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**Ownership, regulation and bank risk-taking: evidence from the Middle East and North  
Africa (MENA) region**

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## **Ownership, regulation and bank risk-taking: evidence from the Middle East and North Africa (MENA) region**

### **Abstract**

**Purpose** – This study investigates how ownership structure and bank regulations individually and interactively influence risk-taking behaviour of a bank.

**Design/Methodology/Approach** – Our empirical framework is based on dynamic two-step system generalised method of moments (GMM) estimation technique to analyse an unbalanced panel dataset covering 144 conventional banks from 12 Middle East and North Africa (MENA) countries.

**Findings** – Our estimation results suggest that foreign shareholding has an inverse relationship with bank risk-taking. In addition, official supervisory power is found to have a positive association with bank risk, and this relationship is reinforced for banks with higher ownership concentration. In addition, capital stringency increases bank risk, whereas market discipline has an opposite effect, only in countries with higher activity restrictions. Finally, the interaction between ownership concentration and activity restriction has an inverse association with bank risk-taking. Overall, our evidence suggests that the Basel II framework and the regulatory reform initiatives in the post-global financial crisis period do not seem to have reduced bank risk-taking in MENA countries.

**Originality/value** - This study contributes to the literature on the effectiveness of regulatory reform based on the three pillars of the Basel II guidance (e.g., capital regulations, market-oriented disclosures and official supervisory power), and offers evidence in support of ‘political/regulatory capture hypothesis’ of bank regulation. Our results also provide support for ‘global advantage hypothesis’ of bank ownership.

**Key Words** Ownership structure; bank regulation; bank risk-taking; MENA countries

**JEL Classifications** G21, G28, G32

**Paper type** Research paper

## 1. Introduction

The recent financial crisis highlighted several weaknesses in corporate governance (CG) and risk management practices of banks in both developed and emerging economies. Available literature (such as Anderson, 2009) suggests that a systematic breakdown in corporate governance and regulatory regimes influenced banks' risk-taking behaviour in the financial sector, and thus contributed to the severity of the financial crisis. In the wake of the crisis, the significance of the inter-relationships among internal corporate governance mechanism (such as, ownership), institutional governance mechanism (such as, bank regulation) and bank-risk taking have become more prominent to the policymakers to enhance banking sector stability and development.

Recognising the significance of corporate governance and regulations, several studies (e.g., Laeven and Levine, 2009; Shehzad et al., 2010) examine the effects of ownership and bank regulations on risk-taking, but they do not consider the impact of different types of ownership. Whilst Laeven and Levine (2009) consider the largest listed banks, Shehzad et al., (2010) cover a shorter time span (2005-2007). The former deals with the default risk, whereas the latter includes credit risks and capital adequacy. Several related studies (e.g., Barry et al., 2011; Haw et al., 2010 and Iannotta et al., 2007) address the impact of ownership on bank risks in Europe and East Asia. These studies are cross-sectional in nature and do not consider time variations in ownership. Similarly, Brissimis et al., (2008) and Agoraki et al., (2011) address the interrelationships among bank regulation, competition and risk-taking in European banking, but they do not consider bank-specific ownership variables. In addition, available empirical evidence on the relationship between bank regulation and risk-taking behaviour is largely inconclusive. As Allen and Carletti (2013) argue, in the absence of an overarching theoretical framework on bank regulation, there is a lack of consensus on what should be done to reform regulation.

Moreover, most studies appear to be either global or Europe-specific, with relatively less studies focussing on emerging economies. To the best of our knowledge, existing literature does not seem to address the effects of both ownership and individual components of bank regulation as well as their interactions in a single empirical

framework especially in the context of Middle East and North Africa (MENA) countries. For example, a growing body recent literature (e.g., Ghosh, 2017; Srairi, 2013); Hammami and Boubaker, 2015; Lassoued et al., 2016) examine the effects of corporate governance or ownership structure on bank performance in MENA countries, without taking into consideration the effect of bank regulation. A related literature (e.g., Ghanem, 2017; Bitar et al., 2016) use bank-level data on capital adequacy ratios, rather than overall indices of capital stringency or other regulations such as supervisory power and market discipline. Maghyreh and Awartani, (2014) use an old set of data (2000-2009) to examine the effect of bank regulation on bank distress in the GCC countries, without addressing the effects of the interaction variables.

Therefore, this study attempts to address this gap by examining the impact of ownership and bank regulation on bank risk-taking in the context of MENA region. Considering the uniqueness in political and institutional settings and regulatory reforms, it is imperative to study MENA banking [1]. As Kobeissi and Wang (2009) observe, the institutional environments, deregulation and privatisation processes in Arab countries are mostly relevant and specific to this region.

One important policy-oriented motivation of this study is to examine the effects of ongoing banking reform initiatives that started taking place in the most of MENA countries in the 2000s under the Basel regulatory framework. These reforms are intended to improve corporate governance, capital adequacy, disclosures and transparency, and prudential regulations (OECD, 2009), so as to reduce bank risk-taking behaviour and to enhance financial stability. The MENA region represents an interesting case for this study partly because of the dominance of concentrated banking sector in its financial system, together with unique ownership structure (e.g., significant family and government ownership of banks) and monopolistic competition (Turk-Ariss, 2009; Naceur and Omran, 2011; Awartani et al., 2016). Since the corporate bond and equity markets are underdeveloped in this region, the corporate sector depends largely on bank finance (OECD, 2009; Awartani et al., 2016). Moreover, as the World Bank (WB, 2011; Prasad et al. 2016) observes, the adoption of the Basel guidelines has resulted in partial success in terms of regional convergence in bank regulations, although there are divergences among MENA countries depending on the level of sophistication of a country's financial system.

