The effect of internal risks on the performance of Jordanian commercial banks

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CHRONICLE	ABSTRACT
	This study mainly aimed to examine the effect of internal risks on the financial performance of the Jordanian commercial banks. The study sample comprised the entire commercial banks that are included in the Amman Stock Exchange (ASE) spanning the period from 2009 to 2019. The study formulated four hypotheses, which are related to the effects of liquidity risk and leverage risk on the bank's performance, proxied by ROA and ROE. Based on the results, liquidity risk did not have a significant effect on both ROA and ROE, while leverage risk did not have a significant effect on ROA, but it did on ROE. It can thus be concluded that the use of financial leverage should be taken into consideration because of its negative influence on the banks' financial performance, specifically on the shareholders' returns. It is recommended that future studies examine the effect of additional risk types, like credit risk and operational risk on the performance of banks.

1. Introduction

Performance of banks represents their success considering capital, profitability, and shareholders' equity and thus, banks generally utilize various instruments to improve their success potential. Nevertheless, banks are faced with various challenges in the form of economic and financial crises, dynamic technological communication development, and lack of control over the activities of financial and administrative departments. To this end, banks must deal with distinct internal and external risks. Improving bank performance involves increasing the Net Interest Margin (NIM), Return on Assets (ROA), Return on Equity (ROE) and minimizing if not eradicating other possible risks that may arise (Pidada, Yuesti & Kepramareni, 2018). ROA refers to the ratio between net income and total assets, while ROE refers to a measure obtained when dividing net income by shareholder's equity (Al-Eitan & Bani-Khalid, 2019) and both are used banks performance proxies in the present study. In literature, scholars made use of various commercial banks samples all over the globe to examine the effects of external and internal risks on the bank's financial performance. A group of studies in literature focused on the effect of internal risks of banks on their financial performance and these included studies by Mohamed (2020), Bekhet, Alsmadi and Khudari (2020), Mennawi (2020), Inegbedion, Vincent and Obadiaru (2020), Abu-Alrop

(2020) and Oudat and Ali (2021). Studies of this caliber reported mixed results concerning the effects of internal risks of banks on their financial performance. Specifically, Haryati and Kristijadi (2014), Shahardin (2017), Bekhet, Alsmadi and Khudari (2020) revealed the negative effect of internal risks on bank's performance, other studies like Abu-Alrop (2020) reported positive effects of internal risks on the same, while some other studies like Oudat and Ali (2021) highlighted insignificant effects of liquidity risk on the commercial bank's performance, proxied by ROE. Owing to the mixed findings, the present study aims to examine the impact of internal risks of commercial banks, specifically liquidity risk and leverage risk on their financial performance (ROE and ROA). The study is expected to contribute to literature as it determines the effects on commercial banks of Jordan, using data from the year 2009 to 2019. The study examines individual effects of liquidity risk and leverage risk on ROA and ROE, which proxy the commercial banks performance. The study recommends that decision-makers in Jordanian commercial banks leverage the study findings.

There are five sections to this study, with the next section dedicated to literature review and hypotheses development. The third section contains research methods, detailing research sample and research measurements, and the fourth section presents the empirical analysis results and discussion of the same. Finally, the fifth section provides the conclusion, limitations and it enumerates research directions for future studies.

2. Literature Review and Research Hypotheses

2.1 Internal Risks of Banks

Bank risks are generally of eight types, namely legal risk, strategic risk, compliance risk, reputation risk, operational risk, market risk, credit risk and lastly liquidity risk. From the above risk types, some like liquidity, market and credit risks can be measured, while the remaining are immeasurable (Camilleri, 2005; Haryati & Kristijadi, 2014; Samad, 2015). In another take on the types of risks by Alsmadi and Khudari (2020) and Mennawi (2020), five types of risks were highlighted namely operational risk, credit risk, liquidity risk, leverage risk and capital risk. Studies examined the effects of specific types of risks, including liquidity risk and leverage risk (Mennawi, 2020), market risk, operational risk, liquidity risk and credit risk (Haryati & Kristijadi, 2014), leverage risk, liquidity risk and equity price risk (Mohamed, 2020), while other studies focused on operational risk, liquidity risk, leverage risk, credit risk and capital risk (e.g., Bekhet, Alsmadi & Khudari, 2020). Abu-Alrop (2020) focused on examining financial risk of Russian commercial banks for the period from 2008 to 2017, using foreign exchange risk, leverage risk, credit risk, liquidity risk and interest rate risk. On the other hand, two types of bank risks were addressed in Ruziqa's (2013) study, and they were credit risk and liquidity risk and only a single type of risk was examined by Isanzu (2017), in the context of Chinese banks performance.

