceptable level (Elbahar, 2016).

Another interesting point that should not be ignored is the argument of the claim that banks display better performance when they possess good risk management systems. This is evident in a few studies conducted on the topic examining the relationship between risks and bank performance in the developed and developing countries (Allen et al., 2004; Ashraf et al., 2007; Sun & Chang, 2011; Musyoki & Kadubo, 2011; and Aebi et al., 2012).

An exhaustive analysis of the relevant literature disclosed a paucity of previous studies that investigate the risk of bank performance in developing countries such as Jordan. Hence, this study aims to contribute through the relationship between risks and bank performance of listed banks in Jordan. Operational risk, credit risk and liquidity risk are considered as the most important risks in banking sector (Tandelilin et al., 2007). Therefore, this study examines the relationship between the three kinds of risks and banks performance of Jordanian banks.

Operational risk

Operational risk is asymmetric and it impact to losses or gains of the banks. The banks should manage expenditure to avoid from operational risk especially when the marginal expenditure and marginal reduction are equal during operational event with loss expectations. Therefore, banks can reduce the expected future cash flow by minimizing the operational loss events expected costs and rise in bank performance (King, 2001). In addition, Cummins et al. (2006) stressed that it seems sensible for banks to create expenditures on the management of operational risk to the barest minimum, where the marginal expenditure and the marginal reduction in expected losses from equal operational events. Froot (2007) argued that by managing operational risk, future projected cash flows can be maximized by banks through the reduction of the projected costs of operational loss events and thus will increase the bank performance. In addition, since bank customers have more sensitivity to insolvency risk; that could be exacerbated by huge operational losses, banks are highly motivated to efficiently manage operational losses in order to reduce insolvency risk and increase bank performance.

Also, it is compulsory for banks' management to manage the operational losses because of customers are more conscious about the insolvency risk. When the insolvency risk is low, the bank performance will be high (Cummins et al., 2006: Merton & Perold, 1993). Abu Hussain & Al-Ajmi (2012) was the only study found a significant positive relationship between operational risk and bank performance. However, Tafii et al. (2011); Al-Tamimi et al. (2015); Ali et al. (2011); Ashraf et al. (2007); Demirovic & Thomas (2007); Isshaq & Alufar-Bokpin (2009); and Aruwa & Musa (2014) found a significant negative relationship between operational risk and bank performance. Hence, this study hypothesized on the basis of prior studies as follows:

H1: There is a significant negative relationship between operational risk and bank performance.

Credit risk

Credit risk is known as the level of enormously valuable assortment that occurs in debt instrument due to the diversity in indebted individuals and the quality of counter parties' credit. This type of risk is tremendously a key risk of the banks. In any case, the overall assets and benefits are controlled risk, besides the balance sheet items, re-estimation of attributes, liabilities and general credit quality (Drehman et al., 2010).

Hakim & Neamie (2001) examined the relationship between credit risk and bank performance by utilizing Egypt and Lebanon banks over the period of six years from 1993 to 1999. It gave an estimation of fixed effects model of bank return with various intercepts and coefficients. The result demonstrated a positive relationship between credit variable and profitability.

Likewise, the relationship between credit risk and profitability as a proxy of bank performance was studied by Aduda & Gitonga (2011). The findings displayed an equitable relationship between credit risk management and profitability in all commercial banks. However, another study by Sayedi (2014) found that there is insignificant and negative relationship between credit risk and profitability.

Further, the relationship between credit risk and bank profitability as a proxy of bank performance was investigated by Miller &Noulas (1997). They revealed that there was actually significant and negative relationship between the two variables, hence, the effective risk management is associated with better bank performance. Hence, banks will confront with an immense complication in making profits at the maximum level. Credit risk is defined as the possibility for a bank's assets especially loans, to experience a drop in value which entails to valueless. In relation to that, provision for loan losses must be taken by banks because higher provision is often linked to the size of the overall loans which, unfortunately, and indicator of high risk. The management of credit, is hence, truly vital to the strong financial system as a whole (Tsorhe et al., 2011).