We carry out our examination using an unbalanced panel dataset which covers data from 144 commercial banks based on 12 MENA countries over a period of 12 years (2001-2012). We adopt generalised method of moments (GMM) estimation technique to carry out our analysis. In doing so, we examine the following three research questions in detail from the perspective of MENA countries: i) How do ownership concentration and types of ownership (e.g., government and foreign shareholdings) influence the risk-taking behaviour of a bank? ii) How are bank regulations based on the Basel II guidelines and activity restrictions related to bank risk-taking? iii) How do the interactions among bank regulations and ownership determine bank risk-taking?

Our paper makes several important contributions to the extant literature. First, we use an integrated empirical framework to examine the individual and interactive effects of ownership and bank regulation on bank risk-taking behaviour in the context of the emerging MENA region. Unlike other MENA-based studies, we use dynamic two-step system generalised method of moments (GMM) panel data estimator to address the concerns about potential endogeneity and reverse causality among ownership, regulations and bank-risk taking.

Second, we complement related studies (such as Hammami and Boubaker, 2015; Lassoued et al., 2016) and examine the effects of concentration and types of ownership on bank risk-taking. We find that only foreign ownership has an inverse effect on bank risk-taking, and thus support ‘global advantage hypothesis [2]’. Third, we extend related studies (such as Ghanem, 2017; Bitar et al., 2016; Maghyreh and Awartani, 2014) and investigate if the Basel II guidelines (e.g., capital regulations, supervisory power and market-oriented disclosures) and activity restrictions discipline bank risk-taking behaviour. Contrary to the evidence of most relevant studies, we find support for the ‘political/regulatory capture hypotheses [3]’ of bank regulation in that official supervisory power has a positive relationship with bank risk-taking. Overall, our evidence suggests that the three pillars of the Basel II regulatory framework as well as the regulatory reform initiatives in the post-GFC period do not seem to contain bank risk-taking behaviour in the MENA region.

Finally, we examine the effects of the interaction variables, and find evidence in support of the interdependence among ownership and bank regulations. For example, we find that the positive effect of supervisory power on bank risk-taking is reinforced for banks with higher concentration of ownership. In addition, capital stringency shows positive effect on bank risk only in countries with higher activity restrictions. On the contrary, market discipline reduces bank risk-taking only in countries with higher activity restrictions. Moreover, the interaction between ownership concentration and activity restrictions has an inverse association with bank risk-taking, indicating that increased restrictions on bank activities tend to reduce risk-taking behaviour of controlling shareholders.

The rest of the paper is structured as follows. Section 2 describes institutional background of the study, and section 3 provides a critical review of literature and develops hypotheses. Section 4 describes methodological details including empirical models and data, and section 5 presents empirical results and analysis. Finally, section 6 concludes the paper.

## **2. Institutional background**

The banking systems of MENA countries are characterised by higher concentration of ownership, together with unique regulatory structure and monopolistic competitive conditions (Turk-Ariss, 2009; Prasad et al., 2016). In the presence of underdeveloped markets for equities and corporate bonds, the corporate sector of this region relies on bank loans as the main form of external finance (OECD, 2009; Awartani et al., 2016). This, along with the opaqueness of corporate borrowers, causes unique challenges for MENA banks (Koldertsova, 2011). Naceur and Omran (2011) observe that financial sector in the GCC region is significantly dominated by family as well as government ownership of banks. For example, Awartani et al., (2016) observe a higher level of government ownership and a lack of competition in MENA banking. They observe that state ownership in the banking sector is 21% in Saudi Arabia, 34% in Kuwait, 60% in Egypt, and 70% in the UAE. Similarly, a WB report (WB, 2011) shows that state banks play a dominant role in the banking sectors of the UAE, Qatar, Saudi Arabia, Algeria, Syria, whereas private sector banks have sizable presence in Bahrain, Kuwait, Oman, Egypt, Jordan, Lebanon, Morocco, Tunisia and Yemen. The report, however, observes

that state ownership in MENA countries has been on the decline, whilst foreign ownership is on the rise. Nevertheless, as the International Monetary Fund (IMF, 2008) observes, the level of compliance in MENA region is significantly lower in areas such as the transfer of ownership and the abuse of financial services.

A related literature highlights the development of corporate governance and bank regulations in the MENA region. For example, Koldertsova (2011) observes that the first wave of corporate governance awareness in this region in early 2000s was influenced by a drive to attract foreign direct investment, together with a shift towards market-based financial systems. However, as Koldertsova (2011) argues, the stock market crash in GCC countries in 2006 was instrumental in bringing broad-based corporate governance reform across the MENA region.

Consequently, there has been a significant improvement in corporate governance practices of the listed firms in this region, with Oman being the first country to follow the Organisation for Economic Cooperation and Development (OECD) guidelines in introducing corporate governance codes in 2002, followed by other MENA countries (Crescent Enterprises, 2016). Hawkamah, a regional think tank, develops Environmental, Social and Governance (ESG) Index to evaluate corporate governance and disclosure quality of the listed companies in this region. They observe a significant improvement in the quality of disclosures of the MENA listed firms from 2007 to 2016 in all three ESG categories, with Omani companies leading the way, followed by Lebanon, Jordan, Bahrain and the UAE in terms average governance scores (Nadal, 2017). Moreover, as Crescent Enterprises (2016) observes, several countries such as Kuwait, UAE and Saudi Arabia have recently revised respective companies acts to improve shareholder protections, disclosures and other governance practices.

However, Crescent Enterprises (2016) highlights several key concerns such as the effectiveness of boards and the quality of disclosure practices that are constraining the region's ability to attract foreign institutional investment. For Nadal (2017), there are still several notable concerns about corporate governance in this region in relation to a shareholder(blockholder)-centric governance, limited board independent, poor protection of minority shareholders, conflicts of interest, and information asymmetry. Whilst Egypt, Morocco and Bahrain have already developed CG guidelines for state-

owned enterprises (SOEs), and Algeria and Tunisia are working on this development, there has been a slow progress in improving CG practices in SOEs and privately-held firms in the MENA region (Kane, 2017).

