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Determinants of Bank Liquidity in the Middle East Region

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ABSTRACT

The objective of this study is to examine the determinants of bank liquidity in the Middle East region. It also aims to compare the liquidity levels of banking sectors between Middle Eastern countries. Two different liquidity measures, four bank specific factors and three macroeconomic factors have been manipulated by using the WLS regression on 183 banks from eight different countries during a period of 3 years (2014, 2015 and 2016).The research employed "loans-to-assets" and "loans-to-deposits" as proxies to measure the bank's liquidity level. The bank specific factors include assets quality, performance level, capitalization ratio and bank size. The macro economic factors used in this study are economic growth, unemployment and inflation rates. The results indicate that Lebanese banks have the highest level of liquidity whereas Omani banks have the lowest level of liquidity. In addition, the study shows a decreasing of bank liquidity during 2016 in Middle Eastern countries. The additional analysis reveals the significant impacts of economic growth, assets quality, capital level and bank size on liquidity in the banking sector. Finally, the results reveal that larger banks have to monitor their liquidity risks by controlling the level of provided loans and, they recommend central banks keep an eye on equity ratio and non-performing percentage of loans especially during economic growth.

Keywords: Liquidity, Banks, Capital Structure, Performance, Economic Growth, Unemployment, Inflation
JEL Classifications: G21, J6

1. INTRODUCTION

The global financial crisis of 2008 has motivated researchers to reexamine the subject of liquidity risk after being accused of being one of the major contributors of the observed financial contagion and the credit crunch. The majority of studies have considered that managing the liquidity level in the banking sector will establish a high level of financial stability, and a well-managed institution should have a precise system of identification for monitoring and controlling of liquidity risks.

Basel III (2008) highlighted the importance of holding liquid assets and recommended that banks should increase their liquidity level to meet their financial obligations and cover the risks emerged during periods of crises so as not to incur losses.

Blundell-Wignall and Atkinson (2010), have indicated that the banking sector has to be responsible for the management of liquidity as long as it is solvent and meets capital adequacy requirements. They indicate that bank liquidity is an important factor that may lead to financial distress during a crisis. According to Ferrouhi and Lehadiri (2014), the crisis of 2008 underscored the importance of establishing a high level of liquidity to cope with adverse conditions[1]. For Umar and Sun (2015) the last financial crisis of 2008 revealed that when banks do not perform well, the economy does not do well. In addition, they conclude that bank liquidity is very important for the smooth functioning of the economy.

Subsequently, many other studies have examined the determinants of bank liquidity in many countries during different periods

1 Several other authors have studied the liquidity issue for many decades (Diamond and Dybvig, 1983; Molyneux and Thornton, 1992; Diamond and Rajan, 2001; Allen and Gale, 2004). They revealed the importance of liquidity risk management as a determinant of performance and stability in the banking sector. For example, Alper and Anbar (2011) found that a low level of liquidity had a negative impact on the profitability of Turkish banks during the period of 2002-2010.

(Bunda and Desquilbet, 2008; Bordeleau and Graham, 2010; Alper et al., 2011; Al Khouri, 2012; Moussa, 2015; Abdul Rahman and Saeed, 2015). They considered that managing and mitigating the issue of liquidity risk in the banking sector require a deep understanding of the different factors affecting this issue. They also assumed that bank liquidity is dependent on several bank-specific factors (such as size of bank, profitability level, liquidity level of assets and capitalization [CAR] level) as well as external macro factors (such as economic growth, interest rate, exchange rate volatility, monetary policy, inflation and unemployment rate).

By recognizing the significant aspect of liquidity in a worldwide context, the purpose of this research is to provide new evidence by addressing the following questions: What are the different internal and external factors affecting the liquidity level in the banking sector in the Middle East region?, Is there any difference in liquidity level between Middle Eastern countries? If the answer is yes, what are the reasons behind these differences?

However, the last economic recession, the politic crises (the Arab spring) and the low level of oil prices in the Middle East region during the last decade make the transformation process of short-term deposits into long-term loans very risky in the banking sector which could have a negative impact on the financial condition of the region and make the banks unable to pay their short-term debts. Thus, the internal bank specific factors and external environment lead us to shed light on the liquidity level and liquidity risk exposure of banking sector in the Middle East region.

Some authors studied the determinants of bank liquidity in emerging economies (Bunda and Desquilbet, 2008) and others in developed economies (Hackethal et al., 2010) but none of the existing studies had explored the determinants of bank liquidity in Middle East economies.

To bridge the above-mentioned gaps, the first objective of this study is to investigate the internal and external determinants affecting the liquidity of the banking sector in the Middle East region. The second objective is to compare liquidity risk levels of the banking sector in Middle Eastern countries.

This research begins with a review of the theoretical and empirical literature related to bank specificity and external determinants of bank liquidity. Second, it presents the research methodology employed to attain the objective of the study. Third, it provides the findings of the research and discusses them. Finally, the last section concludes the research papers.

2. LITERATURE REVIEW

The determinants of liquidity in the banking sector have been studied by many scholars. To deduct the study's hypotheses, the research reviews the literature regarding liquidity risk and its internal and external determinants in the banking sector.

2.1. Liquidity Risk Management

Three basic liquidity management theories were used to prevent and tackle liquidity shortages: Commercial loan theory, shiftability theory and income anticipation theory.

Firstly, there is the commercial loan theory, also called traditional or real bills doctrine theory elaborated by Adam Smith in 1776. This theory warns banks from giving long-term loans and restricts their earning assets to short-term self-liquidating productive loans and real bills. It also suggests that with every short-term self-liquidating loan, the central bank should lend money to the bank on the security of such loans. As a result, the appropriate level of liquidity for the bank is assured. The rigid adherence to this theory would neglect long-term loans that are essential in financing huge investments, and thus, would affect the growth of a nation's economy (Casu et al., 2006).

Secondly, the shiftability theory, developed by Harold G. Moulton in 1915, had replaced the traditional one. According to this theory, in case of massive deposit withdrawals, banks could protect their liquidity positions by holding credit instruments such as commercial papers and treasury bills. These instruments could be easily sold on secondary markets without incurring losses of capital. The major drawback of this theory is that it neglects the case of an acute crisis where all banks want to sell their assets resulting in a loss of market (Casu et al., 2006).

Thirdly, the income anticipation theory, developed by Herbert V. Prochnow in 1949, reveals that liquidation of a long-term loan is achieved through the payment of monthly installments. These installments are calculated based on an examination of the customer's creditworthiness and on an anticipation of his future earnings. This theory dominates the previously mentioned ones since it assures a high degree of safety and liquidity.

The international financial crisis of 2008 provided evidence that liquidity risk management of financial institutions has to be improved to protect depositors and guarantee high levels of performance and financial stability. Many financial committees, experts and specialists revealed the need to discard the old theories and practice new models and regulations to prevent liquidity risks.

