

Institutional Determinants of Bank Capital Ratios

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Abstract

We investigate the role played by the institutional framework in determining bank capital levels. Using a sample of 187 banks operating in the MENA region for the period 2004 to 2014, we find that low corruption levels, high political stability, as well as high economic and financial freedom are associated with higher capital adequacy levels. Bank concentration and risk have a significant positive effect on total capital ratio while size is negatively significant. We also find that the effect of the institutional quality on bank capital ratios is more pronounced for commercial, listed, and non-government owned banks.

JEL classification: G21, G28, G32

Keywords: Bank Capital Structure, Institutions, MENA Region

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Abstract

We investigate the role played by the institutional framework in determining bank capital levels. Using a sample of 187 banks operating in the MENA region for the period 2004 to 2014, we find that low corruption levels, high political stability, as well as high economic and financial freedom are associated with higher capital adequacy levels. Bank concentration and risk have a significant positive effect on total capital ratio while size is negatively significant. We also find that the effect of the institutional quality on bank capital ratios is more pronounced for commercial, listed, and non-government owned banks.

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1. Introduction

Traditional analysis of bank capital structure has been mostly concentrated 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 literature pioneered by (Demirgüç-Kunt & Maksimovic 1999) pointed out the importance of considering the legal and institutional framework affecting capital structure decisions of firms. In their paper, (Demirgüç-Kunt & Maksimovic 1999) posit that a significant part of long term debt variation can be explained by institutional foundations. Nevertheless, existing literature on the role of institutions in capital structure includes mainly 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 combine the two strands of literature by analyzing the role of institutional factors on capital holdings of banks in a region whose underdeveloped institutions can be considered as a major obstacle to its economic and financial development: the MENA region¹.

The MENA region is a fast-growing area which remains understudied when it comes to capital structures of its financial institutions. This area 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 creditor rights, and a skeletal rule of law (World Bank Mena Knowledge and Learning Issue 114, January 2014). The financial sector is highly bank-based with banks assets attaining on average 130% of GDP (Saadaoui 2015). The region is characterized by underdeveloped bond stock 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

¹ 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

developed, with the exception of Lebanon, Jordan, and the GCC countries (Creane et al. 2004). At the same time, most MENA banks showed resiliency during the last global financial crisis. 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. In fact, banks in the MENA region are substantially over capitalized with total regulatory capital levels and tier 1 capital being significantly higher than Basel capital regulations. 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.

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 underdeveloped civil society. According to the Enterprise Survey of the World Bank (2016), the most important obstacles to development in the MENA region are the ongoing political instability and the high levels of corruption. In the World Bank Report (Mena Knowledge and Learning Issue 114, January 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 implemented 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 aim to 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. Up to our knowledge, no other study explicitly studies 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 ratios Underdeveloped and

emerging countries are subject to different kinds of constraints and challenges which implies that what applies to developed countries might not apply to them.

We consider a sample of 187 banks from 15 MENA region banks covering the 2004–2014 period. Our findings suggest that institutional variables are significant in explaining risk based capital adequacy ratio but do not seem to influence the internally set capital ratio; Equity to Total Assets. We provide evidence that higher corruption and political instability levels are associated with lower capital adequacy ratio. Creditor rights, however, negatively influence capital adequacy ratio. As for economic freedom indexes and financial openness measure, the effect is positive. We also find that the effect of institutional variables is more pronounced among listed, commercial, 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, variables used and the empirical model are presented in section 3. Section 4 discusses the regression results and presents some of the robustness tests. Finally, section 5 concludes.

2. Related Literature

A substantive literature focused on studying 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 which leads banks to choose high levels of leverage, thus maintaining low capital ratios while complying with regulations imposed (Keeley 1990). However, this justification of bank capital levels does not explain the prevalence of bank capital buffers. Among justifications of capital buffers in the literature is the fear of falling below capital requirements and the costs associated with insolvency and authority interference should this situation prevail (Milne & Whalley 2001). In addition, market discipline might force banks to maintain a certain level of capital buffer. Thus, banks use capital buffers mainly because of fear of adverse shocks, authority intervention, and market discipline.

Recently, a growing body of literature has focused on the role that institutions might play in determining capital structures. However, findings on the role of the legal and institutional framework in explaining firms' funding choices are mixed. On one hand, many studies find that firms operating in a better institutional framework may 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). This strong legal framework can help mitigate agency problems by reducing information asymmetries. When information is more readily available to investors, firms might start relying more on external rather than internal funding. Thus, the negative relationship between capital holdings and the institutional environment 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 high 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 result is also supported by Rajan & Zingales 1995 who explain that whenever manager rights during bankruptcy are limited and creditor rights are stronger, managers tend to prefer equity over debt. Thus, a consensus has not been reached in the literature regarding the effect of institutional quality on capital funding choices of non-financial firms. Other studies covering corporate capital decisions include but are not limited to: Deesomsak et al. 2004; Bancel & Mittoo 2004; Gungoraydinoglu & Öztekin 2011; de Jong et al. 2008; An et al. 2016. Most of the analysis provided by these studies excludes financial firms.

Studies linking the institutional framework to capital holdings of financial firms and banks more specifically are more scarce. Fonseca & González 2010 analyze the determinants of bank capital buffers and the role of institutions across a selection of world countries. The authors study how institutions might alter the effect of market power and market discipline on capital holdings. They find that on 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. Klomp & Haan 2013 find

that capital regulations are more binding in countries with strong institutional establishments. Using data from 70 developing countries, the authors confirm the existence of a significant negative relationship between bank activity restrictions and risk-taking but only in countries endowed with high quality of institutions. Chen et al. 2015 study 35 emerging economies to examine the link between corruption and bank risk taking. Their findings suggest that high levels of corruption are associated with higher bank risk taking.

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 and 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 Klomp & Haan 2013 conclusion that stricter supervision reduces bank risk taking among banks in emerging countries. Saadaoui 2015 studies the cyclical behavior of MENA bank capital buffers and concludes that banks with high market power and large size behave more in a countercyclical way.

Very few studies assess the role of the institutional framework prevailing in the Mena region countries on bank sector characteristics. Naceur & Omran 2011 study Mena bank performance determinants. They conclude that institutional variables including corruption and rule of law are also found to be significant in determining bank performance. Maraghni & Bouheni 2015 show that that institutional conditions are significant in determining the risk of insolvency among 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 developments.

Most recently, 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 better institutional framework rely relatively more on debt than equity. In fact, Gropp & Heider 2010 demonstrate that unlike what has long been thought, bank capital ratios exhibit many similarities with capital structures of non-financial firms. This implies that bank regulations play no major role in determining bank capital ratios (Flannery 1994; Diamond & Rajan 2000; Allen et al. 2011). 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.