Empirically, Ghosh (2017) use bank-level data (from 2000 to 2012) to examine the effect of corporate governance reforms on bank performance in MENA countries, and find that CG characteristics are not equally effective in influencing bank performance, and that the reform initiatives need to take into consideration the unique economic characteristics of a country. For Farazi et al., (2011), it is premature to test the effect of foreign shareholding on bank performance in the majority of non-GCC countries, since the market entry and the development of foreign banks are recent phenomena in these countries. Moreover, as Omran et al., (2008) argue, ownership concentration is a consequence of poor legal protection of investors in many emerging countries (such as Egypt, Jordan, Oman and Tunisia), and hence, it is less likely to have a significant effect on bank performance.

Much of the regulatory reforms relating to corporate governance, capital adequacy, disclosures, risk management and prudential regulations have been guided by the Basel Committee (OECD, 2009). The IMF and the WB have developed strong collaborative relationships with the Basel Committee to implement Basel II core principles that are key elements of the Financial Sector Assessment Program (FSAP) (IMF, 2008). Consequently, the IMF (2008) observes a noticeable improvement in MENA countries in relation to compliance with Basel core principles. Based on a recent World Bank's global Banking Regulation and Supervision Survey (BRSS), Mohseni-Cheraghloou (2012) observes that 64 percent of the MENA countries comply with the Basel II capital adequacy regime, and 92 percent require banks to enhance disclosures on risk management framework and off-balance sheet transactions. Lassoued et al., (2016) observe that state-owned banks in the MENA region tend to have higher capital adequacy ratios. The WB (2011) suggests that the implementation of Basel II has resulted in greater stability and higher capital requirements in MENA region. The WB report further observes that the adoption of international standards has brought some degree of regional convergence in regulatory framework, although there are divergences among MENA countries, depending on the level of sophistication of a country's financial system.

Whilst there has been a noticeable improvement in MENA countries in relation to the implementation of Basel II capital requirements, a lack of effective risk-based supervision and deposit insurance remain the main challenges for the development of regulatory framework (Mohseni-Cheraghlou, 2012; WB, 2011; Ayadi and De Groen, 2013). The WB (2011) report also observes that the notion of independence in bank supervision in some countries is constrained by a weaker political autonomy of the central bank, together with the dominant role played by the ministry of finance in state-owned banks. Mohseni-Cheraghlou (2012) further highlights a weaker supervisory power of a number of central banks of this region in suspending or removing managers or directors for improper business practices. Whilst Pillar 3 of the Basel II framework is to encourage regulators to enhance market discipline through greater disclosure requirements for investors, MENA countries do not seem to provide adequate incentives to market participants to assess bank's capital over risk exposures (WB, 2011).

Meanwhile, a majority of MENA countries have formally agreed to fully comply with the Basel III accord by January 2019, although there are variations amongst countries in terms of overall progress. Among others, political uncertainty and oil price volatility might be important reasons for such as variations. For example, as Ghosh (2016) analyses macro- and bank-level data from 2000 to 2012 and find that the Arab Spring lowered bank profitability and increased bank risks in MENA countries.

Among others, Prasad et al., (2016) observe that the MENA countries, in general, and GCC countries, in particular, have made noticeable progress in strengthening prudential regulations and implementing Basel III standards by tightening the capital and liquidity requirements, establishing separate financial stability office/unit and setting up early warning system and periodic stress testing of banks. They also find that all the GCC countries except the UAE have implemented the Basel III framework for capital and liquidity requirements. In February 2017, the UAE issued new regulations for all banks to comply with the Basel III capital adequacy requirements (WAM, 2017). The UAE has also adopted the Bankruptcy law in 2006 to improve investors' confidence and to enhance firms' access to bank finance (Gulf News, 2016). Among the non-GCC countries, Lebanon and Morocco have enforced Basel III capital requirements in 2014

for progressive implementation, whereas Morocco and Tunisia have implemented the liquidity coverage ratio, and other countries such as Jordan, Lebanon, and Egypt are on track to implement Basel III regulations within the agreed timeline (see also Prasad et al., 2016).

### **3. Literature review and hypotheses development**

#### *3.1. Ownership structure and risk-taking behaviour:*

Ownership concentration influences risk-taking behaviour of a bank, even though there are disagreements among the researchers on how ownership concentration affects risk-taking. Agency theory suggests that higher cash-flow ownership of controlling shareholders reduces agency costs and improves firm performance (La Porta et al., 2002). In support of this argument, Iannotta et al., (2007) find that ownership concentration has a positive relationship with loan quality, and a negative relationship with asset risk and insolvency risk among banks in the Far East and European countries. Srairi (2013) also finds an inverse association between ownership concentration and bank risk-taking in MENA countries. Similarly, Haque and Brown (2017) find ownership concentration having a positive effect on bank efficiency in the MENA region. However, Haw et al., (2010) argue that concentrated shareholding can cause greater agency problems in the banking sector, which could lead to connected lending and relationship banking. Accordingly, they find that concentrated control exhibits greater return volatility and higher insolvency risks among listed commercial banks. Likewise, Hammami and Boubaker (2015) find a positive relationship between ownership concentration and bank risk-taking in MENA countries. Against the backdrop of the lack of consensus on the relationship between ownership concentration and risk-taking, we intend to test the following hypothesis based on the prediction of the agency theory:

*Hypothesis 1a.* Ownership concentration is inversely associated with the risk-taking behaviour of a bank.

