The determinants of banking regulation in the MENA region

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Abstract: Theoretical foundations in banks' response to capital settlement suggest that the systems proposed by Basel are not sound. It is conceivable that regulators will consider alternative approaches to enhance the safety and soundness of the banking system. The regulation includes several decrees and ratios; the areas of interest encompassing the areas are subject to principal component analysis (PCA).The paper aims to present a regulatory framework based on balance sheet ratios, such as Capital requirements (equity ratio; Tier 1 ratio; Total Equity/Net Loans; Total Equity/Deposits); for liquidity needs (liquidity/deposits; liquidity/total assets; liquidity/deposits and loans, and net loans/total assets); for leverage requirements (total liabilities/total assets; total assets/equity; and total liabilities/equity); also banking restriction index; Official supervision index; Private surveillance index, finally global index of regulations and supervision. Besides, it performs a PCA analysis on a set of 13 financial ratios to exploit and compare the financial characteristics of 239 banks (175 Conventional and 64 Islamic commercial banks) in the MENA region over a 2004-2015 period. This gives the main indices EXIGCP, EXIGLIQ, LEVCP, and LEVP.

Keywords: Banks; Regulation; Basel I, II, III; Principal Component Analysis; MENA

JEL Classification: G18; G21; G28; C38

1. Introduction

All aspects of banking are directly or indirectly influenced by the availability of capital. This is one of the key factors to consider when assessing the safety and soundness of a particular bank. Indeed; capital absorbs losses and serves as the basis for maintaining the confidence of depositors; it is also the essential determinant of lending capacity.

In the late 1980s, the Basel Committee on Banking and Supervision launched the first set of guidelines (Basel I) to harmonize banking regulation. It aimed to improve the stability of banking systems and to close the harmonization gap that had caused past financial crises.

However, the Basel I accord was ineffective for the rapid development of financial innovation. As a result, in 2004, it published a framework under Basel II. This agreement is based on three pillars: the minimum capital requirement, prudential supervision, and market discipline. Implementing Basel II has been slow and difficult. However, the financial crisis of 2007-2008 showed that even Basel II was insufficient to avoid bank failures. For example, many banks noted by governments appeared to have sufficient minimum capital requirements shortly before the onset of the crisis (Demirguc-Kunt, Detragiache and Merrouche, 2013). This position led the Basel Committee on Banking and Supervision to implement another new banking regulatory framework and resulted in the Basel III directives.

Even with the extreme instability of the financial system, it was noted that unlike conventional banks, Islamic financial service institutions were not affected by the crisis. This will increase the biggest challenge for banks, without compromising the returns they need to integrate a higher level of risk management tools. With Basel III regulations, it is imperative to know which Islamic or conventional banking systems are best equipped to withstand any future financial crisis. This sparked new thinking about the classic Western financial system.

These reflections led to new avenues of research on the role of Islamic financial institutions and explaining how and why Islamic banks survived the crisis.

Previous research has analyzed the performance, efficiency, and risk of this system by comparing it to conventional banks. The aim was to identify the major differences between the two systems to understand which system is the most reliable in particular circumstances. However, no empirical study has been conducted to examine the impact of banking regulations on the stability of Islamic banks. This study intends to fill this gap in the literature.

This paper concentrated on contributing to the existing literature by reviewing the main regulatory, legal, and institutional environment, theories relevant to the MENA Banks.

The rest of the article is organized as follows: first section summarizes an overview of existing theories and empirical research related to capital and risk

requirements, liquidity and risk requirements, leverage and risk requirements. Second section provides examples of the selection process, database, and experimental models. Third section presents the results of the statistical tests. Discussions of the results admit drawing conclusions and suggest ways for future research.

2. Review of the literature

The study of the impact of capital requirements on the stability of banking systems has always been confusing. VanHosse (2007) argues that banking regulators are still looking for an appropriate method to calculate minimum capital requirements.

Besides, Islamic banks do not share the same risk as conventional banks, their financing structure is very different and the Basel III agreement, based on the balance sheet of conventional banks, does not consider the particularities of the economic model Islamic bank (Bitar and Madiès, 2013).

Unlike conventional banks, the funding structure of Islamic banks does not guarantee multiple types of accounts.

Islamic banks finance the growth of their balance sheets through three sources of funding: Capital, demand deposits, and investment accounts [Turk-Ariss and Sarieddine (2007), Beck, Demirgüç-Kunt and Merrouche (2010), Saeed and Izzeldin (2014)]. These hold restricted and unrestricted investment accounts, which are not guaranteed by the bank because Investment Account Holders (IAH) is investors. Then, the profit and the initial capital invested by this category of depositors are linked to the success of the investment and, therefore, it does not require deposit insurance. Consequently, the operation of deposit insurance is not required for Islamic banks.

