Institutional Environment and Bank Capital Ratios

Tammuz H. ALRAHEB[ab], Christina NICOLAS [ac], Amine TARAZI[ad]

ª Université de Limoges, LAPE, 5 rue Félix Eboué, 87031 Limoges Cedex, France.

This draft: 22 December 2017.

Please do not quote without the permission of the authors.

Abstract

We investigate the influence of the institutional environment on bank capital levels. Using a sample of 183 banks operating in the MENA region for the period 2004 to 2014, we find that, when stock markets have little presence, institutional variables significantly affect risk-weighted regulatory capital ratios but not leverage ratios. This is also more pronounced for conventional, listed, non-government owned bank. Conversely, when stock markets are more developed, only leverage ratios are influenced by institutional factors. Our findings contribute to the bank capital structure literature and have important policy implications for developing countries.

---

[b] Email: tammuz.al-raheb@unilim.fr (T. H. Alraheb).
[c] Corresponding author. Email: christina.nicolas@unilim.fr , Phone: 0041779957501, (C. Nicolas)
[d] Email: amine.tarazi@unilim.fr (A. Tarazi)

Institutional Environment and Bank Capital Ratios

Abstract

We investigate the influence of the institutional environment on bank capital levels. Using a sample of 183 banks operating in the MENA region for the period 2004 to 2014, we find that, when stock markets have little presence, institutional variables significantly affect risk-weighted regulatory capital ratios but not leverage ratios. This is also more pronounced for conventional, listed, non-government owned bank. Conversely, when stock markets are more developed, only leverage ratios are influenced by institutional factors. Our findings contribute to the bank capital structure literature and have important policy implications for developing countries.

1. Introduction

Research on bank capital structure has mostly focused on bank specific factors and market related fundamentals (Diamond & Rajan 2000; Berger et al. 2008; Gropp & Heider 2010; Harding et al. 2013). Another strand of the literature pioneered by Demirgüç-Kunt & Maksimovic (1999) has stressed the importance of considering the legal and institutional framework affecting firms' capital structure decisions. In their paper, Demirgüç-Kunt & Maksimovic (1999) posit that a significant part of long term debt variation can be explained by countries' institutional foundations. Nevertheless, the existing literature on the role played by institutions in explaining capital structure variation mainly includes studies of non-financial firms rather than financial ones (Booth et al. 2001; de Jong et al. 2008; Cho et al. 2014; Belkhir et al. 2016). In this paper, we build on these two strands of the literature to investigate whether institutional factors affect capital holdings of banking firms. We address the issue of whether the institutional environment plays a different role in enhancing either regulatory discipline or market discipline depending on the extent of the presence of stock markets. Regulatory and market discipline might not operate simultaneously as shown by Distinguin et al. (2013). We hence consider both regulatory capital ratios (imposed by regulators) and simple non-risk weighted leverage ratios (internally set by the bank management)[1]. Our research is particularly relevant for developing countries and we focus on a world region whose underdeveloped institutions can be considered as a major obstacle to its economic and financial development: the MENA region[2]. It is also a region where stock markets are either strongly present or almost inexistent. To our knowledge, our paper is the first

---

[1] Over our sample period (pre-Basel III) leverage ratios were not part of the regulatory framework.

[2] The MENA region refers to the Middle East and North Africa and consists of the following countries: Algeria, Bahrain, Djibouti, Egypt, Iraq, Iran, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates (UAE) and Yemen

attempt to specifically focus on the influence of institutional foundations on bank capital ratios, both regulatory and internally set by the bank management.

The MENA region is a fast-growing area which remains understudied when it comes to the capital structure of its financial institutions. This region suffers from ongoing political instability and lags behind the rest of the world in many dimensions. Particularly, institutions in the MENA region exhibit many deficiencies: widespread corruption, weak governance, limited creditors' rights, and a skeletal rule of law (World Bank 2014). The financial system is highly bank-based with banks assets reaching on average 130% of GDP (Saadaoui 2015). The region is characterized by underdeveloped financial markets (if existing) in most countries. There is no suitable alternative to bank finance. The banking sector is highly concentrated in most countries of the region (with the three largest banks holding more than 65% of total banking assets on average) and barriers to entry are still high (Turk-Ariss 2009; Anzoategui et al. 2010). Thus, MENA banking sector is far from being adequately developed, with the exception of Lebanon, Jordan, and the GCC[3] countries (Creane et al. 2004). At the same time, most MENA banks showed resiliency during the global financial crisis of 2007-2008. In fact, this region was less affected by the financial turmoil compared to other parts of the world. Some researchers attributed this partial resiliency to a number of factors including the presence of a stable funding basis, prudent lending, and sound bank capitalization. Banks in the MENA region hold total regulatory capital ratios and tier 1 capital ratios significantly above international standards and the Basel requirements[4]. This should, in principle, make them safer and more resilient to economic shocks. However, this might also make them too cautious in their intermediation role and their contribution to economic growth and development.

---

[3] Gulf Cooperation Council - Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates.
[4]MENA Total capital adequacy ratio and Tier 1 capital ratio fluctuated on average between 18.5% and 21.7% and 15% and 18.2%, respectively, during the period 2004 to 2014. (Source: BankScope - Bureau van Dijk database)

Throughout the last decade, the MENA region has experienced profound changes. What is prevalent however, is the fact that it still has underdeveloped institutions. A fragile rule of law and government ineffectiveness still prevail coupled with a weak and under-developed civil society. According to a recent World Bank survey (World Bank (2016)), the most important obstacles to development in the MENA region are the ongoing political instability and the high levels of corruption. Also, in an earlier World Bank report (World Bank (2014)), improving the rule of law, fighting corruption, improving accountability, stimulating government transparency and filling the gap between regulation and implementation are essential reforms that need to be conducted to improve the quality of institutions in the region.

The aim of this paper is to investigate the role played by institutional factors in determining capital buffers set by regulators and banks themselves. We contribute to the literature in several ways. First, we provide new insights on the financial benefits of developing the quality of existing institutions by examining the effect of different aspects of institutional development on bank capital ratios. We focus on capital levels of banking institutions whose capital decisions might substantially differ from non-financial firms. To our knowledge, no other study has explicitly focused on the link between institutions and bank capital ratios. Second, we perform our study on a region, which unlike other Western regions, remains understudied when it comes to bank capital and solvency ratios. Third, we consider both weighted regulatory capital ratios and un-weighted leverage ratios to investigate whether the quality of institutions affects banks' internal capital decisions regardless of regulation or more specifically to comply with regulatory constraints.

We consider a sample of 183 banks from 14 MENA region countries covering the 2004–2014 period. Our findings indicate that institutional variables are significant in explaining risk-based capital adequacy ratios imposed by regulators. However, institutional variables (except for corruption) affect non-weighted equity-to-asset ratios (internally set capital) only for countries with developed stock markets. We provide evidence that higher corruption and political instability levels are associated with lower

5

capital adequacy ratios. Creditor rights, however, negatively influence capital adequacy ratios. As for economic freedom and financial openness measures, the effect is positive. We also find that the effect of institutional variables is more pronounced for listed, conventional, and non-government owned banks compared to non-listed, Islamic, and privately-owned banks, respectively.

The paper unfolds as follows. Section 2 presents an overview of the existing literature. Description of the sample, the used variables and the empirical model are presented in section 3. Section 4 discusses the regression results and presents robustness tests. Finally, section 5 concludes.

2. Related Literature

There is a substantive literature dedicated to the determinants of bank capital ratios. Brewer et al. (2008) argue that bank capital is significantly dependent on capital regulations. Moreover, the existence of deposit insurance creates moral hazard incentives which lead banks to choose high levels of leverage, thus maintaining low capital ratios while complying with regulation (Keeley 1990). However, this justification of bank capital levels does not explain the prevalence of bank capital buffers, i.e. higher levels than those required by regulations. In fact, many researchers emphasize that capital regulations are not binding and might not be significant determinants of bank capital levels (Flannery, 1994, and Diamond & Rajan, 2000).

One major explanation of high capital buffers is the fear of shocks which might drive a bank below capital requirements accompanied by high costs of adjusting back to the minimum threshold, leading to regulatory interference and eventually loss of reputation (Milne & Whalley, 2001). Moreover, according to Brewer et al. (2008) and Harding et al. (2013), bank capital ratios seem high in countries where regulators have prompt sanction powers in dissolving financial institutions that fall below regulatory minimum. The latter authors also point out the importance of the franchise value in the

choice of the optimal capital structure. From another perspective, Berger et al (1995) argue that banks' capital buffers are used to meet unexpected investment opportunities. Fonseca & Gonzales (2007) analyze the determinants of bank capital buffers across a selection of world countries. They conclude that market discipline and market power positively and largely influence the level of capital held by banks. Consequently, banks accumulate regulatory capital buffers mainly because of fear of adverse shocks, regulatory intervention, and market discipline.

Recently, a growing body of literature has focused on the role that institutions might play in determining firm capital structure. However, the findings regarding the influence of legal and institutional frameworks in explaining firms' funding choices are mixed. On the one hand, many studies find that firms operating in a better institutional environment have easier access to external funding associated with more favorable conditions (La Porta et al. 1997; Demirgüç-Kunt & Maksimovic 1999; Booth et al. 2001; Giannetti 2003; Djankov et al. 2007; Qian & Strahan 2007; González & González 2008; Fan et al. 2012). A strong legal framework can help mitigate agency problems by reducing information asymmetries and when information is more readily available to investors, firms might start relying more on external rather internal funding. Hence, firms might hold less capital and more debt in countries with more developed institutions when considering the investors' or the supply point of view. On the other hand, supporters of the demand side view argue that lower debt prevails in markets with higher creditor rights. Cho et al. (2014) explain this finding using a large sample of 48 countries. They argue that managers in countries with high creditor protection prefer to limit debt usage to avoid losing control should financial distress prevail. This view is also supported by Rajan & Zingales (1995) who argue that whenever manager rights are limited during bankruptcy and creditor rights are strong, managers tend to prefer equity over debt. Thus, no consensus has been reached in the literature regarding the effect of institutional quality

on capital funding choices of non-financial firms[5]. In their paper, Flannery & Oztekin (2012) go further by studying the role that institutions might play in capital structure adjustment speeds. They find that firms operating in countries with better institutions benefit from lower transaction costs which makes them adjust faster to their target capital structure.

