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Determinants of the Capital Adequacy Ratio Islamic Versus Conventional Banks in MENA Region

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Abstract

Aim - This paper investigates the Bank-particular and country-level factors of the capital adequacy ratio of conventional and Islamic banks in the MENA region in a comparative manner.

Methodology -Data for all variables related to banks were collected from the Fitch database, while the data for macroeconomic was collected from the Bloomberg database, World's bank database, and Transparency International website. Control variable used to account for differences in bank characteristics and macroeconomic conditions for the MENA region countries. Descriptive analysis was used to describe data and a two regression models are applied to test a population of 334 banks (282 conventional banks and 52 Islamic banks) from 2010 to 2019 from 17 countries in the MENA region namely; Algeria, Bahrain, Morocco, Egypt, Jordan, Kuwait, Qatar, Oman, Saudi Arabia, Lebanon, Tunisia, Syria, Israel, Yemen, the United Arab Emirates, and Gaza.

Results- The pooled cross- sectional regression analysis shows that for all banks in the MENA region, the liquidity, deposits, loans, corruption index, size, and GDP are negatively associated with the capital adequacy ratio. In contrast, profitability, credit risk, and governance index are associated positively with the capital adequacy ratio. Moreover, it shows a significant distinction among the capital adequacy ratio of conventional and Islamic banks across the MENA region and conventional banks hold higher capital adequacy ratios than Islamic banks. However, the panel regression findings provide evidence that the influence of the profitability and governance index factors on the capital adequacy ratio differs significantly between conventional and Islamic banks. For conventional banks, the panel data regression analysis shows that profitability and governance quality are significantly and positively correlated with the capital adequacy ratio. While, deposits, size, and loans are significantly negatively associated with the capital adequacy ratio and liquidity and credit risk do not have any significant relationship with the capital adequacy ratio. For Islamic banks, only deposits, loans, size, and GDP show a significant adverse relation with the capital adequacy ratio. This comparison study contributes to the literature by allowing regulators to see whether the factors that influence the capital adequacy ratio as defined by Basel II criteria are identical for both banking systems or whether the difference in conceptual backgrounds of both banking systems impedes adherence to the same regulation.

Keywords: Capital Adequacy ratio, Islamic Banks , Conventional Banks , IFSB, AAOIFI, BCBS

1. Introduction

The importance of a bank capital does extend beyond maintaining the financial institutions' daily operations and the long-term viability. Bank capital, without a doubt, acts as a safety net against bank losses. So, if a bank fails, the higher the capital is, the greater the loss to shareholders happens. As a result, shareholders of highly capitalized banks should be more at risk-averse than those of low-capitalized banks. On the other hand, Elbannan (2017), argues that while banks are primarily concerned with profit maximization, the regulatory authorities are more keen with enacting the most suitable rules and guidelines to maximize their responsibility for ensuring consistency and stability of the financial markets. One of the primary goals for banking authorities is to improve capital adequacy criteria, which are regarded as a critical instrument for increasing the trustworthiness and viability of banking activities. Thus, all banking regulators globally use the framework of risk-weighted capital adequacy established by the Basel Committee on Banking Supervision (BCBS) to ensure that banks have enough capital. In 1988, the first risk-weighted capital adequacy requirement known as Basel, was established and required banks to hold 8% of risk-adjusted assets as a minimum level of capital, including Tier I capital (equity capital and declared reserves) and Tier II capital (other capital such as; long term debt, hybrid instruments, and undisclosed reserves). Basel II replaced Basel I in 2004, and in response to the global financial crisis of 2008, BCBS established additional rules in 2013 to impose stricter capital requirements known as Basel III. In contrast, several prior studies have identified a strong link between the minimum capital adequacy ratio and bank risk-taking behavior (Albaity et al., 2021; Bitar et al., 2018). Furthermore, according to Ahmed & Albaity (2019), the financial institutions affected by the Asian crisis of 1997–1999 and the recent global financial crisis of 2007–2009, had capital

ratios that were higher than the minimum required levels prior to the crisis. They indicated that the leading cause of these crises was the poor quality of the financial institutions' assets rather than that the financial institutions were insolvent. As a result, instead of focusing on the level of capital that banking institutions should retain, regulators should pay attention to variations in the quality of their investment portfolios. Although the Basel I, II, and III standards are in place to raise capital, straighten the leverage ratios, amend provisioning regulations, and adjust liquidity criteria, their standards do not include the unique peculiarities of specific financial institutions, such as Islamic banks (Johnes et al., 2014; Badalashvili, 2017).

Islamic finance and banking have expanded speedily over the last three decades, according to the Islamic Finance Service Board (IFSB, 2013). From 2004 to 2011, the Islamic banking industry grew by 38 %; furthermore, the Shari'a-compliant financial industry's total assets hit US\$2.5 trillion in 2017 (IFSB, 2018). According to IFSB (2020), the Islamic banking industry grew 14% in 2019 with total assets of \$2.88 trillion, equating to \$1.99 trillion of the global banking sector's total assets, and the Islamic finance global assets are expected to reach \$3.69 trillion by 2024. In addition, Islamic banking's market share has surpassed 20% in numerous countries, demonstrating its potential as a viable alternative to conventional banks (El-chaarani & Shaker, 2018). In addition to the Islamic banks' remarkable expansion, Islamic banks were not directly influenced by the global financial crisis of 2007-2008, in contradistinction to the conventional banks that were directly and negatively affected (Hamdan, 2009; Beck et al., 2013). As a result, Islamic banks' behavior raises many concerns about the industry's development and draws attention to the need for particular rules for Islamic banks that account for their unique characteristics as a result of the nature of their assets and financial operations (Mejía et al., 2014; El-Ansary et al., 2019).

As a consequence, the Islamic Financial Services Board (IFSB); an international regulatory organization established in 2005 to boost the development and stability of the Islamic financial industry, published a set of guidelines that balanced Basel guidelines and the characteristics of Islamic banks called the Core Principles for Islamic Finance Regulation (CPIFRs). However, not all Islamic banks have fully implemented the CPIFRs and continued to follow Basel guidelines that challenge Islamic banks in applying its standards (IFSB, 2015b). Accordingly, in countries with dual banking systems, Islamic and conventional banks tend to adhere to the same regulatory framework (Meslier et al., 2017; Bitar et al., 2020). However, if banking systems are functioning efficiently, this could enhance the economy by increasing the profitability and increasing capital buffers that absorb the risk, if some of the savings are used efficiently to strengthen safety and soundness (Nuhiu et al., 2017).