Two types of risks are considered in this study, consistent with the studies by Shahardin (2017), Kamaludin (2017) and Mohamed (2020) and they are liquidity risk and leverage risk. More specifically, liquidity risk is described as the ratio of liquid assets to total assets (Haryati & Kristijadi, 2014) and it arises when banks are unable to meet the short-term financing requirements or the financial demands. In this regard, lower liquidity risk ratio often reflects good assets management (Shahardin, 2017). Similarly, Kamaludin (2017) related that liquidity risk arises because the bank is unable to transform assets into cash in a timely manner, while Mohamed (2020) contended that it is one of the financial risks that are characterized by financing difficulties. Another take on this type of risk came from Muscettola (2013), who described it as the excess of bank borrowings/excess of its indebtedness – into other words, with liquidity risk, that is higher borrowing cost (Menicucci & Paolucci, 2016). Authors also proposed different measurements of liquidity risks, among which are as follows; Mohamed (2020) and Abubakar (2015) recommended measuring it by debt-equity ratio, which is essentially the ratio of total liabilities to the total equity of shareholders, Yoon and Jang (2005) recommended measuring it by calculating long-term debt to total assets, while Al-Qudah and Jaradat (2013) suggested using total deposits to total assets.

2.2 Financial Performance of Banks

According to Mohamed (2020), financial performance is the efficiency of the entity to generate profit using its resources. Two common proxies of financial performance of banks that have been extensively utilized in literature are Return on Assets (ROA) and Return on Equity (ROE) (e.g., in Al-Eitan & Bani-Khalid, 2019; Ogboi & Unuafe, 2013; Moussa, 2015; Inegbedion, Vincent & Obadiaru, 2020; Ruziqa, 2013; Abubakar, 2015; Al-Qudah & Jaradat, 2013). Specifically, ROA represents the measurement of net income over total assets (Kamaludin, 2017; Al-Eitan & Bani-Khalid, 2019; Saidat et al., 2020), and higher ROA values reflect higher level of bank performance (Shahardin, 2017). On the other hand, ROE is the bank's effective management in the shareholders capital deployment and is measured as a ratio of net income or profit after tax to shareholders equity (Al-Eitan & Bani-Khalid, 2019; Oudat & Ali, 2021). It has also been measured as a ratio of total deposits to total assets, where a high debt ratio means that the bank's total assets constitute debts (Abubakar, 2015).

2.3 Effects of Internal Risks of Banks on Bank Performance

With regards to the internal risk's effects of banks on their performance, a recent Jordanian study by Bekhet, Alsmadi and Khudari (2020) focused on the internal and external factors that impact commercial banks profitability. Their findings showed that bank performance was negatively impacted by three kinds of risks, namely operational risk, leverage risk and

credit risk. Similarly, Kamaludin (2017) found operational risk and counterparty risk to have a negative impact on ROA, while Mennawi's (2020) study on Islamic banks in the case of Sudan showed that credit risk and leverage risk had negative impacts on bank performance. In the context of Indonesia, Haryati and Kristijadi (2014) examined the effect of risk profile on the commercial banks financial performance and found the performance of banks to be negatively affected by risk profile, which includes liquidity, credit, market, and operational risks. Added to the above studies, a negative significant impact was found by Shahardin (2017) of liquidity risk on ROA, indicating that increased liquidity risk would lead to decreased profitability of the bank. In Bahrain, Oudat and Ali (2021) examined the effect of three types of risk (capital risk, liquidity risk and exchange risk) among commercial and investment banks on their performance (ROE). Their findings indicated no significant liquidity risk on ROE among commercial banks but a significant impact of liquidity risk on the same among investment banks. In Mohamed's (2020) study, the author found leverage risk to impact ROA negatively and significantly. In the Russian context, Abu-Alrop (2020) measured the financial performance of commercial banks through return on assets, net interest margin and return on equity and the effect of risks on them. According to their findings, operational risk, credit risk and liquidity risk positively affected the bank's financial performance, but interest rate risk and leverage risk negatively affected the same. In Nigeria, Inegbedion, Vincent and Obadiaru (2020) focused on investigating the risk management impact on the financial performance of Nigerian commercial banks and they highlighted long-term significant effects of liquidity risk, credit risk and leverage risk on the commercial bank's performance. According to Toumi, Viviani and Belkacem (2011), commercial banks borrow for assets acquisition to make more profits, while Abubakar's (2015) study on the relationship between bank financial leverage (debt-equity ratio, debt ratio) and financial performance of banks proxied by ROE concluded with a negative relationship between debt-equity ratio and ROE. Therefore, on the basis of the above discussion, this study hypothesizes that internal risks (liquidity and leverage risks) are negatively related to the performance of banks and thus, the following hypotheses are proposed to be tested;