In fact, many studies found a negative relationship between credit risk and financial performance. A lot of literature in finance highlighted the probability that risky lending escalates the decline in payback. In turns, this contributed a negative impact to the earnings of commercial banks (Rogers, 2006). In the similar note, Jiang et al. (2012) found that banks with higher credit risks can be considered as less efficient. This finding is further supported by other studies such as Al-Tamimi et al. (2015); Ali et al. (2011); Ashraf et al. (2007); Demirovic & Thomas (2007); How et al. (2005); Pasiouras (2008); and Ruziqa (2013) which similarly recorded a negative significant relationship between credit risk and bank performance. Hence, this particular study emphasizes the relationship between credit risk and bank performance as follows:

H2: There is a significant negative relationship between credit risk and bank performance.

Liquidity risk

Bank liquidity shows that the banks have sufficient liquid resources that can be effortlessly liquid in getting new investments or compensating any financial or contractual commitment. Banks will be uncovered to risks in liquidity when they possess insufficient liquid resources that can be utilized to reimburse any anticipated and startling commitment. Based on that, the liquidity risk is deliberated as one of the foremost vital sort of risks that the management of banks ought to be anxious about.

The liquidity risk in the banking sector has a contradictory effect on profitability. Molyneux & Thornton (1992); and Barth et al. (2003) suggested that liquidity risk has a positive effect on profitability. In fact, Jiang et al. (2012) highlighted a positive and significant coefficient on liquidity risk, which led to the assumption that notwithstanding the trade-off between liquidity and profitability, a bank handling higher liquidity risk endures efficiency losses. However, Hakim & Neamie (2001) established that the liquidity variable is insignificant across all banks and possess zero impact on profitability.

On the other hand, Tabari et al. (2013) found that the relationship between liquidity risk and bank performance is significant and negative; hence, led to a conclusion that the liquidity risk will trigger to the deterioration of the performance of the bank. Similarly, a significant negative relationship between liquidity risk and bank performance were found by Al-Tamimi et al. (2015); Distinguin et al. (2012); Pana et al. (2010); Bourke (1989); and Kosmidou et al. (2005). Hence, the relationship between liquidity risk and bank performance is hypothesized as follows:

H3: There is a significant negative relationship between liquidity risk and bank performance.

METHODOLOGY

Sample and Research Design

This study utilizes 15 listed banks of Jordan from 2010 to 2014. The reason to conduct this study using 15 banks, which are listed in firms because they have same nature and environment of business (Hashem et al., 2015). This study attempts to identify relationships that may exist between risks and bank performance of the Jordanian banks.

Data Collection

The risk and bank performance data are collected from annual reports of listed banks in Amman Stock Exchange. These annual reports are collected from the official websites of the banks.

Model Specification and Research Variables

The study utilizes well-established model that used by previous studies such as Aruwa & Musa (2014). The dependent variable is Return on Assets (ROA) while the independent variables are operational risk, credit risk, and liquidity risk. This study also considered the effect of the three control variables namely, firm size, bank age and management change, when investigating the risk variables and bank performance.

$$ROA_{it}=\alpha+\beta_1 OR_{it}+\beta_2 CR_{it}+\beta_3 LQ_{it}+\beta_4 FIRMSIZE_{it}+\beta_5 BANKAGE_{it}+\beta_6 MCHANG_{it} + \varepsilon_{it}$$

Where,
ROA=Return on asset ratio, net income divided by total assets.
OR=Operational risk, total expenses divided by total revenue.
CR=Credit risk, total debt divided by total assets.
LQ=Liquidity risk, net loans divided by deposits.
FIRMSIZE=Firm size, the log of total assets.
BANKAGE=Bank age, numbers of years since the bank start incorporation.
MCHANG=Management change, a dummy variable, coded "*1*" if there is a change in board members and "*0*" otherwise.
β1, β2, β3, β4, β5, β6=The coefficients of variables.
α=Constant.
ε=Random Error of variable.
i=Banks.
t=Years.

DATA ANALYSIS AND FINDINGS

Descriptive Statistics

Before undertaking the hypothesis testing procedures, an initial summary of the variables is generated as illustrated in Table 1.