Thus, this study aims first to investigate the bank factors that may impact the ratio of capital adequacy in addition to the macroeconomic variables that may have an impact on the capital adequacy ratio. Second, to investigate whether there is difference between the capital adequacy ratio for Islamic and conventional banks operating in the MENA region countries. Some authors concluded that Islamic banks were more capitalized than conventional banks (e.g. Zins and weill, 2017; Bitar et al., 2020). Additinally, to examine whether the same variable have the same impact on the capital adequacy ratio for Islamic and conventional banks.

2-Literature Review and the Hypothesis

2-1 Capital Adequacy Theories

According to the financial intermediation theory, which was first put forth by Schumpeter in 1939, financial intermediation is centred on reducing the costs associated with producing knowledge in order to address complex issues. The advantage of an intermediary being under supervision over depositors is best understood in the context of financial intermediation (Diamond & Douglas, 1984). The best contracts and a significant allocation are made possible by financial intermediation, which is beneficial for the process (Pyle, 1971). Loans and deposits without significant leverage typically have a low likelihood of defaulting. The likelihood of default is still low with the supervision and diversification approach, though. Santomero (1997) and Bikker et al. (2003), among others, further stated that banks and financial intermediaries in general are able to reduce the liquidity risk associated with the flow of funds from surplus parties (depositors) by acting as agents of parties who need money (borrowers), which is why they are able to exist. Therefore, and according to the intermediation theory of financial intermediary institutions, banks are viewed as a solution to these issues because they have a comparative advantage when it comes to information about the crediting values of debtors (Scholes et al., 1976). In addition, banks are better able to monitor debtors than individual creditors as they can provide more liquidity than money raised from the other business sectors and they can issue securities as well (Gropp & Heider, 2010). Furthermore, according to the risk management theory, credit is the provision of money or an equivalent claim supported by a loan agreement or an agreement between a bank and another party that calls for the borrowing party to repay its debt with interest after a specific amount of time (Amaliah et al., 2019).

Accordingly, credit risk is the possibility that a client, debtor, or counterpart will not be able to meet their financial commitments under the terms of the contract or agreement that has been reached. As a result, this concept can be broadened to include risk that results from declining credit quality (Masood et al., 2016). Thus, banks as intermediary financial institutions that receive public funds and then distribute them back to customers in the form of credit and to maintain their reputation as reputable institutions, banks must exercise caution in all of their operational activities (Masood et al., 2016). Additionally, banks should minimise the negative consequences of risk on financial outcomes and bank capital by risk management in bank operations encompasses risk identification, measurement, and assessment (Zhang et al., 2016). Therefore, banks must create a unique organisational unit for risk management purposes. In a broad sense, a bank's ability to withstand loan losses depends on the income from other lucrative loans and on its capital (Amaliah et al., 2019). Therefore, the success of financial institutions and banks depends on capitalization decisions. In this regard, banks are required to adhere to strict international and national norms. In order to guarantee the stability and solvency of the banking system in any nation, bank capital regulations are in place (Zhang et al., 2016). Accordingly, and from a functional aspect, the adequacy of capital can be considered the size of capital that can spread protection to its customers through its ability to absorb losses related to insolvency and liquidation risks that the bank might face while giving credits (Belkhir et al., 2016). As a result, banks with inadequate capital suffer from some restrictions, because their management is heavily working out how to increase capital to guard themselves against possible different risks. Thus, the primary function of adequate capital is to provide banks with the required buffer or shield to absorb any unexpected losses and protect the bank solvency (Hewaidy & Alyousef, 2018). Batten and VO (2019), argue that among the capital requirements proposed by BASEL committee, the capital adequacy ratio is most important

for several reasons, such as; first, it affects the bank's profitability rate. Second, it is the bank's tool to minimize the operating losses and increase the banks' creditability to their customers. Finally, it proves the banks' ability to enrich their long-term capital expenditures and ventures. Therefore, capital regulation's significance in securing banks' stability has motivated many researchers to investigate the determinants of banks' capital adequacy since the introduction of the Basel accord and increased after the US financial crisis (Batten and VO, 2019).

2-2 Empirical Evidence of the Determinants of Capital Adequacy Ratio (CAR) and Developed Hypotheses

Although using the legal regulations to determine the bank's capital structure has been admitted for a long time, the results obtained from empirical studies in both developed and developing countries indicate that banks, on average, keep capital levels over the legal requirements. For example, Juca et al. (2012a) stated that the biggest twenty banks in Brazil keep about an 18% minimum level of capital, while the legal requirement according to the Basel committee is only 8%. Similarly, Aljoman Centre (2015) reported that the capital adequacy ratio of all banks in Kuwait is above what is required by the Basel standard and by the central bank of Kuwait (CBK). The high level of CAR indicates the additional capital for additional investments owned by banks. Nevertheless, if the banks are not cautious in evaluating the risk of their potential investments, they might be exposed to a higher level of risk. Thus, these results denote that factors impact other than regulation in interpreting and determining banks' capital adequacy ratio. As a result, there have been several studies about the determinants of a bank's capital adequacy ratio, with the majority of these studies focusing on determinants linked to bank- specific factors such as size, risk, profitability, asset, deposits to assets, management loans, liquidity, and so on, and only a few studies considering macroeconomic factors as determinants of a bank's capital adequacy ratio (Al-

Tamimi and Obeidat 2013; Polat and Al-Khalaf 2014; Alajmi and Alqasem 2015; Mili et al. 2017; Hewaidy and Alyousef 2018). In addition, a few studies have examined the MENA region context. Moreover, Aktas et al. (2015) stated in their study conducted in banks of 10 countries of south-eastern Europe, namely; Albania, Bosnia, Bulgaria, Croatia, Greece, Macedonia, Montenegro, Romania, Serbia, and Slovenia, over the period 2007-2012, that return on assets, bank's size, liquidity, net interest margin, and risk have a remarkable effect role in the capital adequacy ratio. Furthermore, in their investigation, Octavia and Brown (2009) highlighted that macroeconomics factors are less influential in determining the capital structure based on the 56 banks from 10 developing countries discussed in this study. While on the other hand, Vu and Nahm (2013) noted GDP and inflation rate as macroeconomics factors that have significantly affected bank profit efficiency in Vietnam. However, there is no agreement on how the drivers of the capital adequacy ratio for banks affect the capital adequacy ratio, whether these drivers represent banks' characteristics or macroeconomic factors. For example, a study has been conducted in Jordan listed commercial banks from 2000 through 2008 by (Al-Tamimi and Obeidat, 2013) using the OLS; they stated that there is a positive effect of liquidity and return on assets on the capital adequacy ratio and a significant negative correlation between CAR and credit risk. These results are consistent with Kalifa and Bektaş (2018), who noted that profitability, leverage, and credit risk positively impacted the capital adequacy ratio of Islamic banks of QISMUT countries from 2005 to 2014. In addition, they marked that some macroeconomics variables such as market capitalization and exchange rates significantly influence a bank's capital adequacy ratio.