Shliefer and Vishny (1997) argue that government ownership might be useful to enhance social welfare and address the concerns of externalities and monopoly power. Otchere (2005) observes that, state ownership is beneficial in countries with

underdeveloped institutions, even though Haw et al., (2010) argue that government-owned banks are likely to experience greater agency problems in countries with poor legal and regulatory institutions. Moreover, most studies argue that state-owned banks are likely to be inefficient due to interest group politics, bureaucracy and corruptions, and contradictions among banks' economic and social objectives and political interests (Shliefer and Vishny, 1997). Accordingly, several studies (e.g., Cornett et al., 2010; Iannotta et al., 2007) find that government shareholding has a negative effect on loan quality, and a positive effect on credit and insolvency risks of a bank. Whilst Lassoued et al., (2016) find government ownerships having a positive association with bank risk-taking in MENA countries, Hammami and Boubaker (2015) find an opposite evidence. Therefore, based on a majority of studies, we expect that government ownership is likely to increase risk-taking behaviour of banks.

According to Kobeissi and Sun (2010), foreign banks experience liabilities of foreignness (LOF) [4] due to the challenges in understanding and adapting to host country norms and practices. This causes additional operating costs and greater risks in overseas markets. For example, Leye et al., (2007) find foreign banks having greater risks than domestic banks in Latin American countries. However, according to 'global advantage hypothesis', foreign banks can take advantage of more sophisticated technologies, highly skilled employees, and improved risk management practices (Lensink et al., 2008). This is likely to help foreign banks to overcome the LOF in less competitive host countries and to reduce overall bank risk (Kobeissi and Sun, 2010). Accordingly, several studies (for example, Taboada, 2011; Micco et al., 2007) show that foreign banks have higher profitability and greater efficiency than domestic banks in emerging economies. Agoraki et al., (2011) and Lassoued et al., (2016) also find that foreign ownership reduces risk-taking behaviour of banks in emerging economies. Based on our review of the above literature, we develop the following hypothesis:

*Hypothesis 1b.* Government ownership has a positive effect, whereas foreign ownership has a negative effect on risk-taking behaviour of a bank.

### *3.2. Bank regulation and risk-taking:*

The extant literature shows a disagreement among the scholars with respect to the relationship between bank regulation and bank risk-taking. Among others, Barth et al., (2013) provide two opposing perspectives that can explain these inconsistencies. On the one hand, the ‘public interest view’ suggests that increased bank regulations are meant to safeguard the interests of the public by containing bank risk-taking behaviour and minimising the prospect of bank failures. On the other hand, the ‘private interest view’ suggests that certain bank regulations are designed and enforced to give preferential treatment or private benefits to certain groups within the society, leading to an increase in bank risk-taking. Accordingly, Andres and Vallelado (2008) argue that bank regulations reduce the effectiveness of other governance mechanisms through imposing ownership restrictions, or limiting operational activities, or reducing competition in the banking industry. Moreover, there might be an emergence of new agency conflicts between the regulators and shareholders, since the former wants to reduce systemic risk, whereas the latter wants to increase shareholder value.

Capital regulations tend to discipline risk-taking behaviour of banks. According to private interest view’, excessive capital regulations can cause higher entry barriers and a higher opportunity costs, as banks might lose lucrative business opportunities (Barth et al., 2013). In addition, capital stringency is likely to influence banks to pursue risky investment portfolio and costly equity financing (see, Pasiouras et al., 2009; Laeven and Levine, 2009). However, ‘public interest view’ suggests that a more stringent capital adequacy requirement is likely to restrict competition and aggressive lending behaviour, leading to a decline in bank risk (Agoraki et al., 2011 and Bolt and Tieman, 2004). Repullo (2004) also argues that higher capital requirements reduce incentives of shareholders to undertake risky lending decisions.

Empirically, Maghyereh and Awartani (2014) use logit regressions and find no significant relationship between capital stringency and the likelihood of bank distress in the GCC region. However, Ghanem (2017) use bank-level data from 1997–2013 and find that the implementation of the Basel II capital regulation has a positive effect on credit growth of banks in Egypt, Jordan, Lebanon, Morocco and Tunisia. Bitar et al., (2016) use on OLS regressions to analyse bank-level data from 1999 to 2013 and find that capital ratios are positively associated with loan loss reserve ratios, bank efficiency and profitability, and thus support the recommendations of the Basel Committee to hold

higher capital ratios. Since the MENA region makes considerable progress in implementing the Basel guidelines on capital regulations, we expect capital stringency having an inverse association with bank risk-taking.

According to ‘private interest view’ of bank regulations, activity restrictions (such as securities and insurance underwriting) tend to reduce the possibility of economies of scale and scope as well as the diversification opportunities, and hence intensify the risk-taking incentives of owners (Barth et al., 2013; Laeven and Levine, 2009; Cleassens, 2003). Nonetheless, ‘public interest view’ suggests that higher restrictions on bank activities reduce moral hazard problem and discipline bank risk-taking behaviour by restricting banks from engaging in derivatives and other non-interest income related activities, and thus reduce the prospect of becoming ‘too big to monitor and discipline’ (Laeven and Levine, 2007; Agoraki et al., 2011; Barth et al., 2013). Maghyereh and Awartani (2014) find activity restrictions having a negative effect bank distress risks in the GCC region. Considering a limited scope of capital market related activities of banks in MENA countries, we expect activity restrictions having a negative effect on bank risk-taking.