As we mentioned previously, we find no existing studies in the literature that specifically explore the link between institutional variables and bank capital holdings. Fonseca & González (2010) analyze the determinants of bank capital buffers while controlling for the role of institutions across a selection of world countries. The authors examine how institutions might alter the effect of market power and market discipline on capital holdings. For this purpose, they use the simple average of six institutional indicators as per Kaufman et al. (2001): control of corruption, government effectiveness, voice and accountability, regulatory quality, political stability, and the rule of law. They find that on the one hand, institutions improve market discipline and therefore increase bank capital ratios. On the other hand, good institutional quality reduces bank market power thus reducing bank incentives to hold high capital buffers. The overall effect on capital buffer is negative.

A recent study by Haq et al. (2017) focused on studying the effect of informal institutions on bank capital structure. Using a large sample of banks in 79 countries, they employ the Hofstede cultural framework to show that national culture[6] significantly affects capital structure of banks. More specifically, higher individualism, lower power distance, long-term orientation and indulgence positively affects bank capital ratios. They

---

[5] For further studies covering corporate capital decisions, please see: Deesomsak et al. (2004); Bancel & Mittoo (2004); Gungoraydinoglu & Öztekin (2011); de Jong et al. (2008); An et al. (2016).

[6] National culture data is only available for 5 countries of our sample. Hence, data availability is once again an obstacle to inclusion of data on informal institutions for the case of the MENA region.

also show that this effect is much lower for large banks. They explain this by the fact that higher external monitoring and corporate governance in large banks opposes the effect of national culture.

In the MENA region, studies on bank capital have focused on bank-specific factors rather on the way in which banks interact with their macroeconomic and institutional environment. In their studies of bank capital and risk in the MENA region, Farazi et al. (2011); Srairi (2010); Al-tamimi & Jellali (2013) focus on the role played by ownership structure. Their findings show that state-owned banks take higher risk and have lower performance levels. Murinde & Yaseen (2006) investigate the dynamic capital-risk adjustment structure among MENA banks. They conclude that capital regulations are significant determinants of capital ratios. However, the authors point out that they do not affect capital levels, but they increase risk taking behaviors. Bougatef & Mgadmi (2016) examine the role of prudential regulation on bank risk taking and capital holding in a selection of MENA banks. They find that regulatory pressure does not significantly affect neither risk nor capital ratios of MENA banks. The authors link this finding to weaknesses in the institutions of those countries. This finding contradicts many studies on developing economies and more specifically the conclusion of Klomp & Haan (2013) that stricter supervision reduces bank risk taking among banks in emerging countries. Saadaoui (2015) studies the cyclical behavior of MENA bank capital buffers and confirms the existence of a positive relationship between the business cycle and bank capital ratios indicating that the implementation of Basel counter-cyclical capital regulations is not necessary in the case of MENA banks.

Very few studies assess the influence of institutional factors on the banking sector characteristics in the MENA region. Naceur & Omran (2011) study the determinants of the performance of MENA banks. They conclude that institutional variables including corruption and rule of law play an important role in bank performance. Maraghni & Bouheni (2015) show that institutional conditions are significant in determining the insolvency risk of Tunisian banks. Sassi (2013) points out the benefits of operating in a good institutional environment in terms of bank efficiency. Likewise, Nabi & Suliman

(2008) and Gazdar & Cherif (2015) show that banking development contributes much more to economic growth in countries exhibiting higher levels of institutional development.

Belkhir et al. (2016) study the role of institutions in determining corporate structure decisions of firms in the MENA region. Using data on 444 firms operating in the MENA region, they conclude that countries endowed with a better institutional framework (regulatory effectiveness and rule of law) rely relatively more on debt than equity. Corruption, on the contrary, has the opposite effect. Arwatani et al (2016) perform a study on corporate debt maturity of MENA banks. Their findings confirm a positive relationship between the use of long term debt and the quality of institutions in each country. Since Gropp & Heider (2010) have shown that the drivers of banks' capital structure are close to those of non-financial firms, institutional factors could also play an important role in explaining bank capital ratios in the MENA region. Hence, bank regulations might be playing a less important role in determining bank capital ratios (Flannery 1994; Diamond & Rajan 2000; Allen et al. 2011) and institutional factors need to be taken into consideration.

3. Data, variables, and econometric specification

In this section, before presenting our econometric approach and our variables, we describe our sample.

3.1 Sample

Our sample period ranges from 2004 to 2014. We eliminate outliers at 1% and 99% of all variables. After filtering, the sample includes 1499 bank-year observations, representing 183 banks (145 conventional and 38 Islamic banks) from 14 MENA region countries. These countries are Algeria, Bahrain, Egypt, Israel, Jordan, Kuwait, Lebanon,

Malta, Morocco, Oman, Qatar, Tunisia, United Arab Emirates and Yemen. The sample includes state-owned and privately-owned banks and both listed and unlisted banks. Yearly bank level data are extracted from the BankScope - Bureau van Dijk database. We use consolidated data and unconsolidated data when the former are not available. Macroeconomic data are gathered from the Global Financial Development Database and the World Development Indicators of the World Bank. As for institutional data, we use different databases; the World Governance Indicators, the Doing Business Creditor Rights (World Bank), the Transparency International Organization and the World Heritage Foundation.

3.2 Definition of variables

3.2.1 Dependent variables

The MENA region has underdeveloped capital markets in some countries, and even no capital markets in others. For this reason, we focus in this study on book capital ratios. Our main dependent variable is the total regulatory capital ratio (TCR). This total capital adequacy ratio as per Basel rules is the ratio of Tier 1 and Tier 2 capital (hybrid capital, subordinated debt, reserves for loan losses, and valuation reserves) to total risk weighted assets (and off-balance sheet weighted risks). We also consider the equity to total assets ratio (EQTA) which is non-risk weighted and therefore reflects the internal bank capital holding decisions while TCR reflects the regulatory influenced capital. We also consider the Tier 1 ratio, which is considered as the core capital.

3.2.2 Independent variables

3.2.2.1 Main variables

First, we use an indicator of political stability (PS) from the World Governance Indicators of the World Bank[7]. Political instability is one of the major obstacles facing countries in the MENA region. This indicator is scaled from -2.5 to +2.5 with higher values indicating higher political stability. On the one hand, banks in politically unstable regions might boost their capital ratios as a mean of gaining trust of investors/clients. Hence, attracting depositors might be a major explanation of high capital holdings by banks in fragile political environments. On the other hand, banks operating in fragile environments might be reluctant to raise equity and might prefer to maintain low capital ratios to prevent any potential loss of control should the country's political situation get worse. Hence, the impact of political stability on capital holdings is uncertain.

We use two indicators of creditors' rights form the Doing Business database, namely resolving insolvency and getting credit. The Resolving Insolvency (RI) variable includes the time, costs, outcome of insolvency, liquidation, and reorganization proceedings. The Getting Credit (GC) indicator measures the ease of obtaining credit as well as the ease of accessing credit information (existence of credit bureaus and credit registries for example). These two indicators are scaled from 0 to 100 with higher scores indicating higher levels of creditors' rights. Results concerning the effect of creditors' rights on capital ratios have been conflicting. As mentioned previously, high creditor rights might lead managers to limit debt usage to avoid losing control should financial distress prevail. At the same time, higher creditors' rights result in less information asymmetry and easier access to external funding. Thus, credit would be available at more

---

[7] Our study includes country-level indicator of political stability. For other insights on political patronage and the role of political connections in banking, please see studies such as the ones by Fraser et al. (2006) and Bliss and Gul (2012).

favorable conditions. Hence, firms in this case might prefer holding more debt than equity.

We also use two Economic Freedom (EF) sub-indexes from the World Heritage Foundation, namely investment freedom[8] and financial freedom. We build an indicator that we call Financial Openness (FO) to focus closer on the potential role that can be attributed to trade and financial freedom. Trade freedom measures the ease of importing and exporting goods and services. Financial freedom captures the independence of the financial sector from government control as well as bank efficiency. This indicator is also scaled from 0 (lowest freedom) to 100 (highest freedom). We expect a positive effect of EF and FO indexes on bank capital ratios. Broader exposure to international markets as well as more financial freedom and thus higher competition pushes banks to hold higher capital levels possibly to signal stronger financial conditions aiming at attracting more funds.

We include the corruption perception index (CPI) which represents the perceived level of corruption in a country's public sector[9]. CPI is calculated on a scale of 0 (severely corrupt) to 100 (no corruption). Corruption is a widespread phenomenon which is more prevalent in underdeveloped and developing economies. It's effect on economic growth has been widely studied. Many studies confirm the detrimental role of corruption on growth. Other studies, however, such as Shleifer & Vishny (1993); Mo (2001); Wei (2000), find that it can have a beneficial effect on economic growth by promoting a better allocation of resources. One way is paying bribes to evade inefficient rules for example (Huntington 1970; Acemoglu & Verdier 2000). In the MENA region, a large part of bank

---

[9] We concentrate on country-level corruption levels to be coherent with other institutional variables. For bank-level corruption studies, such as corruption in lending, see studies such as Houston et al. (2011), Barry et al. (2016), inter alia.

capital is held by government officials and political parties. Hence, corruption might lead banks to abide less by capital regulations as political power and bribery can be used to circumvent such regulations.

3.2.2.2 Control variables

We include several bank specific variables widely used in most capital determinants studies. We proxy bank size by introducing the natural logarithm of bank total assets (SIZE). SIZE is expected to negatively influence capital levels as larger banks tend to hold less capital consistent with the "too big to fail hypothesis" (Brewer et al. 2008; Kleff & Weber 2008; Fonseca & González 2010). These banks might also benefit from economies of scale, broader asset diversification, and an ease of obtaining equity on a short notice which makes them subject to lower financial distress costs (Rime 2001; Berger et al. 2008).

To account for risk, we include the ratio of non-performing loans to total loans (NPL). This risk measure has been widely used in the banking capital literature (Aggarwal & Jacques 2001; Fiordelisi et al. 2011; Shim 2013; Distinguin et al. 2013). The effect of risk on capital holdings is mixed. Many studies find a positive effect of risk on capital since regulatory capital serves as a cushion for possible losses and banks tend to hold more capital when they have a higher risk exposure (Shrieves & Dahl 1992; Nier & Baumann 2006; Gropp & Heider 2010; Berger et al. 2008). However, from another perspective, the relationship between capital and risk might be negative since banks who have a high appetite for risk also tend to hold lower capital ratios (Fonseca & González 2010).