According to the Islamic Financial Services Board, IFSB (2005a), the rate of return on PSIA depends on the level of competition between banks in a country.

As a result, bank managers will experience "incentive misalignment" by engaging in risky investments leading to higher risk and lower levels of bank capitalization [IFSB (2010); Abedifar, Molyneux and Tarazi, (2013)].

The theory of financial intermediation defines a bank as an enterprise of liquidity creation and risk transformation [Berger and Bouwman (2009)].

Despite the importance of capital ratios in determining the stability and solvency of the banking sector, one outcome of recent financial crises is the recognition that liquidity is important for the stability of banks, and for equity. This was quickly reflected in the Basel III guidelines.

This has been reflected in articles such as Berger and Bouwman (2012) and Horváth, Seidler and Weill (2012).

For Islamic banks, liquidity management is one of the most important challenges for the development of the banking sector (Ray, 1995, Vogel and Hayes, 1998) and Abdullah (2010).

Yilmaz (2011) defines the liquidity risk of Islamic banks as:"the ability of a bank to maintain sufficient funds to honor its commitments, which may be related to its ability to attract deposits or sell its assets".

Liquidity risk arises from insufficient maturities (Oldfield and Santomero, 1997) for the lack of short-term liquid Islamic investment tools (Harzi, 2012), excessive reliance on long-term debt like Mudaraba (Metwali, 1997), like Murabaha (Ariffin, 2012).

As a result, a sudden and unexpected withdrawal can lead to cash or liquidity mismatches, making Islamic banks more vulnerable to risk than conventional banks.
The authors argue that Basel III liquidity risk requirements will affect Islamic banks for several reasons.
First, it cannot transfer the excess liquidity of Islamic bankingto conventional banks [Akhtar, Ali, and Sadaqat (2011)]. Second, access to liquidity in stressful situations is limited by the constraints imposed on borrowing and selling debt (Anas and Mounir, 2008; Beck, Demirgüç-Kunt and Merrouche, 2013) imposed by Sharia law. Third, Yilmaz (2011) expresses that Islamic banks operate in an underdeveloped Islamic money market (Sundarajan and Erico, 2002, Iqbal and Llewellyn, 2002, Čihák and Hesse, 2010) and cannot benefit from the Central Bank as a lender of last resort, making them more vulnerable to liquidity risk than traditional counterparties. However, Islamic banks do not have good liquidity management as the industry is still in its infancy.

Therefore, requiring Islamic banks to apply Basel III could penalize them compared to their traditional counterparts.
The subject of leverage has never been a priority in banking literature. The subprime mortgage crisis has shown that underestimating the importance of financial leverage on the stability of the banking system was a bad research policy.
Papanikolaou and Wolff (2010) study the relationship between the debt ratio and the risk of American commercial banks ''Too big to fail''. The authors claim that the use of leveraged commercial banks has led them to blatantly abuse the use of financial products. Their results indicate that the use of mass finance and modern financial instruments can lead to financial vulnerability and contribute to the fragility of the financial system. They also suggest that, on the one hand, commercial bank assets should be more focused on traditional lending than on derivatives and highly complex financial products. In contrast, the liability of commercial banks should rest more on traditional intermediation activities such as accepting deposits than on non-interest activities. Overall, the results support the ongoing debate on the need for stricter banking rules by requiring explicit and risk-free leverage.

The Basel risk-weighting method is ineffective in dealing with complex financial products such as CDS (Credit Default Swap) contracts that allow banks to expand their leverage with no limits.

They should consider the Basel III leverage ratio a key indicator, given the degree of the ineffectiveness of risk-based capital adequacy measures. According to Toumi, Viviani and Belkacem (2011), this ratio illustrates the frequency with which banks multiply their invested capital by attracting new resources. Pappas, Izzeldin and Fuertes (2012) argue that Islamic banks are less indebted than conventional banks. They

further explain that they require these banks with asset-backed rather than debt-based financial products to comply with Shariah. As a result, working under such circumstances exerts pressure by forcing Islamic banking leverage on conventional banks by associating them closely with the real economy [Saeed and Izeldin (2014)].

To sum up, the literature almost agrees that conventional high-leverage banks are more exposed and less stable than low-leverage banks. On the other hand, the constraints of Sharia law on the influence of Islamic banks make them, on the one hand, less indebted, more stable and less risky than conventional banks, and a greater constraint on yields and interest margins. Yet Islamic banks can benefit from PLS and over-indebtedness smoothing policies, which can lead to insolvency.