H_1: *There is a significant effect of liquidity risk on the ROA of commercial banks in Jordan.*

H_2: *There is a significant effect of leverage risk on the ROA of commercial banks in Jordan.*

H_3: *There is a significant effect of liquidity risk on the ROE of commercial banks in Jordan.*

H_4: *There is a significant effect of leverage risk on the ROE of commercial banks in Jordan.*

2.4 Research Model

The study developed a conceptual model presented in Fig. 1, consisting of two independent variables, which are liquidity risk and leverage risk, and two dependent variables, which are ROA and ROE. Both risks are related to both ROA and ROE, the entire relationships of which comprise of 4 hypotheses (H1-H4).
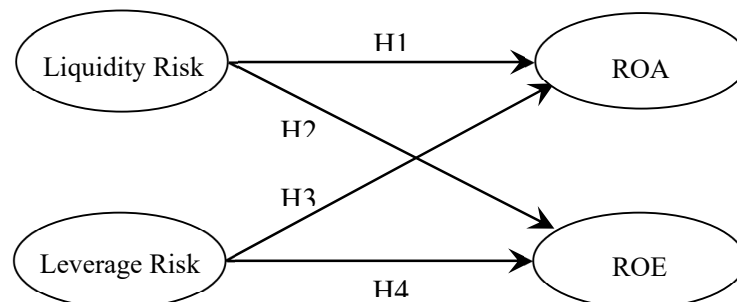

Fig. 1. Research Conceptual Model

3. Methods

3.1 Research Sample and Data

The study data was gathered from the annual reports of the Jordanian commercial banks published in a list provided by Amman Stock Exchange (ASE) in its website (www.exchange.jo). The list covered the period of the study, which was from 2009 to 2019. Hence, the study sample covers all listed commercial banks in the ASE for the years from 2009 to 2019.

3.2 Measures

This study conceptualized the commercial banks risks as liquidity risk and leverage risk. More specifically, liquidity risk is the shortfall/excess of liquidity resulting from unfavorable financial status of the bank (Mennawi, 2020), while leverage risk is the ability of the bank to meet its financial commitments (Kamar, 2017). Leverage risk is obtained by calculating total deposits to total assets (Al-Qudah & Jaradat, 2013). In the present study, both risk types were measured by calculating them using the following formulae,

Liquidity risk = Bank cash + Investment/Bank total deposits

Leverage risk = Bank total Deposits/Bank total assets

With regards to the measurement of the commercial bank's performance, the present study used to common financial performance ratios, namely ROA and ROE, which have been extensively used in prior literature (e.g., Al-Eitan & Bani-Khalid, 2019; Inegbedion, Vincent & Obadiaru, 2020). While ROA represents the efficiency of the bank in using its assets for profitability (Mennawi, 2020), ROE represents the level to which the bank uses the shareholders' investments to generate returns (Yoon & Jang, 2005; Al-Eitan & Bani-Khalid, 2019). Financial performance indicators of the commercial banks (ROA and ROE) were calculated using the following formulae.