While, on the other hand, in Kuwait, Hewaidy and Alyousef (2018) investigated the effects of some banks' variables on the capital adequacy ratio within the period 2009–2016 using a simple multiple regression model, and their outcomes suggest that the capital adequacy ratio has been affected negatively by bank size, liquidity and asset quality in addition to a massive effect by the management efficiency on the CAR. Although the results obtained by Masood and Ansari (2016), showed that a bank's profitability, size, and non-performing loans do not affect the ratio of capital adequacy of Pakistani banks, the equities ratio and the deposit asset ratio revealed a positive correlation with CAR, while the concentration of ownership and credit risk has a significant adverse effect on the ratio of capital adequacy.

Nevertheless, studies that explored developed countries found that several factors could affect banks' capital adequacy ratio. For example, Badalashvili (2016) studying the Greece banks over the period 2001-2015, found that asset structure, non-performing loans had a significant adverse effect on capital adequacy level while ROA, net interest margin, and inflation do not have any significant relationship with CAR. Moreover, a positive relationship between the level of risk-taking, banks' liquidity, and capital adequacy level has been noticed by Altunbas et al. (2007) for large European banks from 1992 to 2000. This finding proved regulatory bodies' consideration to controlling the risk level with a sufficient level of money because they discovered that the greater the financial consistency of businesses, the lower the degree of risk and capital the banks possess. The studies that tested the determinants of CAR of Islamic banks calculated based on the Basel II accord were conducted in Indonesian Islamic banks between 2009 and 2011 by Abusharba et al. (2013). Their results derived from the multiple regression analysis stated that ROA and liquidity have positively impacted CAR, while non-performing finance has an adverse impact without significant deposit structure and operating efficiency on the capital adequacy ratio. Otherwise,

Elsiefy (2013) conducted a comparative analysis between Islamic and conventional banks in Qatar, and capital adequacy was utilized as an explanatory.

variable. His outcomes showed that profitability has a negative relationship with CAR conventional banks, which such a relation was not significant in Islamic banks. In addition to the recent research conducted by Bitar et al. (2018), that applied to the Islamic banks in 28 countries from MENA and SEA from 1999-to 2013. Their results showed a positive impact on the size, profitability, and liquidity of the capital adequacy ratio, while the GDP has a negative impact. On the other hand, prior studies found mixed results on the determinant of CAR because the results were inconsistent. For example, in some studies, some factors were shown to have a positive influence, while in others, the same ones were found to have a negative or no effect. These results can be rationalized by the fact that these studies were conducted in various countries with varying rules and economic conditions, that each study utilized different methodologies to examine its data, and that each study covered a different period. Over and above, only a few studies have considered macroeconomics variables as a determinant of CAR. Therefore, this study contributes to this area of research by testing how some of the most common bank's factors and some macroeconomic, regulatory factors in the bank's home country assist determine the adequacy level of capital not just for conventional banks, as well as for Islamic banks covering all countries in the MENA region. Moreover, this research examines three economic indicators and three bank-specific factors that may help determine banks' CAR.

2-2-1 Banks Specific Determinants

2.2.1.1 Profitability (ROA)

The term profitability refers to the ability of an entity to generate profit from all its business activities and available resources. Many studies assumed that the relationship between profitability and capital is positive (Bitar et al., 2018; Ben Moussa, 2018; Unvan et al., 2020). They built this assumption based on the results they found that approved the fact that the majority of the organizations tend to use retained earnings rather than external financing methods to finance their investment. This finding was in line with results found by El-Ansary & Hafez (2015) in their investigation of determinants of CAR in Egyptian banks from 2006 to 2012. Moreover, Unvan et al. (2020) noted in their study of the determinants of banks' CAR for Ghana banks from 2008 to 2017 that profitability has a significant positive effect on the level of capital. These results might be justified because the higher the bank's efficiency is in absorbing risk by keeping an adequate amount of capital, which will reduce risk and increase profitability. While on the other hand, Sivarama and Sukar (2014) and Badalashvili (2017) stated that profitability does not affect the capital adequacy ratio in their study applied to the USA and Greece banks, respectively.

Furthermore, profitability for Islamic banks is as relevant as it is in conventional banks. For example, Akhtar et al. (2011) noted a statistically significant positive relationship between Pakistani Islamic bank profitability and their capital adequacy ratios. This result is consistent with the results derived by Abusharba et al., (2013) who suggests the same positive relationship in the Indonesian Islamic banks. However, it is theoretically considered that the bank's high profitability will lead to a higher capital adequacy ratio than the bank will hold. Therefore, hypothesis one of this research can be stated as:

H1.1: "There is a significant relationship between the capital adequacy ratio (CAR) and profitability".

2.2.1.2 Liquidity Risk

The liquidity ratio has the same relevance importance for both banking systems, Islamic and conventional, as it reflects the ability of each bank to meet its daily liabilities and obligations (Almeida et al., 2014). In other words, the bank can lose 10% of its assets without any liquidity problems and face the threat of bankruptcy, if the bank has a capital adequacy ratio of 10%. This assumption has been established by many studies. Abusharba et al. (2013) found a significant positive relationship between capital adequacy ratio and liquidity ratio in Indonesian Islamic banks. For conventional banks, a positive impact of liquidity ratio on capital adequacy ratio has been stated by Al-Tamimi & Obeidat (2013) in Jordan banks. On the other hand, Maqbool (2018) examined the effect of liquidity on profitability and efficiency, she argued that the impact of the liquidity on profitability and efficiency is inverse which accordingly influence the capital adequacy ratio. Bitar et al. (2018) explained this inverse relation as there is no need for banks that own high liquid assets and a higher level of equity to borrow; therefore, the bankruptcy costs that these banks might face are low. Meanwhile, Büyükşalvarcı & Abdioğlu (2011) revealed that, based on their study that covered Turkish banks' annual reports from 2006 -to 2011, the relationship between liquidity and capital adequacy is not statistically significant. Accordingly, the relationship between liquidity and capital adequacy ratio still unclear. Therefore, a non directional hypothesis is stated as follows:

H1.2: "There is a significant relationship between the capital adequacy ratio (CAR) and liquidity risk".