3. Methodology: variables, data sources, and Analysis of the principal components

The choice of the four aggregate indices constructed from the analysis of the principal component of 13 balance sheet ratios, selected from the BankScope data base; the Bank regulation and supervision database from the World Bank; Barth et al., 2001, 2003, 2004, 2006, 2008, 2012); and Balance Sheet of each bank in MENA[1] region.

The components of variables are from, balance sheet ratios, such as capital requirements (ratio equity; Tier 1 ratio; equity net loans; equity/deposits); for liquidity needs (liquidity/deposits; liquidity/total assets; liquidity/deposits and loans, and net loans/total assets); for leverage requirements (total liabilities/total assets; total assets/equity; and total liabilities/equity); also banking restriction index; Official supervision index; Private surveillance index, finally the global index of regulation and surveillance.

The intuition for the choice of PCA: the literature uses different accounting measures to examine the same financial phenomena; for example, studies show that capital requirements can be measured using the equity-to-assets ratio, the solvency ratio, or the Tier1 ratio.

PCA is, essentially, robust for exploring a multidimensional data structure. The principle of this method is to provide an approximate representation of the cloud of a multitude of variables in a subspace of restricted size.

The PCA helps to minimize the dimension of the different variables by creating a new platform of optimal components that correspond to the most important part of information. This procedure makes it possible to identify and feed regression models with certain components that represent as much information on the variables initially introduced.

According to Canbas, Cabuk and Kilic (2005), Andreica (2013) and Bitar, Madiès and Taramasco (2015), principal component analysis is a procedure for

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[1] MENA Region : Algérie, Bahreïn, Egypte, Iran, Irak, Israël, Jordanie, Kuwait, Liban, Libye, Maroc, Oman, Palestine, Qatar, Arabie Saoudite, Syrie, Tunisie, Emirates Arabes Unis, Yemen

understanding different data models, the correlated variables (which measure the same characteristics financial data) are examined to determine the most useful indicators of changes in the financial position of banking institutions. Thus, this technique is a way to highlight the similarities and differences by shrinking the original dataset and channeling a complex array of correlated variables into a few uncorrelated variables or factors called components.

Before proceeding with PCA, it performs several tests to assess the validity of such a technique for analysis. First, it developed a Pearson correlation matrix to capture all potential subgroups of highly correlated variables.

The literature shows that each category of financial indicators (eg capital, stability, liquidity, debt) can be measured by different financial ratios. These ratios are strongly correlated, which makes it possible to continue the PCA. Second, the work of Canbas, Cabuk, and Kilic (2005), Adeyeye, and Oloyede (2014), help to calculate Bartlett's test of sphericity to assess the adequacy of the financial data set before engaging in PCA.

Adeyeye et al. (2015) also use principal component analysis with discriminant analysis to study the probability of failure of Nigerian banks. The authors point out that profitability, liquidity, credit risk and capital adequacy are good predictors of bank failure and that the PCA is important, but it is a complementary tool that can explore the financial structure. Badarau and Leveiuge (2011) assess the potential strength of the capitalization channel of banks in eight European countries using the PCA. The results show that Germany and Italy could be exposed to financial shocks through the banking channel, while other countries, such as France, are the least exposed to financial shocks. Issah and Antwi (2017) study the role of macroeconomic conditions and try to predict a firm's basic performance represented by return on assets (ROA) and macroeconomic variables. The predictor variables used in the model's construction were selected using PCA. The results indicate that macroeconomic conditions should consider when forecasting company performance.

So, using this technique is a way to highlight the similarities and differences by reducing the initial dataset and channeling a complex array of correlated variables into a few uncorrelated variables or factors called components.

The literature shows that the PCA is a powerful tool that adds value and concatenates an important set of financial measures into a few components that represent the key information necessary to compare several aspects of banking and financial soundness.

Table 1: Definitions of variables: Banking and financial indicators. Review of the literature, hypotheses tested and sources