The Return on Assets (ROA) is used to proxy bank profitability. It is calculated as the ratio of a bank's net income to its average assets. Profitability is expected to boost capital ratios as more profitable banks tend to have higher capital to assets ratio by injecting their retained earnings into capital, consistent with the pecking order theory (Gropp and Heider 2010, Brewer et al 2008). This view is especially expected to hold in a region with underdeveloped financial markets such as the MENA region.

To account for a country's regulatory framework, we include an indicator of regulatory capital stringency (REG). This indicator is manually constructed based on the Barth et al World Bank Regulation and Supervisory Database[10] (Barth et al. 2004, Barth et al 2008, and Barth et al. 2013). This indicator ranges from 0 to 3 with one point given to every risk type covered by the country's regulatory jurisdiction (credit risk, market risk, and operational risk). The higher the indicator, the stricter the capital regulations are. The sign of this variable is expected to be positive since banks will be more constrained to hold higher capital ratios in countries where regulations on capital are tighter and cover more aspects of banking risk.

We follow González & González (2008) in using bank concentration (CONC) as a determinant of capital levels. This variable is calculated based on the sum of the assets of the three largest banks to the total assets of the banking sector in a country. In countries with high bank concentration, banks with higher market power would hold more capital to preserve their charter value. At the same time, a higher franchise value might be considered as a source of extra income, which reduces the need to hold higher capital levels to hedge against unexpected losses (Fonseca & Gonzales 2010).

To account for the importance of the stock market in each country, we use the ratio of stock market capitalization to GDP (MK_GDP) which we obtain from the World Bank.

We consider GDP Growth (GDP) to examine the possible impact of the business cycle on capital ratios. Many studies document a negative relationship between

---

[10] We use the three versions available of this database (2003, 2007, and 2012). We consider the variables constant between the 3 versions. In other words, years 2004 to 2006 take the values of the 2003 survey, years 2008 to 2011 take the values of the 2007 survey, and years 2013 and 2014 takes the values of the 2012 most recent survey.

regulatory capital ratios and the business cycle (Ayuso et al. 2004; Shim 2013). As per these authors, banks tend to decrease (increase) their capital holding during economic upturns (downturns). At the same time, banks might prefer to increase capital ratios during economic booms to benefit from potential investment opportunities (Berger 1995).

Finally, we include three dummy variables to capture whether a bank is conventional or Islamic, Government-owned or privately-owned, and listed or unlisted on a stock exchange. We aim to test how a bank's internally-set (leverage ratio) and externally-set capital ratios (regulatory ratio) are influenced by these different characteristics.

3.3 Econometric specification

We adopt the following econometric model:

$$CR_{ijt} = \beta_0 + \sum_{k=1}^{6} \beta_1 \, INST_{jt} + \sum_{k=1}^{3} \beta_2 \, BANK_{ijt} + \sum_{k=1}^{3} \beta_3 \, OTHER_{jt} \sum_{k=1}^{3} \beta_4 SPECS_{ijt} + c_j + c_t + \varepsilon_{ijt} \qquad [1]$$

where CR_{ijt} stands for the capital ratio which represents either the total capital adequacy ratio (TCR), the TIER1 ratio or the equity to total assets ratio (EQTA) of bank i in country j at time t. $INST_{jt}$ is a set of variables accounting for the country's institutional framework. $BANK_{ijt}$ represents a vector of variables used to control for bank specific characteristics. $OTHER_{ijt}$ is a vector of variables containing country level variables, other than institutional ones. $SPECS_{ijt}$ includes a set of dummy variables specifying whether a bank is conventional or Islamic, Government owned or privately owned, and listed or unlisted. C_j and c_t control for country and time specific effects respectively to account for country level unobserved heterogeneity or some other global trend in banking behavior.

To mitigate possible endogeneity issues, we use the first lag of all bank level independent variables. Thus, size, return on assets, and risk measures are included in the regression at their lagged values.

Regarding the estimation method, although the fixed effects within estimator would resolve the issue of correlation between the unobserved individual effects and the explanatory variables, by subtracting individuals means from variables, all time-invariant variables would be dropped. To deal with this issue, we use the Hausman Taylor (1981) instrumental variable estimator approach by which some of the regressors are allowed to correlate with the individual effects (HT). We adopt the HT methodology because our main variables, the institutional variables, are almost time-invariant. Furthermore, HT deals with possible endogeneity induced by individual bank specific effects and allows us to control for cross country variations while at the same time allowing for the incorporation of time-invariant variables. We use the Hausman test to verify that using the HT model is the most appropriate in the case of our data. The Hausman test does not reject the null that the HT estimator is equivalent to the fixed effects estimator. Fixed effects estimator is thus consistent but less efficient, suggesting the use of HT as consistent and more efficient estimator.

4. Results

4.1 Descriptive statistics

Table (1) presents the descriptive statistics of the variables used in this study. Mean TCR, EQTA, and TIER1 are respectively at 18.4%, 13.8%, and 18%. EQTA exhibits large cross-country variations, ranging between 3% and 77%. The highest average profitability in the region (ROA) is recorded in Algeria with 2.8% while the remaining countries range around 1%. On average, Bahrain and Egypt have the largest banks in our sample. Banking concentration averages at 69% for the whole sample with the most concentrated banking sectors being in Qatar and Bahrain.

[[insert table 1 here]]

Table (2) shows the distribution of banks in our sample between Islamic and conventional, listed and unlisted, and governmentally owned banks and privately-owned

banks. Five countries in our sample do not have Islamic banks, while Algeria and Yemen do not have any listed banks, compared to Kuwait where all banks are listed. Egypt, Lebanon and UAE have the highest total number of banks.

[[insert table 2 here]]

Table (3) shows the evolution of TCR and EQTA averages by country and through time. TCR in the MENA region fluctuated between 17.7% and 21.6% during our sample period (2004 to 2014). EQTA was as low as 13.8% in 2004 reaching a high of 15.6% in 2011. In 2014, TCR is the highest in Algeria at 30.6% and the lowest in Morroco at 13.6%. For EQTA, in 2014, Israel has the lowest level (5.9%) and Bahrain the highest (29.6%).

[[insert table 3 here]]

Table (4) presents the average TCR and EQTA values for each country when market capitalization is high and low. The average TCR values for all countries does not change significantly when market capitalization is high or low. EQTA, however is higher on average when the stock market is more developed.

[[insert table 4 here]]

Table (5) presents the distribution of our institutional variables by country. Institutional quality varies greatly between countries in our sample. On a scale of -2.5 to +2.5, PS ranges between -2.5 and 1.39 and averages as low as -0.44. The mean for the region is at -0.44 which shows high political instability for the region as a whole. FO and EF indicators both average at 64/100 approximately. Corruption levels have high disparity between countries, attaining as low as 15/100 to as high as 77/100 with a total sample average of 45/100.

[[insert table 5 here]]

Table (6) displays the correlation matrix between all variables employed. No major correlation issues exist between our variables except for correlation coefficients between institutional variables. Due to high correlation between these variables, we include one institutional variable at a time when running our regressions.

[[insert table 6 here]]

4.2 Regressions results

4.2.1 Main regression results

Table 7 reports the main regression results. Each institutional variable is separately introduced in the regressions due to high correlation among these variables. Panel A (columns 1 to 6) reports the results for TCR, Panel B (columns 7 to 12) represents the results for EQTA while Panel C reports results of TIER1. All institutional variables reported are significant in explaining the total capital ratio (TCR). TCR is positively affected by political stability. Banks in politically stable countries tend to hold higher risk weighted capital ratios. Consistent with (González & González 2008) who show that stronger creditor rights cause firms to be more leveraged, we find that creditor rights have a negative significant effect on TCR. When a client defaults on his debt, the easier the bank can guarantee the retrieval of the amount of the loan, the less the bank will hold capital as a cushion to hedge against risky loan loss. Hence, banks hold less capital in countries where resolving insolvency is easier. Moreover, creditor rights also measure the ease of liquidation and reorganization proceedings. A bank might prefer holding lower capital ratios when stricter liquidation rules apply. La Porta et al., (1997) argue that firms are likely to be more leveraged in the presence of more favorable creditor rights because in such a context credit would be available in more favorable conditions. Higher economic and financial freedom indexes are significantly associated with higher values of TCR. Broader exposure to international markets and thus higher competition to attract funds pushes banks to hold higher capital levels possibly to signal

stronger financial conditions. CPI is positively significant at the 1% level. Less corruption leads banks to hold more capital, a result which is consistent with the findings of Belkhir et al., (2016) regarding MENA non-financial firms whose leverage levels are found to be positively linked with corruption.

Among control variables, we find that risk, concentration, and size are highly significant. Large banks tend to hold less capital, consistent with the view that they can raise capital more quickly should an adverse situation occur. This is also in line with Berger et al. (2008), Fonseca and Gonzales (2010) and Demirgüç-Kunt, Kane, & Laeven, (2014) who posit that large banks benefit from government bailouts and other guarantees, have higher economies of scale and better risk management and therefore can hold less capital than smaller banks. Consistent with previous studies, riskier banks exhibit higher capital ratios in order to mitigate any potential unexpected loss induced by their higher risk exposure (Berger et al. 2008; Awdeh et al. 2011). The coefficient of CONC is significant and positive indicating that banks operating in a more concentrated environment tend to hold higher capital ratios. GDP however has an insignificant coefficient meaning that there seems to be no cyclical or counter cyclical behavior of capital ratios for banks in the MENA region. Capital adequacy ratio coverage (REG), which measures the stringency of capital regulations is also insignificant. Banks do not seem to be affected by the country's regulatory framework when choosing their capital holdings. This is in line with (Bougatef & Mgadmi 2016; Awdeh et al. 2011) who show that regulations do not affect capital holdings of banks operating in the MENA region.

Furthermore, the dummy variables we include provide evidence that government owned banks as well as listed banks hold higher TCR than privately owned banks and unlisted banks, respectively. Listed banks are indeed expected to hold more capital because of easier access but also because they are subject to market discipline and hence "pushed" by the market to hold higher TCR. Concerning, EQTA, it is also higher among government owned banks.

Unlike TCR, EQTA levels are not affected by institutional variables except for corruption which has a positive and significant coefficient. Institutional factors hence appear to affect the regulatory constraint related to capital without playing a major role in determining the capital targets that banks set internally regardless of regulation. TIER1 capital also behaves as EQTA, whereby only corruption is significant in explaining this ratio.