Table 1
SUMMARY OF DESCRIPTIVE STATISTICS N=75

Variables	Mean	Std. Dev.	Minimum	Maximum
ROA	0.0127457	0.0048383	-0.0016592	0.0250551
OR	0.5882972	0.1224084	0.3386002	1.029558
CR	0.8631452	0.0323187	0.7803605	0.9286216
LQ	0 .0242872	0.0383219	0.000	0.1860429
FIRMSIZE (Log)	21.36685	0.9478624	19.65224	23.97595
FIRMSIZE (In Billions JD)	3.50	5.82	3.43	25.9
BANKAGE	35.2	16.2006	13	74
MCHANG	0.4933333	0.5033223	0	1

Based on Table 1 above, the results of descriptive statistics are taken from the variables that incorporated into the model. The descriptive statistics comprised mean, standard deviation, minimum and maximum. Taking into account the descriptive analysis as condensed in Table 1, the mean value of the Return on Assets (ROA) is 0.0127457 with a minimum value of -0.0016592 and the maximum of 0.0250551, showing a limited disparity in the ROA over the Jordanian banks in the sample. As to Operation Risk (OR), the mean value is 0.5882972, and the minimum and maximum of the banks are 0.3386002 and 1.029558, respectively.

For Credit Risk (CR), the result in the Table 1 uncovers that the value of the mean for credit risk is 0.8631452 with a minimum of 0.7803605 and the maximum of 0.9286216. The summary of the results reveals that the mean for liquidity risk (LQ) is 0 .0242872 with the minimum 0.000 and the maximum 0.1860429 in the Jordanian banks. The zero value of the liquidity risk as shown in Table 1 is due to the formula which was used to measure liquidity risk (total loan divided by total deposit), some banks present that the loan ratio was not valued for

several years, thus, the results of descriptive statistics representing the same situation of banks for several years.

With regards to the firm size (FIRMSIZE), the result in Table 1 reveals that the mean of the firm size is around 21.36685 for Jordanian banks with a minimum of 19.65224 and a maximum of 23.97595. Moreover, in term of Billions of Jordanian Dinar (JD), the result in Table 1 shows that the mean number of firm size is JD 3.50 Billion with a minimum of JD 3.43 Billion and a maximum of JD 25.9 Billion.

In terms of bank age (BANKAGE), the mean bank age is 35.2 years with a minimum age of 13 years and a maximum age of 74 years for banks in Jordan. Lastly, for the management change (MCHANG), the mean is 0.4933333.

Diagnostic Tests

Diagnostic tests are carried out to support the validity of the results from regression analysis by identifying and correcting the model from regression related problems namely non-normality, heteroscedasticity, autocorrelation and multicollinearity (Hair et al., 2006). The discussions are as follows.

Normality Test

In order to determine whether the data is normal enough for further statistical test, normality test is conducted. Under this normality test, the main concern is the distribution of score on variables, and this is conducted by examining the value of skewness (symmetry of the distribution) and kurtosis (peakedness of the distribution). According to Klein (1998), the data is normally distributed if the value of skewness is less ± 3 and the kurtosis does not exceed ± 10. We summarize the normality results in Table 2.

Table 2
SUMMARY OF NORMALITY TEST

Variables	Obs.	Skewness	Kurtosis
ROA	75	-0.509	0.617
OR	75	1.388	2.774
CR	75	0.300	-0.341
LQ	75	2.332	5.654
FIRMSIZE	75	1.133	1.552
BANKAGE	75	0.699	-0.277
MCHANG	75	0.027	-2.055

The results in Table 2 show that all variables are normally distributed based on skewness and kurtosis tests. Thus, the results support normality data assumption.

Heteroscedasticity Test

The result of heteroscedasticity test is summarized in Table 3 based on Breusch-Pagan/Cook-Weisberg tests. The p-value is less than 0.05 in the model, indicating that heteroscedasticity exists. In statistical analysis, the result is shown in Table 3, Ramsey test specifies that if the F-statistic is lower than the p-value, it provides significance point, and then the null hypothesis of correct specification is accepted. However, the p-value is lower than F-statistic based on Table 3; this implies that the functional form has the problem of heteroscedasticity in the model.