2.2.1.3 Credit Risk

Credit risk generally refers to losses that banks can face when borrowers flop to confront the credit they owe to the bank following agreed terms (Amaliah et al., 2019). Therefore, loans are considered the most evident source of credit risk for most banks (BIS, 2014). In the banking sector, the credit risk reflects efficient performance, because if banks dishonor to pay their financial obligations, they will face insolvency and bankruptcy (Elsiefy 2013). Al-Tamimi and Obeidat (2013) found an inverse relationship between credit risk and the capital adequacy ratio for the conventional banks they studied in Jordan from 2000 - to 2008 using Multiple Linear Regression Analysis.

On the other hand, El-Ansary et al. (2019) found in their study conducted on Islamic and conventional banks from 2009-to 2013 in some MENA region countries that the credit risk of the conventional banks has a significant positive influence on the capital adequacy ratio, while it has no significant relation with CAR for Islamic banks. Meanwhile, in a sample of Saudi Arabian banks, Polat & Alkhalaf (2014) discovered no significant relation between capital adequacy and credit risk. This discrepancy in results could be because each study used a different credit risk measurement. Thus, hypothesis three is developed to be stated as follows:

H1.3: "There is a significant relationship between the capital adequacy ratio (CAR) and credit risk".

2.2.1.4 Deposits to Assets

Deposits are identified as the amounts of funds held in the bank by customers to gain interest. Therefore, the banks' primary source of credit is from these deposits and the central bank. Thus, as long as deposits increase, the bank regulations must be increased to pledge the depositor's money and reduce liquidity and bankruptcy risks (Al-Sabbagh 2004). Accordingly, deposits are

turned into an obligation to banks because they must pay interest to depositors based on the terms of the deposit's agreement. As a result, deposits appear under the liabilities section in the bank's balance sheet; regarding the system of conventional banks, these deposits are commonly classified into three categories: current deposits, saving deposits, and time deposits.

While in the Islamic banks' system, deposits are divided into three sorts: Wadiah demand deposits, Mudarabah saving deposits, and Mudarabah time deposits (Ismal, 2011). Moreover, IFSB (2018) stated that the nature of investment deposits in Islamic banks is riskier than conventional ones. Along with this concept, Mekonnen (2015), Masood and Ansari (2016), and Abba et al. (2018), in their studies conducted in three different countries, Ethiopia, Pakistan, and Nigeria, respectively, pointed out that the deposits to assets ratio is positively related to the capital adequacy ratio. Moreover, and within the Islamic banks' context, Karim et al. (2014) investigated the capital adequacy behavior of conventional and Islamic banks in 14 Organization of Islamic Conference (OIC) countries from 1999 to 2009. Their results stated a positive relationship between CAR and deposits to assets ratio in Islamic and conventional banks. On the other hand, Ogere et al. (2013) found a negative relationship between the deposits to assets ratio and capital adequacy ratio of Nigerian banks. Moreover, Ahmad & Albaity (2019) found that deposits have a significant negative influence on banks' capital adequacy ratio in some Asian countries, namely, Pakistan, Jordan, Indonesia, the Philippines, Saudi Arabia, and Thailand, from 2009 to 2018. This negative relationship might be justified because deposits are cheaper than external sources as a source of financing (Bokhari et al., 2012). Therefore, when deposits level decrease, the cost of external financing sources will increase, which means that banks need more funds to meet this cost of external capital (Ahmad & Albaity 2019). Accordingly, and based on the majority of the past

studies, this study considers the deposit ratio as one of the capital adequacy determinants that need to be tested. Thus, hypothesis four is developed to be stated as follows:

H1.4: "There is a significant relationship between the capital adequacy ratio (CAR) and bank deposits to assets ratio".

2.2.1.5 Loans

The Basel Capital Accord advised that when banks keep the minimum ratio of required capital adequacy ratios, the financial systems of these banks become more stable and efficient, because holding the minimum ratio of required capital adequacy decreases the bank's probability of failure and collapse (Bateni et al., 2014). As a result, besides the financial crisis, the regulatory authorities condense more efforts to strengthen banks by raising capital or lowering the number of risky assets (loans) on their balance sheets (Abba, 2013). Loans represent a significant section of any bank's assets because the prime function of any bank is to give loans to customers. Thus, the ratio of the total loans as a percentage of the total assets is very significant for many reasons; first, it is considered the leading indicator of a bank's position regarding the credit risk, and also the attached risks that could be related to the bank's resources that consist of advances and loans (Amaliah et al., 2019). Second, it reflects the bank's capital diversification of its assets (loans and investments). Finally, it measures the effect of loans inside the assets portfolio on capital. Therefore, many researchers investigated the relationship between capital and loans to assets ratios but showed mixed results. For example, Alajmi & Alqasem (2015) pointed out that the loans to assets ratio, has no significant relationship with the capital adequacy ratio for Kuwaiti banks.

While the results found by Ali et al. (2020) on the effect of the total loans to total assets on the capital adequacy ratio in Kuwaiti banks during 2009-to 2016, suggest that better loans to asset ratio of banks will lead to more steady banks as represented by CAR based on the significant

positive relationship found by them. Furthermore, Bateni et al. (2014) supports this positive relationship between the loans to assets ratio and the adequacy of capital in their studies conducted in Iranian banks. Additionally, Terzi & El-Ammari (2018), in their study to investigate the determiners of Islamic banking performance, included 10 Islamic banks in 10 different countries, namely; Sudan, Saudi Arabia, Bahrain, Turkey, Lebanon, Mauritania, Pakistan, Tunisia, Emirate, and Qatar between 2012 and 2014, they found that the ratio of loans to total assets has affected the ROA positively. This positive impact could be explained because loans are the primary source of income for the banking industry. On the contrary, a study conducted by Bitar and Tarazi (2019) to investigate the relationship between creditors' rights and capital decisions for conventional banks vs. Islamic banks in 24 different countries covering the period from 1999 to 2013 found a negative association between loans to assets ratio for the conventional banks only. As a result, banks with significant loan portfolios do not need to maintain a high capital ratio because they are less exposed to credit risk. Dreca (2013) justified this negative sign of the correlation between LAR and CAR as that when banks give more loans; it transfers it from capital which leads to a decrease in CAR. Therefore, this study considers banks' loans to assets ratio as a determinant of the capital adequacy ratio. Accordingly, hypothesis five is developed based on extant research as follows;

H1.5: "There is a significant relationship between the capital adequacy ratio (CAR) and loans to assets ratio".