3. Data, variables, and empirical models

In this section, before presenting our empirical model 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 187 banks (148 conventional and 39 Islamic banks) from the 15 MENA region countries. These countries are Algeria, Bahrain, Egypt, Iraq, Israel, Jordan, Kuwait, Lebanon, Malta, Morocco, Oman, Qatar, Tunisia, United Arab Emirates (UAE) and Yemen. The sample also includes state-owned and privately-owned banks and both listed and non-listed banks. Yearly bank level data are extracted from Bankscope - Bureau van Dijk database. Macroeconomic data are gathered from the Global Financial Development

Database and the World Development Indicators of the World Bank. For institutional data, we use different databases; the World Governance Indicators and the Doing Business Creditor Rights Database of the World Bank, The Transparency International Organization database and the World Heritage Foundation database.

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 total regulatory capital ratio (TCR). This total capital adequacy ratio as per Basel rules is the ratio of the sum of Tier 1 and Tier 2 capital ratios (which include; hybrid capital, subordinated debt, reserves for loan losses, and valuation reserves) to total risk weighted assets (and off balance sheet weighted risks). For further insights, we consider equity to total assets ratio (EQTA) which is non-risk weighted and therefore reflects internal bank capital holding decisions.

3.2.2 Independent variables

3.2.2.1 Main variables

We use different sources for collecting institutional variables. First, we use an indicator of political stability (PS). Political instability is one of the major obstacles facing countries in the MENA region. This indicator is scaled from -25 to +25 with higher values indicating higher political stability. We expect banks in politically unstable regions to boost their capital ratios as a mean of gaining trust of investors which might be hesitant in such politically unstable environments. Hence, attracting depositors might be a major explanation of high capital holdings by banks in fragile political environments. At the same time, banks operating in fragile environments might be reluctant in raising new capital and might prefer maintain low capital ratios to prevent any potential loss of controls should the

country's political situation get worse. Hence, the impact of political stability on capital holdings is uncertain.

We use two indicators of creditor's rights from the Doing Business database, namely resolving insolvency and getting credit. 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.

We also use the economic freedom (EF) index from the World Heritage Foundation. It is based on 10 equally weighted sub-indexes measuring different categories of economic freedom². From two sub-indexes (investment freedom and financial freedom), we build an indicator which 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. Economic freedom indicators are also scaled from 0 (lowest freedom) to 100 (highest freedom).

We include the corruption perception index (CPI) which represents the perceived level of corruption in a country's public sector. CPI is calculated on a scale of 0 (severely corrupt) to 100 (no corruption). Corruption is a widespread phenome 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

² These sub-indexes are: property rights, freedom from corruption, fiscal freedom, government spending, business freedom, labor freedom, monetary freedom, trade freedom, investment freedom and financial freedom.

resources. One way is committing bribery to evade inefficient rules for example (Huntington 1968; Acemoglu & Verdier 2000). We investigate whether corruption plays a role in determining bank capital ratios. In the MENA region, a very large part of bank capital is held by government officials and political parties. Hence, we can expect that high levels of corruption might lead to detaining high capital ratios as more money can be streamed from public funds into personal gains. Conversely, more corruption might lead banks to abide less by capital regulations as 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 for the influence of bank size using the logarithm of bank total assets (SIZE). SIZE is expected to negatively influence capital levels as bigger banks tend to hold less capital consistent with the “too big to fail hypothesis” (Brewer et al. 2008; Kleff & Weber 2004; Fonseca & González 2010). Such banks might benefit from economies to 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 nonperforming 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). However, existing literature on 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 eventual 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 might also tend to hold lower capital ratios (which is also risky) (Fonseca & González 2010).

The Return on Assets (ROA) is used as an indicator of bank performance. It is calculated as the ratio of a bank's net income to its average assets. This ratio is an important indicator of a bank's efficiency and operational performance as it considers the return generated from a bank's assets. Profitability is expected to boost capital ratios as more profitable banks tend to have a larger 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. ROA is lagged one period in order to deal with potential simultaneity.

To account for a country's regulatory framework, we include an indicator of regulatory capital stringency (REG). This indicator is manually calculated based on the Barth et al World Bank Regulation and Supervisory Database³ (Barth et al. 2004). It consists of a score 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 total banks assets in a country. A consensus is not reached in the literature concerning the sign of this variable in the capital equation.

Finally, we consider GDP Growth (GDP) to examine the possible impact of the business cycle on capital ratios. Many studies document a negative relationship between regulatory capital ratios and the business cycle (Ayuso et al. 2004; Shim 2013). Per these authors, banks tend to decrease (increase) their capital holding during economic upturns

³ We use the three versions available of this database (2003, 2007, and 2012). We project forward values in between.

(downturns). At the same time, banks might prefer to increase capital ratios during economic booms to benefit from potential investment opportunities (Berger 1995).

3.3 Econometric specification

We adopt the following benchmark model:

$$TCR_{ict} = \beta_0 + \sum_{k=1}^6 \beta_1 Inst_{ct} + \sum_{k=1}^3 \beta_2 Bank_{ict} + \sum_{k=1}^3 \beta_3 Other_{ict} + \sum_{k=1}^3 \beta_4 Specs_{ict} + C_c + C_t + \varepsilon_{ict}$$

Where; TCR is the Capital adequacy ratio. Inst is a set of variables accounting for country institutional framework. Bank represents a vector of variables used to control for bank specific characteristics. Other is a vector of variables containing country level variables, other than institutional ones. Specs includes a set of dummy variables specifying whether a country is Conventional or Islamic, Government owned or privately owned, and listed or unlisted. C_c 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. ε_{ict} is the white noise disturbance.

The Hausman tests suggests estimating the coefficients with fixed effects. However, using fixed effects is not possible with time invariant variables and dummies. Hence, to deal with this issue we carry out our regressions using the (Hausman & Taylor 1981) model which allows using time invariant variables. Hausman-Taylor assume that some explanatory variables are correlated with individual random effects. We cluster standard errors at the bank level.

4. Results

4.1 Descriptive statistics

Table (1) presents the descriptive statistics of the variables used in this study. Average EQTA for all countries in our sample are 8%, except for Israel (5.9%). Highest 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 biggest banks in our sample. While the most concentrated banking sectors are 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]]

4.2 Regressions results

4.2.1 Main regression results

Table 3 reports the benchmark regression. We use one institutional variable per regression due to high correlation issues between these variables. Columns 1 to 6 report the results for TCR while columns 7 to 12 represent results for EQTA. All institutional variables reported are significant in explaining total capital ratio. TCR is positively affected by political stability. Banks in politically stable countries tend to hold higher risk weighted capital as the more politically stable the country is, the more authoritative the regulators are. Creditor rights have a negative effect on TCR. This is consistent with (González & González 2008) who show that stronger creditor rights cause firms to hold more leverage. 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. (Cho et al. 2014) discuss that firms might hold more leverage with more favorable credit rights since in this context credit would be available in more favorable conditions. Hence, the negative relationship between creditor rights and capital.

The higher the economic and financial freedom, the higher the TCR. This can be justified by a higher exposure to international markets, which implies higher competition and hence the need to hold higher capital levels. CPI is positively significant at the 1%

level. Less corruption leads to banks abiding more by capital regulations. This is consistent with (Belkhir et al. 2016) findings on MENA non-financial firms whose leverage levels is found to increase with corruption.