The Basel Committee of Banking supervision (2008) has recommended the banking sector to minimize liquidity risks and meet its financial duties by owning sufficient cash to be ready for any unexpected demand from depositors. Moreover, the Basel Committee has increased the minimum capital requirement through an additional capital buffer to protect depositors.

Kashyap (2010) found that banks have different ways to face large losses and maintain their capital requirements during crises, and one of the best ways is to manage their liquidity level and increase their capital by issuing new stocks or by cutting dividend payout. He also has recommended banks during financial distress to act conservatively by holding a higher level of capital than the required level by the international regulation committees. Wilson (2009) has stated that banks have to decrease their liquidity risks

during an economic slowdown by improving the protection of depositors through a significant capital to cover a certain level of cash withdrawal.

Other scholars found that it is essential for banks to increase their capital and liquidity levels to prevent any potential losses of assets and investments for their investors.

Kosmidou et al. (2005) identified a positive impact of the increasing of the liquidity level on the average return on assets and the net interest margin of UK commercial banks. Pasiouras and Kosmidou (2007) confirmed the positive impact of liquidity risk management on the performance of domestic and foreign banks operating in 15 European Union countries.

Shen et al. (2009) revealed that liquidity risk is negatively related to return on assets average and return on equity average of banks in 12 different countries (United States, Canada, France, Taiwan, the United Kingdom, Germany, Japan, Luxembourg, Italy, the Netherlands, Switzerland, and Australia).

2.2. Internal and External Determinants of Bank Liquidity

In the literature, two different categories of bank liquidity determinants have been witnessed: The internal determinants (bank-specific factors) that are related to management decisions and financial statements ratios, and external determinants (macroeconomic-specific factors) that are related to economic conditions.

2.2.1. Internal determinants of bank liquidity

Numerous bank-specific determinants were examined in previous researches. However, their relationships with bank liquidity differ across the empirical studies. These determinants are mainly related to the financial behavior and structure of banks such as asset quality, CAR level, performance and size.

Assets Quality is mainly the quality of bank loans[2] and it is considered the first internal factor that may influence the liquidity of banks.

For Bloem and Gorter (2001), increasing the level of nonperforming loans to total loans (Asset Quality ratio) will decrease depositors' confidence, lead to large level of withdrawals and increase the liquidity problem. Growe et al., (2014) have confirmed this association between liquidity and assets quality by indicating that poor loans quality leads to poor assets quality, and poor assets quality leads to a low level of liquidity. According to Melese and Laximkantham (2015), poor loans quality would lead to an efficiency problem. Consequently, banks would diminish their liquidity holdings, thus causing the banking system to fail.

Many studies have confirmed the negative association between assets quality and bank liquidity (Munteanu, 2012; Deléchat et al., 2012). Many others have also revealed a negative or insignificant impact of assets quality ratio on bank liquidity.

Roman and Sargu (2015) have studied the determinants of liquidity in Central and Eastern Europe countries between 2004 and 2011. They expected that assets quality as measured by nonperforming loans to total loans ratio would negatively and significantly affect bank liquidity. They explained that turning more loans into nonperforming loans would decrease banks' loaning operations and as a result, would affect the overall liquidity. The expected significant negative relationship was not proved in any country.

Roman and Sargu, (2015) found in the same study a significant positive association between assets quality and bank liquidity in the Czech Republic, Lithuania and Romania. They also revealed that the regulatory bodies of these countries have obliged banks to increase their liquidity ratios during a financial crisis. However, Vodavá (2013) and Melese and Laximkantham (2015) have found that assets quality has no statistically significant impact on banking liquidity.

Based on the previous discussion, the first hypothesis of this research is defined as follows:

H_1: A high assets quality ratio has a negative impact on bank's liquidity.

Capital ratio is an indicator of the equity level in the banking sector. Two hypotheses are used to explain the relationship between a bank's CAR and liquidity.

The first hypothesis supposes that the capital level has a positive impact on bank liquidity. For Menicucci and Paolucci (2016), a high capital ratio is a good indicator of a bank's stability and liquidity. Repullo (2004) has confirmed this principle by indicating that increasing the level of capital will lead banks to increase the liquidity level and absorb liquidity risk.

El Khoury (2015) has studied the determinants of liquidity in the Lebanese banking sector using data from 23 commercial banks between 2005 and 2013. She confirmed the risk absorption hypothesis and found that capital level has a positive and statistically significant impact on both liquid assets to total assets ratio and liquid assets to customers' deposits ratio.

In the case of 36 emerging economies, Bunda and Desquilbet (2008), have found that a high capital level has a positive influence over the liquidity of 1107 banks. The study of Bonfim and Kim (2011) also support the idea that banks with a better capital adequacy present a lower liquidity risk exposure. Many other scholars have found the same positive association between liquid assets to total assets ratio and a banks' capital level (Munteanu, 2012 and Vodová, 2013). AQ1

The second hypothesis treating the relationship between capital level and bank liquidity indicates that a higher capital level may impede liquidity creation by making the capital structure of banks fragile. Therefore, this hypothesis indicates that there is a negative association between bank liquidity and capital level.

2 Poor loans are called nonperforming loans due to the fact that they are in default or close to being in default since the borrower has not paid the installments and the interests for ninety (90) days or more (European Central Bank, 2017).

Many studies have confirmed the second hypothesis by indicating that banks' CAR negatively affects bank liquidity as measured by liquid assets to total assets ratio (Chagwiza, 2014; Moussa, 2015).

Based on the discussion above, the second hypothesis of the study is defined as follows:

H_2: A high capitalization level has positive impact on bank's liquidity.

Performance is a subjective indicator of how well an institution could use assets from its primary mode of business and generate profits (Greenwood and Jovanovic, 1990). It is a general measure of the overall financial health of an institution over a specific period of time. The relationship between performance and bank's liquidity has been considered in the literature.

According to Molyneux and Thornton (1992), there is a negative relationship between performance and liquidity in the banking sector. This is due to the fact that holding liquid assets will create an opportunity cost for banks. So these liquid assets will have lower returns than other types of assets.

Hackethal et al. (2010) have studied the determinants of liquidity in Germany's state-owned savings banks. The authors found that the performance level has a significant negative impact on bank liquidity. Many other studies have confirmed the negative impact of performance on bank liquidity (Melese and Laximikantham, 2015; Vodavá, 2011b; Deléchat et al., 2012; Moussa, 2015).

However, many other researchers, such as Vodavá (2013) and Roman and Sargu (2015), have failed to find any significant association between performance and bank's liquidity.

As a result, the third hypothesis is presented as follows:

H_3: A high performance level has a negative impact on bank liquidity.

The relationship between bank size and liquidity has been widely debated in previous literature. According to the "too big to fail" hypothesis, the size of a bank can have a negative impact on its liquidity. Some banks characterize themselves as too big to fail so they are less motivated to hold higher liquidity ratios (Lucchetta, 2007). In other cases, some large banks do not work to increase their liquidity level because they guarantee several types of financial assistance in case of financial distress. They consider themselves too big and they know that government has to protect them from a failure which would negatively affect the economic and financial situations of the whole country.