Indicators	Literature for Islamic and conventional banks
1. Capital requirements	
a. The capital adequacy ratio RAC	It's the sum of Tier & Tier2 as a percentage of risk-weighted assets. According to the Basel Committee, banks must maintain a minimum capital adequacy ratio of 8%. Capital is positively (negatively) associated with the financial health and stability of banks. Stiroh (2004a); Canbas and al. (2005); Mercieca and al. (2007); Shih and al. (2007); Pasiouras (2008); Demirgüç-Kunt and Huizinga (2010); Chortareasa and al. (2012); Vasquez and Federico (2012); Barth and al. (2013); Beck et al. (2013); Berger and Bouwman (2013); Lee and Hsieh (2013); Pessarossi and Weill (2013); Anginer and Demirgüç-Kunt (2014); Imbierowicz and Rauch (2014); Rozman and al. (2014).
b. Tier 1 ratio (RT1)	Similar to the capital adequacy ratio, the Tier1 ratio. This measure of capital adequacy measures the level of Tier 1 divided by risk-weighted assets calculated according to the Basel rules. Banks must maintain Tier1 of at least 4.5% (Basel II) and 6% (Basel III). Capital is negatively (positively) associated with bank stability. Pettway (1976); Kahane (1977); Koehn and Santomero (1980); Kim and Santomero (1988); Berger and Di Patti (2006); Altunbas and al. (2007); Goddard and al. (2010); Abedifar and al. (2013).
c. Total Equity / Net Loans (TCPN) d. Total Equity / Deposits (TCD)	• Another bank capitalization ratio. It measures the amount of bank equity relative to bank deposits and short-term financing. • This ratio is the equity financing of a bank balance sheet as a percentage of its liabilities. It is seen as another way to look at the adequacy of bank capital. Peltzman (1970); Rime (2001); Ariff and Can (2008); Demirgüç-Kunt and Detragiache (2010).
2. Liquidity requirements	
a. liquidity/ deposits (LD) b. liquidity / total assets (LA) c. liquidity / deposits and loans (LDE)	a. The ratio of liquidity to total deposits in loans. Like liquid assets to be deposited and the short-term financing ratio, this ratio also examines the amount of available cash for depositors and borrowers. b. The Total Liquid Assets / Assets ratio refers to assets that are readily convertible into cash at any time without any constraints. Liquidity is positively (negatively) associated with stability. Canbas and al. (2005); Shih and al. (2007); Srairi (2008); Čihák and Hesse (2010); Belans and Hassiki (2012); Pappas and al. (2012); Vasquez and Federico (2012); Beck and al. (2013); Rajhi (2013); Anginer and Demirgüç-Kunt (2014).
d. Net Loans / Total Assets (PNA)	Liquidity is negatively associated with the profitability or efficiency of banks. Ariff and Can (2008); Alam (2012).
3. Leverage requirements	
a. Total Liabilities / Total Assets (AP)	The ratio of total liabilities to total assets measures the share of bank debt relative to bank assets. This ratio is also referred to as the debt ratio and considered a measure of bank risk. Leverage is positively associated with the efficiency or profitability of banks. Berger and Di Patti (2006); Srairi (2008); Männasoo and Mayes (2009); Belans and Hassiki (2012).
b. Total Assets / Equity (AC)	This is the ratio of equity to assets. This is the traditional measure of bank capital (leverage).

	Leverage is negatively associated with credit risk or the risk of default by Islamic banks. Pappas and al. (2012); Abedifar et al. (2013).
c. Total Liabilities / Equity (PC)	• Leverage is positively associated with the risk of default by conventional banks. Pappas et al. (2012); Vázquez and Federico (2012). • Islamic banks are less indebted than conventional banks. Belans and Hassiki (2012); Pappas and al. (2012); Abedifar et al. (2013).
4. Banking Restriction Index	• Claessens (2003) shows that lowering restrictions on activity increases the possibility of increasing and transferring risks. • Claessens and Leaven (2004) point out the decrease in activity restriction leads to greater competition and therefore more risk. • Fernandez and Gonzalez (2005); Agoraki et al (2011) find that the activity restriction is insignificant while indicating that there is no direct effect of the activity restrictions on credit risk and show that more severe restrictions on activities are effective for reducing the risk of insolvency.
5. Official supervision index	Levine (2003) shows that strong supervisors could improve bank governance and promotes competition.
6. Private Monitoring Index	
7. Global Index of Regulations and Supervisions	Rachdi and Bouheni (2014) GI: The index is determined according to the method of Bouheni and Rachdi (2014); GI = Log (Σ RA * Σ AD * Σ SO * Σ IMP) With: RA = Restrictions on activities; AD = deposit insurance; SO = Official supervision; IMP = Private monitoring index.

This table describes the variables used in the PCA, their sources in the previous literature, and their impact on the financial soundness of the banking system (eg, capital, liquidity, debt).

The study applied PCA using Statistical Package Science for Social (SPSS) software to reduce the dimensionality of the initial space of financial data to allow a visual description of the total sample of predictor variables and avoidance.

The PCA has identified four global indices, which are principal determinants of bank regulation in MENA region: capital requirement, liquidity requirement, financial leverage, and leverage on liabilities.

4. Results and interpretations

4.1. Descriptive statistics

Table 2 presents descriptive statistics for financial indicators of the pooled sample.

The value of each ratio represents the minimum, maximum, average and standard deviation over the study period 2004-2015.

The average Capital Adequacy Ratio (RAC) over the period 2004-2015 for MENA banks comfortably satisfy the enhanced capital standards of Basel (21 %).