Among control variables, we find that risk, concentration, and size are highly significant determinants of total capital ratios. Large banks tend to hold less capital as they have easy access to capital and can raise capital more quickly should an adverse situation prevail so such banks can afford having lower capital levels. This is also in line with (Demirgüç-Kunt et al. 2014) who posit that large banks benefit from government bailouts and other guarantees so they are less interested in holding high TCR. Riskier banks are obliged to hold higher capital levels (Berger et al. 2008; Awdeh et al. 2011). Bank asset concentration also has a significant positive coefficient, meaning that banks operating in a concentrated environment tend to increase their capital ratios. GDP however has an insignificant coefficient meaning that there is no cyclical or counter cyclical behavior of capital ratios among banks in the MENA region. Capital adequacy ratio coverage, 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 and Lebanon respectively.

Furthermore, the dummy variables we included provide evidence that government owned banks as well as listed banks hold higher TCR than privately owned banks and unlisted banks, respectively. For listed banks this is expected since they are usually pushed by market to hold higher TCR once exposed to broader competitiveness on the market. 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 also a positive coefficient. We can infer from this that institutions seem to affect the regulatory constraint related to capital without playing a major role in determining the internal bank based decisions concerning capital holdings. Return on assets is positively

significant in explaining EQTA. This implies that MENA banks equity is mainly funded by earnings.

[[insert table 3 here]]

4.2.2 Further Investigations

For deeper insight, we split our sample into several sub samples. Tables 4 and 5 show the size sub-samples; we consider a bank as large if it has more than one billion dollars in total assets. Results shows no different effects of institutional variables on large and small banks externally set capitalization (TCR). However, proxies for creditor rights (GC and RI) positively impact TCR for small banks only. GC and CPI positively impact the internally set capital, EQTA, for big banks. Economic freedom is the only institutional variable that affects EQTA for small banks, higher EF leads to higher internally set capital.

[[insert table 4 here]]

[[insert table 5 here]]

Tables 6 and 7 display the result for governmentally owned banks versus their privately counterparts. As one would expect, all institutional variables affect TCR of privately owned banks while governmentally owned banks are not affected by them, except for the economic freedom indexes.

[[insert table 6 here]]

[[insert table 7 here]]

In tables 8 and 9, we split the sample by type of bank; Commercial and Islamic. We find that commercial banks' TCR is influenced by almost all institutional variables considered while Islamic banks do not seem to be affected by most of them. Islamic banks don't behave like commercial banks in the sense that they are based on Islamic contracts and therefore using capital to hedge against risk in this case is irrelevant.

[[insert table 8 here]]

[[insert table 9 here]]

Finally, we test whether the behavior of listed and unlisted banks differ in this scope (tables 10 and 11). Our findings show that that 5 out of 6 institutional variables explain capital ratios of listed banks while only 3 explain unlisted banks.

[[insert table 10 here]]

[[insert table 11 here]]

5. Summary and concluding remarks

This paper studies the relationship between the institutional framework and bank capital structure using panel data on 187 banks operating in the MENA region for the period 2004 to 2014. We therefore 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 regulatory capital ratio which accounts for risky asset portfolio and a measure of the leverage ratio which is non-risk weighted. The reason for this is to be able to identify the canal through which institutions affect capital structure, that is whether the effect is internal based or not. The institutional variables we account for in this paper are the following; political stability, creditor rights, economic and financial freedom, and corruption. We follow the literature to control for classic bank capital ratio determinants by including measures of return on assets, risk, size, bank concentration, as well as GDP growth. We also include a measure to account for country level supervisory capital regulations. We estimate our model using

the Hausman-Taylor methodology which allows including time-invariant and dummy variables.

Regression results suggest that banks in countries with higher Political Stability, more pronounced economic and financial freedom, as well as lower levels of corruption hold more TCR. Creditor rights, on the contrary, seem to have a negative influence on TCR. Creditor rights include the ease of liquidation, a bank may prefer holding lower TCR when tighter regulatory procedures on reorganization and liquidations exist. Except for corruption, these results do not hold for EQTQ ratio which doesn't seem to be affected by the institutional foundations of a given country. This might imply that institutional quality might affect TCR through risky asset or even hybrid capital choices.

We also find that the effect of the institutional quality on TCR is more pronounced for commercial, listed, and non-government owned banks as opposed to Islamic, Unlisted and government owned banks.

Our results hold several policy implications. Institutional quality must not be disregarded when studying capital structures of banks operating in the MENA region. The region suffers from several institutional deficiencies which seem to have implications on many sectors including the financial and banking sector. Hence, promoting institutional development can be considered of vital importance not only to a country's economic and social development but also to its financial well-being.

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Table 1. Descriptive statistics

| <u>Variable</u> | <u>Obs</u> | <u>Mean</u> | <u>Std. Dev.</u> | <u>Min</u> | <u>Max</u> |
|------------------------|-------------------|--------------------|-------------------------|-------------------|-------------------|
| TCR | 1256 | 18.37 | 7.04 | 5.77 | 49.66 |
| EQTA | 1594 | 13.72 | 9.53 | 2.81 | 76.94 |
| 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 |
| 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 |
| GCREDIT | 1457 | 38.96 | 19.76 | 6.25 | 87.50 |
| RESOLVINGI | 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 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 if it is commercial. Gov is a dummy variable which takes the value of 1 if the government owns 75% 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. RESOLVINGI 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 1. MENA Banks distribution by type

| | Number of banks | Commercial | 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 |
| IRAQ | 4 | 3 | 1 | 3 | 1 | 3 | 1 |
| 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 | 187 | 148 | 39 | 112 | 75 | 155 | 32 |