This negative impact of bank size on liquidity level has been reviewed by many researchers. Vodová (2013) have studied the liquidity's determinants of the banking sector in Hungary from 2001 to 2010. The study showed that the size of banks is negatively related to the liquidity level. This result was also supported by the study of Cucinelli (2013) in the context of European banks, the study of Hackethal et al. (2010) in Germany and the study of Bunda and Desquilbet (2008) in emerging economies.

Many other researchers have found that bank's size positively affects its liquidity level. Small banks emphasis more traditional intermediation and transformation activities and as a result, they hold smaller liquidity ratios (Chagwiza, 2014; El Khoury, 2015; Moussa, 2015; Melese and Laximikantham; 2015).

Based on the above analysis, the fourth hypothesis of the study is presented as follow:

H_4: A high bank size has a negative impact on bank's liquidity.

2.2.2. External determinants and bank liquidity

Besides the internal determinants of bank liquidity, this research also considers the external determinants of bank liquidity, especially the macro economic factors of the Middle East region. These determinants are mainly related to economic growth, inflation rate and unemployment level.

Economic growth measures the capacity of an economy to produce goods and services in each country and it is considered as one of the most important factors that can influence the liquidity of banks. During economic growth, business activities develop and thus the demands for loans increase. As a result, banks will have more opportunities to give loans when they decrease their liquid assets. This can lead to a negative association between economic growth and liquidity.

Trenca et al. (2015) studied the macroeconomic determinants of 40 commercial banks in 6 Southern Europe countries (Croatia, Greece, Italy, Portugal, Spain and Cyprus) from 2005 to 2011. They found that economic growth as measured by GDP has a negative and statistically significant impact on bank's liquidity. Vodavá, (2011b) confirmed the negative impact of economic growth on bank liquidity in Czech commercial banks from 2001 to 2009.

Other researchers posit that banks prefer to preserve a high level of liquidity during an economic upturn, since they have low confidence in the ability of their customers to repay installments during an economic downturn (Alper et al., 2012; Chagwiza, 2014; Moussa, 2015). Thus, a positive association exists between bank liquidity and economic growth. However, El Khoury (2015) has failed to prove any significant association between bank liquidity and economic growth.

In consequence, the study expects a negative association between economic growth and liquidity.

H_5: Economic growth has a negative impact on bank's liquidity.

Inflation rate is the general increase in price levels. The impact of inflation rate on bank liquidity has been a subject of debate in previous literature. Some authors imply that an increase of the inflation rate will lower the purchasing power of individuals, who will then need more money to buy the same products. As a result,

the demand for loans will increase and thus, bank liquidity will decrease (Trenca et al., 2015). Moreover, higher inflation rates deteriorate overall macroeconomic conditions and lower liquidity (Vodavá, 2011b).

Moussa (2015) studied the determinants of liquidity in the Tunisian banking sector from 2000 to 2010. He found a negative association between inflation and banking liquidity. Bunda and Desquilbet (2008) confirmed the negative impact of high inflation rate on the liquidity of banks in emerging economies. A similar result was also found by Vodová (2011b) in Czech Banks; Malik and Rafique, (2013) in Pakistani banks and El Khoury (2015) in Lebanese banks.

Other researchers state that higher inflation would decrease the real rate of return, which will discourage banks from giving more loans and encourage them to hold more liquid assets. As a result, a positive association exists between inflation rate and liquidity level (Trenca et al., 2015). Finally, both Chagwiza (2014) and Vodavá (2013) have failed to find any significant relationship between liquidity and inflation.

Accordingly, in this study we will suppose that inflation has a positive impact on liquidity.

H_6: Inflation has a negative impact on bank's liquidity.

The unemployment rate is defined as the number of people who do not have a job, have actively looked for work in the past 4 weeks and are currently available for work as compared to the total labor force (Bureau of Labor Statistics, 2017). This macroeconomic factor has been widely considered in the literature. Some authors posit that an increase in the unemployment rate will decrease the demand for loans and thus will increase bank liquidity (El Khoury, 2015). Moreover, banks would refuse to guarantee paying installments and thus they would be discouraged to provide loans. Consequently, there is a positive association between unemployment rate and bank liquidity.

This result of negative impact of unemployment on bank liquidity is detected in the Romanian banking sector (Munteanu, 2012) and in the Lebanese banking sector (El Khoury, 2015).

However, Trenca et al., (2015) have found that an increase in the unemployment rate would decrease banking liquidity. Finally, some authors have found that the unemployment rate is not significant in determining bank liquidity (Vodavá, 2011b; Vodavá, 2013).

Based on the previous discussion, the study expects a positive association between the unemployment rate and bank liquidity (Table 1).

H_7: Unemployment has a significant positive impact on bank's liquidity.

3. RESEARCH METHODOLOGY

The research methodology defines the process used to collect data for the empirical study. It is divided into four parts. The first presents the target population and sample. The second indicates the data sources. The third specifies how variables are measured. The last discusses the analysis techniques used.

Table 1: Summary of research hypotheses

Determinants	Independent variables	Hypothesis	Expected relationship
Internal	Assets quality	H1	Negative
	Capitalization	H2	Positive
	Performance	H3	Negative
	Bank size	H4	Negative
External	Economic growth	H5	Negative
	Inflation rate	H6	Negative
	Unemployment rate	H7	Positive

3.1. Sample Definition

Studying the determinants of bank liquidity in the Middle East region is a challenging task. For this study, a sample of banks from Middle Eastern countries was collected over the period 2014-2016. The cross-countries banks data was collected from the BankScope database and the websites of studied banks. The macro economic factors were collected from the central bank database of each country, the international monetary fund (IMF) and the World Bank database. Table 2 represents the secondary data sources.

The total number of population consists of 183 banks from Lebanon, Qatar, Kuwait, Jordan, Oman, Iran, the Kingdom of Saudi Arabia (KSA), and the United Arab Emirates (UAE). From the initial population of banks in Middle Eastern countries, a large number has been excluded due to missing data. The other Middle Eastern countries such as Syria, Iraq, Bahrain, Yemen and Palestine were excluded from the sample due to the violent conflicts and their impacts on the banking sector.

Table 3 and Figure 1 present the total number of banks in this study. As a result, 473 bank-year observations were selected and studied over a 3 year period (2014-2016). The number of banks in the study's sample is positively related to the number of banks extracted from the population of banks in each country.

The data in Table 3 indicates that the banking sector is very developed in UAE with 34 (18.58%) banks and Lebanon with 35 (18.58%) banks. Qatar, KSA and Oman have the last three positions with 13 (7.1%) banks, 17 (9.29%) banks and 17 (9.29%) banks respectively. Kuwait, Iran and Jordan are in the middle positions with 26 (14.21%), 24 (13.11%) and 18 (9.84%) banks respectively.