Table 3 TEST OF MODEL SPECIFICATION AND HETEROSCEDASTICITY			
	Chi^2	**F-value**	**p-value**
Breusch-Pagan	9.26	-	0.0023
Ramsey Test	-	0.65	0.5853
Ho (null)	Reject	-	Reject

Note: *Ho* (null): Constant variance (homoscedasticity).

Autocorrelation Test

The word autocorrelation can be used to choose the query of whether or not the sample data set is created from a random procedure. It is common that the residual terms of any two cases ought not to be correlated but instead independent. Autocorrelation is believed to be existing where the residual terms are not independent. Autocorrelation can be identified by utilizing Wooldridge test. Below is the autocorrelation result in Table 4.

Table 4 AUTOCORRELATION TEST		
	F (1, 14)	**p-value**
Autocorrelation	7.815	0.0143
H0	Reject	Reject

Note: Wooldridge test for autocorrelation; *Ho* (null): No first-order autocorrelation.

From the outcome of Table 4 above, the Wooldridge test is conducted to find out whether there is an autocorrelation problem in the data. From the analysis done, it is discovered that autocorrelation exists in relation to return on assets in the Jordanian banks.

Multicollinearity Test

Multicollinearity is a situation where two or more presumption's variables are extremely associated with one another. It refers to the extent to which one variable can be described by the other variables in the analysis. As multicollinearity increases, it confuses the interpretation of the variety since it is more challenging to determine the impact of any single variable, attributable to their interrelationships (Gloede et al., 2013). Research by Mullner et al. (1998) stated that multicollinearity is one out of the numerous methods utilized by the researchers to check the presence of an irregular relationship between independent variables that more often than not clarify the consequences of which variables influenced can be controlled by alternate variables within the study.

Pearson Correlation Matrix

Roldan-Valadez et al. (2013) expressed that the correlation analysis is important in depicting the direction and strength of the linear relationship amongst two variables. More precisely, the Pearson Correlation analysis was undertaken to clarify and assess the strengths of the relationship amongst the study variables as presented in Table 1. The correlation coefficient (*r*) values are presented in Table 5. Table 5 displays the strength of the relationship among variables. Hair et al. (2010) suggested that the correlation value of 0 proves no relationship, while the correlation ± 1.0 indicates a perfect relationship. On the other hand, interpreted the correlation within 0 and 1.0 which are as follows; the correlation (*r*) between ± 0.1 and ± 0.29 indicate little relationship, and then between ± 0.30 and ± 0.49 indicate an average relationship

and more than ± 0.50 displays strong/solid relationship. The results of Pearson correlation matrix test are summarized in Table 5.

Table 5
SUMMARY OF PEARSON CORRELATION MATRIX

	OR	CR	LQ	FIRMSIZE	BANKAGE	MCHANG
OR	1.000					
CR	-0.161	1.000				
LQ	-0.064	-0.287*	1.000			
FIRMSIZE	-0.163*	0.082	-0.234*	1.000		
BANKAGE	-0.36	0.062	-0.204	0.710**	1.000	
MCHANG	0.303**	-0.079	-0.046	0.043	-0.122	1.000

Notes: ** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed).

Table 5 reveals the Pearson Correlation Matrix between the control variables and independent variables of the sample. As shown in Table 5 the highest level of correlation is between firm size (FIRMSIZE) and bank age (BANKAGE) with 0.71. Hence, the next procedure of Variance Inflation Factor (VIF) is needed to detect multicollinearity problem.

Variance Inflation Factors (VIF)

The use of Variance Inflation Factor (VIF) for every independent variable turned into a common strategy for identifying the multicollinearity (Naser et al., 2002). The VIF expressed that if VIF is more than 10, it demonstrates that the independent variable in the research has extreme relationships that prompt the multicollinearity issue.

Table 6 reveals the outcome of the multicollinearity issue as VIF for all independent variables is less than 10 which imply that the independent variables are within the normal range. It is accordingly presumed that the present study is free from serious multicollinearity problem.