[[insert table 7 here]]

4.2.2 Degree of development of stock markets

To go deeper in our investigation, we divide our sample into two sub-samples of developed stock markets (above the median) versus less developed stock markets (below the median) using the market capitalization to GDP indicator (MK_GDP) of the World Bank. For our sample, the MK_GDP median is at 47.8%. The results are presented in tables 8 and 9. Institutional variables significantly influence TCR for less developed stock markets whereas EQTA is not affected. Conversely, when markets are more developed institutional variables are only significant in explaining leverage ratios (EQTA). In other words, when the stock market is developed, a better institutional environment positively affects banks' internally set capital possibly because capital serves as a signal of better soundness to the market. While when the market is weakly present, a well-developed institutional environment seems essential to ensure the effectiveness of bank capital regulations. Furthermore, when the stock market is relatively more developed, such results are robust for large banks, listed banks, and Islamic banks (Table 10). For countries with weaker presence of stock markets, our results are effective for both large and small banks, listed banks and conventional banks. While for unlisted banks and Islamic banks, the institutional environment does not seem to affect their internally set capital (EQTA) nor the regulatory capital (TCR). In fact, Islamic banks have their own agendas and capital regulations are not really relevant for such banks. Listed banks also seem to be more influenced by the institutional environment since

market discipline is also much more relevant in the case of listed banks compared to unlisted banks.

[[insert table 8 here]]

[[insert table 9 here]]

[[insert table 10 here]]

4.2.3 Further Investigations

For deeper insight, we split our sample into several sub samples. Tables 11 and 12 show results for the subsamples of small and large banks. We consider a bank as large if its total assets are above one billion USD and/or if it belongs to the top 5 banks in each of our countries. Results show no different effects of institutional variables on large and small banks' regulatory capital ratio (TCR), except for proxies of creditor rights (GC and RI) that negatively impact TCR for small banks only (GC is only marginally significant at 10% for large banks). Also, GC and CPI positively impact EQTA only for large banks. Economic freedom is the only institutional variable that affects EQTA for small banks, higher EF leads to higher internally set capital.

[[insert table 11 here]]

[[insert table 12 here]]

Tables 13 and 14 display the results for governmentally owned banks versus their private counterparts. As one would expect, all the institutional variables affect TCR for privately owned banks while for governmentally owned banks except for the economic freedom indexes, institutional variables are not significant.

[[insert table 13 here]]

[[insert table 14 here]]

In tables 15 and 16, we split the sample by type of bank: conventional and Islamic. We find that conventional banks' TCR is influenced by almost all the institutional variables while Islamic banks' capital ratios are not affected by most of them. Our results hence suggest that improving the institutional environment in the MENA region is less likely to affect the solvency of Islamic banks possibly because using capital to hedge against risk is less relevant for such banks.

[[insert table 15 here]]

[[insert table 16 here]]

We further test whether the behavior of listed and unlisted banks differ in this scope (tables 17 and 18). Our findings show that listed banks hold higher TCR in more corrupt economies while unlisted banks are not affected by corruption. Political stability has a negative relationship with TCR of unlisted banks while it is positively significant in the case of listed banks.

[[insert table 17 here]]

[[insert table 18 here]]

4.3 Robustness tests

To check for the robustness of our results, we conduct the following estimations. We estimate our model using the random effects estimator. Our main results remain unchanged. We use another indicator for corruption: the control of corruption indicator which we obtain from the World Governance Indicators of the World Bank. Results remain unchanged. We also exclude the GCC countries, Malta and Israel from the

regressions as these countries are endowed with better institutional foundations compared to others in the sample; the results remain unaltered.

5. Summary and concluding remarks

This paper studies the influence of institutional factors on bank capital structure using panel data on 183 banks operating in the MENA region for the period 2004 to 2014. We contribute to the increasing number of studies pioneered by Demirguc-Kunt and Maksimovic (1999) on the importance of accounting for country level institutional characteristics when studying different aspects of the financial sector.

For this purpose, we use two measures of bank capital structure; the risk-weighted capital ratio imposed by regulators, which accounts for the level of risk in banks' asset portfolios, and a measure of leverage which is a non-risk weighted simple equity-to-asset ratio set by bank managers internally. Our results indicate that banks in countries with higher political stability, more pronounced economic and financial freedom, as well as lower levels of corruption hold more regulatory capital but creditor rights, on the contrary, have the opposite effect. A closer look shows that such effects only hold in countries where stock markets are weakly developed. Furthermore, the influence of institutional factors is more pronounced for conventional, listed, and non-government owned banks.

Conversely, when stock markets are more present only non-weighted capital ratios are affected by institutional factors. Hence, institutional factors appear to play a stronger role regarding market discipline than regulatory discipline in countries with developed stock markets but when stock markets are weakly present they are effective in enhancing regulatory discipline.

Our results have several policy implications. Institutional quality must not be assessed independently of the degree of presence of stock markets when studying capital structures

of banks operating in developing countries and in the MENA region more specifically. The region suffers from several institutional deficiencies which seem to have implications on many sectors including the financial and banking sector. According to our results banks operating in countries with better institutional environments hold higher bank capital ratios and are therefore expected to be safer than banks in countries with less developed institutions. However, the degree of development of stock markets also plays an important role by influencing the channel through which banks are monitored. Our results show that the quality of the institutional environment differently affects risk-weighted regulatory capital and non-weighted equity ratios depending on whether the stock market is more or less developed. According to our findings, institutional foundations seem to play a significant role in determining regulatory capital ratios in countries with less developed stock markets. Thus, institutional quality should not be disregarded especially in countries where the stock market is relatively underdeveloped. Such quality appears to be an important value to ensure better and more effective compliance to regulation when stock markets are weakly present. However, when stock markets are more developed institutional quality adds less in terms of regulatory scrutiny and compliance possibly because the market has already imposed some discipline.

Hence, promoting institutional development can be considered of vital importance not only to a country's economic and social development but also to ensure financial stability and resilience to local or global shocks. Finally, our results indicate that complying with more stringent international regulatory standards is possibly easier to achieve in countries with a better institutional environment. Also, in weaker institutional environments, regulators and supervisors need to monitor banks more closely and make more efforts in that direction.

References

Acemoglu, D. & Verdier, T., 2000. The choice between market failures and corruption. *American Economic Review*, 90(1), pp.194–211.

Aggarwal, R. & Jacques, K.T., 2001. The impact of FDICIA and prompt corrective action on bank capital and risk: Estimates using a simultaneous equations model. *Journal of Banking & Finance*, 25(6), pp.1139–1160.

Al-tamimi, H.A.H. & Jellali, N., 2013. The effects of ownership structure and competition on risk-taking behavior: Evidence from UAE coneventional and Islamic banks. *The International Journal of Business and Finance Research*, 7(2), pp.115–124.

Allen, F., Carletti, E. & Marquez, R., 2011. Credit market competition and capital regulation. *Review of Financial Studies*, 24(4), pp.983–1018.

An, Z., Li, D. & Yu, J., 2016. Earnings management, capital structure, and the role of institutional environments. *Journal of Banking & Finance*, 68, pp.131–152. Available at: http://dx.doi.org/10.1016/j.jbankfin.2016.02.007.

Anzoategui, D., Martinez Peria, M.S. & Rocha, R.R., 2010. Bank Competition in the Middle East and Northern Africa Region. *Review of Middle East Economics and Finance*, 6(2).

Awdeh, A., El-Moussawi, C. & Machrouh, F., 2011. The Effect of Capital Requirements on Banking Risk. *International Research journal of Finance and Economics*, 66(66), pp.133–146.

Ayuso, J., Pérez, D. & Saurina, J., 2004. Are capital buffers pro-cyclical? Evidence from Spanish panel data. *Journal of Financial Intermediation*, 13(2), pp.249–264.

Bancel, F. & Mittoo, U.R., 2004. The Determinants of Capital Structure Choice : A Survey of European Firms. *Financial Management*, 33(4), pp.103–132. Available at: http://www.jstor.org/stable/3666330.

Barth, J.R., Caprio, G. & Levine, R., 2004. Bank regulation and supervision: What works best? *Journal of Financial Intermediation*, 13(2), pp.205–248.

Barth, J.R., Caprio, G. & Levine, R., 2008. Bank Regulations are Changing: For Better or Worse?" *Comparative Economic Studies*, December, 50(4), pp.537-563.

Barth, J.R., Caprio, G. & Levine, R., 2013. "Bank regulation and supervision in 180 countries from 1999 to 2011," *Journal of Financial Economic Policy*, 5(2), pp.111-219

Belkhir, M., Maghyereh, A. & Awartani, B., 2016. Institutions and corporate capital structure in the MENA region. *Emerging Markets Review*, 26, pp.99–129. Available at: http://dx.doi.org/10.1016/j.ememar.2016.01.001.

Berger, A., 1995. The relationship between capital and earnings on banking. *Journal of Money, Credit & Banking*, v27(n2), p.p432. Available at: http://find.galegroup.com/itx/infomark.do?&contentSet=IAC-Documents&type=retrieve&tabID=T002&prodId=ITOF&docId=A16967801&source=gale&srcprod=ITOF&userGroupName=lom_umichanna&version=1.0.

Berger, A.N. et al., 2008. How Do Large Banking Organizations Manage Their Capital Ratios? *Journal of Financial Services Research, 34*, pp. 123-149

Booth, L., Aivazian, V. & Demirguc-kunt, A., 2001. Capital Structures in Developing Countries. *Journal of Finance*, 56(1), pp.87–130.

Bougatef, K. & Mgadmi, N., 2016. The impact of prudential regulation on bank capital and risk-taking: The case of MENA countries. *Spanish Review of Financial Economics*. Available at: http://dx.doi.org/10.1016/j.srfe.2015.11.001.

Brewer, E., Kaufman, G.G. & Wall, L.D., 2008. Bank capital ratios across countries: Why do they vary? *Journal of Financial Services Research*, 34(2–3), pp.177–201.

Chen, M. et al., 2015. Corruption and bank risk-taking: Evidence from emerging economies. *Emerging Markets Review*, 24, pp.122–148.

Cho, S.-S. et al., 2014. Creditor rights and capital structure: Evidence from international data. *Journal of Corporate Finance*, 25, pp.40–60.

Creane, S. et al., 2004. Financial Sector Development in the Middle East and North Africa. *IMF Working Papers*.

Deesomsak, R., Paudyal, K. & Pescetto, G., 2004. The determinants of capital structure: Evidence from the Asia Pacific region. *Journal of Multinational Financial Management*, 14(4–5), pp.387–405.