2.2.3 Country Specific Determinants

Cerovic et al. (2017) suggest that bank regulation measures ought to be in accordance with the banking principles affected by the social, political, and institutional variables. In addition, (Chen et al., 2015), argues that factors like political stability, regulatory quality, government effectiveness, control of corruption, rule of law, voice and accountability, institutional quality, and

a country's governance system is critical for fostering efficiency in the banking system. In order to establish restraint in banking activities, reduce risk-taking actions, and advance consistency, banks are subject to laws such as capital requirements standards, insurance contracts, and strict government supervision (Uddin et al., 2020). Similarly, Bitar et al. (2017b) argues that modifications to the institutional setting have important policy ramifications for comprehending financial sector risk in the context of developing nations, yet the effect of these institutional environment characteristics on the banks' capitalization, however, was only briefly examined in a few past research. Based on these literature strands, this study hypothesizes the existence of a relationship between institution quality and bank capital. Furthermore, because this study focuses on the factors that determine capital adequacy ratios in MENA countries, it is important to control for the quality of each country's political and institutional systems and its impact on conventional and Islamic bank capital ratios. In light of this, the impact of the institutional environment on determining conventional and Islamic bank capital ratios is investigated in this study by looking at the various corruption and governance indices, which cover a wide range of institutional environment-related factors like Corruption levels, institutional quality, government stability, control of corruption, voice and transparency, and the legal system.

2.2.3.1 Corruption Perception Index

According to the World Bank (2019), corruption is dishonest behavior from the decision-makers by misusing their powers to violate the terms and rules to obtain illegal gains. Corruption can take many forms, such as officials offering or receiving bribes, committing fraud, nepotism, transferring wealth, under-the-table payments, and so on (Kunieda et al., 2016). Ashraf (2017), points out that the corruption may gradually skew banks' self-perception of their risk-taking levels,

enhance their tolerance to excessive risks, or push them to spend funds on more hazardous projects to satisfy a sticky return objective. Moreover, corruption can lead to enormous barriers to any economic progress and development in general and particularly in the banking sector because of the negative effect of the bad loan issues in the banking sector on the gross national saving rate (Hasan & Ashfaq, 2021).

Ali et al. (2020), examined the effect of corruption on the banks' asset quality of conventional banks, and he states that corrupt activities distort banks' ability to allocate loanable funds efficiently. Similarly, Bougatef (2015) approved that corruption obstructs Islamic banks from allocating their resources ideally. Based on this, the capital adequacy ratio for conventional and Islamic banks might be affected by corruption practices. Accordingly, this study considers the corruption level of each country in the data population sample as a determinant of the capital adequacy ratio. And hypothesis six is developed to be stated as follows;

H1.6: "There is a significant relationship between the capital adequacy ratio (CAR) and corruption perception index".

2.2.3.2 World Governance Indicator

According to Otero et al. (2019), some banks perform better in riskier environments with varying governance standards and different financial conditions in different countries. Thus, country-level governance represented by the world governance indicators reflects the quality of the governance environment of each country and reflects the degree of adherence to international regulatory bodies. Meanwhile, Mertzanis et al. (2019) argues that a solid macro governance model can be used as an alternative for corporate governance at the bank level. Additionally, Choretareas et al. (2012) explains that local authorities with adequate oversight can potentially boost bank efficiency

by decreasing corrupt practices in bank lending activities. Therefore, the macro governance framework could be considered a substitute for corporate governance at the bank level. Moreover, Bitar (2017b) argues that changes in the governance quality might affect bank capital through economic and financial development. Additionally, the study conducted by Bitar and Tarazi (2019) used the world bank's governance quality as a control variable to investigate how the rules of the institutional framework influence financial advancement for every country, as well as the correlation between creditor rights and capital ratios choices. Their study suggested that world governance positively impacts the capital adequacy ratio of conventional and Islamic banks for 24 countries between the period 2009 to 2013. Thus, this study considers the world governance index of each country as a determinant of capital adequacy, especially in the MENA region countries suffering from high political instability and the weak rule of law. And hypothesis seven is developed to be stated as follows;

H1.7: "There is a significant relationship between the capital adequacy ratio (CAR) and world governance index".

2.2.4 The Variations in CAR between Islamic and Conventional Banks

This study compares the determinants of capital adequacy ratio calculated based on Basel II guidelines between Islamic and conventional banks. Although both banking systems perform the same intermediary function, the Islamic banking system is considered a different banking trend, because they use Sharia principles to allocate and invest resources (Salman & Nawaz, 2018). Conventional banks have a completely different system. Firstly, they depend on interest as a significant source of bank revenues; therefore, they pay interest to depositors and get interest from borrowers. Second, unlike Islamic banks, they do not slice losses with customers and require secured assets as collateral in most transactions. Third, they have a long history and experience

that helped spread widely and penetrates the Islamic banking market and competes by offering Islamic banking services (El-Ansary et al., 2019).

On the contrary, Islamic banks do not deal with pre-determined interests based on Quranic orders and interpretations based on Sharia concepts. In other words, Islamic banks gain their profits by applying profit and risk-sharing agreements with the depositors and investors. These agreements mean that all transactions should be balanced regarding risk and reward allocation. among all parties (Abedifar et al., 2013). Moreover, Islamic banking does not deal with derivatives, and all of its products have to be secured by tangible assets in the real economy, according to Sharia standards. Additionally, Sharia's rules forbid the financing of sinful and non-ethical activities such as dealing in the alcohol, gambling, or tobacco industries (Salman & Nawaz, 2018). Accordingly, Islamic banks' investment and financing decisions are more conservative due to these characteristics. Additionally, some prior studies showed variation in capital ratios between conventional and Islamic banks. For example, from 1999 to 2013, Bitar and Tarazi (2019) examined 680 conventional banks and 113 Islamic banks operating in 24 countries. Moreover, they detected that Islamic banks hold a higher capital ratio than conventional banks.

