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The effect of liquidity risk on bank performance: A comparative study of Islamic and conventional banks in the middle east and north Africa region

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C H R O N I C L E

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A B S T R A C T

This study explores the impact of liquidity risk on Bank performance through a comparative study between conventional and Islamic banks in the Middle East and North Africa Region (MENA). Bank Size, Capital adequacy ratio, liquidity Gap and Return on Assets are used as independent variables and the Bank Age, Inflation Rate and Growth Rate of Domestic product are used as macro-economic variables and the dependent variable is liquidity risk. The methodological choice is the generalized method of moments (GMM). We used a sample of 10 Islamic banks and 25 conventional banks in the MENA region during the period of 2006-2018. The results show various impacts of these variables on liquidity risk in both banks. We also find that the rise in CAR in Islamic banks and conventional banks does not influence liquidity risk. The logical explanations are that the bank could allocate funds to improve credit and fixed assets.

1. Introduction

Liquidity is the ability of a bank to finance an asset rise and meet its obligations of deadlines without assuming losses (Roman & Sargu, 2015; Ghenimi et al., 2018). The fundamental role of banks in managing the transformation of short-term deposits into long-term loans makes them inherently vulnerable to liquidity risk. Almost, all transactions or financial commitments affect the liquidity of a bank. Effective liquidity risk management helps to ensure the bank's ability to handle cash flows. Since banks works are closely with investors, Clark et al. (2016) advance that global risk aversion has been criticized for not describing how investors behave.

In that context, liquidity risk management is important since a deficiency in a single institution can impact the entire system (Sulaiman, 2013). Liquidity risk is the result of the disparity between deadlines on both sides of the balance sheet. This disparity results either from a cash surplus that can be invested or from a cash deficit that requires more liquidity. If the bank has excess liquidity, this means that it will not be able to make a profit, while those with low liquidity are exposed to a risk of withdrawal. In the same vein, Broll et al. (2015) assign that the bank's investment in a risky asset position goes down when the return risk increases, if and only if the risk aversion elasticity exceeds. Therefore, the bank faces the risk of failure and bankruptcy if their losses could not be covered by a capital (Hassan et al., 2013).

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Liquidity risks may be due to insufficient market depth, market disruption or the inability of the bank to access markets. This also concerns the issue of solvency, in which the bank may not be able to meet the financing requirements to finance its assets. Also, it includes the requirement for the bank to make payments to third parties (Iqbal, 2012). The liquidity problem can arise in banks, due to mismanagement of funds or unexpected withdrawals of funds by the depositor, especially in times of problematic economic conditions. The 2008-2009 global financial crises had an impact on banks' ability to cope with liquidity risk and on financial markets either. Therefore, these situations would pose a greater challenge to banks in terms of liquidity management (Siddiqui, 2008). According to Vieito et al. (2016), financial crises are normally associated with negative effects on financial markets.

The present paper makes some contributions to the literature in terms of the determinants of liquidity risks. It is then important to examine the concepts of liquidity risk and their determinants. Moreover, we attempt to present a comparison between the liquidity risk determinants of Islamic banks and those of conventional banks in a framework applied to banks in the MENA region. Generally, through this research, we test the extent to which liquidity risk has an impact on the performance of Islamic and conventional banks in the Middle East and North Arica (MENA) region.

The outline of the paper respects two major parts. The first presents the concepts and determinants of liquidity risk and a comparative study between the liquidity risk determinants of Islamic banks and conventional banks. The second part is devoted to the empirical study on liquidity risk determinants in Islamic banks and conventional banks in the MENA region.