Table 2. The impact of institutional variables on bank capital-Main Regression

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---------|-----------------------|-----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | TCR | | | | | | EQTA | | | | | |
| ROA | -0.203 (-1.50) | -0.0693 (-0.50) | -0.109 (-0.78) | -0.142 (-1.05) | -0.140 (-1.06) | -0.149 (-1.11) | 0.606*** (8.26) | 0.554*** (7.48) | 0.733*** (9.88) | 0.678*** (9.23) | 0.673*** (9.16) | 0.612*** (8.34) |
| NPL | 0.178*** (5.34) | 0.141*** (4.01) | 0.158*** (4.51) | 0.152*** (4.48) | 0.155*** (4.74) | 0.183*** (5.53) | 0.0323* (1.79) | 0.00928 (0.50) | 0.0165 (0.92) | 0.0247 (1.41) | 0.0278 (1.60) | 0.0321* (1.78) |
| CONC | 0.0813*** (2.86) | 0.141*** (4.47) | 0.103*** (3.42) | 0.0741** (2.47) | 0.0652** (2.23) | 0.0433 (1.47) | -0.0181 (-0.99) | -0.0242 (-1.23) | -0.0187 (-1.02) | -0.0262 (-1.43) | -0.0203 (-1.11) | -0.0295 (-1.55) |
| GDP | -0.0466 (-1.21) | -0.0538 (-1.32) | -0.0401 (-0.97) | -0.0482 (-1.23) | -0.0519 (-1.36) | -0.0554 (-1.44) | -0.0307 (-1.23) | -0.0192 (-0.77) | 0.0218 (0.84) | 0.00721 (0.29) | 0.00670 (0.27) | -0.0309 (-1.24) |
| REG | -0.0786 (-0.44) | -0.183 (-1.00) | -0.299 (-1.51) | 0.0242 (0.13) | 0.0700 (0.40) | -0.135 (-0.76) | -0.0290 (-0.26) | -0.0526 (-0.48) | 0.0184 (0.16) | 0.000996 (0.01) | -0.0254 (-0.23) | -0.0336 (-0.31) |
| SIZE | -5.057*** (-10.13) | -4.635*** (-8.01) | -4.159*** (-7.70) | -4.931*** (-9.97) | -4.603*** (-9.64) | -5.288*** (-10.58) | -5.987*** (-18.31) | -7.073*** (-18.18) | -6.216*** (-18.19) | -5.884*** (-18.75) | -5.856*** (-18.68) | -6.158*** (-18.91) |
| Islamic | -1.797 (-0.94) | -1.742 (-0.95) | -1.582 (-0.90) | -1.764 (-0.95) | -1.589 (-0.90) | -1.788 (-0.91) | 0.411 (0.22) | -0.0417 (-0.02) | 0.324 (0.17) | 0.590 (0.34) | 0.577 (0.33) | 0.346 (0.18) |
| Gov | 4.701** (2.52) | 4.505** (2.51) | 4.157** (2.41) | 4.620** (2.55) | 4.406** (2.56) | 4.936*** (2.59) | 5.088*** (2.70) | 5.693*** (2.76) | 5.555*** (2.90) | 5.538*** (3.17) | 5.514*** (3.16) | 5.317*** (2.80) |
| Listed | 5.380*** (2.93) | 5.417*** (3.05) | 5.047*** (2.96) | 5.564*** (3.06) | 5.055*** (2.93) | 5.565*** (2.97) | 1.636 (0.96) | 2.463 (1.31) | 1.805 (1.04) | 2.165 (1.33) | 2.012 (1.24) | 1.899 (1.10) |
| PS | 1.037** (2.04) | | | | | | 0.0531 (0.18) | | | | | |
| GC | | -0.0837*** (-5.29) | | | | | | 0.0159* (1.67) | | | | |
| RI | | | -0.138** (-2.38) | | | | | | 0.000157 (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) |
| 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 |

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 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 if it is commercial. Gov is a dummy variable which takes the value of 1 if the government owns 75% 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. RESOLVINGI 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 3. The impact of institutional variables on bank capital-Large Banks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---------|----------------------|---------------------|---------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | TCR | | | | | | EQTA | | | | | |
| ROA | -0.257 (-1.03) | -0.108 (-0.43) | -0.0328 (-0.13) | -0.177 (-0.69) | -0.0739 (-0.30) | -0.166 (-0.66) | 0.700*** (5.94) | 0.561*** (4.78) | 0.673*** (5.59) | 0.691*** (5.73) | 0.692*** (5.81) | 0.739*** (6.28) |
| NPL | 0.148** (2.52) | 0.136** (2.34) | 0.171*** (3.03) | 0.130** (2.16) | 0.146** (2.57) | 0.152*** (2.61) | 0.0201 (0.88) | 0.0399* (1.75) | 0.0259 (1.16) | 0.0215 (0.92) | 0.0194 (0.83) | 0.0184 (0.81) |
| CONC | 0.0610 (1.47) | 0.0879* (1.95) | 0.0642 (1.48) | 0.0566 (1.26) | 0.0581 (1.37) | 0.0219 (0.51) | 0.0619*** (3.20) | 0.0377* (1.87) | 0.0514*** (2.59) | 0.0560*** (2.68) | 0.0555*** (2.70) | 0.0441** (2.23) |
| GDP | -0.0806 (-1.27) | -0.0982 (-1.49) | -0.0989 (-1.49) | -0.0832 (-1.26) | -0.0991 (-1.58) | -0.0812 (-1.28) | 0.00142 (0.05) | 0.0305 (1.02) | 0.0163 (0.53) | 0.00660 (0.21) | 0.00727 (0.23) | 0.00458 (0.15) |
| REG | -0.0736 (-0.26) | -0.258 (-0.92) | -0.193 (-0.62) | -0.0177 (-0.06) | 0.0532 (0.19) | -0.102 (-0.36) | -0.211* (-1.65) | -0.151 (-1.22) | -0.176 (-1.23) | -0.209 (-1.58) | -0.187 (-1.42) | -0.201 (-1.60) |
| SIZE | -3.800*** (-4.67) | -1.720* (-1.81) | -0.940 (-1.10) | -3.127*** (-3.89) | -3.590*** (-4.67) | -4.027*** (-5.05) | -2.796*** (-6.95) | -3.657*** (-7.04) | -2.527*** (-5.64) | -2.838*** (-7.11) | -2.859*** (-7.17) | -2.996*** (-7.58) |
| Islamic | -3.526** (-2.16) | -2.984** (-2.20) | -2.782** (-2.22) | -3.143** (-2.01) | -3.394** (-2.18) | -3.619** (-2.19) | -1.987* (-1.74) | -2.656* (-1.90) | -2.115* (-1.79) | -2.022* (-1.73) | -2.012* (-1.71) | -2.040* (-1.74) |
| Gov | 1.754 (1.03) | 0.492 (0.33) | -0.179 (-0.13) | 1.215 (0.74) | 1.595 (0.99) | 2.020 (1.18) | 1.082 (0.94) | 2.095 (1.49) | 1.072 (0.90) | 1.126 (0.96) | 1.143 (0.97) | 1.256 (1.07) |
| Listed | 4.014** (2.24) | 3.766*** (2.58) | 3.699*** (2.74) | 3.849** (2.24) | 3.578** (2.09) | 3.986** (2.19) | 0.111 (0.09) | 0.447 (0.29) | 0.142 (0.11) | 0.123 (0.09) | 0.110 (0.08) | 0.0583 (0.04) |
| PS | 1.022 (1.33) | | | | | | 0.228 (0.69) | | | | | |