Table 6
SUMMARY OF VARIANCE INFLATION FACTOR TEST

Variables	Collinearity Statistics	
	Tolerance	**VIF**
OR	0.838714	1.19
CR	0.894355	1.12
LQ	0.866853	1.15
FIRMSIZE	0.458690	2.18
BANKAGE	0.473373	2.11
MCHANG	0.879493	1.14
Mean VIF		1.48

Notes: OR=total expenses divided by total revenue; CR=total debt divided by total assets; LQ=net loans divided by deposits; FIRMSIZE=the log of total assets; BANKAGE=numbers of years since the company start incorporation; MCHANG=a dummy variable, coded "1" if there is a change in board members and "0" otherwise.

Linear Regression Analysis

The result of Breusch-Pagan/Cook-Weisberg Test for Heteroscedasticity in Table 3 shows that the p-value is less than 0.05 in the model, indicating the existence of heteroscedasticity. In addition, Table 4 shows the Wooldridge test that autocorrelation exists in the model. Based on these results as shown in Tables 3 and 4, the heteroscedasticity and autocorrelation problems were corrected by stata. As shown in Table 7, the problem of heteroscedasticity and autocorrelation were corrected by using stata command of correction the

errors of heteroscedasticity and autocorrelation. Table 7 reveals the analysis of the results for the model in the study.

Table 7
THE COEFFICIENTS OF MULTIPLE REGRESSION ANALYSIS

ROA	**Expected Sig**	**Coef.**	**z-value**
OR	-	-0.0327737	-14.11 ***
CR	-	-0.0201249	-2.07 **
LQ	-	0.0047191	0.50
FIRMSIZE	+	-0.0011402	-2.36 ***
BANKAGE	+	0.0001015	4.28 ***
MCHANG	+	0.0005025	0.81
_cons		0.0698236	5.22
R-squared		0.7369	
Wald chi^2 (6)		297.43	
Prob>chi^2		0.0000	

Notes: ***Significant at level 0.01; **Significant at level 0.05; *Significant at level 0.1.

DISCUSSIONS

As shown in Table 7, the R^2 of the model is 0.7369. This implies that the variables explain 73.69 percent of the bank performance based on ROA. This is being considered as acceptable results. In cases where there is a small sample, R^2 value is a rather optimistic overestimation of the real population value (Tabachnick & Fidell, 2007). R^2 signifies that 0.7369 percent of the disparity in the dependent variable is discussed by the disparities in the independent variables within the study. This implies that the deviation in bank performance measured by ROA is statistically described by the regression equation. The result in Table 7 also displays that the model is significant (p<0.0l) indicates the validity of the model.

In order to test the hypotheses, standard beta coefficients were utilized. The result in Table 7 displays four variables in the study which are significant with bank performance. The variables are operational risk (OR) (β=-0.0327737, p<0.01), credit risk (CR) (β=-0.0201249, p<0.05), firm size (FIRMSIZE) (β=-0.0011402, p<0.01) and finally bank age (BANKAGE) (β=0.0001015, p<0.01). However, other variables such as liquidity risk (LQ) (β=0.0047191, p>0.1), and management change (MCHANG) (β=0.0005025, p>0.1) do not have a significant relationship with bank performance.

In addition, operational risk has a significant negative relationship with ROA. The results indicate that the higher the operational risk, the lower the bank's performance. The possible explanations behind the relationship are an absence of certainty and persistence of the bank's clients towards Jordanian banks. Since 1990, governments around the globe have lifted limitations on banks to boost great improvement in the banks. The new banking instruments were presented after the evacuation of these confinements and the irreconcilable situations rose up out of cross-industry organizations had expanded bank's operational risks, making various financial issues. This finding is consistent with other studies such as Tafii et al. (2011); Al-Tamimi et al. (2015); Beck et al. (2013); Imbierowicz & Rauch (2014); Islam et al. (2015); and Jiménez et al. (2013) which found a negative relationship between operational risk and performance.