3.2. Variables Definition

Tables 4 and 5 below present the definition of dependent and independent variables respectively. They also provide the significance of each variable along with the previous studies that have used the same specifications.

For the American Federal Reserve (2006), bank liquidity is the ability and ease with which assets can be converted to cash. Liquid assets are those that can be converted to cash quickly if

Table 2: Data sources

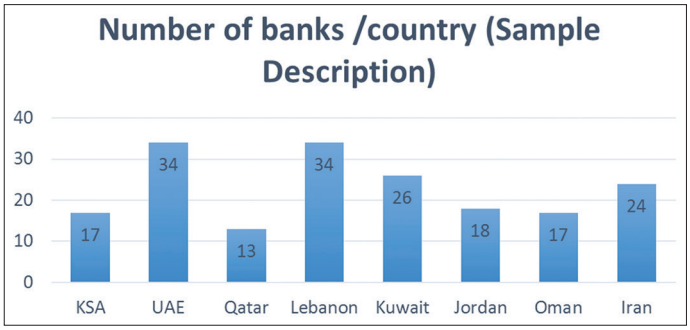
	Definition	Source
Dependent variable	Bank liquidity	Bankscope database
Independent variables		
Internal determinants	Assets quality	BankScope database
	Capitalization	Websites of banks (annual reports)
	Performance	
	Bank size	
External determinants	Economic growth	World bank database
	Inflation	IMF
	Unemployment rate	Central bank database of each country

IMF: International monetary fund

Table 3: Sample and population description

Country	KSA	UAE	Qatar	Lebanon	Kuwait	Jordan	Oman	Iran	Total
Number of banks (Sample)	17	34	13	34	26	18	17	24	183
% of sample	9.29	18.58	7.10	18.58	14.21	9.84	9.29	13.11	100
Number of bank/Observation for 3 years (2014-2016)	51	82	33	95	69	42	41	60	473

Figure 1: Sample description



needed to meet financial obligations; examples of liquid assets generally include cash, central bank reserves, and government debt. The Basel Committee on Banking Supervision (2008) defines liquidity as the ability of a bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses.

In this research two different dependent variables are used to measure the liquidity level of the banking sector in the Middle East region: (L_1): $\frac{\text{Total loans}}{\text{Total assts}}$ and $(L2)$: $\frac{\text{Total loans}}{\text{Total deposits}}$ (Table 4).

Firstly, L1 measures the percentage of assets invested in loans. It also represents the percentage of illiquid assets owned by a bank. A high rate of L1 indicates that banks which have an excessive level of illiquid assets have a low ability to meet their obligations. This ratio has to be between 70% and 80 % (World Council of Credit Union). Secondly, L2 measures the ability of banks to meet deposits withdrawals. A high rate of L2 indicates that banks rely on borrowed funds and have low liquidity level because deposits are considered the main source of funding while loans are considered the most illiquid assets.

As for the independent variables, two different categuories are used: (1) bank specific factors and, (2) macro economic factors (Table 5).

The bank specific independent variables include assets quality, CAR, performance and bank size. The financial decision of banks, included the liquidity level, cannot be isolated from their performance, capital structure and size.

For the macro economic factors, the three variables used are the economic growth, the inflation rate and the unemployment rate. These variables are used to capture the economic stability and the macro economic performance in Middle Eastern countries because the level of liquidity cannot be independent from the environment in which banks operate. The instability of the external environment provides signaling of potential liquidity crisis.

3.3. Technical Analysis Method

The following two Classical Linear Regression assumptions are used to determine the impact of independent variables (internal and external determinants) on the liquidity level (dependent variable) of the banking sector in Middle Eastern countries:

$$L_{1i,t} = \alpha + \beta_1 AQ_{i,t} + \beta_2 CAR_{i,t} + \beta_3 ROA_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 ECO_t + \beta_6 INF_t + \beta_7 UE_t + \varepsilon$$

$$L_{2i,t} = \alpha + \beta_1 AQ_{i,t} + \beta_2 CAR_{i,t} + \beta_3 ROA_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 ECO_t + \beta_6 INF_t + \beta_7 UE_t + \varepsilon$$

Where:

"$L_{1i,t}$": First liquidity measure for bank "i" in period "i". It is measured by the ratio of total loans over total assets.
"$L_{2i,t}$": Second liquidity measure for bank "i" in period "i". It is measured by the ratio of total loans over total deposits.
"α": Y-intercept.
"β_i": Coefficient of variable where "i" ranges from 1 to 7.
"$AQ_{i,t}$" Asset quality of bank "i" for period "t".
"$CAR_{i,t}$: Capitalization of bank"i" for period "t".
"$ROA_{i,t}$": Performance of bank "i" for period "t".
"$SIZE_{i,t}$": Size of bank "i" in period "t".
"ECO_t": Economic growth rate for period "t".
"INF_t": Inflation rate for period "t".

Table 4: Dependent variables: Proxies, significance and studies

Dependent variable	Indicator	Proxy	Significance	Studies
Banks liquidity	Liquidity (L_1)	$\frac{\text{Total loans}}{\text{Total assts}}$	Higher L_1 ratio indicates lower liquidity	Vodová, 2011a; Vodová, 2011b; Vodová, 2013; Chagwiza, 2014; Moussa, 2015; El Khoury, 2015; Roman and Sargu, 2015.
	Liquidity (L_2)	$\frac{\text{Total loans}}{\text{Total deposits}}$	Higher L_2 ratio indicates lower liquidity	Vodová, 2011a; Vodová, 2011b; Tseganesh, 2012; Vodová, 2013; Chagwiza, 2014; Moussa, 2015; El Khoury, 2015; Abdul Rahman and Saeed, 2015.