2. Liquidity Risk: Concepts and determinants

2.1. Liquidity Risk and Bank Capitalization in Islamic and Conventional Banks

Liquidity represents the capacity of a bank to finance all assets rise. Nikolaou (2009) stated that liquidity risk can have a hostile effect on banks income and capital. Roman and Sargu (2015) suggest that bank capitalization and liquidity are correlated negatively which is explained by the fact that shareholders employ a large amount of equity which put a great deal of pressure on the bank’s management. Petria et al. (2015) examined the relationship between bank capitalization and commercial bank liquidity in Central and Eastern European countries over the period 2004-2011. The authors suggest that liquid assets provide low returns. They show that the measures adopted by the regulatory and supervisory authorities have a negative impact on banks' liquidity. Amr et al. (2010) and Munteanu (2012) show in their study on Islamic banks, that the capital adequacy ratio has a positive impact on liquidity risk. In the same framework, Ghenimi et al. (2018), specifies that bank capitalization has a negative impact on bank liquidity. Based on these statements, we advance the following hypothesis:

H_{1a}: *Bank capitalization has a negative impact on liquidity risk in Islamic banks.*

In the same fashion, Sulaiman (2013) demonstrates that bank capitalization has a negative impact on liquidity risk in conventional banks. Moreover, the studies conducted by Sukmana et al. (2016) also confirm the negative impact of bank capitalization on liquidity risk in conventional banks. The results of these researchers were confirmed by Effendi et al. (2017). At this level of analysis, we advance the following hypothesis:

H_{1b}: *Bank capitalization has a negative impact on liquidity risk in conventional banks.*

2.2. Liquidity risk and bank size in Islamic and conventional banks

In their study on the liquidity risk relationship and the size of the bank, Abdullah and Khan (2012) found that this articulation is negatively correlated in the Islamic banks. Moreover, Sulaiman et al. (2013) studied liquidity risk in Islamic banks over the period 1994-2009. The results demonstrated that the size is negatively correlated to liquidity risk. In the same context, Dietrich et al. (2014) find out that bank liquidity is negatively correlated with the size of the bank. These results are also confirmed by the study conducted by Ghenimi et al. (2018). At this level of analysis, we advance the following hypothesis:

H_{2a}: *The size of the bank has a negative impact on liquidity risk in Islamic banks.*

Also, several researchers (Akhtar et al., 2011; Iqbal, 2012; Ghenimi et al., 2015) confirm that the size of the bank has a positive impact on liquidity risk in conventional banks. In the same vein, Muharram and Kurnia (2013), Sukmana et al. (2016) and Effendi et al. (2017)) conclude that the size of the bank has a negative impact on liquidity risk in the conventional bank. At this level of analysis, we advance the following hypothesis:

H_{2b}: The size of the bank has a positive impact on liquidity risk in conventional banks.

2.3. Liquidity Risk and Return on Assets (ROA) in Islamic and Conventional Banks

Even though that some studies (Shen et al., 2009; AL-Khouri, 2011) confirm the negative relationship between asset profitability and liquidity risk in Islamic banks, others (Sulaiman et al., 2013; Muharram & kurnia, 2013; Roman & Sargu, 2015; Ghenimi et al., 2018) stress that bank profitability has a positive impact on liquidity. At this level of analysis, we advance the following hypothesis:

H_{3a}: *Bank profitability (ROA) has a positive impact on liquidity risk in Islamic banks.*

Most studies (Akhtar et al., 2011; Iqbal, 2012; Sulaiman et al., 2013; Muharram & Kurnia, 2013; Sukmana et al., 2016) have shown that the return on assets has a positive impact on liquidity risk in the conventional bank. According to the researchers, bank profitability has a positive impact on liquidity risk. On the base of these statements, we advance the following assumption:

H_{3b}: *Bank profitability (ROA) has a positive impact on liquidity risk in the conventional bank.*

2.4. Liquidity Risk and Liquidity Gaps in Islamic and Conventional Banks

Muharram and Kurnia (2013) assign that liquidity gaps have a positive impact on liquidity risk. In the same fashion, Ghenimi et al. (2018) point out that liquidity gaps have a positive impact on bank liquidity in Islamic banks. At this level of analysis, we advance the following hypothesis:

H_{4a}: *Liquidity gaps have a positive impact on liquidity risk in Islamic banks.*

According to Muharram and Kurnia (2012, 2013), liquidity gaps have a negative impact on liquidity risk in Islamic banks. Their results were confirmed by Ghenimi et al. (2018) demonstrating the negative relationship between liquidity gaps and liquidity risk. For the reason, we propose the following hypothesis:

H_{4b}: *Liquidity gaps have a positive impact on liquidity risk in conventional banks.*

The conventional bank adopts a system of interest to give its customers a profit excluded in the Islamic bank. On the other hand, these banks adopt a profit-sharing system to generate profits for their customers. The interest system is more volatile and riskier than the profit-sharing system. This will give a different influence on liquidity risk. Based on this argument, we propose the following hypothesis:

H_5: *There is a difference between the liquidity risk determinants of Islamic banks and those of conventional banks.*

3. Methodological aspects

3.1. Sample of the research

Empirically, several studies have focused on Islamic banks and conventional banks. Our objective is to analyze the factors that could explain the liquidity risk of Islamic banks and conventional banks in 7 countries in the Middle East and North Africa (MENA) region using the generalized method of moment (GMM). The data come from seven countries, namely Bahrain, Tunisia, Kuwait, Qatar, Oman, Saudi Arabia and Egypt. These are 10 Islamic banks and 25 conventional banks for the period 2006-2018. The sample is as following:

Table 1
Sample of the study

Country	Islamic banks	Conventional banks
Egypt.	1	1
Oman	0	4
Tunisia	0	2
Kuwait	2	5
Qatar	2	5
Saudi Arabia	3	5
Bahrain	2	3
Total	10	25

Source: designed by the researchers

Based on this sample, we collected data over a 13-year period from 2006 to 2018, resulting in a panel of 455 observations.

3.2 Measures of variables

The research used several variables on the base of empirical studies and the availability of recent data on key liquidity risk determinants of Islamic banks and conventional banks.

3.2.1. The dependent or explaining variable: Liquidity risk (LR)

This risk is measured using net loan to the total assets (Bitar et al 2016 and Rashid et al 2017). This risk is related to the lack of liquidity available to banks to meet the claims. It is calculated as following:

$$\mathbf{LR} = \frac{\boldsymbol{Net\ loans}}{\boldsymbol{Totalassets}}$$

3.2.2. Independent or explanatory variables

We focus on the liquidity risk determinants of Islamic and conventional banks using a set of bank-specific factors, namely, bank capitalization, profitability, liquidity gap and bank size. The choice of these variables is motivated by the fact that they are under the control of the bank's management. Thus, we can analyze how these internal factors influence bank liquidity.

3.2.2.1. The capital adequacy ratio (CAR)

Bank capitalization is calculated by the ratio of equity to total assets. In fact, a great CAR means that banks have large capital which can be used to cover the deadline dates and the bank has less difficulty. Basically, the bank is in good financial situation if CAR>0 and higher. This indicator is calculated as following: CAR = $\frac{\boldsymbol{Equity\ Ratio}}{\boldsymbol{Total\ assets}}$

3.2.2.2. The Return on asset Ratio (ROA)

This ratio states the ability of a bank to generate income from its resources and with minimum rate about 5%, measured by the ratio of net income to total assets:

ROA = (Net income) /(Total assets)

3.2.2.3. The size of the bank (BS)

According to Shen et al. (2009), the size of the bank is considered as one of the main determinants of liquidity risk. Maudos & Solís (2009) point out that the size of the bank can have an impact on risk. The size of the bank is defined using the logarithm of the bank's total assets:

BS = ln (total assets)

3.2.2.4. The liquidity gap (LG)

According to Ghenimi and al. (2018), a large liquidity gap means that banks have more liquidity risk and vice versa. The liquidity gap is the disparity between assets and liabilities that cause liquidity risk.