Demirgüç-Kunt, A., Kane, E. & Laeven, L., 2014. Deposit Insurance Database. *Working Paper of the International monetary Fund*, 14(June), pp.1–43.

Demirgüç-Kunt, A. & Maksimovic, V., 1999. Institutions, financial markets, and firm debt maturity. *Journal of Financial Economics*, 54(3), pp.295–336. Available at: http://www.sciencedirect.com/science/article/pii/S0304405X99000392.

Diamond, D. & Rajan, R., 2000. A Theory of Bank Capital. *Journal of Finance*, 55(6), pp.2431–2465. Available at: http://www.jstor.org.

Distinguin, I., Roulet, C. & Tarazi, A., 2013. Bank regulatory capital and liquidity: Evidence from US and European publicly traded banks. *Journal of Banking and Finance*, 37(9), pp.3295–3317.

Distinguin, I., Kouassi, T., Tarazi, A., 2013. Interbank deposits and market discipline: Evidence from Central and Eastern Europe. *Journal of Comparative Economics, 41, pp.544-560*

Djankov, S., McLiesh, C. & Shleifer, A., 2007. Private credit in 129 countries. *Journal of Financial Economics*, 84(2), pp.299–329.

Fan, J., Titman, S. & Twite, G., 2012. An International Comparison of Capital Structure and Debt Maturity Choices. *Journal of Financial and Quantitative Analysis*, 47(1), pp.23–56.

Farazi, S., Feyen, E. & Rocha, R.D.R., 2011. Bank ownership and performance in the Middle East and North Africa Region. *World Bank Policy Research Working Paper Series, Vol*, (April).

Fiordelisi, F., Marques-Ibanez, D. & Molyneux, P., 2011. Efficiency and risk in European banking. *Journal of Banking and Finance*, 35(5), pp.1315–1326. Available at: http://dx.doi.org/10.1016/j.jbankfin.2010.10.005.

Flannery, B.M.J., 1994. Debt Maturity and the Deadweight Cost of Leverage : Optimally Financing Banking Firms. *The American Economic Review*, 84(1), pp.320–331.

Fonseca, A.R. & González, F., 2010. How bank capital buffers vary across countries: The influence of cost of deposits, market power and bank regulation. *Journal of Banking and Finance*, 34(4), pp.892–902.

Gazdar, K. & Cherif, M., 2015. Institutions and the finance-growth nexus: Empirical evidence from MENA countries. *Borsa Istanbul Review*, 15(3), pp.137–160. Available at: http://dx.doi.org/10.1016/j.bir.2015.06.001.

Giannetti, M., 2003. Do Better Institutions Mitigate Agency Problems ? Evidence from Corporate Finance Choices. *The Journal of Financial and Quantitative Analysis*, 38(1), pp.185–212.

González, V. & González, F., 2008. Influence of bank concentration and institutions on capital structure: New international evidence. *Journal of Corporate Finance*, 14, pp.363–375.

Gropp, R. & Heider, F., 2010. The Determinants of Bank Capital Sturcture. *Review of Finance*, 14, pp.587-622

Gungoraydinoglu, A. & Öztekin, Ö., 2011. Firm- and country-level determinants of corporate leverage: Some new international evidence. *Journal of Corporate Finance*, 17(5), pp.1457–1474.

Harding, J.P., Liang, X. & Ross, S.L., 2013. Bank Capital Requirements, Capital Structure and Regulation. *Journal of Financial Services Research*, 43(2), pp.127–148.

Hausman, J. & Taylor, W., 1981. Panel Data and Unobservable Individual Effects Author. *Econometrica*, 49(6), pp.1377–1398.

Haq, M., Hu. D., Faff. R., Pathan. S., 2017. Pacific-Basin Finance Journal

Huntington, S.P., 1970. Political Order in Changing Societies.*Comparative Education Review, 14(3)*

de Jong, A., Kabir, R. & Nguyen, T.T., 2008. Capital structure around the world: The roles of firm- and country-specific determinants. *Journal of Banking and Finance*, 32(9), pp.1954–1969.

Kaufman, D., Kraay, A., Zoido-Lobaton, P., 2001. Governance matters II: Update indicators for 2001. World Bank.

Keeley, M., 1990. Deposit Insurance, Risk, and Market Power in Banking. *The American Economic Review*, 80(5), pp.1183–1200.

Kleff, V. & Weber, M., 2008. How Do Banks Determine Capital? Evidence from Germany. *German Economic Review, 9(3),* pp.354-372

Klomp, J. & Haan, J. De, 2013. Bank regulation, the quality of institutions and banking risk in emerging and developing countries : An empirical analysis. *Mimeo*, pp.1–57.

Maraghni, H. & Bouheni, F. Ben, 2015. Bank Capital Ratio, Prudential Regulation and Liquidity Risk Taking: Behavior of Tunisian Banks in a Simultaneous Approach. *International Journal of Economics and Finance*, 7(6), pp.263–278. Available at: http://www.ccsenet.org/journal/index.php/ijef/article/view/46074.

Mo, P.H., 2001. Corruption and Economic Growth. *Journal of Comparative Economics*, 29(1), pp.66–79.

Nabi, M. & Suliman, M., 2008. The Institutional Environment and the Banking - Growth Nexus: Theory and Investigation for MENA. *Economic Reserach Forum Working Paper*, (392).

Naceur, S. Ben & Omran, M., 2011. The effects of bank regulations, competition, and financial reforms on banks' performance. *Emerging Markets Review*, 12(1), pp.1–20.

Nier, E. & Baumann, U., 2006. Market discipline, disclosure and moral hazard in banking. *Journal of Financial Intermediation*, 15(3), pp.332–361.

La Porta, R. et al., 1997. Legal Determinants of External Finance. *The Journal of Finance*, 52(3).

Qian, J. & Strahan, P.E., 2007. How Laws and Institutions Shape Financial Contracts : The Case of Bank Loans. *The Journal of Finance*, 62(6), pp.2803–2834.

Rime, B., 2001. Capital requirements and bank behavior: Empirical evidence for Switzerland. *Journal of Banking & Finance*, 25, pp.789–805.

Saadaoui, Z., 2015. The Cyclical Behaviour of Bank Capital Buffers: An Empirical Evidence for MENA Banking Systems. *Review of Middle East Economics and Finance*, 11(2), pp.145–182. Available at: http://www.degruyter.com/view/j/rmeef.2015.11.issue-2/rmeef-2013-0067/rmeef-2013-0067.xml.

Sassi, H., 2013. The Impact of Bank Regulations and Institutions on Efficiency in Selected MENA Banks. *International Journal of Economics and Finance*, 5(8), pp.84–100.

Shim, J., 2013. Bank capital buffer and portfolio risk: The influence of business cycle and revenue diversification. *Journal of Banking and Finance*, 37(3), pp.761–772. Available at: http://dx.doi.org/10.1016/j.jbankfin.2012.10.002.

Shleifer, A. & Vishny, R., 1993. Corruption. *The Quarterly Journal of Economics*, 108(3), pp.599–617.

Shrieves, R. & Dahl, D., 1992. The relationship between risk and capital in commercial banks. *Journal of Banking & Finance*, 16. Available at: http://www.sciencedirect.com/science/article/pii/037842669290024T.

Srairi, S.A., 2010. Cost and profit efficiency of conventional and Islamic banks in GCC countries. *Journal of Productivity Analysis*, 34(1), pp.45–62.

Turk-Ariss, R., 2009. Competitive behavior in Middle East and North Africa banking systems. *Quarterly Review of Economics and Finance*, 49(2), pp.693–710.

Wei, S.-J., 2000. How Taxing is Corruption on International Investors? *The Review of Economics and Statistics*, 82(1), pp.1–11.

World Bank. 2014. Strengthening governance and Institutions in MENA: Issues and priorities. MENA World Knowledge and Learning, Issue 114

World Bank. 2016. What's holding back the private sector in MENA. Lessons from The Enterprise Survey.

Table 1. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
TCR	1256	18.37	7.04	5.77	49.66
EQTA	1594	13.72	9.53	2.81	76.94
TIER1	1236	18.01	10.53	4.75	75.41
ROA	1651	1.44	1.53	-5.76	8.99
NPL	1651	6.50	6.41	0.12	37.30
CONC	1651	68.93	16.85	40.22	99.87
MK_GDP	1803	57.32	35.34	12.26	163.37
GDP	1651	4.73	3.94	-15.09	26.17
SIZE	1651	15.08	1.51	9.31	18.68
REG	1651	1.31	1.37	0	3
ISLAMIC	1651	0.18	0.38	0	1
GOV	1651	0.19	0	0	1
LISTED	1651	0.65	0.48	0	1
CPI	1651	45.18	14.77	15.00	77.00
PS	1651	-0.44	1.02	-2.47	1.39
GC	1457	38.96	19.76	6.25	87.50
RI	1536	35.02	11.27	17.13	65.24
EF	1582	63.36	6.24	48.30	77.70
FO	1582	64.48673	10.29179	30.1	85.4

TCR is the total capital adequacy ratio calculated as the sum of Tier 1 and Tier 2 capital to total risk weighted assets. EQTA is the equity to total unweighted assets ratio. ROA is the return on average assets. NPL is a a measure of risk which is calculated as the ratio of non-performing loans to total loans. CONC is a measure of bank concentration, it is equal to the share of assets held by the three largest banks in a country. MK_GDP is the ratio of market capitalization to GDP. GDP measures the annual GDP Growth rate. REG is a score which measures the stringency of a country's capital regulatory jurisdiction. SIZE is calculated by the log of the total assets held by a bank. Islamic is a dummy variable which takes the value of 1 if the bank is Islamic and zero it is conventional. Gov is a dummy variable which takes the value of 1 if the government owns 25% or more of a banks' capital and zero otherwise. Listed is also another dummy variable which takes the value of 1 if the bank is listed on a stock exchange market and zero otherwise. PS is the measure of political stability. GC is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country.