Also, the results indicate that nearly all of banks' capital is actually Tier 1 capital.

Hence, the new Tier 1 requirement of 6% (or 8.5% including buffers) is securely met (i.e., the average Tier 1 capital is 19 %).

The findings suggest that Basel capital standards will not require MENA banks to go through any additional forms of capitalization.

MENA banks are well-positioned to absorb higher provisions and impairment charges given the higher capital adequacy ratios reported by most.

It can also be argued that Basel III capital standards are implausible to materially add to the presented challenges faced by MENA banks.

The average Liquidity Coverage Ratios of MENA banks highlight sound liquidity profiles and broad compliance with Basel III standards.

In the MENA, retail customers tend to be more Shariah sensitive, providing Islamic banks with a large base of low-cost retail savings deposits, hence supporting their stronger LCRs.

According to Moody's Corporation 2015 report, retail deposits consisted of 67% of Islamic Bank's customer deposits.

We believe that due to the limited availability of Shariah Executive high-quality Liquid Assets (HQLS), Muslim banks are often supported by large, but low-delivery buffers of money or invoices, and therefore confronted with a profit challenge.

At the same time, lower oil prices supported reducing all domestic liquidity in MENA countries, creating financing and liquidity pressures for the banks.

This development can lead to a gradual weakening of the LCR for the banking sector.

However, we argue that liquidity for Muslim banks will continue to take advantage of the expansion of their retail companies, while the development of domestic Sukuk markets will improve access to HQLS, an extra increase from its LCRS.

The standard deviation of liquidity shows that small variations in terms of liquidity, maintain a similar percentage of cash according to their risk intensity of financing portfolio.

Also, the results show the effect of the patent index and public monitoring force on interpretation stability in the Mena region.

This conclusion shows the negative impact of the private monitoring index and official control force to expose the Bank's stability through the Mena region.

However, the result shows that the patent index and public monitoring concentrations have a positive effect on explaining stability.

A possible explanation is that powerful regulatory bodies can improve private examination by reducing obstacles to the transmission of information, which increases the Bank's stability.

Although trainers in growing economies can use this power to create private benefits by weakening private control, which reduces stability in growing economies.

Restrictions on operations are negative for media and overwhelming quantum in commercial banks and banking companies; however, this effect is lacking in investment banks.

This discovery shows that the larger quantities of commercial banks and banking portfolios are more serious by tightening operating restrictions.

Deposit insurance is the most important result, in particular for commercial banks with a significant negative impact on stability.

This effect becomes marginally in the investment banks and disappears into bank portfolio companies.

Similarly, the main adverse effect on the private control index for commercial banks 'stability, the supervisors are more concerned about commercial banks' stability in the banking system.

This finding can be observed with a significant negative impact of the strict official supervisory authority in the stability of commercial banks.

Besides, diversified businesses can prevent excessive official supervision into investment banks and banking-based companies.

This situation can be seen as a minor supervisory authority's insignificant corporate bank investment banking and business models.

Also, the estimates of the coefficients of the banks belonging to the Board are negative in most quantities and different business models, although the modest effect of banking portfolio companies.

4.2. Empirical results

The application of the PCA technique to all previously discussed data allows us to identify four principal components, which together account for 90% of the overall data dispersion.

The information in the 13 original variables can be summarized by the four principal components that simultaneously satisfy the criteria of Kaiser (1960) and Cattel (1966).

The value of the chi-square is very important, and the observed significance is very low (level of significance is <0.01). Therefore, rejecting the assumption that the correlation matrix is an identity matrix. Next, the Kaiser-Meyer-Olkin aggregate measure (KMO) and the sampling adequacy measure (MSA) for each variable are examined.

Beaumont (2012) postulates that the KMO measure should be consulted and Bartlett's spherical test, does not decide whether to proceed with the PCA. Wuensch (2012) considers that variables with an MSA greater than 0.9 are appreciable, while variables with an MSA of less than 0.5 are unacceptable and should be removed from the analysis. As a result, the KMO statistics values of 0.774, 0.703, and 0.5 indicating that they are good to contribute with PCA, and Bartlett's test (all values are statistically significant at a significance level of 1%) meet the standards prescribed by Hair and all (2012), Willaims, Brown, and Onsman (2012) and Beaumont (2012), Magotra, Sharma and Sharma (2017), thus confirm the statistical relevance of the data for the use of the approach.

The results are interesting, the first index on the EXIGCP includes Tier1 ratio information; this leads to the conclusion that for banks in the MENA region, it is appropriate to focus on the core of capital to preserve bank stability.

Therefore, banks are encouraged to increase the Tier 1 element in their capital adequacy ratios rather than the Tier 2 element.