Liquidity gap = Total assets –Total liabilities

3.2.3. The control variables

3.2.3.1. The inflation rate (CPI)

Inflation changes the balance sheet and the profit and loss of banks via the interest rate. Inflation is measured using the growth of the Consumer Price Index:

CPI = consumer price index

3.2.3.2. The Growth Rate of Domestic product

This rate is measured by the real rate of DP growth rate.

GRDP = real GDP growth rate

3.2.3.3. Age of the bank (AB)

This variable is measured by the difference between the observation year and the creation date.

Table 2
Definition of variables used in this study

The dependent variable	Definition	Source	Expected sign	
liquidity risk (LR)	Net loan/total assets	Our calculations		
	The independent variables		BI	BC
Capital adequacy ratio (CAR)	Capital/total assets	Our calculations	-	-
Return on Assets Ratio (ROA)	Net income/total assets	Our calculations	+	+
Size of the bank(BS)	Logarithm of total assets	Our calculations	-	+
Liquidity gap (LG)	Total assets and liabilities	Our calculations	+	-
	The control variables			
Inflation rate(IR)	Consumer Price Index	Our calculations	+	+
GRDP	Growth Rate of Domestic product	Our calculations	-	+
Bank age(BA)	The difference between the year of observation and the date of creation.	Our calculations	-	-

Source: Designed by the researchers

3.3 Presentation of the research model

For the purpose to test the relationship between liquidity risk and the selected variables, we use the generalized timing method, which allows us to identify the determinants of liquidity risk. The research model selected advances concepts as the determinants of liquidity risk.

$$LR = f\,(CAR, ROA, BS, LG, IR, GRDP, BA). \quad (1)$$

Our research asserts that the variable to be explained (liquidity risk) is a function of the ratio of capital adequacy (CAR), return on assets (ROA), bank size (TB), liquidity gaps (EL), inflation rate (TNF), the real rate of growth of GDP (TCPIB) and the age of the bank (AB). Thus, Eq. (2) can be formulated as following:

$$LR_t = \beta_0 + \beta_1 BA_t + \beta_2 ROA_t + \beta_3 CAR_t + \beta_4 LG_t + \beta_5 IR_t + \beta_6 GRDP_t + \beta_7 BA + \varepsilon_t \quad (2)$$

The second equation of our research can be formulated as following:

$$LR_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 ROA_{it} + \beta_3 CAR_{it} + \beta_4 LG_{it} + \beta_5 IR_{it} + \beta_6 GRDP_{it} + \beta_7 BA_{it} + \varepsilon_{it} \quad (3)$$

with i=1, 2,3…... N is the banking individuals and t-1, 2 .3.... T is the time.

In fact, according to Ghenimi et al. (2018), Ordinary Least Squares (OLS) estimation or the regression methods is likely to be inappropriate because it fails to respond to very important sources of endogeneity related to this type of empirical model. If there is no possible solution to these problems, a new method is needed which is: The generalized method of moment (GMM) as proposed by Arellano and Bond (1991) and developed later by Blundell and Bond (1998).

Ghenimi et al. (2018) advance that the dynamic panels are characterized by the presence of one or more delayed endogenous variables among explanatory variables. In our study, we include one delayed endogenous variable rp (-1). The objective is to minimize the simultaneity bias. The econometric model adopted aims to put into perspective the determinants of liquidity risk in Islamic and conventional banks. Our proposed models are:

$$LR \text{ in Islamic Banks} = \beta_0 + \beta_1 LR(it\text{-}1) + \beta_2 BS_{it} + \beta_3 ROA_{it} + \beta_4 CAR_{it} + \beta_5 LG_{it} + \beta_6 IR_{it} + \beta_7 GRDP_{it} + \beta_8 BA_{it} + \varepsilon_{it} \quad (4)$$

$$LR \text{ in Conventional Banks} = \beta_0 + \beta_1 LR(it\text{-}1) + \beta_2 BS_{it} + \beta_3 ROA_{it} + \beta_4 CAR_{it} + \beta_5 LG_{it} + \beta_6 IR_{it} + \beta_7 GRDP_{it} + \beta_8 BA_{it} + \varepsilon_{it} \quad (5)$$

with *i*=1, 2,3…... *N* is the individual banking and t 1, 2 .3.... T is the time.