Table 2. MENA bank distribution by type

	Number of banks	Conventional	Islamic	Listed	Unlisted	Private	Governmental
ALGERIA	5	5	0	0	5	5	0
BAHRAIN	18	10	8	10	8	14	4
EGYPT	24	21	3	19	5	21	3
ISRAEL	7	7	0	6	1	7	0
JORDAN	15	12	3	12	3	14	1
KUWAIT	11	5	6	11	0	8	3
LEBANON	29	29	0	5	24	26	3
MALTA	7	7	0	3	4	7	0
MOROCCO	9	9	0	6	3	9	0
OMAN	10	8	2	7	3	7	3
QATAR	9	6	3	6	3	7	2
TUNISIA	9	8	1	6	3	8	1
UNITED ARAB EMIRATES	24	15	9	18	6	15	9
YEMEN	6	3	3	0	6	4	2
Grand Total	**183**	**145**	**38**	**109**	**74**	**152**	**31**

Table 3: Average values of Capital ratios by country over the sample period 2004-2014

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Algeria	TCR	21.1	16.8	17.1	19.7	18.6	20.0	18.4	20.0		49.0	36.0
	EQTA	14.7	13.9	16.5	17.1	15.7	23.6	23.6	23.8	23.5	21.9	20.9
Bahrain	TCR	23.0	23.2	21.7	25.2	23.0	21.7	25.2	22.5	22.1	23.1	23.8
	EQTA	24.6	21.3	19.5	27.9	23.5	21.6	21.8	23.5	23.2	26.0	29.6
Egypt	TCR	12.7	15.7	14.0	12.8	12.6	20.1	19.0	18.2	16.3	16.4	16.7
	EQTA	8.2	9.6	9.3	8.6	9.2	10.5	10.0	10.9	11.1	11.4	11.6
Israel	TCR	11.8	11.9	12.1	11.5	12.5	14.4	14.4	14.3	15.3	15.1	14.9
	EQTA	5.8	5.5	6.0	5.8	5.7	6.3	6.1	5.8	6.1	5.9	5.9
Jordan	TCR	17.5	18.1	20.4	18.9	20.3	19.1	19.6	18.0	20.4	19.8	20.1
	EQTA	14.1	14.8	15.9	15.8	14.8	13.5	15.1	14.7	14.7	14.2	14.0
Kuwait	TCR	16.5	19.3	18.7	18.9	17.1	16.1	20.4	19.7	19.7	22.1	19.1
	EQTA	14.8	18.2	21.4	24.4	23.9	15.1	16.3	18.3	22.0	15.3	20.4
Lebanon	TCR	22.2	24.6	24.9	22.9	22.1	16.6	15.1	12.1	13.3	14.4	15.1
	EQTA	7.0	7.8	8.4	10.4	10.0	11.5	10.9	10.7	10.8	10.7	10.6
Malta	TCR	16.1	16.7	14.2	14.2	23.4	19.6	19.4	20.7	13.2	17.9	14.0
	EQTA	18.5	18.3	16.3	16.7	16.2	18.4	17.4	19.1	19.3	17.0	10.5
Morocco	TCR	8.5	12.6	10.8	8.9	11.2	11.2	12.2	11.9	13.1	13.6	13.6
	EQTA	8.7	8.5	7.7	7.5	8.8	9.3	9.6	9.7	9.7	9.5	9.9
Oman	TCR	18.1	23.3	19.3	18.7	15.3	15.1	15.6	15.1	15.6	15.7	18.9
	EQTA	16.4	17.7	16.9	17.6	19.3	18.7	18.6	17.1	16.9	22.6	25.5
Qatar	TCR	28.2	21.8	18.0	20.0	18.4	18.1	20.9	21.2	17.6	17.0	17.0
	EQTA	18.1	19.7	17.2	19.5	19.0	20.7	19.1	22.8	16.5	20.6	17.6
Tunisia	TCR	24.0	27.2	24.9	28.6	28.7			26.5	22.2	31.5	
	EQTA	11.7	12.6	14.0	13.7	13.1	13.5	12.8	11.7	11.2	10.2	11.4
United Arab Emirates	TCR	22.5	27.1	19.7	18.1	16.4	21.2	21.7	22.2	22.1	20.5	18.9
	EQTA	21.7	21.5	19.2	15.4	14.8	15.9	15.9	16.9	19.4	17.9	18.5
Yemen	TCR	46.0	11.6	29.3	26.5	16.3	17.3	17.7	21.0	27.9	26.8	27.7
	EQTA	10.0	10.4	11.0	13.8	15.0	14.0	11.4	13.5	11.4	8.5	7.9
MENA	**TCR**	**20.6**	**19.3**	**19**	**18.9**	**18.3**	**17.7**	**18.4**	**18.8**	**18.4**	**21.6**	**19.7**
	EQTA	**13.8**	**14.3**	**14.2**	**15.3**	**15**	**15.2**	**15**	**15.6**	**15.4**	**15.1**	**15.3**

TCR is the total capital adequacy ratio calculated as the sum of Tier 1 and Tier 2 capital to total risk weighted assets. EQTA is the equity to total unweighted assets ratio.

Table 4: Average values of Capital ratios by country over the sample period (high and low market capitalization)

	High MK_GDP		Low MK_GDP	
	TCR	EQTA	TCR	EQTA
BAHRAIN	23.02	24.09		
EGYPT	16.84	9.25	17.23	11.02
ISRAEL	13.31	5.88	11.24	5.50
JORDAN	19.36	14.71		
KUWAIT	18.92	19.13		
LEBANON			18.25	9.81
MALTA	17.59	17.49		
MOROCCO	11.99	9.13		
OMAN	19.01	17.98	16.60	19.50
QATAR	19.44	19.32		
TUNISIA			26.69	12.37
UNITED ARAB EMIRATES	20.52	17.79	20.80	18.05
Average	**18.85**	**16.01**	**18.45**	**12.78**

MK_GDP is the market capitalization to GDP ratio. TCR is the total capital adequacy ratio calculated as the sum of Tier 1 and Tier 2 capital to total risk weighted assets. EQTA is the equity to total unweighted assets ratio. (Some countries appear in both sub-samples since the median is chosen for the whole sample period)

Table 5: Average values of institutional variables by country over the sample period 2004-2014

	PS	GC	RI	EF	FO	CPI
Algeria	-1.37	21.25	54.72	55.34	48.73	30.50
Bahrain	-0.36	38.39	42.91	74.94	77.94	53.08
Egypt	-0.80	37.50	20.92	54.89	49.36	31.50
Israel	-1.27	86.25	55.92	65.51	69.73	61.50
Jordan	-0.35	13.75	29.21	66.18	66.22	49.25
Kuwait	0.28	47.50	32.80	65.89	64.29	44.92
Lebanon	-1.29	37.50	32.28	59.20	66.38	28.67
Malta	1.27	18.75	42.16			58.73
Morocco	-0.37	34.38	34.42	59.38	52.40	34.42
Oman	0.78	40.00	37.88	66.42	63.16	53.17
Qatar	1.00	27.68	57.72	65.52	61.28	64.67
Tunisia	-0.08	37.50	55.89	59.82	44.27	43.67
United Arab Emirates	0.86	43.75	29.98	69.19	62.19	63.00
Yemen	-1.82	13.75	25.07	51.10	48.03	22.92

PS is the measure of political stability. GC is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country.

Table 6: Correlation matrix

	ROA	NPL	CONC	GDP	REG	SIZE	PS	GC	RI	EF	FO	CPI
ROA	1.00											
NPL	-0.15	1.00										
CONC	-0.01	-0.05	1.00									
GDP	0.21	-0.03	0.05	1.00								
REG	-0.06	-0.14	0.00	-0.15	1.00							
SIZE	-0.01	-0.31	-0.18	-0.02	0.15	1.00						
PS	0.12	-0.26	0.10	-0.01	0.03	0.24	1.00					
GC	-0.10	-0.19	-0.27	-0.20	0.23	0.41	0.14	1.00				
RI	0.03	-0.23	0.30	0.08	0.09	-0.03	0.10	0.09	1.00			
EF	0.11	-0.23	0.07	0.15	0.07	0.02	0.43	0.17	0.30	1.00		
FO	0.01	-0.19	-0.04	0.10	0.01	-0.01	-0.00	0.25	0.14	0.81	1.00	
CPI	0.10	-0.31	0.07	0.04	0.14	0.22	0.80	0.30	0.35	0.73	0.45	1.00