| | | | | | | | | | | | | |
|----------------|---------------------|-------------------|-----------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| GC | -0.0424* (-1.74) | | | | | | 0.0255** (2.41) | | | | | |
| RI | -0.0361 (-0.39) | | | | | | -0.0215 (-0.53) | | | | | |
| EF | 0.258** (2.34) | | | | | | 0.0161 (0.32) | | | | | |
| FO | 0.385*** (6.50) | | | | | | 0.0313 (1.23) | | | | | |
| CPI | 0.130** (2.35) | | | | | | 0.0725*** (2.80) | | | | | |
| constant | 71.72*** (5.12) | 37.00** (2.32) | 23.58 (1.59) | 44.99*** (3.04) | 45.32*** (3.35) | 71.92*** (5.41) | 49.50*** (7.16) | 63.11*** (7.21) | 45.87*** (5.97) | 49.32*** (6.66) | 48.92*** (7.05) | 51.19*** (7.72) |
| 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). The independent variables are the following: ROA is the return on average assets. NPL is 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 commercial. Gov is a dummy variable which takes the value of 1 if the government owns 75% 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. RESOLVINGI 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 4. The impact of institutional variables on bank capital-Small Banks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | TCR | | | | | | EQTA | | | | | |
| ROA | -0.161 (-0.96) | -0.00287 (-0.02) | -0.115 (-0.67) | -0.110 (-0.67) | -0.136 (-0.83) | -0.127 (-0.77) | 0.564*** (6.23) | 0.543*** (5.91) | 0.716*** (7.89) | 0.655*** (7.24) | 0.659*** (7.26) | 0.561*** (6.20) |
| NPL | 0.182*** (4.41) | 0.135*** (3.08) | 0.144*** (3.30) | 0.151*** (3.63) | 0.152*** (3.73) | 0.187*** (4.57) | 0.0228 (0.96) | -0.0167 (-0.68) | -0.00644 (-0.27) | 0.00804 (0.35) | 0.0111 (0.49) | 0.0215 (0.91) |
| CONC | 0.0879** (2.22) | 0.173*** (3.95) | 0.121*** (2.96) | 0.0780* (1.92) | 0.0665* (1.65) | 0.0513 (1.25) | 0.0772*** (-2.98) | 0.0668** (-2.38) | 0.0681*** (-2.66) | 0.0817*** (-3.21) | 0.0684*** (-2.67) | 0.0827*** (-3.05) |
| GDP | -0.0306 (-0.62) | -0.0303 (-0.58) | -0.00634 (-0.12) | -0.0323 (-0.65) | -0.0322 (-0.65) | -0.0451 (-0.91) | -0.0411 (-1.23) | -0.0382 (-1.14) | 0.0256 (0.74) | 0.00872 (0.26) | 0.00907 (0.27) | -0.0425 (-1.27) |
| REG | -0.0866 (-0.37) | -0.127 (-0.52) | -0.359 (-1.38) | 0.0616 (0.26) | 0.0637 (0.27) | -0.161 (-0.68) | 0.0178 (0.12) | -0.0463 (-0.31) | 0.0188 (0.12) | 0.0578 (0.40) | 0.00995 (0.07) | 0.00926 (0.06) |
| SIZE | 5.996*** (-8.61) | 6.347*** (-7.95) | 6.351*** (-8.29) | 6.236*** (-8.99) | 5.567*** (-8.23) | 6.224*** (-8.95) | -7.429*** (-16.78) | 8.512*** (-16.71) | -7.731*** (-17.26) | -7.351*** (-17.33) | -7.306*** (-17.26) | -7.639*** (-17.25) |
| Islamic | -1.228 (-0.52) | -1.274 (-0.55) | -1.415 (-0.59) | -1.285 (-0.55) | -1.034 (-0.47) | -1.155 (-0.48) | 0.851 (0.37) | 0.230 (0.10) | 0.652 (0.29) | 1.080 (0.53) | 1.038 (0.51) | 0.698 (0.30) |
| Gov | 5.499** (2.29) | 5.636** (2.40) | 5.769** (2.38) | 5.567** (2.35) | 5.392** (2.42) | 5.611** (2.30) | 4.712** (1.96) | 4.735* (1.94) | 5.296** (2.22) | 5.473** (2.55) | 5.443** (2.55) | 4.835** (2.01) |
| Listed | 4.424* (1.80) | 5.156** (2.16) | 5.142** (2.08) | 5.031** (2.09) | 4.417* (1.95) | 4.558* (1.83) | 0.163 (0.08) | 0.627 (0.29) | 0.663 (0.31) | 1.215 (0.62) | 0.961 (0.49) | 0.419 (0.20) |
| PS | 1.096 (1.53) | | | | | | -0.122 (-0.29) | | | | | |
| GC | | 0.106*** | | | | | | 0.00685 | | | | |