RL is the liquidity risk, TB is the size of the bank, ROA is the return on assets, RAC is the capital adequacy ratio, EL is the liquidity gaps, TNF is the inflation rate, TCPIB is the real rate of GDP growth and AB is the age of the bank.

4. Analysis and Interpretation of Results

4.1. Descriptive Analysis

Descriptive statistics are used to characterize various variables. An examination of some statistical indicators of the study variables presented in the tables below for Islamic and conventional banks reveals the following findings:

Table 3
Descriptive Statistics on Variables in Conventional Banks

Variables	Number of observations	Average	Gap-type	Minimum	Maximum
TNF	325	3.573753	11.87861	-25.95842	33.75154
GRDP	325	4.91373	5.314734	-7.076103	26.17025
BA	325	44.6	21.44516	6	135
LG	325	7444759	1.22e+07	-3073502	6.87e+07
BS	325	7.186765	.7526265	5.841859	8.935607
CAR	325	.2169259	.3251517	.0015649	3.087343
ROA	325	.0145051	.0629725	-1.058337	.1904368
LR	325	.7109683	.1428986	.1296787	1.744273

Source: Designed by the researchers

Table 4
Descriptive Statistics on Variables in Islamic Banks

Variables	Number of observations	Average	Gap-type	Minimum	Maximum
TNF	130	3.896545	11.25796	-25.95842	22.93255
GRDP	130	4.954205	5.282316	-7.076103	26.17025
BA	130	28.2	15.83314	1	61
LG	130	8343396	1.17e+07	69763	5.58e+07
BS	130	7.167988	.8549022	5.274294	8.562298
CAR	130	.2507407	.1770463	.0361117	.9017096
ROA	130	.0162238	.0266697	-. 0817852	.1256264
LR	130	.661762	.1549915	.0238525	.9122586

Source: Designed by the researchers

According to these tables, we assign that the averages in Islamic banks are larger than conventional banks with the variables of liquidity gaps, CAR, ROA, IR, and GRDP. This means that Islamic banks are more able to control their adequacy capital than conventional banks. While the size of the bank, the liquidity risk and the age of the bank in conventional banks are greater than in Islamic banks. This implies that conventional banks are more risky than Islamic banks. It is interesting to study the problem of multi-collinearity between explanatory variables. According to Kennedy (1992), there is a serious problem of multi-collinearity if the correlation coefficient is greater than 80% for each pair of variables.

Table 5
The correlation matrix of Islamic banks

	LR	BS	ROA	CAR	LG	IR	GRDP	BA
LR	1.0000							
BS	0.2718	1.0000						
ROA	0.2220	0.1710	1.0000					
CAR	0.0556	-0.1981	0.2730	1.0000				
LG	0.3063	0.0389	0.2500	-0.0103	1.0000			
IR	-0.0914	-0.0384	0.0275	-0.1157	-0.0872	1.0000		
GRDP	0.1487	0.0603	0.3102	-0.0086	-0.477	0.3283	1.0000	
BA	-0.0078	0.2043	-0.1212	-0.5583	0.3316	-0.0356	-0.2862	1.0000

Table 6
The correlation matrix of conventional banks

	LR	BS	ROA	CAR	LG	IR	GRDP	BA
LR	1.0000							
BS	-0.1817	1.0000						
ROA	0.3577	0.0582	1.0000					
CAR	0.5232	-0.1696	-0.1398	1.0000				
LG	-0.0994	0.0080	0.0445	-0.1080	1.0000			
IR	0.0121	0.1440	-0.0403	0.0298	-0.0823	1.0000		
GRDP	0.0470	0.1440	-0.0196	0.0063	0.0177	0.2697	1.0000	
BA	-0.0297	-0.2010	-0.0284	0.1240	-0.0263	-0.0558	-0.1733	1.0000