Table 7: The impact of institutional variables on bank capital - Main Regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	1.037**						0.0531					
	(2.04)						(0.18)					
GC		-0.0837***						0.0159*				
		(-5.29)						(1.67)				
RI			-0.138**						0.000157			
			(-2.38)						(0.00)			
EF				0.303***						0.0667		
				(4.54)						(1.63)		
FO					0.362***						-0.0158	
					(8.77)						(-0.69)	
CPI						0.142***						0.0514**
						(4.01)						(2.17)
ROA	-0.203	-0.0693	-0.109	-0.142	-0.140	-0.149	0.606***	0.554***	0.733***	0.678***	0.673***	0.612***
	(-1.50)	(-0.50)	(-0.78)	(-1.05)	(-1.06)	(-1.11)	(8.26)	(7.48)	(9.88)	(9.23)	(9.16)	(8.34)
NPL	0.178***	0.141***	0.158***	0.152***	0.155***	0.183***	0.0323*	0.00928	0.0165	0.0247	0.0278	0.0321*
	(5.34)	(4.01)	(4.51)	(4.48)	(4.74)	(5.53)	(1.79)	(0.50)	(0.92)	(1.41)	(1.60)	(1.78)
CONC	0.0813***	0.141***	0.103***	0.0741**	0.0652**	0.0433	-0.0181	-0.0242	-0.0187	-0.0262	-0.0203	-0.0295
	(2.86)	(4.47)	(3.42)	(2.47)	(2.23)	(1.47)	(-0.99)	(-1.23)	(-1.02)	(-1.43)	(-1.11)	(-1.55)
GDP	-0.0466	-0.0538	-0.0401	-0.0482	-0.0519	-0.0554	-0.0307	-0.0192	0.0218	0.00721	0.00670	-0.0309
	(-1.21)	(-1.32)	(-0.97)	(-1.23)	(-1.36)	(-1.44)	(-1.23)	(-0.77)	(0.84)	(0.29)	(0.27)	(-1.24)
REG	-0.0786	-0.183	-0.299	0.0242	0.0700	-0.135	-0.0290	-0.0526	0.0184	0.000996	-0.0254	-0.0336
	(-0.44)	(-1.00)	(-1.51)	(0.13)	(0.40)	(-0.76)	(-0.26)	(-0.48)	(0.16)	(0.01)	(-0.23)	(-0.31)
SIZE	-5.057***	-4.635***	-4.159***	-4.931***	-4.603***	-5.288***	-5.987***	-7.073***	-6.216***	-5.884***	-5.856***	-6.158***
	(-10.13)	(-8.01)	(-7.70)	(-9.97)	(-9.64)	(-10.58)	(-18.31)	(-18.18)	(-18.19)	(-18.75)	(-18.68)	(-18.91)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Islamic	-1.797	-1.742	-1.582	-1.764	-1.589	-1.788	0.411	-0.0417	0.324	0.590	0.577	0.346
	(-0.94)	(-0.95)	(-0.90)	(-0.95)	(-0.90)	(-0.91)	(0.22)	(-0.02)	(0.17)	(0.34)	(0.33)	(0.18)
Gov	4.701**	4.505**	4.157**	4.620**	4.406**	4.936***	5.088***	5.693***	5.555***	5.538***	5.514***	5.317***
	(2.52)	(2.51)	(2.41)	(2.55)	(2.56)	(2.59)	(2.70)	(2.76)	(2.90)	(3.17)	(3.16)	(2.80)
Listed	5.380***	5.417***	5.047***	5.564***	5.055***	5.565***	1.636	2.463	1.805	2.165	2.012	1.899
	(2.93)	(3.05)	(2.96)	(3.06)	(2.93)	(2.97)	(0.96)	(1.31)	(1.04)	(1.33)	(1.24)	(1.10)
constant	84.67***	78.05***	72.27***	64.36***	57.10***	84.23***	101.1***	116.6***	103.8***	95.16***	99.19***	102.1***
	(10.59)	(8.70)	(8.36)	(7.69)	(7.20)	(10.82)	(18.48)	(18.47)	(18.16)	(17.24)	(18.67)	(19.08)
Observations	1191	1057	1109	1154	1154	1191	1499	1322	1398	1440	1440	1499
Groups	170	168	168	164	164	170	210	209	204	197	197	210
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table reports the main regression results of bank capital determinants and the effect of institutional variables using the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). The independent variables are the following: ROA is the return on average assets. NPL is a a measure of risk which is calculated as the ratio of non-performing loans to total loans. CONC is a measure of bank concentration, it is equal to the share of assets held by the three largest banks in a country. GDP measures the annual GDP Growth rate. REG is a score which measures the stringency of a country's capital regulatory jurisdiction. SIZE is calculated by the log of the total assets held by a bank. Islamic is a dummy variable which takes the value of 1 if the bank is Islamic and zero it is conventional. Gov is a dummy variable which takes the value of 1 if the government owns 25% or more of a bank's capital and zero otherwise. Listed is also another dummy variable which takes the value of 1 if the bank is listed on a stock exchange market and zero otherwise. PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table 7 (Continued): The impact of institutional variables on bank capital - Main Regression

	(13)	(14)	(15)	(16)	(17)	(18)
	Panel C: TIER1					
PS	0.0157					
	(0.02)					
GC		-0.0303				
		(-1.09)				
RI			-0.0632			
			(-0.58)			
EF				0.0361		
				(0.3)		
FO					0.022	
					(0.31)	
CPI						0.155***
						(2.7)
ROA	0.00419	0.0835	0.0653	-0.00406	-0.00553	-0.0015
	(0.02)	(0.38)	(0.3)	(-0.02)	(-0.03)	(-0.01)
NPL	0.224***	0.201***	0.191***	0.225***	0.227***	0.227***
	(3.75)	(3.02)	(2.95)	(3.73)	(3.79)	(3.84)
CONC	0.0202	0.0424	0.0334	0.0171	0.0151	-0.0223
	(0.45)	(0.83)	(0.7)	(0.37)	(0.33)	(-0.48)
GDP	-0.0238	0.00057	0.00359	-0.0185	-0.0222	-0.0517
	(-0.37)	(0.01)	(0.05)	(-0.28)	(-0.34)	(-0.79)

REG	-0.332	-0.385	-0.433	-0.302	-0.315	-0.432
	(-1.14)	(-1.20)	(-1.31)	(-1.01)	(-1.07)	(-1.50)
SIZE	-7.387***	-7.714***	-7.516***	-7.515***	-7.467***	-8.063***
	(-8.56)	(-7.05)	(-7.40)	(-8.61)	(-8.62)	(-9.14)
Islamic	-0.369	-0.878	-0.802	-0.681	-0.595	-0.767
	(-0.12)	(-0.28)	(-0.26)	(-0.23)	(-0.20)	(-0.25)
Gov	7.910***	8.050**	8.083***	7.811***	7.858***	8.594***
	(2.64)	(2.57)	(2.61)	(2.6)	(2.62)	(2.76)
Listed	3.222	3.348	3.298	3.36	3.186	3.793
	(1.13)	(1.1)	(1.1)	(1.15)	(1.09)	(1.27)
constant	122.5***	127.6***	125.3***	122.1***	122.6***	130.5***
	(8.83)	(7.42)	(7.69)	(7.99)	(8.5)	(9.38)
Observations	914	814	848	897	897	914
Groups	146	144	144	142	142	146
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Table 8: The impact of institutional variables on bank capital – Underdeveloped Stock Markets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	0.584						0.885					
	(0.48)						(1.30)					
GC		-0.167**						0.0544				
		(-2.43)						(1.54)				
RI			-0.368***						-0.0323			
			(-3.26)						(-0.46)			
EF				0.876***						0.0993		
				(5.23)						(0.98)		
FO					0.640***						0.0910*	
					(7.93)						(1.77)	
CPI						0.461***						0.0833
						(5.11)						(1.53)
Constant	41.45***	44.87***	46.22***	-7.334	0.0128	32.78***	110.4***	108.6***	113.9***	102.8***	103.1***	102.4***
	(3.17)	(3.29)	(3.49)	(-0.53)	(0.00)	(2.78)	(10.76)	(9.64)	(10.57)	(9.51)	(10.33)	(10.94)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	429	390	417	409	409	429	505	451	492	479	479	505
Nbr. of groups	90	88	88	84	84	90	101	101	101	94	94	101

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of banks operating in countries with less developed stock markets. We use the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table 9: The impact of institutional variables on bank capital – Developed Stock Markets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	1.181*						-0.373					
	(1.92)						(-0.84)					
GC		-0.0209						-0.00743				
		(-0.91)						(-0.43)				
RI			0.0306						-0.0834*			
			(0.44)						(-1.65)			
EF				0.0616						0.133**		
				(0.82)						(2.50)		
FO					0.0456						0.0000319	
					(0.90)						(0.00)	
CPI						0.0271						1.982***
						(0.68)						(3.24)
Constant	99.06***	85.19***	77.03***	93.77***	93.90***	98.14***	91.54***	123.5***	102.0***	83.82***	89.78***	96.39***
	(11.06)	(7.74)	(7.34)	(9.70)	(9.96)	(10.49)	(13.23)	(13.94)	(13.35)	(11.87)	(13.13)	(13.70)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	762	667	692	745	745	762	994	871	906	961	961	994
Nbr. of groups	158	153	153	153	153	158	205	198	193	193	193	205

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of banks operating in countries with relatively well-developed stock markets. We use the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table 10: The impact of institutional variables on bank capital - Stock Market Development further sub-sampling

	High MKGDP		Low MKGDP		High MKGDP		Low MKGDP	
	Small Banks				Large Banks			
	TCR	EQTA	TCR	EQTA	TCR	EQTA	TCR	EQTA
PS	1.581*	-0.921	-1.006	1.595*	0.685	0.598	1.901	-0.622
	(1.77)	(-1.41)	(-0.59)	(1.69)	(0.69)	(1.23)	(1.13)	(-0.99)
GC	-0.0387	-0.0194	-0.202**	0.0627	0.0146	0.0191	-0.137	0.00240
	(-1.27)	(-0.80)	(-2.05)	(1.21)	(0.41)	(1.04)	(-1.42)	(0.07)
RI	0.0562	-0.0588	-0.450***	-0.0651	-0.0555	0.188***	-0.184	-0.0233
	(0.64)	(-0.86)	(-3.18)	(-0.69)	(-0.48)	(-3.11)	(-1.01)	(-0.34)
EF	-0.000608	0.163**	0.913***	0.0987	0.200	0.0958	0.771***	0.149
	(-0.01)	(2.25)	(4.18)	(0.71)	(1.45)	(1.41)	(2.94)	(1.46)
FO	-0.0511	-0.0326	0.601***	0.0862	0.121	0.0404	0.651***	0.0889*
	(-0.75)	(-0.69)	(5.30)	(1.16)	(1.49)	(1.08)	(6.06)	(1.91)
CPI	0.00263	0.0410	0.295**	0.0423	0.0709	0.105***	0.591***	0.119*
	(0.05)	(0.91)	(2.25)	(0.54)	(1.01)	(2.95)	(5.36)	(2.55)

	Unlisted Banks				Listed Banks			
	TCR	EQTA	TCR	EQTA	TCR	EQTA	TCR	EQTA
PS	-1.234	0.0567	-5.536**	0.635	1.900**	-0.139	1.672	-0.347
	(-1.02)	(0.08)	(-2.00)	(0.54)	(2.52)	(-0.25)	(1.20)	(-0.33)
GC	-0.139***	-0.0225	-0.353**	-0.0639	0.0190	-0.00572	-0.00656	0.0928*
	(-2.94)	(-0.80)	(-2.00)	(-1.09)	(0.71)	(-0.27)	(-0.09)	(1.84)
RI	-0.00555	-0.0288	0.0617	-0.0907	0.00288	-0.173***	-0.344***	0.0388
	(-0.04)	(-0.28)	(0.19)	(-0.70)	(0.04)	(-2.86)	(-3.23)	(0.45)
EF	-0.279*	0.0169	0.772*	0.171	0.105	0.106*	0.750***	0.0608

	(-1.65)	(0.18)	(1.70)	(0.97)	(1.20)	(1.69)	(4.20)	(0.42)
FO	-0.0756	-0.0641	0.407*	0.101	0.110*	0.0308	0.685***	0.0753
	(-0.82)	(-1.09)	(1.85)	(1.14)	(1.77)	(0.81)	(7.43)	(0.97)
CPI	-0.161*	0.0499	0.358	0.0221	0.0741	0.110**	0.442***	0.0974
	(-1.83)	(0.90)	(1.55)	(0.23)	(1.58)	(2.96)	(4.66)	(1.31)

Table 10: (Continued): The impact of institutional variables on bank capital - Stock Market Development further sub-sampling