The ‘private interest view’ or the ‘political/regulatory capture’ hypothesis holds that that politically affiliated supervisors are likely to serve private benefits or political interests in emerging economies, as they have little incentives to restrict bank risk-taking in the greater interest of the depositors and public (Beck et al., 2006; Agoraki et al., 2011). However, as the ‘public interest view’ suggests, an increase in authority and independence in bank supervisions is likely to make monitoring and disciplinary mechanisms more effective, which in turn reduces bank risk-taking (Beck et al., 2006; Barth et al., 2013). For Shehzad et al., (2010), supervisory authorities tend to safeguard the interests of the depositors through a check on banking policies, which in turn reduces bank risk-taking. Empirically, Maghyereh and Awartani (2014) find that official supervisory power has a negative relationship with the likelihood of bank distress in the GCC region. Therefore, we expect official supervisory power having an inverse effect on bank risk-taking.

The ‘private interest view’ holds that market discipline mechanisms with respect to the disclosure of extensive and reliable information about operational and risk management

practices of banks are likely to reduce information asymmetry (Beck et al., 2006; Barth et al., 2006; 2013). This eventually enables depositors and private investors to monitor bank activities and reduces bank risk-taking behaviour. Empirically, Bourgain et al., (2012) find that increased financial disclosures cause an improvement in risk management practices of banks in MENA countries. Therefore, market-oriented disclosure policies and practices are likely to contain bank risk-taking.

Based on a critical review of the extant theoretical and empirical literature, we develop the following hypothesis:

*Hypothesis 2.* Capital regulations, activity restrictions, official supervisory power and market discipline exert positive influence on bank risk-taking.

Several recent studies address the inter-dependence between bank regulations and ownership structure in shaping the risk-taking behaviour of a bank. For example, Laeven and Levine (2009) posit that the impact of bank regulations on bank risk-taking is largely dependent on ownership structure of a bank. However, Haw et al., (2010) argue that country-level institutions play important roles in reducing the detrimental effect of concentrated control. Moreover, Shehzad et al., (2010) suggest that the degree of investor protection rights and the power of the bank supervisors tend to shape the influence of ownership concentration on bank risk. For them, regulatory restrictions can contain the influence of ownership concentration. Given the disagreements among the researchers on this critical issue, we intend to test the following hypothesis:

*Hypothesis 3.* The effects of ownership concentration and types of ownership on bank risk-taking depend on bank regulations, and vice-versa.

## **4. Empirical specifications and data**

### *4.1. Sample and data*

This study is based on an unbalanced panel dataset on 927 bank-year observations from 144 commercial banks covering a period of 12 years (2001-2012). A longer time horizon will enable us to understand the variations in bank regulations and ownership data, and to address the concerns about the unreliability in published data (see Cornett

et al., 2010). Our dataset covers 12 MENA countries such as Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates, Algeria, Egypt, Jordan, Lebanon, Morocco and Syria. We use Bankscope database, along with annual reports and bank websites, to collect bank level data on ownership and financial characteristics.

In order to get bank regulation data on capital stringency, official supervisory power, activity restrictions, and market discipline, we use WB database on bank regulations and supervision (Barth et al., 2001, 2004, and 2008) and WB's bank regulation survey 2011 (published in 2012). We also use other notable secondary data sources such as World Development Indicators, International Financial Statistics, OECD survey on CG, and annual reports of the central banks to gather macro-economic data.

#### *4.2. The model*

We use dynamic two-step system generalised method of moments (GMM) panel data estimator, as proposed by Arellano and Bond (1991) and Blundell and Bond (1998) with Windmeijer's (2005) finite sample correction. Standard errors are robust to panel-specific autocorrelation and heteroskedasticity. We use this estimation method to address the concerns about potential endogeneity and reverse causality among ownership, regulations and bank-risk taking, as highlighted by several notable studies such as Agoraki et al., (2011). We treat the lagged dependent variables as endogenous, so that 'GMM-style' instruments of deeper lags are created. In addition, we use the first lags of all independent variables and country dummies as additional instruments. The validity of the instruments is tested using Hansen J statistic of over-identifying restrictions and Arellano-Bond test of the absence of serial autocorrelation.

In order to examine the first two research questions, we specify the following empirical model:

$$\gamma_{it} = \beta_0 + \beta_1\gamma_{i,t-1} + \beta_2\text{Own}_{it} + \beta_3\text{Reg}_t + \beta_4\text{X}_{it} + \beta_5\text{C}_t + u_{it} \quad (1)$$

In this model, bank risk-taking  $\gamma$  of bank  $i$  in the year  $t$  is a function of the first lag of the dependent variable, ownership structure ( $\text{Own}_{it}$ ), bank regulations ( $\text{Reg}_t$ ), bank-

specific control variables ( $X_{it}$ ), country-specific control variables ( $C_t$ ), and the error term  $u$ . Table 1 provides a description of all variables, along with the sources of data.

\*\*\*\*Insert Table 1 around here\*\*\*\*

To examine the effect of the interactions among ownership and bank regulations, we estimate the following two empirical models:

$$\gamma_{it} = \beta_0 + \beta_1\gamma_{i,t-1} + \beta_2\text{Own}_{it} + \beta_3\text{Reg}_t + \beta_4(\text{Own}_{it} \times \text{Reg}_t) + \beta_5X_{it} + \beta_6C_t + u_{it} \quad (2)$$

$$\gamma_{it} = \beta_0 + \beta_1\gamma_{i,t-1} + \beta_2\text{Own}_{it} + \beta_3\text{Reg}_t + \beta_4(\text{Reg}_{jt} \times \text{Reg}_{kt}) + \beta_5\text{Reg}_{jt} + \beta_6\text{Reg}_{kt} + \beta_7X_{it} + \beta_8C_t + u_{it} \quad (3)$$

Eq.(2) incorporates interactions between ownership and regulations ( $\text{Own}_{it} \times \text{Reg}_t$ ), together with  $\text{Own}_{it}$  and  $\text{Reg}_t$  as standalone variables, and all explanatory and control variables of Eq.(1). Similarly, Eq.(3) incorporates the interaction between individual components of bank regulations ( $\text{Reg}_{jt} \times \text{Reg}_{kt}$ ), with  $j$  and  $k$  indicating capital stringency and supervisory power, respectively. Eq.(3) also includes  $\text{Reg}_{jt}$  and  $\text{Reg}_{kt}$  as standalone variables, along with other bank regulation variables as well as ownership, and all other control variables of Eq.(1). In addition, Eq.(3) is also re-estimated by replacing ( $\text{Reg}_{jt} \times \text{Reg}_{kt}$ ) with other combinations of four bank regulation variables such as capital stringency ( $CS$ ), official supervisory power ( $SP$ ), market discipline ( $MD$ ) and activity restrictions ( $AR$ ) (please see, Agoraki et al., 2011).