Tier 1 capital represents the sum of shareholders' funds and perpetual, non-cumulative preferred stock. Total capital is the numerator within the capital adequacy ratio and contains a proportion of Tier 2 capital additionally to Tier 1 capital.

Tier 2 includes subordinated debt and a few hybrid capitals.

Under Basel II guidelines, the entire capital ratio must be maintained at a level of least 8%.

Bank common equity includes common stock, retained earnings, reserves for general banking risks, and statutory reserves. Because data on Tier 2 capital are rare, we decided to compute a proxy called "other capital" defined as the difference between total capital and customary equity.

Other capital mainly includes subordinated debt and hybrid capital. Finally, we consider the tangible equity ratio, which represents a bank's tangible equity divided by total assets (Tangible equity/TA). Tangible equity removes goodwill and other intangible assets from a bank's equity base.

Capital requirements have a positive influence on banks' stock returns. There is evidence that Tier1 capital is simpler than other sorts of capital.

Furthermore, the impact of capital requirements on bank efficiency and profitability is more effective for too-big-to-fail banks, banks in countries with a better governance policy, and banks during the Arab Spring political transition period.

These results confirm the importance of Tier 1. The hypothesis that higher capital ratios, such as Tier 1 or ordinary capital, strengthen the performance and stability of banks.

These results have significant political implications for the capital structure of Islamic banks across countries in the MENA region.

First, they mark the persistence of banks' capital ratios. Second, bank regulators, governments, and politicians can focus on institutional governance (shareholder rights), banking competition, and banking regulation and supervision to establish targeted policies concerning bank capital. "

The financial structure of an Islamic bank is mainly composed of Tier 1 Capital (bank equity).

Having a Tier 2 in the capital of Islamic banks is rare, as it is capital or hybrid capital tied to the payment of interest, and when it is, Tier 2 capital is limited to 50% of the total of capital.

So when the redefinition of capital has a fairly significant effect on traditional banks, this is not the case for Islamic banks, as their capital is largely composed of ordinary shares (and rarely of Tier 2 products).

The second EXIGLIQ index includes information on the ratio of cash to total debt deposits. Like liquid assets to be deposited and the short-term financing ratio, this ratio also examines the amount of cash not only for depositors but also for borrowers.

Deposits are the most important source of liquidity, which can create a situation where banks can easily attract liquidity at a lower price and avoid liquidity shocks. Liquidity

problems can, however, create a crisis as depositors lose confidence in their banks. Also, the financing liquidity risk arises as bank customers' demand an extensive amount of liquidity unexpectedly associated with asymmetric information. Second, additional margins are another matter for spreading liquidity maturity mismatch, where the margin is a discount paid to depositors for attracting maximum deposits for extending the short-time to long-term deposits. In these circumstances, banks buy cash using collateral for short-term loans and fund the difference between loans and core deposits through joint-stock banks. Banks, therefore, face the challenge of exchanging short-term and long-term deposits. Finally, the higher costs associated with frequent renewals, the renewal problems cause banks to sell their assets and worsen the liquidity conditions for financing. These costs will most likely increase interest rate difficulties during financial stress. As a result, the bank's liquidity is adjusted to a change in deposits, which puts pressure on banks' lending, which is felt in the credit markets. Banks cannot easily get the liquidity to finance their activities and cause a rapid decline in their financial results.

These factors mentioned above therefore make banks risky and the whole financial system more volatile, and the liquidity risk of financing has a negative effect on assets for liquidation prices.

Islamic banks should no longer experience limits below the leverage ratio, as it usually limits them in advance by the risk management of their liquidity (Islamic assets and products are less liquid than conventional products).

But because the business model developed by Islamic banks is a more universal banking model, and because deposit / loan ratios are higher than conventional banks, we can reasonably predict that the leverage ratio will not be a real limiting point for Islamic banks.

If we compare the current net effect with Islamic and conventional banks, we see a significant distortion of competition for the lack of short-term liquidity facilities in Islamic funding, but also because conventional banks did not have liquidity constraints and this new framework will be severely penalized. So, Basel III forces traditional banks to limit their willingness to liquidity.

The third LEVCP index highlights the information from the two ratios of total liabilities to total assets measures the share of bank debt relative to bank assets, and the ratio of equity to assets. Cash enables banks to resolve any urgent problem resulting from an unexpected cash withdrawal, which can affect overall bank stability if the bank does not have sufficient liquid assets that can be converted into money immediately and cheaply. A previous financial crisis is known as a liquidity crisis. After 2010, the bank regulators took steps to avoid such a risk in the financial system.

Implementing leverage ratio restrictions besides a risky capital ratio reduces the share of Islamic banks in the banking system.