Further, credit risk is also found to have a significant negative relationship with ROA. The negative relationship with ROA implies that the higher the credit risk, the lower the bank performance. The plausible reason for the negative relationship between credit risk and ROA is because of increase in non-performing loan of the banks will reduce the bank performance. The

credit risk is negatively correlated with the operating expenses of Jordanian banks, signifying the ability of the credit risk to serve as an effective risk indicator. In other words, the process for managing credit risk can be simplified by using the proper guidelines, and it is not necessary for banks to develop a risk system procedure by themselves or with others, which lowers related costs. This result is consistent with previous studies such as Miller & Noulas (1997); Rogers (2006); Ab-Rahim et al. (2012); Beck et al. (2013); Imbierowicz & Rauch (2014); Islam et al. (2015); Jiménez et al. (2013); Ongore & Kusa (2013); Ruziqa (2013); and Said (2013) which found a negative relationship between credit risk and performance.

Liquidity risk is found insignificant with ROA. The result is consistent with Hakim Neamie (2001). Three control variables namely firm size, bank age and management changes are utilized in this study. First is the firm size. The use of firm size as a control variable is being justified by the findings of companies with various distinct characteristics. According to Patro et al. (2003), firm size is explicitly associated with its size and is inversely comparative to the alternate of growth prospects. In addition, the firm size affects firm performance and is usually utilized as a control variable in experimental research (Cheung et al., 2007; De Andres et al., 2005; and Ghosh, 2006). The result in Table 7 shows a negative significant relationship at 0.01 level between firm size (FIRMSIZE) and ROA. This is not consistent with Klapper & Love (2004) who discovered that there is a significant positive relationship between firm size and performance.

The second control variable is the bank age and the result presented in Table 7 shows a positive significant relationship between bank age and ROA at 0.01% level. The result is consistent with the previous studies such as Evans (1987). This shows that an increase in company age would increase the management abilities and skills to improve firm performance therefore, bank performance increases with the bank age.

Finally, the third control variable is the management change. Table 7 displays a positive insignificant relationship between management change and ROA. The result is not consistent with previous studies that any changes in the board of director's structure lead to decreased firm performance (Hart, 1995; and Warner et al., 1988).

CONCLUSION AND LIMITATIONS

The objective of this study is to examine the effect of risk variables on the performance of Jordanian banks. Specifically, the study covers 15 listed banks in the Amman Stock Exchange. The years are from 2010 to 2014. For bank performance, the most common measure, ROA is used. Three types of risk are examined: operational risk, credit risk, and liquidity risk. The selection of these banks and types of risk are determined based on data availability. Empirically, this study has achieved the research objectives by applying a regression analysis to investigate the relationship between risks and bank performance.

In view of the results obtained, the result shows that the relationship between operational risk and bank performance is negatively significant. This result indicates that the higher the operational risk, the lower the bank performance for these periods under review.

In addition, credit risk has a significant negative relationship with bank performance. This shows that credit risk influences bank performance. This negative relationship could be due to the increase in the non-performing loan which reduces bank performance. However, liquidity risk has an insignificant positive relationship with bank performance.

Other control variables which include: firm size, bank age and management change are also investigated. The study documented a significant negative relationship between the firm size and bank performance. Bank age is found to have a positive and significant relationship

with the bank performance. On the other hand, management change is found to have insignificant relationship with bank performance.

With regards to the implications of this study, the result is important to the policy makers because it will facilitate to the formulation of policies regarding risks in banking sector, through the implementation of effective risk management in the banks. It is imperative for the banks, regulators and policy makers in Jordan to continue in promoting the implementation of effective risk management in the banks. Hence, it will prevent possible threat of bankruptcy.

In addition, it is important for practitioners by showing the risks that affect bank performance and enable them to improve their risk management practices. Jordanian banks should formulate sound practices for managing risks, particularly during of rapid growth in new products or markets. This study provides an avenue for the researchers to examine the risks and bank performance of other Middle East countries. In fact, the study recommends to the bankers to manage relevant risks in Jordanian listed banks in order to increase the bank performance.

This study has several limitations. First, only 15 listed banks are utilized in the study. Hence, the sample is small. Second, some of the data used in this study collected from data-stream hence, not all data were available.

Future research may focus on the other risks such as interest rate risk, market risk, and foreign exchange risk. In addition, future studies can also consider risks in the other countries such as Iraq, Libya, Tunisia, and Syria in order to provide more robust results of the relationship between risks and bank performance of developing countries.

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