Table 5. The impact of institutional variables on bank capital-Government Owned Banks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | TCR | | | | | | EQTA | | | | | |
| ROA | -0.0343 (-0.12) | -0.0562 (-0.19) | 0.0509 (0.17) | -0.0479 (-0.17) | 0.0360 (0.12) | 0.0163 (0.06) | 0.635*** (3.18) | 0.598*** (3.22) | 0.381* (1.94) | 0.439** (2.24) | 0.447** (2.28) | 0.646*** (3.28) |
| NPL | 0.217*** (2.62) | 0.179* (1.92) | 0.267*** (2.76) | 0.155* (1.81) | 0.241*** (2.89) | 0.239*** (2.86) | -0.0154 (-0.28) | -0.0544 (-1.01) | -0.00194 (-0.03) | -0.0227 (-0.43) | -0.0153 (-0.30) | -0.00269 (-0.05) |
| CONC | 0.239*** (3.40) | 0.263*** (3.30) | 0.280*** (3.82) | 0.195*** (2.72) | 0.181** (2.47) | 0.191*** (2.65) | -0.0639 (-1.39) | -0.0177 (-0.36) | -0.0591 (-1.32) | -0.0675 (-1.49) | -0.0711 (-1.59) | -0.0825* (-1.73) |
| GDP | 0.105 (1.17) | 0.171* (1.75) | 0.139 (1.42) | 0.119 (1.34) | 0.0752 (0.85) | 0.0569 (0.63) | -0.0626 (-1.09) | -0.0393 (-0.70) | 0.0716 (1.20) | 0.0188 (0.33) | 0.0168 (0.30) | -0.0772 (-1.33) |
| REG | -0.830** (-2.17) | -0.847** (-2.08) | -0.641 (-1.59) | -0.443 (-1.08) | -0.575 (-1.48) | -0.785** (-2.08) | -0.180 (-0.70) | -0.333 (-1.30) | 0.0304 (0.12) | -0.0161 (-0.06) | -0.00875 (-0.03) | -0.193 (-0.76) |
| SIZE | -3.790*** (-4.29) | -4.602*** (-3.90) | -3.215*** (-3.45) | -4.464*** (-4.94) | -4.550*** (-5.04) | -5.245*** (-5.24) | -7.275*** (-10.28) | -8.335*** (-9.24) | -8.284*** (-10.75) | -7.453*** (-11.40) | -7.455*** (-11.41) | -7.480*** (-10.77) |
| Islamic | -0.554 (-0.18) | -0.855 (-0.21) | -0.332 (-0.11) | -0.944 (-0.27) | -0.755 (-0.21) | -0.977 (-0.24) | -0.244 (-0.06) | -0.173 (-0.04) | -0.544 (-0.12) | -0.368 (-0.09) | -0.297 (-0.07) | -0.344 (-0.08) |
| Listed | 5.771 (1.63) | 6.483 (1.41) | 4.457 (1.31) | 6.721* (1.71) | 6.788* (1.70) | 7.681* (1.68) | -0.670 (-0.17) | 1.155 (0.24) | 1.281 (0.28) | -0.417 (-0.10) | -0.433 (-0.11) | -0.210 (-0.05) |
| PS | -1.733 (-1.41) | | | | | | 0.161 (0.19) | | | | | |
| GC | | 0.00323 (0.08) | | | | | | -0.00820 (-0.33) | | | | |
| RI | | | 0.276 (1.41) | | | | | | 0.0808 (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) | |
| 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). The independent variables are the following: ROA is the return on average assets. NPL is 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 if it is commercial. Gov is a dummy variable which takes the value of 1 if the government owns 75% 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. RESOLVINGI 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 6. The impact of institutional variables on bank capital- Non-government owned Banks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | TCR | | | | | | EQTA | | | | | |
| ROA | -0.256* | -0.00360 | -0.125 | -0.142 | -0.186 | -0.168 | 0.627*** | 0.554*** | 0.824*** | 0.760*** | 0.755*** | 0.629*** |
| | (-1.65) | (-0.02) | (-0.76) | (-0.90) | (-1.23) | (-1.09) | (7.83) | (6.66) | (10.19) | (9.45) | (9.40) | (7.86) |
| NPL | 0.173*** | 0.145*** | 0.151*** | 0.153*** | 0.130*** | 0.174*** | 0.0450** | 0.0209 | 0.0287 | 0.0388** | 0.0419** | 0.0431** |
| | (4.73) | (3.79) | (3.95) | (4.10) | (3.59) | (4.75) | (2.31) | (1.04) | (1.50) | (2.06) | (2.23) | (2.22) |
| CONC | 0.0471 | 0.120*** | 0.0765** | 0.0482 | 0.0490 | 0.0166 | -0.00439 | -0.0232 | -0.00204 | -0.00984 | -0.00334 | -0.0135 |
| | (1.47) | (3.42) | (2.22) | (1.41) | (1.49) | (0.50) | (-0.21) | (-1.03) | (-0.10) | (-0.47) | (-0.16) | (-0.63) |
| GDP | -0.0853* | -0.107** | -0.106** | -0.0988** | -0.0960** | -0.0902** | -0.0149 | -0.00718 | 0.0155 | 0.0110 | 0.00916 | -0.0131 |
| | (-1.95) | (-2.34) | (-2.25) | (-2.20) | (-2.21) | (-2.07) | (-0.52) | (-0.25) | (0.52) | (0.38) | (0.32) | (-0.46) |
| REG | 0.00596 | -0.0449 | -0.276 | 0.0348 | 0.137 | -0.0484 | 0.00853 | 0.0199 | -0.0177 | -0.0129 | -0.0394 | 0.0159 |
| | (0.03) | (-0.21) | (-1.16) | (0.16) | (0.66) | (-0.23) | (0.07) | (0.16) | (-0.13) | (-0.10) | (-0.31) | (0.13) |
| SIZE | -5.028*** | -4.376*** | -4.393*** | -4.800*** | -4.530*** | -5.157*** | -5.383*** | -6.496*** | -5.508*** | -5.184*** | -5.123*** | -5.582*** |
| | (-8.58) | (-6.58) | (-6.95) | (-8.10) | (-7.97) | (-8.70) | (-14.56) | (-14.97) | (-14.43) | (-14.43) | (-14.28) | (-15.02) |
| Islamic | -1.412 | -1.329 | -1.402 | -1.405 | -1.365 | -1.427 | 0.473 | -0.0455 | 0.406 | 0.821 | 0.755 | 0.326 |
| | (-0.62) | (-0.63) | (-0.66) | (-0.64) | (-0.66) | (-0.63) | (0.24) | (-0.02) | (0.21) | (0.47) | (0.43) | (0.16) |
| Listed | 6.148*** | 5.836*** | 6.011*** | 6.192*** | 5.767*** | 6.261*** | 2.800 | 3.861* | 2.915 | 3.511** | 3.257* | 3.179* |
| | (2.70) | (2.66) | (2.74) | (2.74) | (2.67) | (2.73) | (1.48) | (1.86) | (1.54) | (2.03) | (1.88) | (1.67) |
| 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) | | | | | | (1.70) | | |
| FO | | | | | 0.385*** | | | | | | | -0.0312 |
| | | | | | (8.46) | | | | | | | (-1.27) |
| CPI | | | | | | 0.124*** | | | | | | 0.0430 |
| | | | | | | (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) |
| 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). The independent variables are the following: ROA is the return on average assets. NPL is 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 if it is commercial. Gov is a dummy variable which takes the value of 1 if the government owns 75% 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. RESOLVINGI 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. The impact of institutional variables on bank capital-Islamic Banks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|--------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | TCR | | | | | | EQTA | | | | | |
| ROA | 0.205 (0.95) | 0.350* (1.69) | 0.359* (1.70) | 0.249 (1.16) | 0.127 (0.60) | 0.227 (1.05) | 0.657*** (3.66) | 0.733*** (4.07) | 0.988*** (5.71) | 0.790*** (4.56) | 0.784*** (4.34) | 0.581*** (3.27) |
| NPL | 0.127 (1.18) | 0.108 (1.10) | 0.0854 (0.85) | 0.109 (1.01) | 0.104 (0.99) | 0.101 (0.92) | 0.110 (1.59) | 0.0442 (0.62) | 0.0992 (1.55) | 0.114* (1.74) | 0.102 (1.53) | 0.0788 (1.17) |
| CONC | -0.0314 (-0.38) | -0.196** (-2.11) | -0.0868 (-1.13) | -0.0586 (-0.70) | -0.120 (-1.42) | -0.0551 (-0.65) | -0.0151 (-0.21) | -0.0267 (-0.34) | 0.0430 (0.66) | -0.0200 (-0.30) | -0.00874 (-0.13) | -0.0823 (-1.12) |
| GDP | 0.0664 (0.93) | 0.0871 (1.29) | 0.0707 (1.02) | 0.0681 (0.95) | 0.0845 (1.21) | 0.0593 (0.79) | -0.0642 (-0.80) | -0.0680 (-0.90) | -0.0379 (-0.49) | 0.000635 (0.01) | 0.00110 (0.01) | -0.113 (-1.41) |
| REG | 0.121 (0.25) | 0.0534 (0.13) | -0.217 (-0.52) | -0.0872 (-0.20) | -0.101 (-0.24) | -0.207 (-0.48) | -0.738* (-1.81) | -1.016*** (-2.58) | -0.732* (-1.91) | -0.506 (-1.29) | -0.649* (-1.66) | -0.807** (-2.03) |
| SIZE | -4.374*** (-3.87) | -3.999*** (-3.31) | -3.528*** (-2.84) | -4.638*** (-3.83) | -4.548*** (-3.96) | -4.566*** (-3.80) | -8.731*** (-8.57) | -10.65*** (-9.35) | -9.226*** (-9.28) | -8.474*** (-8.47) | -8.362*** (-8.33) | -9.213*** (-8.96) |
| Gov | 1.883 (0.50) | 1.249 (0.34) | 0.947 (0.25) | 1.954 (0.51) | 1.849 (0.49) | 1.965 (0.51) | 6.748 (1.64) | 6.810 (1.54) | 6.729 (1.64) | 6.064 (1.48) | 6.067 (1.45) | 7.072* (1.72) |
| Listed | 4.809 (1.38) | 4.430 (1.32) | 3.840 (1.10) | 4.870 (1.37) | 4.847 (1.40) | 5.025 (1.43) | -1.335 (-0.36) | -0.289 (-0.07) | -1.375 (-0.37) | -1.524 (-0.41) | -2.021 (-0.54) | -0.823 (-0.22) |
| PS | 2.832* (1.65) | | | | | | 1.470 (1.16) | | | | | |
| GC | | 0.123** (2.38) | | | | | | 0.0300 (0.66) | | | | |
| RI | | | -0.0284 (-0.17) | | | | | | 0.0514 (0.35) | | | |