The study of the correlation matrix is relevant to detect the existence or not of a problem of multi-collinearity. Based on these tables, we notice that the liquidity risk in Islamic banks comes from a positive relationship with the size of the bank, return on assets, liquidity spreads, bank capitalization and GDP growth rate and a negative relationship with the other variables. However, in conventional banks the liquidity risk has a negative relationship with the size of the bank, the liquidity spreads and the age of the bank. The relationship with other variables is positive. We also remark that all correlation coefficients whether in Islamic

banks or in conventional banks are less than 0.6. This indicates that there is a presumption of absence of problem of multi collinearity.

4.2. Empirical results and discussions

The results presented and discussed in this study arise from the theoretical background throughout the process of our research. Thus, their validity derives from the coherence of the general concepts of research which are the determinants of liquidity risk in Islamic banks and conventional banks. To validate these results, the use of data processing tools was necessary. In fact, we are interested in using the Arellano and Bond (1991) GMM estimator to verify the existence of the effect of explanatory variables on bank liquidity in Islamic banks. Table 7presents the Hansen test results for the most restriction identification and RA test (1) and RA (2) the first-order and second-order correlation series for liquidity risk determinants in the two studied types of banks.

Table 7
Estimating the determinants of liquidity risk

Independent variables	Coefficient		P-Value	
	Islamic banks	Conventional banks	Islamic banks	Conventional banks
Constant	5.018775	.2503326	0.048	0.063*
BS	-. 5375011	.0139325	0.067***	0.041**
ROA	2.696806	.6913268	0.004*	0.000*
CAR	-1.133417	-. 220905	0.059****	0.000*
LG	5.88	-0.58	0.048**	0.003*
IR	.0013475	.000289	0.343	0.050**
GRDP	-. 0150153	.0012823	0.195	0.000*
BA	-. 0164563	-. 0005484	0.080***	0.398
R(1)	0.44	-2.21	0.662	0.027
AR(2)	-1.50	-0.88	0.135	0.381
Hansen test	0.30	19.20	1,000	0.380

NB: According to the Hansen test, if the more-identification restrictions are valid, the null hypothesis that the more-identifying restrictions is valid. According to the AR test (2), if the second-order series correlation is the null hypothesis, there is no correlation.

*, **, *** significance at levels of 10%, 5%, and 1%, respectively.