The estimation results of Hansen J statistics indicate that we cannot reject the null hypothesis of over-identifying restrictions. Moreover, the Arellano-Bond test of the absence of serial autocorrelation suggests that the null hypothesis of second-order autocorrelation [AR(2)] is rejected. Altogether, this suggests that our instruments are valid, since they are appropriately uncorrelated with the disturbance process.

#### 4.2.1. Dependent variables

We use a widely-used measure of insolvency risk namely the Z-index ( $Z$ ), defined as  $Z = (\text{ROA} + \text{EA}) / \sigma\text{ROA}$ , where ROA is the return on assets and EA is the ratio of equity

to assets. In addition, we follow Barry et al., (2011) and Lepetit et al., (2008) in using portfolio risk (*portfolio*) measured by the ratio of return on assets (ROA) to the standard deviation of ROA. In order to calculate  $\sigma$ ROA, we follow among others Agoraki *et al.*, (2011) in using the ROA data of three years starting from year<sub>t-2</sub> to year<sub>t</sub>. As higher values of our measures for insolvency and portfolio risks imply lower risks of a bank, these two variables are entered with negative signs (e.g., a bank with the lowest Z value has the least insolvency risk and vice-versa) in the regression model to facilitate interpretation. Finally, we use a proxy for credit risk (*credit*) as measured by the ratio of non-performing loans to total assets.

#### 4.2.2. Independent and control variables

We use two types of ownership variables to measure internal corporate governance. These include concentration of ownership as measured by the percentage of shareholding of the largest shareholder (*largest*) and the types of ownership e.g. government shareholding (*govt*) and foreign ownership (*foreign*). Among others, Iannotta et al., (2007) and Shehzad et al., (2010) use ownership concentration, and Barry et al., (2011) use various types of ownership as important determinants of bank-risk-taking. In accordance with Hypotheses 1a and 1b, we expect that government ownership has a positive effect on bank risk-taking, whereas ownership concentration and foreign ownership have opposite effects. We follow Laeven and Levine (2009) and Agoraki et al., (2011) in using the indices of capital stringency, official supervisory power, market discipline and activity restrictions as bank regulation variables. For Agoraki et al., (2011), these types of indices are more informative and useful measure of bank regulations. As Hypothesis 2 outlines, all four bank regulation variables are expected to have inverse associations with bank risk-taking.

We follow among others, Shehzad et al., (2010) and Forssbäck (2011) in using several bank-specific determinants of bank risk-taking. These include capitalisation, liquidity, deposit, loan growth, bank size and operating performance as control variables in the regression models. We also follow Barry et al., (2011) in using institutional ownership (*inst*) and banks' shareholding (*bank*) as additional ownership related control variables. In addition, we include a bank-level estimate of market power (measured by the Lerner index) as a determinant of bank risk. We follow Agoraki et al., (2011) and Turk-Ariss

(2010) in computing the Lerner index (details are not shown to conserve space). Finally, we use natural logarithm of real GDP per capita, GDP growth and real rate of interest to control for macroeconomic differences across countries.

## **5. Empirical results and analysis**

This section presents and analyses estimation results of empirical models.

### *5.1. Descriptive statistics and univariate analysis:*

Table 2 provides a description of the sample, together with the mean values and standard deviations of the main variables. It shows that the ownership structure of MENA banks is highly concentrated, as the largest shareholders of the sampled banks own around 52% shares. Interestingly, foreign shareholding is also reasonably high (31%), and this ownership is much higher among banks in Algeria (56%), Bahrain (48%), Egypt (46%) and Syria (42%). This evidence is comparable with that of Farazi et al., (2011), as they observe noticeable increase in market share of foreign banks in MENA countries, with a more significant increase in non-GCC countries. Whilst overall government ownership is 17%, it is relatively higher in the UAE (32%), Algeria (30%), Morocco (29%) and Bahrain (24%). These results are comparable with the observation of a recent WB report (2011). Table 2 also shows that the Lerner index has a mean value of 0.51, which indicates the presence of monopolistic competition. This evidence is consistent with the findings of Turk-Ariss (2010). We have also estimated correlations amongst ownership, bank regulations and other important variables to identify if there is any multicollinearity problem. The correlation matrix (not shown to conserve space) suggests that our estimation results do not seem to suffer from multicollinearity problems.

\*\*\*\*Insert Table 2 around here\*\*\*\*

### *5.2. Ownership, bank regulations and bank risk-taking*

Table 3 shows estimation results of bank risk-taking against individual ownership and bank regulation variables as specified in Eq.(1). Columns 1 through 3 of Table 3 show GMM regression results of three risk measures, namely, default risk, portfolio risk and credit risk. The table shows foreign ownership having an inverse association with each of the three proxies of bank risk-taking. In addition, supervisory power index shows positive associations with default and portfolio risks. The estimation results of the other ownership and bank regulation variables are inconclusive.