Table 5: Independent variables: Proxies, significance and studies

Independent variables	Indicator	Proxy	Significance	Studies
Internal	Asset quality (AQ)	$\frac{\text{Nonperforming loans}}{\text{Total loans}}$	Higher AQ ratio indicates lower asset quality	Vodová, 2011a; Vodová, 2011b; Tseganesh, 2012; Vodová, 2013; El Khoury, 2015.
	Capitalization (CAR)	$\frac{\text{Total equity}}{\text{Total assts}}$	Higher CAR ratio indicates higher bank's capitalization	Vodová, 2011a; Vodová, 2011b; Al Khouri, 2012; Tseganesh, 2012; Vodová, 2013; Moussa, 2015; Roman and Sargu, 2015; El Khoury, 2015; Abdul Rahman and Saeed, 2015.
	Performance (ROA)	$\frac{\text{Net income}}{\text{Total assts}}$	Higher NI/TA indicates higher performance.	Vodová, 2011a; Vodová, 2011b; Al Khouri, 2012; Tseganesh, 2012; Vodová, 2013; Moussa, 2015; Abdul Rahman and Saeed, 2015.
	Bank size (SIZE)	Ln (Total assets)	Higher SIZE indicates higher bank's size	Vodová, 2011a; Vodová, 2011b; Al Khouri, 2012; Tseganesh, 2012; Vodová, 2013; El Khoury, 2015; Moussa, 2015.
External	Economic Growth (ECO)	GDP growth rate	Higher GDP growth rate indicates higher economic growth	Bordeleau and Graham, 2010; Vodová, 2011a; Vodová, 2011b; Al Khouri, 2012; Vodová, 2013; Moussa, 2015.
	Inflation rate (INF)	GDP deflator variation rate	Higher GDP deflator growth indicates higher inflation	Demirguç-Kunt and Huizinga, 1999; Peters et al., 2004; Growe et al., 2014; Petria et al., 2015.
	Unemployme-nt Rate (UE)	$\frac{\text{Unemployed individuals}}{\text{Total labor force}}$	Higher UE indicates higher unemployment rate	Bordeleau and Graham, 2010; Vodová, 2011a; Vodová, 2011b; Munteanu, 2012; Vodová, 2013.

"UE_t": Unemployment rate for period "t".
"$\varepsilon_{i,t}$": Error term.

4. FINDINGS AND DISCUSSION

This section presents the descriptive statistics, the Classical Linear Regression results and analysis.

4.1. Descriptive Statistics

The results of Tables 6 and 7 indicate that the economic situation in Middle Eastern countries was very unstable between 2014 and 2016. Oil prices and the geographical tension in Syria, Yemen, Bahrain, Palestine and Iraq have slowed the economic development[3] and increased the unemployment and inflation rates. The banking sector in the region was not isolated from the economic situation. The impacts of the economic situation were heavily integrated in the different financial ratios of banking sector.

The results of Table 6 show that the highest average of asset quality (AQ) exists in Kuwait (6.4%) and a lower level exists in Qatar (2.23%). These results indicate that banks in Kuwait have the highest average of nonperforming loans whereas the banks in Qatar have more of a tendency to apply a conservative managerial system of their loans portfolios. Moreover, the low GDP growth level (1.53) and the high inflation rate (3.36) may explain the high level of nonperforming loans in Kuwait.

The results of the AQ ratio in Table 7 indicate that the banks in KSA, Jordan and Lebanon have more of a tendency to apply additional regulations to minimize their nonperforming loans as can be seen in a decreasing tendency of this ratio between 2014 and 2016.

As for the CAR ratio, the results of Table 6 indicate that the existing banks in Oman and Kuwait are considered well capitalized with (0.3) and (0.34) respectively. A lower level of this ratio exists in Lebanon and Iran with (0.14) and (0.116) respectively. The results of Table 7 show a decreasing trend of the CAR ratio in Middle Eastern countries.

The return on assets ratio presented in Table 7 indicates a noticeable decreasing tendency of the banking sector performance between 2014 and 2016. The economic and the political situations in the Middle East region may be the reason behind this critical situation. Table 7 shows that Kuwaiti banks have the lowest level

3 Iran had an exception Economic Growth rate after removing the economic sanctions from US and EU.

Table 6: Descriptive statistics of dependent and independent variables

AQ4

???	KSA	UAE	Qatar	Lebanon	Kuwait	Jordan	Oman	Iran
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
AQ	3.5±3.3	5.86±2.89	2.23±2.36	3.59±2.72	6.4±5.3	4.92±4.7	3.84±3.05	4.337±2.95
CAR	0.24±0.21	0.20±0.13	0.26±0.24	0.14±0.13	0.34±0.27	0.164±0.13	0.30±0.24	0.116±0.09
ROA	4.85±2.6	1.98±3.54	1.58±1.2	1.09±1.05	0.34±0.93	1.47±1.3	1.47±1.2	1.21±1.4
SIZE	16.95±1.3	15.78±1.6	16.25±1.38	14.71±1.82	14.71±2.16	14.9±1.3	14.19±1.8	15.98±1.22
UE	30.2±0.98	11.9±0.2	0.4±0.15	15.8±0.1	18.03±1.41	34.36±3.69	46.78±0.68	26.36±2.08
ECO	3.1±1.32	4.06±1.06	2.46±0.88	1.6±0.69	1.53±1.7	2.43±0.51	4.166±1.47	5.53±7.34
INF	1.83±0.49	2.68±1.25	1.72±0.77	-0.87±2.8	3.36±0.25	0.413±2.15	0.72±0.57	12.15±3.23
L_1	0.56±0.21	0.59±0.19	0.59±0.15	0.28±0.12	0.39±0.28	0.51±0.12	0.66±0.25	0.59±0.14
L_2	0.74±0.21	0.83±0.37	0.81±0.15	0.39±0.33	0.59±0.32	0.745±0.60	0.801±0.25	0.704±0.15
Valid N 2014-2016	51	82	33	95	69	42	41	60
Valid banks	17	34	12	34	26	18	17	24

This table shows the results of the descriptive statistics of dependent and independent variables. Dependent variables are the liquidity ratio (L1) measured by total loans to total assets and the liquidity ratio (L2) measured by total loans to total deposits. The independent variables are: AQ calculated by nonperforming loans to total loans ratio. Capitalization (CAR) measured by equity to assets ratio. Banking performance (ROA) calculated by net income to total assets. Bank size (SIZE) measured by natural logarithm of total assets. Economic growth (ECO) measured by the GDP growth. Inflation (INF) measured by GDP deflator. Unemployment rate (UE) measured by the percentage of unemployed individuals to total labor force

of return on assets (0.93) in Middle Eastern countries which can be explained by the high level of nonperforming loans and the low level of economic growth. A high average level of return on assets exists in KSA and UAE with 4.85 and 1.98 respectively.

Table 7 indicates that banks have a clear development tendency in the Middle East region. All the averages concerning bank size increased between 2014 and 2016. Moreover, Table 6 shows that banks in KSA, Iran, UAE and Qatar are the largest based on their assets values.

The descriptive results of liquidity (L_1) in Table 6, measured by total loans over total assets, indicate that the Lebanese banks have the highest liquidity level in Middle East region. The average level of liquidity ratio (L1) is 0.28 in Lebanon whereas the averages are 0.56, 0.59, 0.39, 0.51, 0.66 and 0.59 in the other Middle Eastern countries. The results of Table 7 and Figure 2 confirm these results by indicating also a marginal decrease of liquidity level in Middle Eastern countries between 2014 and 2016. Only Kuwaiti banks had a high decrease level of liquidity between 2015 and 2016.