$ROA \ = \ Bank \ net \ profit \ after \ tax/Bank \ total \ assets$

$ROE = \ Bank \ net \ profit \ after \ tax/Shareholders' \ total \ equity$

Consistent with previous literature, standard estimation methods is used for panel data in the analysis using both fixed and random effects regression models. Based on the results of the Hausman test, the use of a random-effects model was adopted in this study. The scoring equation gives the following standard regression model:

$$Y_{i,t} = \alpha + \beta 1 LIQ_{i,t} + \beta 2 LEV_{I,t} + \beta 3 SIZE_{i,t} + \varepsilon_{i,t} \tag{1}$$

where $Y_{i,t}$ represents the dependent variables i (ROA and ROE) at time t. $LIQ_{i,t}$ denotes the liquidity risk i at time t. $LEV_{i,t}$ is the financial leverage risk i at time t. $SIZE_{i,t}$ represents the control variable i at time t. and $\varepsilon_{i,t}$ is the error term.

4. Empirical Findings and Discussion

Table 1 summarizes the descriptive statistics of the variables selected for the study and the correlation matrices between the pair of variables. ROA and ROE are the performance of Jordanian commercial banks.

Table 1

Descriptive statistics and correlation coefficients

	Mean	SD	Max.	Min.	Obs.	ROA	ROE	LIQ	LEV	SIZE
ROA	0.0217	0.0050	0.0371	0.0003	143	1.000				
ROE	0.110	0.075	0.364	0.0022	143	0.578	1.000			
LIQ	0.0371	0.0421	0.7695	0.9413	143	0.278	0.187	1.000		
LEV	0.8273	0.024	0.0002	0.018	143	0.330	−0.051	0.081	1.000	
SIZE	22.215	1.3512	20.125	23.973	143	0.357	−0.349	−0.389	0.063	1.000

Average ROE, ROA and average SD were all acceptable for emerging markets. However, the average LIQ risk was only 0.037. These banks had good liquidity to cope with any environmental conditions affecting their business. In addition, the average LEV risk has reached 0.8273 since then, indicating that these Jordanian banks face a high degree of credit risk, as the level of risk depends on the lending policies adopted by these banks. Finally, the average bank size in the sample was 22,215, compared to 1.3512 (SD), as Jordan has three main bank sizes: large, medium, and small. Table 1 provides information on the dependent and explanatory variables and their relationship with each other. This table provides some preliminary overview of the relationship between the variables of study interest. Furthermore, most of the correlation values are relatively small, indicating that there is no serious concern about the multilinear relationship. The hypotheses were tested using linear regression analysis as suggested by Alkhazali (2014), through IBM SPSS V. 25. The results are listed in Table 2, which shows both risk types (LIQ-Risk and LEV-Risk) effects. According to prior studies (Antwi et al., 2013; Al-Adamat & Alserhan, 2020), the R-squared value shows the regression model's fit (where R-square value nearer to 1 indicates a more acceptable fit of the model). In the present study, the regression model is acceptable based on its fit (R-square=0.292, F=10.123, Sig.=0.000), indicating that the model is suitable for predicting the independent variables' effects on their dependent counterpart. Based on the analysis results, liquidity risk and leverage risk had no significant impact on ROA (β = 0.149, t-value = 0.224, Sig. = 0.824 and β = -0.868, t-value = -1.034, Sig. = 0.306 respectively), indicating that both H1 and H2 are rejected. Table 2 indicates that the size of the bank negatively affects the return on assets, the larger the bank, the lower the return on investment (ROA). However, smaller banks tend to raise solvency standards when there is an opportunity to increase profitability, cost, and risk. Thus, the first study regression model can be represented as follows;

$$Y \ = \ \alpha \ + \ \beta 1 X1 \ + \ \beta 2 X2 \ + \beta 3 X3 + \ \varepsilon \tag{2}$$

$ROA \ = \ 62.04 \ + \ 0.149 LIQ - 0.868 LEV - 0.0021 SIZE \ + \ \varepsilon$

In the above equation, ROA denotes the first dependent variable, α is constant, β1 and β2 denote the beta coefficients, X1 denotes liquidity risk, X2 denotes leverage risk, and ε denotes error term/residuals.