\*\*\*\*Insert Table 3 around here\*\*\*\*

Table 4 shows estimation results of bank risk-taking against the interaction variables as specified in Eqs.(2)-(3). Columns 1 through 3 of Table 4 show GMM regression results of the three risk measures against the interactions among individual indices of bank regulation, and columns 4 through 6 show similar specification results against the interactions between bank regulation indices and ownership concentration. In estimating Eqs. (2) and (3), we find the interaction terms to be highly collinear with their components. We address this multicollinearity problem by ‘centering’ the variables (see also, Agoraki et al., 2011). These specifications also include individual ownership and regulatory variables, all bank and country-specific control variables and country dummies.

\*\*\*\*Insert Table 4 around here\*\*\*\*

Since our dataset captures a longer time horizon (e.g., 12 years) including the global financial crisis (GFC) period, we further examine if the GFC moderates the effects of ownership and bank regulations on bank risk-taking. Among others, Soedarmono et al. (2013) argue that financial crisis might affect market competitiveness and bank risk-taking. Accordingly, we estimate Eq.(1) for the sub-samples of pre-GFC (2001-2007) and post-GFC (2008-2012) periods. Table 5 shows the GMM results for individual ownership and bank regulation variables, alongside all control variables. The estimation results for ownership and bank regulations are either statistically insignificant or inconsistent for both the pre- and post-GFC periods. We also estimate Eqs.(2)-(3) for the interaction variables and find similar inconclusive results for both sub-periods (results are not shown to conserve spaces). Overall, this evidence suggests that the

banking reform initiatives in the post-GFC period do not seem to have changed risk-taking behaviour of a bank in the MENA region. This is contrary to the evidence of Lassoued et al., (2016), who examine risk-taking of MENA banks from 2006 to 2012 and find that both foreign and government ownerships have a negative effect on bank risk-taking after the 2008 financial crisis.

\*\*\*\*Insert Table 5 around here\*\*\*\*

Altogether, our estimation results of Table 4 suggest that foreign ownership and supervisory power remain unchanged as standalone variables, and that the interaction between supervisory power and ownership concentration shows highly significant positive association with both default and portfolio risks. In addition, activity restrictions index shows negative associations with default and portfolio risks, and its interactions with market discipline and ownership concentration show comparable results. However, the interaction between activity restrictions and capital stringency shows positive relationships with default and portfolio risks.

Overall, our evidence of a positive relationship between foreign ownership and bank risk-taking partly confirms Hypothesis 1b, although our evidence on government ownership is statistically inconclusive. This result confirms ‘global advantage hypothesis’ and suggests that foreign shareholders play a risk-stabilising role in the banking sector of MENA countries. This evidence also corroborates related studies (e.g., Lassoued et al., 2016; Kobeissi and Wang, 2009; Angkinand and Wihlborg, 2010), who find a positive relationship between foreign ownership and bank performance in emerging economies, even though it contradicts with the observation of other MENA-based studies (e.g., Farazi et al., 2011; Hammami and Boubaker, 2015). Nonetheless, we do not find evidence in support of Hypothesis 1a with respect to the relationship between ownership concentration and bank risk-taking.

We find mixed evidence in relation to bank regulation variables in that supervisory power index (*SP*) maintains statistically significant positive relationship with bank risk-taking, and thus contradicts Hypothesis 2, which is based on ‘supervisory power hypothesis’ or ‘public interest view’ of bank regulations. In addition, this positive

relationship is reinforced for banks with higher ownership concentration, a finding that is partly consistent with Hypothesis 3. Altogether, this evidence corroborates ‘political/regulatory capture hypothesis’ or ‘private interest view’ of bank regulation, and supports Haw et al., (2010), who assert that official supervisory power plays a weak governance role, and that higher government intervention intensifies the detrimental effect.

MENA banks hold large portfolio of government securities through participating in government debt auctions and lending to state enterprises, favoured sectors (such as real estate and construction) and large corporations including well-connected family firms (WB, 2011). This may lead to higher concentration on loans and higher portfolio risk. In addition, independent but not empowered supervisors might be unable to deal with excessive political interference and various operational inefficiencies. As Ayadi and De Groen (2013) and Mohseni-Cheraghlou (2012) observe, the supervisory authorities of several GCC countries can act with greater independence, but they do not have the adequate authority to replace inefficient management or to declare a bank insolvent. In addition, weaker political economy of the central banks, lack of enforcement of risk-based supervision, and inadequate expertise of the supervisory staff (WB, 2011) appear to have constrained the effectiveness of the supervisory authorities.

Our study results further suggest that activity restrictions index (*AR*) has a weak negative relationship with bank risk-taking as a standalone variable, and that the interaction between activity restrictions and ownership concentration has a negative relationship with bank risk. This indicates that activity restrictions reduce risk-taking behaviour of banks that have higher concentration of ownership. Our evidence partly supports the ‘public interest view’ of bank regulations in that higher activity restrictions can bring stability in the financial sector, as they seemed to protect most of the MENA banks from the recent financial crisis. However, this evidence contradicts Laeven and Levine (2009), who suggest that activity restrictions increase bank risk, when a bank has a large owner. Moreover, as evident in the results of the interaction variable, activity restrictions also reduce bank risk in countries with better market discipline mechanisms.

However, the interaction between activity restrictions and capital stringency shows a positive association with bank risk, indicating that banks tend to pursue high risk-taking

strategy in order to compensate for the losses from stringent capital regulations and limited diversification opportunities of activity restrictions. Taken together, our estimation results provide support for Hypothesis 3 with respect to the interdependence between bank regulations (e.g., supervisory power, activity restrictions) and ownership structure (e.g., concentration of shareholding) in shaping risk-taking behaviour of a bank, as highlighted in several notable studies such as Laeven and Levine (2009) and Shehzad et al., (2010).