Similarly, Bitar et al. (2020) found that Islamic banks are more capitalized and efficient than conventional banks in their study that covered 3,380 observations for conventional banks and 743 observations for Islamic banks for 28 countries from 2005 to 2012. This result could be justified, because the banning of derivatives and debt instruments and the lack of lenders and loans in Islamic banks contribute to Islamic banks' retaining more extensive capital and liquidity reserves (Zins and Weill, 2017). Accordingly, it is expected to find a significant statistical difference in capital

adequacy ratio between conventional and Islamic banks that are expected to be more capitalized due to Sharia law restrictions. Thus, hypothesis eight is as follows:

H1.8: "There is a significant statistical difference in capital adequacy ratio between Islamic and conventional banks, and Islamic banks hold higher capital ratio".

2.2.5 The Variations in the Role of Banks and Country-Specific Factors between Islamic and Conventional Banks

The literature on the factors contributing to Islamic capital adequacy percentage provides no empirical evidence about whether Islamic banks have similar determinants to their conventional counterparts. However, due to the unique characteristics of Islamic banks, the determinants of their capital ratios may be affected. For example, Belkhir et al. (2016) states that Islamic banks functioning in Islamic countries are commonly restricted by various banking regulatory requirements and perform in an environment of comparatively low financial regulation, particularly in the MENA region, when compared to banks operating in developed countries. Furthermore, Bitar and Tarzi, (2019) argue that, due to Islamic banks' unique characteristics, their capital ratios must adhere not only to the Basel Committee on Banking and Supervision's (BCBS) regulatory guidelines, but also to specific capital guidelines proposed by the Islamic Financial Services Board (IFSB) and the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI). As a result, their capital ratio determinants are likely to be affected. Therefore, this study expects that the effect of the determinants of capital adequacy ratio for conventional banks and Islamic banks is not the same, because Islamic banks are subject to special capital requirements due to Islamic law. Thus, hypothesis nine is as follows;

H1.9: "There is a significant statistical difference in the effect of the independent variables on CAR between Islamic and conventional banks".

3- Research methodology

This study investigates a total study population of 334 banks for ten years from 2010 to 2019 in seventeen countries in the MENA region. Conventional banks represent 282 from Algeria, Egypt, Bahrain, Israel, Jordan, Morocco, Oman, Kuwait, Lebanon, Qatar, Saudi Arabia, United Arab Emirates, Gaza, Syria, Tunisia, Turkey and Yemen. While Islamic banks represent 52 banks in fourteen countries. Algeria, Israel, and Morocco do not have any Islamic banks data. Moreover, Iran did not take part in this study due to data unavailability. This study winsorises all bank-level variables at the 1% and the 99% levels to lessen the effect of outliers. This study examines secondary data in order to compute bank-specific factors and country-level factors. To derive the independent and dependent variables, the bank-specific factors are calculated from the income statement, balance sheet, and cash flow statement items. The Fitch database is used to obtain data for bank-specific variables. The World Bank's database, the Transparency International website, and the Bloomberg database are used to obtain data for the country-level variables. Moreover, to achieve the comparative aim of this study between conventional and Islamic, a dummy variable is used to test the impact of bank type on the capital adequacy ratio determinants. A bank code equals one if the bank is conventional and zero otherwise. Further, the data is clustered at the bank level, not country-level, following Anginer et al. (2014) and Bitar et al. (2017b), because the sample size of this study is only seventeen countries, and several economies may have far more observations than others in the sample. As a result, grouping at the country level may generate skewed results. Since the focus of this study is the MENA region, descriptive statistics are presented for banks operating in the MENA region as a whole, as well as for conventional and Islamic banks independently. A two-tailed t-test is used to assess whether there are any significant variations in the factor means between the two categories. In order to examine the hypotheses of this study, two

regression models were developed to measure the determinants of capital adequacy requirements. First, a 10-year pooled cross-sectional regression analysis is run to see how the independent variables influence the capital adequacy ratio of banks in the countries of the MENA region. Second, a panel data regression is used to test the determinants of each type of bank separately in addition to testing the robustness of the results of the pooled cross-sectional regression model. A panel regression is not employed in the primary model, since the panel regression does not allow the inclusion of any dummy variable and a dummy variable is used in this study to distinct any differences between conventional Islamic banks. As a result, the pooled cross-sectional regression analysis is employed to state results for the entire sample. However, before running the panel regression analysis, the Hausman test is applied to determine if the regression with fixed-effects or random effects is more suitable for each type of bank separately. The main regression model is formulated in which bank-level and country-level determinants of the capital adequacy ratio are investigated and interaction variables are included as shown in Equation 1. Then, the model is adjusted where only the bank-level and country-level factors are included to examine their influence on the capital adequacy ratio for conventional and Islamic banks independently, as shown in Equation 2.

$$CAR_{bit} = \alpha + \beta_1 PROF_{bit} + \beta_2 Liquid_{bit} + \beta_3 CR_{bit} + \beta_4 DEP_{bit} + \beta_5 LOA_{bit} + \beta_6 CI_{kt} + \beta_7 WGI_{kt} + \beta_8 Size_{bit} + \beta_9 GDP_{kt} + \beta_{10} Bank\ Type_{bit} + \beta_{11} Bank\ Type\ X\ PROF_{bit} + \beta_{12} Bank\ Type\ x\ Liquid_{bit} + \beta_{13} Bank\ Type\ x\ CR_{bit} + \beta_{14} Bank\ Type\ x\ DEP_{bit} + \beta_{15} Bank\ Type\ x\ LOA_{bit} + \beta_{16} Bank\ Type\ x\ CI_{bit} + \beta_{17} Bank\ Type\ x\ WGI_{kt} + \beta_{18} Bank\ Type\ x\ Size_{bit} + \beta_{19} Bank\ Type\ x\ GDP_{kt} + \epsilon_i \quad (1)$$

$$CAR_{bit} = \alpha + \beta_1 PROF_{bit} + \beta_2 Liquid_{bit} + \beta_3 CR_{bit} + \beta_4 DEP_{bit} + \beta_5 LOA_{bit} + \beta_6 CI_{kt} + \beta_7 WGI_{kt} + \beta_8 Size_{bit} + \beta_9 GDP_{kt} + \epsilon_i \quad (2)$$