The regression performed respects the GMM and specifically the Arellano and Bond (1991) GMM-System estimator; d'Arellano and Bover (1995); Blundell and Bond (1998). The over-identification test of Hansen, the first- and second-order self-correlation tests of Arellano and Bond are highlighted in Table 7. Indeed, the Hansen over-identification test for Islamic banks displays a value of (0.30) with a P-Value of (1.000) above 0.1, which means that the null hypothesis H0 of the validity of the over-identification restrictions (validity of instruments) cannot be rejected. We can conclude that the instruments used for this regression are valid which induce the validity of the results. The first- and second-order no-correlation tests for Islamic banks show values (0.44, -1.50) with respective P-Values of (0.662, 0.135). This means that the assumption of no first-order self-correlation of errors is rejected. However, the assumption of no second-order self-correlation cannot be rejected. This implies that the empirical model has been correctly specified as there is no serial correlation (auto-correlation) in the processed residues. Therefore, the instruments used in the models are valid. We assign that this model considers the liquidity risk determinants of Islamic banks. On the other hand, we advance that the size of the bank has a negative and significant impact on the liquidity risk of Islamic banks at the level of 10% (6.7%). This can be explained by the fact that small and large Islamic banks have difficulties in assessing the Islamic capital market exactly to meet liquidity needs. This confirms our first hypothesis which predicts a significant negative influence of this variable on liquidity risk. These finding smatch the works of Ahmed et al. (2011), Sulaiman et al. (2013) and Effendi et al. (2017). The liquidity risk of Islamic banks depends on the CAR ratio. Its coefficient is significant at the 10% level (5.9%) with a negative sign. The capital allows the bank to absorb more liquidity risk. The CAR as defined in the Basel II Agreement is a risk-reducing measure, confirming our second assumption with a negative relationship between liquidity risk and the bank capitalization. This finding is consistent with the results of Roman and Sargu (2015) and Ramzan and Zafar (2014). Moreover, we found that the ROA profitability indicator is statistically significant at 1% with a positive sign, which confirm our expectations. We conclude that the most profitable banks can invest more and are therefore subject to liquidity constraints. In contrast, empirical studies conducted by Akhtar et al. (2011) Ramzan and Zafar (2014) showed that ROA had a statistically non-significant relationship with the measure of liquidity risk which confirms our third hypothesis predicting a positive and significant influence of this variable on liquidity risk. This result is matching with the findings of Akhtar et al. (2011), Ramzan and Zafar (2014). Concerning the liquidity gaps coefficient, we found a significant and positive relationship with the liquidity risk of Islamic banks. This result shows that liquidity gaps play an important role in providing liquidity to banks. Greater liquidity spreads mean that banks have more liquidity risk and vice versa. A positive coefficient indicates that banks could reduce their liquidity risk. The positive and statistically significant relationship confirms our fourth hypothesis which predicts a positive influence of this variable on bank liquidity risk confirming the findings of Muharram and Kurnia (2013).

On the other hand, the inflation rate coefficient has a positive and not significant impact on bank liquidity risk. In fact, the rate of inflation has not a significant ability to explain the evolution of the liquidity indicator of Islamic banks. This seems consistent with the insight that inflation is positively correlated with liquidity risk (Sulaiman et al.; 2013), Ghenimi et al. (2015). Economic growth has a negative and not significant impact on bank liquidity risk. Finally, the age of the bank has a negative and not significant impact on liquidity risk. The Hansen over-identification test for conventional banks displays a value of (19.20) with a P-Value of (0.380) greater than 0.1, which means that the null hypothesis H0 of the validity of the over-identification restrictions (validity of instruments) cannot be rejected. We can conclude that the instruments used for this regression are valid thus inducing the validity of the results. The tests for the absence of first and second order autocorrelation of disturbances for conventional banks display values (-2.21, -0.88) with respective P-Values of (0.027, 0.381). This means that the assumption of no first-order self-correlation of errors is rejected, but the assumption of no second-order self-correlation cannot be rejected. This implies that the empirical model has been correctly specified as there is no serial correlation (auto-correlation) in the processed residues, therefore the instruments used in the models are valid. We note that this model considers the determinants of the liquidity risk of conventional banks.