In addition, the research framework considers the local specificities of dual banking systems in two ways.

It is believed that conventional banks have more difficulty in attracting Muslim customers than Islamic banks, for the religious motivations of these customers.

We can therefore study the behavior of banks under the Basel III capital requirements when Islamic banks benefit from a less competitive environment than conventional banks.

In contrast, it is assumed that national regulators will adjust international capital requirements to local Islamic banks, as permitted by Islamic Financial Services Board standards.

In summary, such local peculiarities reduce the downfall of Islamic banks following implementing leverage ratio restrictions in dual banking systems.

Finally, LEVP is the traditional measure of bank capital (leverage). Several indicators of the quality of public governance and financial development have contributed to the role of institutional quality in banking leverage decisions in the MENA region. While a composite and multifaceted concept, good public governance is usually captured by some of its critical dimensions, notably, corruption control, public sector efficiency, rule of law and democracy.

5. Conclusion

In contrast to the apparent cultural and social similarities, the multiple differences between MENA countries provide sufficient variation in the data and help determine the regulatory environment required for the region.

This paper intends to contribute to the existing literature by reviewing the main regulatory, legal, and institutional environment, theories relevant to the MENA Banks.

The question of factors influencing the regulation of MENA banks is interesting for several reasons. First, the financial system of the MENA countries is predominantly banking. However, the development of the banking sector is still inconsistent between these countries and does not seem to correlate with their economic development.

Second, the MENA region contains several fast-growing economies and contributes a significant share of world GDP.

Finally, in contrast to the apparent cultural and social similarities, the differences between MENA countries offer enough variation in the data and allow us to test whether there is a general trend towards regulatory decisions by banks based in the region.

This article identifies the key regulatory determinants for bank's headquartered in the MENA region (an unexplored topic with implications both for banking operations in this region and for the stability of the economy and local financial system). After a review of the literature, the banking regulations include several decrees and ratios.

The outcome of this article is to present a regulatory framework based on balance sheet ratios, such as capital requirements (ratio equity; Tier 1 ratio; equity/net loans; equity/deposits); for liquidity needs (liquidity/deposits; liquidity/total assets; liquidity/deposits and loans, and net loans/total assets); for leverage requirements (total

liabilities/total assets; total assets/equity; and total liabilities/equity); also banking restriction index; Official supervision index; Private surveillance index, finally the global index of regulation and surveillance.

Also, a PCA analysis is carried out on a set of 13 financial ratios to exploit and compare the financial characteristics of 239 banks (175 conventional commercial banks and 64 Islamic commercial banks) in the MENA region over a period 2004-2015.

The application of the PCA technique to all previously processed data allows us to identify four principal components that together represent 90% of the total data dissemination.

The PCA has identified four global indices that are considered being key drivers of banking regulation in the MENA region: capital requirement, liquidity requirement, financial leverage, and leverage on liabilities.

This gives the main indices EXIGCP, EXIGLIQ, LEVCP, and LEVP.

The results are interesting, the first index in EXIGCP includes information on the Tier1 ratio; this leads to the conclusion that for banks in the MENA region, it is appropriate to focus on the core of capital in order to maintain the bank's stability.

Therefore, banks are encouraged to increase the Tier 1 element in their capital adequacy ratio instead of the Tier 2 element.

The second EXIGLIQ index provides information on the relationship between cash and total debt deposits. Like liquid assets to be deposited and the short-term financing ratio, this ratio also examines the amount of cash not only for depositors but also for borrowers.

The third LEVCP index highlights the information from the two ratios of total liabilities to total assets that measures the ratio of bank debt to bank assets and the ratio of capital to assets.

Finally, LEVP is the traditional measure of bank capital (leverage). Several indicators of the quality of public administration and financial development have contributed to the role of institutional quality in decisions about the leverage of banks in the MENA region.

It is also the first study to analyze the determinant of the structure of banking regulation in the MENA region.

To refine analyzes, the overall results for MENA countries can be examined in more detail to consider the intrinsic peculiarities of each country.