The results of liquidity ratio (L2), measured by total loans over total deposits, confirm the high liquidity level of the banking sector in Lebanon. Table 6 shows that the Lebanese banks use only 39% of bank deposits to finance their loans. The other banks in UAE, Qatar, Oman, KSA, Iran and Jordan use 83%, 81%, 80%, 74%, 70.4% and 74.5%, respectively of bank deposits to lend to customers. Figure 3 and Table 7 confirm the highest liquidity level in the Lebanese banks and the highest deterioration of liquidity level in Kuwaiti banks between 2015 and 2016.The results also indicate a marginal increase of liquidity level in Jordan between 2015 and 2016.

4.2. Regression Analysis: Results and Discussion

In order to assess the impacts of the bank specific factors and the macro-economic environment factors on bank liquidity in Middle East region, the multicollinearity and the Weighted Least Squares regression analysis are conducted and analyzed in this section.

Before running the regression, two tests were applied. Both ($\chi 2$) and (F) values indicate the absence of heteroscedasticity evidence. In addition, Hausman's test was performed to differentiate between

Figure 2: Liquidity level in Middle Eastern countries (L_1: Total loans/total assets)

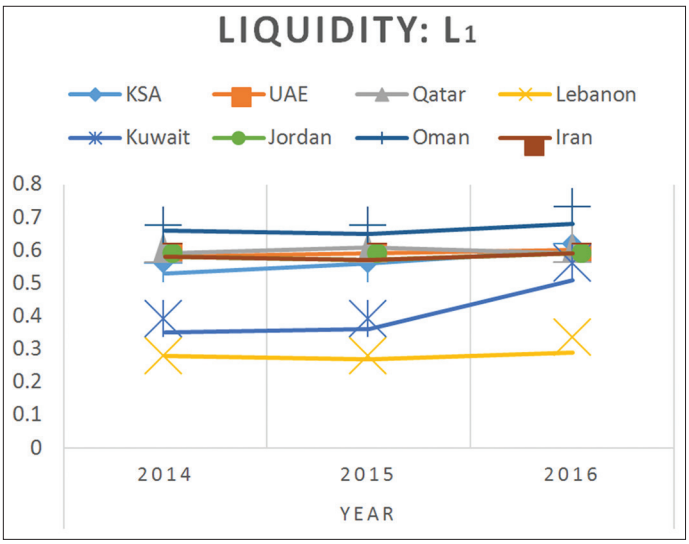
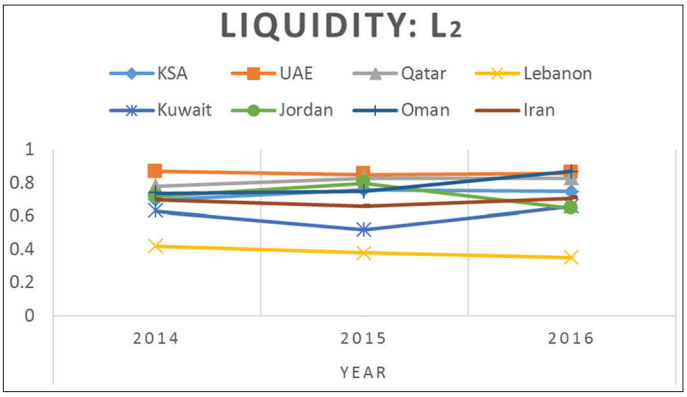


Figure 3: Liquidity level in Middle Eastern countries (L_2: Total loans/total deposits)



random effects and fixe the effects model in panel data. Thus, random effects model is selected under the null hypothesis due to its efficiency.

Table 8 shows the result of the Pearson Product Moment Coefficient test. The results indicate that bank liquidity (L_1) has a

Table 7: Descriptive statistics of dependent and independent variables per year (2014-2016).

Variable	KSA			UAE			Qatar			Lebanon			Kuwait			Jordan			Oman			Iran		
	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016	2014	2015	2016
AQ	3.59	4.16	2.44	5.66	5.75	6.26	1.92	1.88	2.89	3.73	3.54	2.68	6.19	7.83	4.74	5.38	4.93	3.54	3.71	3.46	4.42	3.9	4.74	4.31
CAR	0.27	0.28	0.15	0.22	0.2	0.2	0.28	0.25	0.25	0.14	0.16	0.10	0.39	0.36	0.22	0.17	0.17	0.14	0.32	0.32	0.26	0.11	0.19	0.10
ROA	5.77	5.33	2.85	3.05	1.57	1.12	2.09	1.83	0.82	1.07	1.16	0.93	2.25	−1.2	−0.3	1.62	1.42	1.2	1.66	1.51	1.24	0.97	1.01	1.24
SIZE	16.7	16.7	17.5	15.5	15.7	16.1	16.1	16.2	16.3	14.4	14.6	15.9	14.3	14.5	15.9	14.8	14.9	15.1	14.1	14.1	14.2	15.9	15,9	16.2
UE	30.8	29.1	30.8	11.9	12.2	11.8	0.5	0.7	0.8	15.9	15.8	15.7	19.3	18.3	16.5	31.4	33.2	38.5	46.0	46.9	47.4	24.7	25.7	28.7
ECO	3.6	4.1	1.6	4.3	5.0	2.9	3.9	3.5	2.2	2	0.8	2	0.5	0.6	3.5	3	2.3	2	2.5	4.7	5.3	4.6	−1.3	13.3
INF	2.2	1.27	2.03	2.35	4.07	1.62	3.36	1.81	2.68	1.9	−3.7	-0.8	3.1	3.6	3.4	2.9	−0.8	−0.7	1.01	0.07	1.1	15.5	11.9	9.05
L_1	0.53	0.56	0.60	0.58	0.59	0.60	0.59	0.61	0.59	0.28	0.27	0.29	0.35	0.36	0.51	0.58	0.57	0.59	0.66	0.65	0.68	0.58	0.57	0.59
L_2	0.7	0.76	0.75	0.87	0.85	0.86	0.78	0.83	0.83	0.42	0.38	0.35	0.63	0.52	0.66	0.72	0.80	0.65	0.74	0.75	0.87	0.70	0.66	0.71
Valid N 2014-2016	19	17	15	33	32	27	12	12	9	34	32	29	26	23	20	16	15	10	16	14	11	22	20	18
Valid bank	17	34	12	34	26	18	17	24	17	34	12	34	26	18	17	24	17	34	12	34	26	18	17	24

This table shows the results of the descriptive statistics of dependent and independent variables over 3 years 2014-2016. Dependent variables are the liquidity ratio (L1) measured by total loans to total assets and the liquidity ratio (L2) measured by total loans to total deposits. The independent variables are AQ calculated by nonperforming loans to total loans ratio; Capitalization (CAR) measured by equity to assets ratio; Banking performance (ROA) calculated by net income to total assets; Bank Size (SIZE) measured by natural logarithm of total assets; Economic Growth (ECO) measured by the GDP growth; Inflation (INF) measured by GDP deflator; and Unemployment Rate (UE) measured by the percentage of unemployed individuals to total labor force

negative and significant correlation (-0.306) in regards to the CAR level and a positive correlation in regards to both economic growth (0.412) and bank size (0.401). The results also show positive and significant correlations between bank liquidity (L_2) and assets quality (0.290), CAR (0.433) and economic growth (0.310). These correlations indicate the existence of possible impacts of certain macro environment factors such as economic growth (ECO) and bank specific factors such as CAR on bank liquidity.