Concerning the size result, it has a positive and significant relationship at the level of 10% with liquidity risk suggesting that size is a factor that plays an important role in maintaining stability. This indicates that banks have more ability to establish a large market share and generate greater profits. This confirms our first conventional banking hypothesis which predicts a significant positive influence of this variable on liquidity risk. This finding is consistent with the work of Ghenimi et al. (2015) and Effendi et al. (2017). Moreover, we found that the ROA profitability indicator has a positive and significant impact at the level of 5% on liquidity risk. It confirms that the most profitable banks can invest more and are therefore subject to liquidity constraints. This confirms our third hypothesis which predicts a positive and significant influence of this variable on liquidity risk in conventional banks. This finding is consistent with the findings of Akhtar et al. (2011), Ramzan and Zafar (2014), Muharem et al. (2012), sukmana et al. (2016) and Effendi (2017). As for the liquidity spread coefficient, it is considered significant and negatively linked to the liquidity risk of conventional banks. This result shows that liquidity gaps do not play a significant role in providing liquidity to banks. The negative and statistically significant relationship confirms our fourth hypothesis which predicts a negative influence of this variable on bank liquidity risk. This finding is consistent with Muharram and Kurnia (2012) and Chen et al. (2018). On the other hand, the inflation rate coefficient has a positive and significant impact at the level of 5% on bank liquidity risk. However, the rate of inflation does not seem to have any significance to explain the evolution of the liquidity indicator of conventional banks which seem consistent with the statement that inflation is positively correlated with liquidity risk (Sulaiman et al; 2013), Ghenimi et al. (2015). Economic growth has a positive and significant impact on bank liquidity risk. Finally, the age of the bank has a negative and significant impact on liquidity risk. Moreover, we found that in conventional banks, the size of the bank and the GDP growth rate have a positive relation and liquidity spreads have negative relation with liquidity risk. However, the GDP size and growth rate have a negative relation and the liquidity spreads have a positive relation with liquidity risk in Islamic banks. Other variables have the same impact on liquidity risk in Islamic and conventional banks. This confirms our fifth hypothesis. At this level of analysis, we advance that the determinants of liquidity risk in Islamic banks and conventional banks are different. Islamic and conventional banks have the same number of risk factors. However, the factors that affect the risk on each bank are different. This is due to differences in system and returns. In fact, the Islamic bank uses profit-sharing while the traditional bank uses the payment of interest rate. As a system, the Islamic bank is considered as a partner, while the conventional bank is considered as a customer-oriented system with creditors and debtors. Therefore, policymakers must prevent and manage liquidity risk as regards to different treatments, and different risk factors in the two types of banks.

4. Conclusion

This study explores the impact of liquidity risk on Bank performance through a comparative study between conventional and Islamic banks in the MENA region. Size, CAR, liquidity gap and ROA are used as independent variables and the age of the bank, inflation rate and GDP growth rate are used as macro-economic variables and the dependent variable is liquidity risk. The methodological choice is the generalized method of moment (GMM). We used a sample of 10 Islamic banks and 25 conventional banks in the MENA region during the period 2006-2018. The results showed various impacts of these variables on liquidity risk in both banks. We found that the rise in CAR in Islamic banks and conventional banks does not influence liquidity risk. The logical explanations are that the bank could allocate funds to improve credit and fixed assets. Concerning the ROA, we noticed a positive and significant impact in Islamic banks and conventional banks with liquidity risk.

The control variable size in the conventional banks presented a positive and significant relation with liquidity risk valuing the factor size which plays an important role in maintaining stability. This indicates that banks could launch a large market share and generate higher profits. Unlike conventional banks, the size in Islamic banks presents a negative impact with liquidity risk. This can be explained by the fact that small and large Islamic banks have difficulties in assessing the Islamic capital market to meet liquidity needs.

The liquidity gaps in Islamic banks have a positive and significant relationship with liquidity risk. We conclude that liquidity gaps play an important role in providing liquidity to banks. Greater liquidity gaps mean that banks have more liquidity risk and vice versa. A positive coefficient indicates that banks could reduce their liquidity risk. Unlike Islamic banks, liquidity gaps in conventional banks have a significant and negative effect on liquidity risk. The inflation rate coefficient is positively correlated with liquidity risk for Islamic and conventional banks. However, the rate of inflation does not seem to have any significant effect to explain the evolution of the liquidity risk indicator of the two banks. The GDP growth rate coefficient is positively correlated with liquidity risk for conventional banks, but this coefficient has a negative effect on liquidity risk in Islamic banks. Finally, the age of the bank has a negative impact on liquidity risk in both banks. Although that the present paper makes some contributions to the literature in terms of the determinants of liquidity risks, it has some limitations. We advance that the sample size is small with a limited number of banks which present a methodological limit. Thus, by expanding the number of banks in future research, the results may be more significant. Moreover, we propose to verify our assumptions through a comparative study in terms of associated and separated credit and liquidity risks in Islamic and conventional banks. This would be valuable if considering these two risks (liquidity and credit) which present important elements for the analysis of the banking activity with a possible impact on banks stability.

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