	High MKGDP		Low MKGDP		High MKGDP		Low MKGDP	
	Conventional Banks				Islamic Banks			
	TCR	EQTA	TCR	EQTA	TCR	EQTA	TCR	EQTA
PS	0.359	-1.020**	0.0988	-0.0566	2.165	0.351	-9.461	5.389
	(0.57)	(-2.39)	(0.08)	(-0.11)	(1.01)	(0.25)	(-0.77)	(0.49)
GC	-0.0277	-0.0234	-0.193**	0.0482*	0.146*	0.0206	0.444	0.0744
	(-1.20)	(-1.49)	(-2.52)	(1.79)	(1.74)	(0.27)	(0.93)	(0.08)
RI	0.0427	-0.0722	-0.408***	-0.0191	-0.140	0.00180	-0.427	0.191
	(0.61)	(-1.55)	(-3.16)	(-0.35)	(-0.55)	(0.01)	(-0.71)	(0.06)
EF	-0.00386	0.0499	0.973***	0.113	0.106	0.373**	-0.646	0.283
	(-0.05)	(0.96)	(5.20)	(1.46)	(0.60)	(2.42)	(-0.77)	(0.17)
FO	0.0420	-0.0220	0.695***	0.0792**	0.342	0.120	1.014	2.691
	(0.82)	(-0.75)	(7.79)	(2.07)	(1.63)	(0.81)	(0.77)	(0.02)
CPI	0.0260	-0.0133	0.514***	0.0813*	-0.0702	0.298***	0.271	0.271
	(0.62)	(-0.44)	(5.21)	(1.91)	(-0.60)	(2.68)	(0.67)	(0.18)

This Table shows whether small versus large, unlisted versus listed, and conventional versus Islamic banks behave differently when markets are developed or underdeveloped. MKGDP is the market capital to GDP indicator of stock market development. PS is the measure of political stability. GC is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country.

Table 11: The impact of institutional variables on bank capital - Large Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	1.022						0.228					
	(1.33)						(0.69)					
GC		-0.0424*						0.0255**				
		(-1.74)						(2.41)				
RI			-0.0361						-0.0215			
			(-0.39)						(-0.53)			
EF				0.258**						0.0161		
				(2.34)						(0.32)		
FO					0.385***						0.0313	
					(6.5)						(1.23)	
CPI						0.130**						0.0725***
						(2.35)						(2.8)
Constant	71.72***	37.00**	23.58	44.99***	45.32***	71.92***	49.50***	63.11***	45.87***	49.32***	48.92***	51.19***
	(5.12)	(2.32)	(1.59)	(3.04)	(3.35)	(5.41)	(7.16)	(7.21)	(5.97)	(6.66)	(7.05)	(7.72)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	429	362	383	409	409	429	484	406	436	464	464	484
Nbr. of groups	48	48	48	46	46	48	50	50	50	48	48	50

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of large banks using the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table 12: The impact of institutional variables on bank capital - Small Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	1.096						-0.122					
	(1.53)						(-0.29)					
GC		-0.106***						0.00685				
		(-5.05)						(0.52)				
RI			-0.210***						-0.0116			
			(-2.80)						(-0.26)			
EF				0.352***						0.112**		
				(4.1)						(2.03)		
FO					0.335***						-0.0482	
					(5.77)						(-1.50)	
CPI						0.148***						0.0297
						(3.13)						(0.9)
Constant	97.02***	101.1***	104.0***	79.02***	71.61***	96.20***	126.0***	141.0***	129.2***	117.2***	125.0***	127.9***
	(8.76)	(8.24)	(8.57)	(7.03)	(6.44)	(8.92)	(17.17)	(17.34)	(17.4)	(16.21)	(17.69)	(17.74)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	762	695	726	745	745	762	1015	916	962	976	976	1015
Nbr. of groups	122	120	120	118	118	122	160	159	154	149	149	160

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of small banks using the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively

Table 13: The impact of institutional variables on bank capital - Government Owned Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	-1.733						0.161					
	(-1.41)						(0.19)					
GC		0.00323						-0.0082				
		(0.08)						(-0.33)				
RI			0.276						0.0808			
			(1.41)						(0.72)			
EF				0.330**						0.0436		
				(2.14)						(0.41)		
FO					0.227**						0.0501	
					(2.17)						(0.77)	
CPI						0.148*						0.0745
						(1.93)						(1.38)
Constant	54.09***	67.74***	35.84**	51.22***	58.83***	77.58***	134.4***	149.8***	147.2***	133.8***	133.8***	136.1***
	(3.34)	(3.36)	(2.02)	(2.95)	(3.61)	(4.55)	(10.29)	(9.56)	(10.06)	(10.41)	(11.08)	(11.14)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	264	230	240	264	264	264	283	243	255	279	279	283
Nbr. of groups	34	34	34	34	34	34	38	38	37	37	37	38

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of government-owned banks using the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively

Table 14: The impact of institutional variables on bank capital - Non-government owned Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	1.659***						0.108					
	(2.95)						(0.33)					
GC		-0.103***						0.0184*				
		(-6.00)						(1.75)				
RI			-0.153**						-0.00859			
			(-2.47)						(-0.24)			
EF				0.269***						0.0779*		
				(3.53)						(1.7)		
FO					0.385***						-0.0312	
					(8.46)						(-1.27)	
CPI						0.124***						0.043
						(3.04)						(1.59)
Constant	86.65***	76.02***	77.50***	65.63***	55.45***	83.85***	89.40***	105.3***	90.59***	80.97***	86.03***	90.55***
	(9.56)	(7.58)	(7.92)	(6.73)	(6.04)	(9.38)	(14.92)	(15.31)	(14.72)	(13.27)	(14.67)	(15.31)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	927	827	869	890	890	927	1216	1079	1143	1161	1161	1216
Nbr. of groups	136	134	134	130	130	136	172	171	167	160	160	172

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of non-government-owned banks using the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table 15: The impact of institutional variables on bank capital - Islamic Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	2.832*						1.47					
	(1.65)						(1.16)					
GC		0.123**						0.03				
		(2.38)						(0.66)				
RI			-0.0284						0.0514			
			(-0.17)						(0.35)			
EF				0.193						0.305**		
				(1.34)						(2.17)		
FO					0.449***						0.0634	
					(3)						(0.56)	
CPI						0.0546						0.302***
						(0.57)						(3.15)
Constant	76.97***	70.12***	65.96***	67.77***	55.73***	75.62***	143.8***	168.6***	143.6***	120.5***	131.8***	142.7***
	(3.92)	(3.54)	(3.11)	(3.37)	(2.79)	(3.79)	(8.53)	(9.33)	(8.73)	(7.1)	(7.98)	(8.73)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	172	162	164	172	172	172	257	234	244	254	254	257
Nbr. of groups	32	32	32	32	32	32	42	42	41	41	41	42

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of Islamic banks using the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

*Table 16: The impact of institutional variables on bank capital - **Conventional** Banks*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	0.52						-0.394					
	(0.97)						(-1.46)					
GC		-0.0914***						0.00164				
		(-5.46)						(0.19)				
RI			-0.148**						-0.0267			
			(-2.36)						(-0.90)			
EF				0.335***						0.0307		
				(4.5)						(0.82)		
FO					0.398***						-0.0309	
					(9.22)						(-1.59)	
CPI						0.121***						0.00602
						(3.15)						(0.28)
Constant	75.67***	70.34***	63.51***	55.68***	47.57***	76.72***	80.86***	98.75***	81.34***	77.54***	81.27***	83.28***
	(8.79)	(7.26)	(6.91)	(6.11)	(5.65)	(9.19)	(15.4)	(16.27)	(15.14)	(14.86)	(16.35)	(16.27)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	1003	881	931	968	968	1003	1208	1060	1123	1156	1156	1208
Nbr. of groups	134	133	133	129	129	134	160	160	156	150	150	160

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of conventional banks using the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table 17: The impact of institutional variables on bank capital - Unlisted Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	-3.690***						-0.162					
	(-3.60)						(-0.34)					
GC		-0.161***						0.00954				
		(-4.48)						(0.66)				
RI			0.0603						0.155**			
			(0.41)						(2.43)			
EF				0.296*						-0.0589		
				(1.7)						(-0.76)		
FO					0.272***						-0.0587	
					(3.25)						(-1.46)	
CPI						0.118						0.0493
						(1.38)						(1.16)
Constant	91.18***	86.85***	75.38***	83.65***	71.49***	107.3***	108.5***	99.00***	105.0***	108.4***	111.7***	109.0***
	(5.66)	(4.82)	(4.11)	(4.59)	(4.08)	(6.49)	(11.18)	(9.47)	(10.08)	(11)	(11.25)	(11.35)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	384	339	356	367	367	384	522	464	491	499	499	522
Nbr. of groups	67	65	65	63	63	67	90	89	88	84	84	90

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of unlisted banks using the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Table 18: The impact of institutional variables on bank capital – Listed Banks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A: TCR						Panel B: EQTA					
PS	2.364***						0.323					
	(4.03)						(0.8)					
GC		-0.0276						0.0158				
		(-1.58)						(1.3)				
RI			-0.149**						-0.0702*			
			(-2.55)						(-1.74)			
EF				0.219***						0.0826*		
				(3.19)						(1.71)		
FO					0.314***						0.0177	
					(6.39)						(0.6)	
CPI						0.100***						0.0843***
						(2.61)						(2.88)
Constant	84.77***	88.88***	78.27***	66.48***	62.97***	80.37***	93.38***	118.8***	95.09***	85.94***	88.76***	95.60***
	(9.46)	(8.2)	(8.19)	(7.08)	(6.97)	(9.02)	(14.08)	(14.99)	(13.98)	(12.81)	(13.75)	(14.63)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nbr. of obs.	807	718	753	787	787	807	977	858	907	941	941	977
Nbr. of groups	103	103	103	101	101	103	120	120	116	113	113	120

This table reports the regression results of bank capital determinants and the effect of institutional variables for a sample of listed banks using the Hausman-Taylor model. The dependent variables are TCR; the total capital ratio (column 1 to 6) and EQTA; equity to total assets ratio (column 7 to 12). PS is the measure of political stability. GCREDIT is the first component of creditor's rights and measures the ease of getting credit. RI is the other component of the creditor's rights index and it accounts for the ease of resolving insolvency, as well as liquidation. EF is the economic freedom index. FO is a measure of financial openness and includes financial and trade freedom. CPI is a corruption perception index accounting for the level of perceived corruption in each country. Controls include all the control variables used in the main regression. Reported beneath each coefficient estimate is the t-statistic adjusted for clustering at the bank level. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.