The positive and significant correlation (0.538) between L_1 and L_2 reveals the consistency and the reliability of these variables to measure the liquidity level of the banking sector. Finally, the results of Table 8 reveal a positive correlation between bank size and economic growth (+0.136), negative correlation between bank size and assets quality (−0.185) and negative correlation between bank size and CAR level (−0.512). It can be concluded that economic growth has a positive impact on the development of bank size which can lead indirectly to a decrease of the nonperforming loans and an increase of assets value.

The results in Tables 9 and 10 show positive and significant impacts of bank size on bank liquidity ratios. Increasing the size of banks has positive and significant impacts on L1 (+0.254) and L_2 (+0.168) which indicate that increasing the size of banks leads to a decrease of liquidity level and an increase of liquidity risk. These results are consistent with the studies of Bunda and Desquilbet (2008) and Cucinelli (2013) in which they found that bank size is negatively related to liquidity level.

The results also support the principle of "too big to fail" in which banks with a large size consider themselves too big to fail so they are not motivated to increase their liquidity level. In addition, in some cases, increasing bank size requires fewer conservative strategies that leads banks to rely on interbank markets and facilitates the conditions for providing loans, especially in countries characterized by a low regulation level.

The results reveal a positive and significant impact of economic development on the liquidity ratios of banks. Table 9 shows a significant positive impact of ECO (0.387) on L1, and Table 10 shows a significant positive impact of ECO (0.256) on L2. These positive impacts indicate that the economic growth has a negative impact on the liquidity level of banking sector in Middle East region. It seems that banks have more opportunities to provide loans during economic growth and thus lead to a decrease of their liquidity level. These results confirm the studies of Trenca et al. (2015) and Vodavá, (2013) in which they found a negative impact of economic growth on liquidity level.

The results indicate that the impact of the CAR level is ambiguous. Table 9 shows a negative significant impact of CAR on bank liquidity measured by the percentage of assets invested in loans (L_1). This result indicates that increasing the capital will lead banks to raise their assets level and absorb the liquidity risk.

However, Table 10 shows that the increase in equity level will have a negative impact on liquidity measured by the ability of banks to meet deposit withdrawals (L_2). From these results, it can

Table 8: Multicollinearity matrix

Correlations		Size	ROA	AQ	CAR	UE	ECO	INF	L1	L2
Size	Pearson correlation	1	0.045	−0.185**	−0.512**	−0.018	0.136*	0.030	0.401**	−0.072
	Sig. (2-tailed)		0.408	0.001	0.000	0.747	0.013	0.589	0.000	0.193
ROA	Pearson correlation	0.045	1	−0.040	0.079	0.062	0.107	−0.063	0.015	0.078
	Sig. (2-tailed)	0.408		0.466	0.153	0.262	0.051	0.253	0.790	0.156
AQ	Pearson correlation	−0.185**	−0.040	1	0.291**	−0.044	0.058	−0.005	−0.096	0.290**
	Sig. (2-tailed)	0.001	0.466		0.000	0.422	0.295	0.924	0.080	0.000
CAR	Pearson correlation	−0.512**	0.079	0.291**	1	−0.050	0.042	−0.077	−0.306**	0.433**
	Sig. (2-tailed)	0.000	0.153	0.000		0.360	0.450	0.160	0.000	0.000
UE	Pearson correlation	−0.018	0.062	−0.044	−0.050	1	0.025	−0.123*	0.064	0.018
	Sig. (2-tailed)	0.747	0.262	0.422	0.360		0.651	0.025	0.241	0.749
ECO	Pearson correlation	0.136*	0.107	0.058	0.042	0.025	1	0.032	0.412**	0.310**
	Sig. (2-tailed)	0.013	0.051	0.295	0.450	0.651		0.555	0.000	0.000
INF	Pearson correlation	0.030	−0.063	−0.005	−0.077	−0.123*	0.032	1	0.044	−0.024
	Sig. (2-tailed)	0.589	0.253	0.924	0.160	0.025	0.555		0.420	0.660
L_1	Pearson correlation	0.401**	0.015	−0.096	−0.306**	0.064	0.412**	0.044	1	0.538**
	Sig. (2-tailed)	0.000	0.790	0.080	0.000	0.241	0.000	0.420		0.000
L_2	Pearson correlation	−0.072	0.078	0.290**	0.433**	0.018	0.310**	−0.024	0.538**	1
	Sig. (2-tailed)	0.193	0.156	0.000	0.000	0.749	0.000	0.660	0.000	

**Correlation is significant at the 0.01 level (2-tailed). *Correlation is significant at the 0.05 level (2-tailed). This table shows the results of the bivariate test, Pearson Product Moment Coefficient. Dependent variables are the first liquidity ratio (L1) measured by total loans to total assets and second liquidity ratio (L2) measured by total loans to total deposits. The independent variables for both models are: Asset quality (AQ) calculated by nonperforming loans to total loans ratio; Capitalization (CAR) measured by equity to assets ratio; Banking performance (ROA) calculated by net income to total assets; Bank's size (SIZE) measured by natural logarithm of total assets; Economic Growth (ECO) measured by the GDP growth; Inflation (INF) measured by GDP deflator; and Unemployment Rate (UE) measured by the percentage of unemployed individuals to total labor force

Table 9: Determinants of L_1 (WLS_1)

Model		Unstandardized coefficients		Standardized coefficients	t	Significane
		B	SE	Beta		
1	(Constant)	−3.309	11.387		−0.291	0.772
	SIZE	3.066	0.658	0.254	4.663	0.000***
	ROA	−0.209	0.359	−0.027	−0.583	0.560
	AQ	−0.107	0.295	−0.017	−0.362	0.718
	CAR	−27.401	8.434	−0.181	−3.249	0.001***
	UE	0.086	0.075	0.053	1.144	0.253
	ECO	4.168	0.504	0.387	8.273	0.000***
	INF	0.118	0.365	0.015	0.322	0.747

R-Square: 0.322. Adjusted R-square: 0.308. F statistics: 22.092. Dependent Variable: L1. Levels of significance: (***) 1% , (**) 5% and (*) 10%. This table shows the results of the WLS regression analysis for Model 1. In model 1: The Dependent variable is the first liquidity ratio (L_1) measured by total loans to total assets; Independent variables are asset quality (AQ) calculated by nonperforming loans to total loans ratio; capitalization (CAR) measured by equity to assets ratio; banking performance (ROA) calculated by net income to total assets; Bank's size (SIZE) measured by natural logarithm of total assets; economic growth (ECO) measured by the GDP growth; inflation (INF) measured by GDP deflator; and Unemployment Rate (UE) measured by the percentage of unemployed individuals to total labor force