| | | | | | | | | | | | | | |
|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| EF | | | | 0.193 (1.34) | | | | | | 0.305** (2.17) | | | |
| FO | | | | | 0.449*** (3.00) | | | | | | | 0.0634 (0.56) | |
| CPI | | | | | | 0.0546 (0.57) | | | | | | | 0.302*** (3.15) |
| constant | 76.97*** (3.92) | 70.12*** (3.54) | 65.96*** (3.11) | 67.77*** (3.37) | 55.73*** (2.79) | 75.62*** (3.79) | 143.8*** (8.53) | 168.6*** (9.33) | 143.6*** (8.73) | 120.5*** (7.10) | 131.8*** (7.98) | 142.7*** (8.73) | |
| 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). The independent variables are the following: ROA is the return on average assets. NPL is 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 if it is commercial. Gov is a dummy variable which takes the value of 1 if the government owns 75% 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. RESOLVINGI 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 8. The impact of institutional variables on bank capital- Commercial Banks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|--------|----------------------|-----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | TCR | | | | | | EQTA | | | | | |
| ROA | -0.458** (-2.55) | -0.411** (-2.22) | -0.437** (-2.36) | -0.411** (-2.25) | -0.376** (-2.13) | -0.380** (-2.11) | 0.477*** (5.55) | 0.387*** (4.44) | 0.440*** (5.06) | 0.435*** (4.96) | 0.423*** (4.85) | 0.481*** (5.55) |
| NPL | 0.185*** (5.21) | 0.143*** (3.75) | 0.158*** (4.18) | 0.151*** (4.13) | 0.157*** (4.53) | 0.192*** (5.43) | 0.0167 (0.99) | 0.00483 (0.28) | -0.0122 (-0.73) | 0.00359 (0.22) | 0.00411 (0.26) | 0.0143 (0.85) |
| CONC | 0.0739** (2.41) | 0.125*** (3.66) | 0.0912*** (2.78) | 0.0638** (1.96) | 0.0525* (1.67) | 0.0431 (1.36) | 0.0136 (0.80) | 0.00916 (0.50) | 0.00911 (0.54) | 0.00737 (0.44) | 0.0123 (0.74) | 0.0156 (0.89) |
| GDP | -0.0586 (-1.30) | -0.0444 (-0.92) | -0.0369 (-0.75) | -0.0550 (-1.19) | -0.0597 (-1.34) | -0.0614 (-1.37) | -0.0265 (-1.09) | -0.00650 (-0.26) | 0.0324 (1.27) | 0.00790 (0.33) | 0.00615 (0.25) | -0.0269 (-1.10) |
| REG | -0.242 (-1.23) | -0.333 (-1.63) | -0.508** (-2.25) | -0.136 (-0.67) | -0.0866 (-0.44) | -0.278 (-1.41) | 0.137 (1.32) | 0.182* (1.75) | 0.128 (1.14) | 0.104 (1.04) | 0.0781 (0.77) | 0.122 (1.18) |
| SIZE | -4.448*** (-8.08) | -3.977*** (-6.23) | -3.436*** (-5.84) | -4.377*** (-8.10) | -3.991*** (-7.73) | -4.732*** (-8.62) | -4.838*** (-15.15) | -6.015*** (-16.01) | -4.793*** (-14.54) | -4.748*** (-15.93) | -4.777*** (-16.02) | -5.011*** (-15.85) |
| Gov | 4.056** (2.01) | 3.839* (1.95) | 3.378* (1.83) | 3.968** (2.02) | 3.787** (2.07) | 4.495** (2.18) | 3.888** (2.05) | 4.757** (2.20) | 4.219** (2.23) | 4.426*** (2.61) | 4.435*** (2.60) | 4.126** (2.15) |
| Listed | 5.965*** (2.98) | 5.665*** (2.89) | 5.110*** (2.77) | 5.754*** (2.88) | 5.121*** (2.75) | 6.284*** (3.07) | 2.646 (1.53) | 3.744* (1.89) | 3.084* (1.78) | 3.784** (2.37) | 3.723** (2.33) | 2.915* (1.66) |
| PS | 0.520 (0.97) | | | | | | -0.394 (-1.46) | | | | | |
| GC | | -0.0914*** (-5.46) | | | | | | 0.00164 (0.19) | | | | |
| RI | | | -0.148** (-2.36) | | | | | | -0.0267 (-0.90) | | | |