Table 2

Effects of liquidity risk and leverage risk on ROA

IVs	R-square	F-value	Sig. *	β	t-value	Sig. *
Constant				62.04	6.37	0.000
LIQ-Risk	0.292	10.123	0.000	0.149	0.224	0.824
LEV-Risk				-0.868	-1.034	0.306
Size				-0.0021	4.23	0.002

IVs: Independent variables, LIQ-Risk: Liquidity risk, LEV-Risk: Leverage risk, * Significant at α ≤ 0.05. Dependent variable: ROA. Hausman test Chi-Sq (5) Prob (Chi-Sq) (1)

Moving on to H3 and H4, the analysis results displayed in Table 3 show that the regression model is acceptable to determine the effects of both risk types on the commercial banks financial performance (R-square = 0.688, F = 53.973, Sig. = 0.000). The results also show that liquidity risk had no significant effect on ROE (β = 0.066, t-value = 0151, Sig. = 0.881), but leverage risk had a significant and negative effect on ROE (β = -0.895, t-value = -2.029, Sig. = 0.048), indicating that H3 is rejected and H4 is accepted. Table 3 shows that the size of the bank does not affect the return on equity. The rationale behind this is that most Jordanian banks are small compared to the large international banks, which they think are too big to fail, and therefore have better reasons to increase their risk and get more credit. Thus, the second study regression model can be represented as follows,

$$Y = \alpha + \beta 1 X1 + \beta 2 X2 + \beta 3 X3 + \varepsilon \tag{3}$$

$$ROE = 63.68 + 0.066 LIQ - 0.895 LEV - 0.017 SIZE + \varepsilon$$

In the above equation, ROA denotes the second dependent variable, α is a constant, β3 and β4 denote the beta coefficients, X3 denotes liquidity risk and X4 denotes leverage risk. Lastly, ε denotes the error term. Notably, the model is robust enough to predict the liquidity risk and the leverage risks impacts on ROE, and it managed to explain approximately 68% of the ROE variance.

Table 3
Effects of liquidity risk and leverage risk on ROE

IVs	R-square	F-value	Sig. *	β	t-value	Sig. *
Constant				63.68	16.88	0.000
LIQ-Risk	0.688	53.973	0.000	0.066	0.151	0.881
LEV-Risk				-0.895	-2.029	0.048
Size				-0.017	-0,765	0.423

IVs: Independent variables, LIQ-Risk: Liquidity risk, LEV-Risk: Leverage risk, * Significant at α ≤ 0.05. Dependent variable: ROE, Hausman test Chi-Sq (7) Prob (Chi-Sq) (1)

The obtained results were found to be semi-aligned with those reported by Inegbedion, Vincent and Obadiaru (2020), who found leverage risk to have significant impact on ROE. In the same way, Bekhet, Alsmadi and Khudari (2020) also found a significant negative effect of leverage risk on profitability (ROA and ROE) of banks in Jordan. Meanwhile, in Chen et al.'s (2018) study on the effect of liquidity risk on bank performance, the authors found banks performance to be a function of liquidity risk, in that this type of risk may weaken the performance of banks. Also, Abu-Alrop (2020) reported a significant negative impact of leverage risk on the bank's financial performance. Moreover, Ali and Puah (2019) found no significant effect of liquidity risk on ROE (proxy of profitability) among banks, whereas Haryati and Kristijadi's (2014) study revealed that risk profile intergradient including liquidity risk, market risk, operational risk and credit risk negatively impacted the banks performance. Along a similar line of results, Shahardin (2017) supported the significant and negative influence of liquidity risk on ROA, while Oudat and Ali (2021) found an insignificant result upon examining the influence of liquidity risk on ROE among commercial banks. Lastly, Mohamed (2020) found that leverage risk had a significant negative effect on ROA.

5. Conclusion, Limitations and Future Research Directions

This study primarily aimed to examine the effects of internal risks, namely liquidity risk and leverage risk, on the financial performance (measured by ROA and ROE) in the context of commercial banks in Jordan. Based on the results, both liquidity risk and leverage risk had no significant impact on ROA of Jordanian commercial banks. In the same way, liquidity risk was also found to have no significant impact on the ROE of the commercial banks, but leverage risk was found to have a significant impact on the same, in the negative direction. It can be concluded that the high dependence of banks on debt instruments for profitability enhancement through financial leverage could lead to lowered shareholders' returns. However, the findings of this study should be interpreted with caution as data was limited to the period from 2009-2019, with only liquidity risk and leverage risk examined from the numerous types of bank risks. Future authors can examine additional risk types' of effects (e.g., credit risk, market risk and operational risk) on the commercial banks' performance.

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