Table 10: Determinants of L_2 (WLS_2)

Model		Unstandardized coefficients		Standardized coefficients	t	Significane
		B	SE	Beta		
2	(Constant)	−0.411	0.231		−1.778	0.076
	SIZE	0.040	0.013	0.168	3.031	0.003**
	ROA	0.002	0.007	0.012	0.266	0.791
	AQ	0.022	0.006	0.180	3.707	0.000***
	CAR	1.370	0.168	0.460	8.130	0.000***
	UE	0.002	0.002	0.051	1.073	0.284
	ECO	0.054	0.010	0.256	5.410	0.000***
	INF	0.002	0.007	0.011	0.233	0.816

R-Square: 0.320. Adjusted R-square: 0.305. F statistics: 21.485. Dependent Variable: L2. Levels of significance: (***) 1% , (**) 5% and (*) 10%. This table shows the results WLS regression analysis for Model 2. In model 1: The dependent variable is the second liquidity ratio (L_2) measured by total loans to total deposits. The independent variables are asset quality (AQ) calculated by nonperforming loans to total loans ratio; capitalization (CAR) measured by equity to assets ratio; banking performance (ROA) calculated by net income to total assets; Bank's size (SIZE) measured by natural logarithm of total assets; economic growth (ECO) measured by the GDP growth; inflation (INF) measured by GDP deflator; and unemployment rate (UE) measured by the percentage of unemployed individuals to total labor force

be concluded that an increase of equity level will make banks able to provide loans without being covered by cash deposits.

The results of assets quality ratio are non-significant on bank liquidity measured by L1, but positive and significant on bank liquidity measured by L2. The nonperforming loans will have a negative impact on bank liquidity (L2) by reducing the deposits level and depositors' confidence. In addition, it makes banks eager to provide more loans to compensate for their losses.

The absence of a significant impact of assets quality on L1 is due to the increase of provision for credit losses required by the central banks in Middle Eastern countries.

Finally, the results of Tables 9 and 10 indicate non-significant impacts of performance, inflation and unemployment rates on bank liquidity measured by L_1 and L_2. These results confirm the study of Vodavá (2013) in Hungary and lead us to not accept hypotheses H3, H6 and H7.

It appears that the impacts of inflation and unemployment rates have a marginal importance on the liquidity level in the banking sector. The characteristics and the size of the banking sector in Middle East region can be the reasons for these insignificant results. The existence of few banks with a big size[4] minimizes the impacts of inflation and unemployment levels in the studied region.

Moreover, it seems that liquidity risk management is independent from the performance level of the banking sector. The ownership

4 183 banks are serving 143,133,974 customers. The number of population is extracted from the World Bank website. http://www.worldbank.org/

Table 11: Hypotheses of Model 1 (dependent L_1)

Hypothesis	Variable	Expected relationship	Actual relationship	Validation of hypothesis
H_1	Asset quality (AQ)	− and sig.	− and non sig.	Not validated
H_2	Capitalization (CAR)	+ and sig.	− and sig.	Not validated
H_3	Performance (ROA)	− and sig.	− and non sig.	Not validated
H_4	Size (SIZE)	− and sig.	− and sig.	Validated
H_5	Economic growth (ECO)	− and sig.	− and sig.	Validated
H_6	Inflation rate (INF)	− and sig.	+ and non sig.	Not validated
H_7	Unemployment rate (UE)	+ and sig.	+ and non sig.	Not validated

Higher L_1 ratio indicates less liquidity, thus beta coefficient must be interpreted inversely. Non sig.: Non significant, Sig.: Significant

Table 12: Hypotheses of model 2 (dependent L_2)

Hypothesis	Variable	Expected relationship	Actual relationship	Validation
H_1	Asset quality (AQ)	− and sig.	+ and sig.	Not validated
H_2	Capitalization (CAR)	+ and sig.	+ and sig.	Validated
H_3	Performance (ROA)	− and sig.	+ and non sig.	Not validated
H_4	Size (SIZE)	− and sig.	− and sig.	Validated
H_5	Economic Growth (ECO)	− and sig.	− and sig.	Validated
H_6	Inflation rate (INF)	− and sig.	+ and non sig.	Not validated
H_7	Unemployment rate (UE)	+ and sig.	+ and non sig.	Not validated

Higher L_2 ratio indicates less liquidity, thus beta coefficient must be interpreted inversely. Non sig.: Non significant, Sig.: Significant

structure and the financial behavior of owners can be the causes behind these results. Increasing performance may lead the owners to raise the dividend payoff instead of increasing the levels of liquidity and required reserves.

In line with many previous studies (Chagwiza, 2014; Roman and Sargu, 2015; El Khoury, 2015), the results of the first regression (WLS1) are divergent with those of second regression (WLS2). The details are presented in Tables 11 and 12.

5. CONCLUSION

The liquidity issue was one of many factors that have contributed to the global financial crisis of 2008. The examination of bank liquidity in the Middle East region sheds light on a previously unstudied dimension and helps governments and bankers to minimize liquidity risk by understanding the different reasons behind this risk.

Using data of 473 observations and 183 owned commercial banks in the Middle East region between 2014 and 2016, this research compares the different liquidity levels of banks in Middle Eastern countries and shows the importance of bank-specific and macro environment factors as determinants of bank liquidity.

The results show that the liquidity level of Lebanese banks was the highest in the region during 2014, 2015 and 2016. The role of Lebanese central bank is very conservative thus causing Lebanese banks to increase their levels of capital, liquidity and required reserves above the recommended levels by Basel III.

The liquidity level of Kuwaiti banks greatly decreased in 2016. The high level of nonperforming loans and the negative value of return on assets were the reasons behind the decrease in bank liquidity.

As for bank determinants, the results reveal that the size of banks has a significant negative impact on liquidity level because small banks have a buffer of liquid assets whereas big banks rely on the inter-bank market and credit instruments. Moreover, big banks have a professional commercial ability to attract more customers and provide additional loans that reduce the liquidity level.

Bank liquidity decreases with economic growth. The high level of investment opportunities during the economic expansions makes banks eager to increase their profit margins and so to decrease their liquidity by providing more loans. Moreover, the difficulty to attract more deposits during economic development increases liquidity gap and risk.

The relation between liquidity and CAR level is ambiguous. It indicates that banks use a part of the increased equity to increase their assets and to provide more loans, which indirectly lead to reducing liquidity level measured by total loans to total deposits.

The assets quality ratio increases the liquidity risk measured by total loans to total deposits. These results reveal that the accumulation of many bad loans decreases assets value, increases liquidity risks and makes banks unable to meet their financial obligations.

Central banks and regulators should keep an eye on nonperforming loans, and they must ensure that the money markets are regulated properly. In addition, they have to monitor banks during economic growth, especially the larger ones because they require more liquidity and reserves.

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