Surprisingly, our estimation results suggest inconclusive evidence with respect to the effects of capital stringency (*CS*) and market discipline (*MD*) on bank risk-taking. Whilst the banking sector of MENA region has experienced greater reform in terms of increased capital adequacy ratio and increased disclosure requirements (Mohseni-Cheraghlou, 2012; Ayadi and De Groen, 2013), a lack of bank-level compliance of the other provisions of capital stringency, together with poor market-oriented disclosure practices, might have resulted in inconclusive evidence. As the WB (2011) observes, MENA countries do not provide adequate incentives to the market participants or depositors to evaluate risk-weighted capital of a bank.

Overall, ownership as well as bank regulation variables do not seem to explain variations in credit risk very well. One of the reasons might be the limited availability of bank-level data on non-performing loans. Farazi et al., (2011) regard this as one of the constraints in determining asset quality of MENA banks. Among the control variables, liquid assets and capitalisation show negative associations with bank risk in most of the specifications. Surprisingly, the market power of a bank shows inconsistent results in most cases, indicating that competitive condition among banks cannot explain bank risk-taking in MENA countries.

### *5.3. Robustness tests and further investigations*

We perform a number of robustness tests. First, in order to control time-invariant differences between countries, we estimate all three equations using country fixed effects [5] (results are not shown to conserve space) and find no significant differences with the reported results. This indicates that our results are not influenced by the differences across countries. Second, we also estimate Eq.(1) by introducing our

ownership and bank regulation variables one by one, alongside control variables. There are no noticeable differences in our overall results. Third, we estimate Eq.(2) against the interactions between bank regulation and government ownership, and between bank regulation and foreign ownership. Our estimation results (not shown) are similar to the reported findings, although the results of the interaction variables are largely inconclusive.

## **6. Conclusions**

In this paper, we examined the effects of bank regulation and ownership on bank risk-taking behaviour of 144 banks in 12 MENA countries. Using GMM estimation technique, we find that foreign ownership has an inverse effect on bank risk-taking. We also find official supervisory power having a positive relationship with bank risk-taking, and this relationship is reinforced for banks with higher concentration of ownership. In addition, activity restrictions tend to have a weak negative relationship with bank risk-taking, and this relationship is stronger for banks that have higher concentration of ownership, and for countries that have stronger market discipline. On the contrary, capital stringency shows positive association with bank risk-taking only in countries with higher activity restrictions.

Our study results suggest that a reduction of entry barriers to foreign banks is likely to reduce bank risk and enhance financial sector stability. Whilst Turk-Ariss (2009) and Naceur and Omran (2011) advocate fewer activity restrictions in MENA banking to ensure market contestability and competitiveness, our evidence suggests that activity restrictions can discipline bank risk-taking, and that these restrictions ought to be accompanied by adequate market discipline mechanisms. Finally, our evidence corroborates ‘political/regulatory capture’ hypothesis in that politically connected supervisors lack incentives and power to restrict rent-seeking behaviour of powerful agents, leading to an increase in overall bank risk. Our evidence further suggests that the 2008 global financial crisis and subsequent policy initiatives do not moderate the influence of ownership and bank regulations on bank risk-taking in the MENA region.

Overall, our evidence has important policy implications in that regulatory reform initiatives based on the three pillars of the Basel II guidance do not seem to show the

desired outcome in reducing bank risk, and that these pillars are largely dependent on activity restrictions and/or ownership concentration in shaping the risk-taking behaviour of a bank. It appears that the policymakers and regulators of MENA countries need to be more proactive in ensuring greater autonomy of the central banks, increasing power, expertise and independence of bank supervisors, and enforcing capital stringency provisions and market-oriented disclosures, so as to stabilise bank risk-taking and to enhance banking sector stability. Our results also confirm the significance of interdependence among individual components of bank regulation, and between bank regulation and ownership concentration in explaining the risk-taking behaviour of a bank.

This study has some limitations and future research implications: *First*, one of the caveats of this study is that it does not capture recent changes in ownership and bank regulation, especially during the post-2012 period. This is mainly because of the lack of availability of bank regulation data, as the World Bank's global banking, regulation and supervision survey (BRSS) data (published in 2012) is the only available latest global dataset (to the best of our knowledge) that provides a comprehensive coverage of country-specific progress in regulatory reforms in areas such as capital stringency, official supervisory power, market-oriented disciplinary mechanisms, and restrictions on banking activities. Without similar dataset, it was not possible to construct indices for individual components of bank regulation. Future research can address this issue by developing bank regulation indices covering these three priority areas of the Basel II framework in the context of the MENA region. *Second*, it would be interesting to examine the level of progress of the ongoing implementation of the Basel III regulatory framework and its impact on bank performance, efficiency and risk-taking behaviour. *Third*, this paper does not address the influence of other corporate governance mechanisms such as board characteristics, board committees and executive compensation on bank performance and risk-taking. Future studies can address these internal corporate governance issues, together with their interactions with bank regulation variables.

## Notes

1. See also, Agoraki et al., (2011)

2. According to 'Global advantage hypothesis', foreign banks are likely to make best use of skilled manpower, and sophisticated technologies and operational practices to gain competitive advantage in a foreign market (see also, Lensink et al., 2008).
3. Political/regulatory capture' hypothesis suggest that that politically connected supervisors are likely to influence banks to serve private benefits or political interests (see also, Agoraki et al., 2011)
4. Zaheer (1995: 342-343) defines 'liabilities of foreignness' (LOF) 'all additional costs a firm operating in a market overseas incurs that a local firm would not incur'.
5. We perform Hausman test to determine whether fixed or random effect model is preferable. Based on the test results, we reject 'H<sub>0</sub>= Random effect model is appropriate' and estimate fixed effect model.

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