Where:

CAR: refers to the capital adequacy ratio is calculated by (Tier I + Tier II) to risk-weighted assets of bank b in country i during the period t ;

α : the intercept;

$\beta_1 \dots \beta_n$: the regression coefficients;

ε : the error term;

i : number of Islamic banks and conventional banks in MENA region countries

t : from 2009 to 2019;

k : number of countries in the MENA region

PROF = Return on assets (ROA);

Liquid = Loans or financing to deposits ratio

CR = non-performing loan or financing to total loans

DEP = Total deposits to total assets;

LOA = Total loans to total average assets

CI = the index of corruption

WGI = the index of the six world governance indicators

Size = the log of total assets

GDP = the Gross domestic product growth rate

Bank Type = Dummy variables equal to one if the bank is conventional and zero otherwise

This study used control variable to account for differences in bank characteristics, one bank-specific variable, size, while the control variable used to control for macroeconomic conditions is the gross domestic product growth rate. The following table (3.1) summaries variables descriptions and measurements.

Table (3.1)
Variables Descriptions and Measurements

Variables	Variable Name	Measurements
Dependent Variable	Capital Adequacy Ratio	$\text{CAR} = \frac{\text{Tier I capital} + \text{Tier II capital}}{\text{Risk-Weighted Assets}} > 8\%$ (Credit Risk + Market Risk+ Operational Risk)
Independent Variables	Bank-Specific Factors	
	Profitability	$\text{ROA} = \frac{\text{Net Income}}{\text{Average Total Assets}}$
	Liquidity	$\text{LDR (FDR)} = \frac{\text{Total Loans (Financing)}}{\text{Total Deposits}}$
	Credit risk	$\text{NPL (NPF)} = \frac{\text{Nonperforming Loans (Financing)}}{\text{Total loans (Financing)}}$
	Deposits	$\text{DAR} = \frac{\text{Total Deposits}}{\text{Total Assets}}$
	Loans	$\text{LAR} = \frac{\text{Total Loans}}{\text{Total Assets}}$
	Institutional Environment Variables	
	Corruption Perception Index	$\text{CI} = 10 - \text{CPI for the period 2010-2011}$ $\text{CI} = 10 - \frac{\text{CPI}}{10} \text{ for the period 2012-2019}$
	World Governance Indicators	$\text{WGI Index} = \frac{\sum \text{Off All the Six Indicators for Each Country}}{6}$
Control Variables	Bank-Specific Factors	
	Size	The logarithm of total assets
	Macroeconomic Variables	
	Gross Domestic Product Growth Rate	% Δ of GDP
Dummy Variable	Bank Type	Dummy variables equal to one if the bank is conventional, zero otherwise

*Source: Developed by the researcher.

4- Data Analysis and Findings

4-1 Descriptive Statistics Results

The descriptive statistics is a tool in which it explains and gives a distinct understanding of the independent and dependent variables' mean, median, standard deviation, maximum and minimum values for the banks of the MENA region as a whole as shown in table (4.1) and for the conventional and islamic banks sperately as shown in table (4.2).

Table 4.1
Descriptive Statistics for MENA Region Banks

Statistics	CAR	ROA	Liquidity	Credit Risk	Deposits	Loans	CI	WGI	Size	GDP
Mean	22.2	1.27	64.25	10.4	73.3	52.6	5.61	-0.27	6.60	3.14
Median	17.1	1.25	67.80	4.96	80.0	56.1	5.7	-0.23	6.61	2.92
St. Deviation	16.0	2.17	26.9	16.8	19.9	20	1.32	0.55	0.79	3.72
Minimum	10	-11.9	2.29	0.17	2.37	7.41	3.2	-1.50	4	-27
Maximum	98.0	11.45	132	100	92.3	98.0	7.5	0.66	8.91	19.5
No of observations = 2,642										

As shown in Table 4.1, the overall value of capital adequacy scored 22.2, suggesting that MENA region banks are maintaining a satisfactory rate of reserves based on the accord of Basel II, since the minimum regulatory criteria for this measure are at 8% required by the BCBS and the IFSB, resulting in an average 22 percent value which is nearly more than twice as high as what is expected. The reasons for this cautious approach may be related to financial institution regulatory pressures. However, a high capital adequacy ratio shows a bank's financial strength and willingness to fulfil its debt obligations as they become due. The higher the percentage is, the more likely it will fulfil its commitments in a crisis. The profitability figures, it can be seen that the banks in the

MENA region averaged 1.27 percent, with a range of -11 % to 11%. This result could be attributed to managers' precautionary measures of keeping more money on their books rather than investing in risky assets, which could have decreased profitability, implying that the examined banks would maximize their profitability to promote their position and remain competitive in the sector. Table 6.1 shows that MENA banks appear to be very liquid, with an average ratio of 64 percent and a range of 2.2 percent to 132 percent between 2010 and 2019, indicating that not all MENA banks are the same in terms of liquidity. The credit risk posed by non-performing loans or funding as a percentage of total loans, the overall mean ratio of 10.4% percent shows that MENA banks are in good shape, as they already have enough resources to cover the losses from these non-performing loans. Furthermore, the deposit and loan ratios differ by MENA nation, and the average values are 73.2% 52.6 % percent, respectively. Otherwise, the institutional environment variables in the examined countries where the assessed banks run, namely CI and WGI, the least corrupted country in the MENA region is Qatar with a score of 3.2, while the most corrupted country is Syria with a score of 7.5, and the average score of the corruption level is 5.6.

Furthermore, the country with the best governance index is Israel, with a score of 0.66, while a country with the worst governance index is Yemen with a score of -1.50, and the average score of the governance index among the MENA region countries is -27%. These results point to a different economic condition for the MENA region countries that might affect their exposure to capital risk positively or negatively. Moreover, regarding the control variable, the mean value of the log of total assets identified as size is 6.60, suggesting that the examined MENA banks are market-sized to some degree, but there is significant variance among them, ranging between 4% and 8.91%. Meanwhile, the average value of GDP growth rates is 3.14, the rates of GDP vary across the MENA region, the highest rate is 19.5% in Qatar compared to the lowest rate that is -27% in Yemen.