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Appendixs:

Table 2: Descriptive statistics

<div align="center">Descriptive statistics</div>

	NOT	Minimum	Maximum	Average	Standard deviation
Year	2856	2004	2015	2009.50	3.453
RAC	2850	0	3	, 21	, 206
TIER1	2848	0	2	, 19	, 195
CPPN	2850	-1	10	, 65	1,373
CD	2850	-1	10	, 35	, 970
CPP	2850	0	9	,30	, 816
LD	2849	0	9	, 50	, 696
THE	2850	0	2	, 31	, 209
LDE	2848	0	9	, 42	, 472
PNA	2850	0	8	, 47	, 344
PA	2850	0	2	, 84	, 165
AP	2850	0	1	, 10	, 112
Pc	2850	-1	104	, 13	1,950
PCP	2849	0	1	, 89	, 142
IG	2616	1	2	2.08	, 354
IO	2808	-2	2	, 72	1.349
Valid N (list)	2557				

First panel

KMO index and Bartlett test

Kaiser-Meyer-Olkin sampling precision measurement.		, 774
Bartlett's sphericity test	Approximate chi-square	9492,890
	Dof	10
	Meaning of Bartlett	, 000

Quality of representation

	Initial	Extraction
RAC	1,000	, 786
TIER1	1,000	, 802
CPPN	1,000	, 481
CD	1,000	, 577
CPP	1,000	, 719

Extraction method: Principal component analysis.

Total variance explained

Component	Initial eigenvalues			Extraction Sums of squares of the factors selected		
	Total	% of variance	cumulative%	Total	% of variance	cumulative%
1	3.365	67.308	67.308	3.365	67.308	67.308
2	, 680	13,594	80.902			
3	, 592	11.846	92.749			
4	, 263	5.255	98.004			
5	, 100	1,996	100,000			

Extraction method: Principal component analysis.

Component matrix [a]

	Component
	1
RAC	, 887
TIER1	, 896
CPPN	, 693
CD	, 760
CPP	, 848

Extraction method: Principal component analysis.
at. 1 extracted components.

Matrix of the coefficients of the coordinates of the components

	Component
	1
RAC	, 263
TIER1	, 266
CPPN	, 206
CD	, 226
CPP	, 252

Extraction method: Principal component analysis.
Component scores.

Second panel

Quality of representation

	Initial	Extraction
LD	1,000	, 742
THE	1,000	, 679
LDE	1,000	, 814
PNA	1,000	, 171

Extraction method: Principal
component analysis.

KMO index and Bartlett test

Kaiser-Meyer-Olkin sampling precision measurement.		, 703
Bartlett's sphericity test	Approximate chi-square	4143,277
	dof	6
	Meaning of Bartlett	, 000

Total variance explained

Component	Initial eigenvalues			Extraction Sums of squares of the factors selected		
	Total	% of variance	cumulative%	Total	% of variance	cumulative%
1	2.406	60,140	60,140	2.406	60,140	60,140
2	, 897	22,418	82.558			
3	, 466	11.647	94.205			
4	, 232	5.795	100,000			

Extraction method: Principal component analysis.

Component matrix [a]

	Component
	1
LD	, 861
THE	, 824
LDE	, 902
PNA	-, 414

Extraction method:
Principal component
analysis.
at. 1 extracted components.

Third panel

KMO index and Bartlett test

Kaiser-Meyer-Olkin sampling precision measurement.		, 500
Bartlett's sphericity test	Approximate chi-square	27,793
	dof	1
	Meaning of Bartlett	, 000

Total variance explained

Component	Initial eigenvalues			Extraction Sums of squares of the factors selected		
	Total	% of variance	cumulative%	Total	% of variance	cumulative%
1	1.099	54.929	54.929	1.099	54.929	54.929
2	, 901	45,071	100,000			

Extraction method: Principal component analysis.

Quality of representation

	Initial	Extraction
AP	1,000	, 549
PCP	1,000	, 549

Extraction method: Principal
component analysis.

Total variance explained

Component	Initial eigenvalues			Extraction Sums of squares of the factors selected		
	Total	% of variance	cumulative%	Total	% of variance	cumulative%
1	1.099	54.929	54.929	1.099	54.929	54.929
2	, 901	45,071	100,000			

Extraction method: Principal component analysis.

Matrix of the coefficients of the coordinates of the components

	Component
	1
AP	, 675
PCP	, 675

Extraction method:
Principal component
analysis.
Component scores.

Component matrix [a]

	Component
	1
AP	, 741
PCP	, 741

Extraction method: Principal
component analysis.
at. 1 extracted components.

Fourth panel

Quality of representation

	Initial	Extraction
PA	1,000	, 513
Pc	1,000	, 513

Extraction method: Principal
component analysis.

Total variance explained

Component	Initial eigenvalues			Extraction Sums of squares of the factors selected		
	Total	% of variance	cumulative%	Total	% of variance	cumulative%
1	1.026	51.301	51.301	1.026	51.301	51.301
2	, 974	48,699	100,000			

Extraction method: Principal component analysis.

Component matrix [a]

	Component
	1
PA	, 716
Pc	, 716

Extraction method: Principal
component analysis.

At. 1 extracted components.

Matrix of the coefficients of the coordinates of the components

	Component
	1
PA	, 698
Pc	, 698

Extraction method: Principal
component analysis.
Component scores.