| | | | | | | | | | | | | |
|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| EF | | | | 0.335*** | | | | | | 0.0307 | | |
| | | | | (4.50) | | | | | | (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) | (15.40) | (16.27) | (15.14) | (14.86) | (16.35) | (16.27) |
| 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 commercial 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). The independent variables are the following: ROA is the return on average assets. NPL is 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 if it is commercial. Gov is a dummy variable which takes the value of 1 if the government owns 75% 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. RESOLVINGI 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 9. The impact of institutional variables on bank capital-Unlisted Banks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | TCR | | | | | | EQTA | | | | | |
| ROA | -0.628** (-2.53) | -0.189 (-0.68) | -0.420 (-1.51) | -0.717*** (-2.77) | -0.816*** (-3.25) | -0.811*** (-3.28) | -0.151 (-1.24) | -0.0149 (-0.13) | 0.0596 (0.46) | -0.0799 (-0.62) | -0.0632 (-0.50) | -0.158 (-1.32) |
| NPL | 0.175*** (3.40) | 0.0670 (1.20) | 0.125** (2.23) | 0.149*** (2.73) | 0.166*** (3.19) | 0.181*** (3.47) | 0.0105 (0.43) | -0.0326 (-1.41) | -0.0127 (-0.51) | -0.00307 (-0.13) | -0.00594 (-0.25) | 0.0123 (0.51) |
| CONC | -0.150** (-2.08) | 0.00716 (0.09) | -0.0361 (-0.46) | -0.0463 (-0.60) | -0.00599 (-0.08) | -0.0824 (-1.19) | -0.0219 (-0.64) | 0.0392 (1.12) | -0.0487 (-1.39) | -0.00815 (-0.24) | -0.0164 (-0.48) | -0.0261 (-0.79) |
| GDP | -0.123 (-1.50) | -0.0946 (-1.05) | -0.0796 (-0.87) | -0.143 (-1.64) | -0.107 (-1.23) | -0.0941 (-1.13) | 0.0179 (0.44) | -0.0245 (-0.62) | 0.0108 (0.25) | -0.00386 (-0.09) | -0.0117 (-0.28) | 0.0261 (0.64) |
| REG | -0.662 (-1.64) | -0.701* (-1.70) | -0.680 (-1.55) | -0.624 (-1.49) | -0.508 (-1.21) | -0.689* (-1.69) | 0.454** (2.50) | 0.313* (1.89) | 0.414** (2.30) | 0.352* (1.96) | 0.293 (1.59) | 0.455** (2.53) |
| SIZE | -5.048*** (-5.68) | -4.484*** (-4.48) | -4.277*** (-4.28) | -5.737*** (-6.46) | -5.014*** (-5.70) | -6.238*** (-6.87) | -5.964*** (-12.76) | -5.586*** (-10.38) | -5.851*** (-11.29) | -5.788*** (-12.90) | -5.961*** (-12.96) | -6.080*** (-13.23) |
| Islamic | -3.725 (-0.79) | -3.423 (-0.77) | -3.359 (-0.76) | -3.678 (-0.73) | -3.560 (-0.77) | -3.429 (-0.64) | 2.601 (0.58) | 2.570 (0.62) | 2.687 (0.64) | 2.418 (0.63) | 2.382 (0.61) | 2.490 (0.56) |
| Gov | 6.107 (1.46) | 5.692 (1.45) | 5.462 (1.40) | 6.175 (1.39) | 5.784 (1.42) | 6.442 (1.37) | 3.450 (0.83) | 3.043 (0.78) | 3.135 (0.80) | 3.684 (1.03) | 3.698 (1.03) | 3.689 (0.89) |
| PS | -3.690*** (-3.60) | | | | | | -0.162 (-0.34) | | | | | |
| GC | | -0.161*** (-4.48) | | | | | | 0.00954 (0.66) | | | | |
| RI | | | 0.0603 (0.41) | | | | | | 0.155** (2.43) | | | |

| | | | | | | | | | | | | |
|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| EF | | | | 0.296* | | | | | | -0.0589 | | |
| | | | | (1.70) | | | | | | (-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) | (11.00) | (11.25) | (11.35) |
| 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). The independent variables are the following: ROA is the return on average assets. NPL is 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 if it is commercial. Gov is a dummy variable which takes the value of 1 if the government owns 75% 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. RESOLVINGI 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 10. The impact of institutional variables on bank capital – Listed Banks

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
|---------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | TCR | | | | | | EQTA | | | | | |
| ROA | 0.317** (2.06) | 0.332** (2.08) | 0.357** (2.27) | 0.339** (2.17) | 0.353** (2.31) | 0.377** (2.43) | 0.856*** (9.46) | 0.723*** (7.70) | 0.939*** (10.40) | 0.898*** (10.10) | 0.893*** (9.98) | 0.859*** (9.55) |
| NPL | 0.169*** (3.84) | 0.151*** (3.15) | 0.151*** (3.26) | 0.147*** (3.26) | 0.139*** (3.16) | 0.167*** (3.79) | 0.0653*** (2.63) | 0.0596** (2.26) | 0.0686*** (2.81) | 0.0696*** (2.91) | 0.0744*** (3.13) | 0.0629** (2.55) |
| CONC | 0.112*** (3.84) | 0.137*** (4.15) | 0.130*** (4.27) | 0.116*** (3.78) | 0.0960*** (3.16) | 0.0939*** (3.01) | -0.0174 (-0.79) | -0.0362 (-1.51) | -0.00661 (-0.30) | -0.0234 (-1.07) | -0.0213 (-0.96) | -0.0368 (-1.59) |
| GDP | -0.0247 (-0.57) | -0.0171 (-0.36) | -0.00185 (-0.04) | -0.0110 (-0.25) | -0.0458 (-1.05) | -0.0368 (-0.84) | -0.0748** (-2.27) | -0.0382 (-1.11) | 0.0365 (1.05) | 0.00471 (0.14) | 0.00272 (0.08) | -0.0840** (-2.55) |
| REG | 0.137 (0.72) | 0.0484 (0.24) | -0.128 (-0.61) | 0.160 (0.81) | 0.190 (0.99) | 0.0453 (0.24) | -0.269* (-1.95) | -0.232 (-1.64) | -0.281* (-1.85) | -0.179 (-1.33) | -0.191 (-1.40) | -0.282** (-2.05) |
| SIZE | -4.783*** (-8.65) | -5.254*** (-7.60) | -4.349*** (-7.37) | -4.622*** (-8.17) | -4.659*** (-8.41) | -4.855*** (-8.50) | -5.492*** (-13.46) | -7.173*** (-14.42) | -5.607*** (-13.33) | -5.368*** (-13.42) | -5.318*** (-13.30) | -5.781*** (-13.97) |
| Islamic | -0.677 (-0.39) | -1.063 (-0.58) | -0.472 (-0.28) | -0.635 (-0.37) | -0.621 (-0.36) | -0.852 (-0.48) | -0.280 (-0.18) | -1.301 (-0.68) | -0.781 (-0.50) | -0.664 (-0.45) | -0.627 (-0.42) | -0.519 (-0.33) |
| Gov | 4.133** (2.17) | 4.552** (2.28) | 3.941** (2.12) | 4.037** (2.14) | 3.983** (2.12) | 4.220** (2.20) | 2.954* (1.73) | 4.252** (1.98) | 3.363* (1.92) | 3.240* (1.94) | 3.223* (1.94) | 3.092* (1.76) |
| PS | 2.364*** (4.03) | | | | | | 0.323 (0.80) | | | | | |
| GC | | -0.0276 (-1.58) | | | | | | 0.0158 (1.30) | | | | |
| RI | | | -0.149** (-2.55) | | | | | | -0.0702* (-1.74) | | | |

| | | | | | | | | | | | | | |
|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|--|
| EF | | | | 0.219*** | | | | | | 0.0826* | | | |
| | | | | (3.19) | | | | | | (1.71) | | | |
| FO | | | | | 0.314*** | | | | | | 0.0177 | | |
| | | | | | (6.39) | | | | | | (0.60) | | |
| 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) | (8.20) | (8.19) | (7.08) | (6.97) | (9.02) | (14.08) | (14.99) | (13.98) | (12.81) | (13.75) | (14.63) | |
| 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). The independent variables are the following: ROA is the return on average assets. NPL is 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 if it is commercial. Gov is a dummy variable which takes the value of 1 if the government owns 75% 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. RESOLVINGI 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.