Table 4.2
Descriptive Statistics for Conventional & Islamic Banks

Conventional Banks						Islamic Banks					
Variables	Mean	Median	ST. deviation	Min	Max	Mean	Median	ST. Deviation	Min	Max	t. statistics
CAR	22.5	16.9	17.1	10.0	98.0	20.6	17.7	9.93	10.0	97.0	(2.43)**
ROA	1.35	1.27	3.78	-11.9	11.4	0.85	1.18	2.43	-11.9	8.92	(2.75)**
Liquidity	63.3	65.4	27.3	2.29	132	68.0	75.1	24.4	5.44	117	3.47***
Credit Risk	11.0	5.23	17.83	0.17	100	7.91	4.2	11.14	0.17	83.4	(3.73)***
Deposits	73	80	20	1.49	92.3	74.7	81.2	18.89	6.16	91.9	(1.73)*
Loans	52	54.1	20.00	7.41	98.0	55.6	61.2	19.21	7.41	97.5	3.62***
CI	5.70	5.8	1.31	3.2	7.5	5.26	5.23	1.31	3.2	7.5	(7.12)***
WGI	-0.30	-0.37	0.55	-1.50	0.665	-0.14	-0.10	0.533	-1.50	0.66	5.48***
Size	6.58	6.55	0.81	4	8.91	6.71	6.82	0.703	4.87	8.13	3.42***
GDP	3.18	2.99	3.63	-27	19.5	3	2.87	4.11	-27	19.5	(1.01)
NO. of observations	2,151					491					

The descriptive statistics for banks shown that the capital adequacy ratio is significantly higher at the 5% level for conventional banks than Islamic banks. The mean value for conventional banks is 22.5% and 20.6% for Islamic banks. For conventional banks, the minimum and maximum percentages of total assets at risk for CAR were 10 and 98.06 percent, respectively, and for Islamic banks, 10 and 97.07 percent. The standard deviations were 17% and 9.93% for conventional and Islamic banks. Regardless of the bank type, conventional and Islamic banks mainly exceed the minimum capital requirements imposed by the BCBS and IFSB; Beck *et al.* (2013) and Bitar *et al.* (2016) state the same notice that banks hold a higher capital adequacy ratio than required. Holding higher capital ratios could be explained by the desire of banks to smooth the profits of investment account holders to reduce the risk of withdrawals and avoid liquidity mismatches (Bitar *et al.*, 2017a).

Profitability for conventional banks is, on average, found to be significantly higher at the 5% level with a mean of 1.35% compared with .85 % in Islamic banks. The higher ROA of conventional banks implies that conventional banks have a competitive advantage and greater participation in economic activities with lower costs than Islamic banks (Moin, 2013). This result is consistent with Onakoya & Onakoya (2013), who found that British conventional banks were more profitable than Islamic banks, because the operational costs of the unstandardized Islamic products are higher than the conventional standardized products. The minimum and maximum values are -11.94 and 11.45 percent for conventional banks and -11.94 and 8.92 percent for Islamic banks.

The loans to deposits ratio, also known as the liquidity ratio, is significantly higher for Islamic banks at the 1% significance level. Bank's liquidity is 63.3% for conventional banks and 68% for Islamic banks. As a result, an Islamic bank with a high LDR is thought to have less liquidity, which correlates with lower income and risk when compared to a conventional bank with a low LDR. On

the other hand, a high LDR means that a bank has been put under more financial strain by making unsustainable loans and the possibility that the bank will have to sell certain loans at a loss to meet depositor claims (Tran *et al.*, 2016).

Credit risk in conventional banks is significantly higher on average at 1% compared with Islamic banks. The mean value of credit risk for conventional banks is 11%, with minimum and maximum values of 0.17 and 100 percent, whereas the mean value of NPF ratio for Islamic banks is 7.9% and the minimum and maximum of 0.17 and 83 percent. These results confirm that Islamic banks have a lower NPF ratio than conventional banks, which fosters a better understanding of the standards of their loan management and efficiency because it calculates the percentage of nonperforming loans from total loans. Moreover, Zhang *et al.* (2016) stated that the nonperforming loan ratio and risk-taking increase are based on lousy management, as managers take on additional risks to minimize their losses through an aggressive lending strategy.

The deposit ratio is slightly significant at 10% between conventional and Islamic banks. In addition, the deposit ratio has a mean of 73% for conventional banks compared with Islamic banks, in which the mean is 74%. These figures indicate that depositors' money is secured as only an average of 73% and 74% of banks' conventional and Islamic total assets, respectively. Similarly, Islamic banks have, on average, significantly higher loans to assets ratio at the 1% level compared with conventional banks. Moreover, the mean value is 55% in Islamic banks compared with a mean value of 52% in conventional banks, which suggests that Islamic banks hold a higher level of loans as a proportion of total assets compared to conventional banks. These findings are consistent with Turk-Ariss (2010a), who found that Islamic banks with greater market power devote a more significant proportion of their assets to loan financing than conventional banks. Furthermore, these figures, along with the profitability figures, confirm that a bank's efficiency

could be declined by the higher share of net loans to total assets, as stated by Bitar *et al.* (2018). Moreover, the higher the loan assets ratio gets, the higher the risk is expected and, accordingly, the lower the capital adequacy ratio becomes, because loans have fewer liquid assets than other financial assets (Abedifar *et al.*, 2013).

Conventional and Islamic banks have the same minimum and maximum values for the institutional environment variables used to capture economic disparities for MENA region countries. The corruption index indicates that the most corrupted country has a 7.5 score and the least corrupted country has a score of 3.2. Moreover, it significantly differs at the 1% level in conventional banks compared with their Islamic counterparts. On the other hand, a country with the best governance index metrics gets a score of 0.66, while one with the worst gets a score of -1.50. Additionally, this index significantly differs at the 1% level in Islamic banks compared to conventional banks due to the difference between the number of observations that reach 2151 and 491 for conventional and Islamic banks respectively.

Otherwise, the size calculated by the logarithm of assets showed that Islamic banks in the MENA region are significantly larger on average at 1% than conventional banks. During the study period, although Islamic banks are slightly larger than conventional banks, they have a lower capital adequacy ratio compared with conventional banks because, as shown in Table 6.2, Islamic banks scored a mean value of 6.71%, while conventional banks scored a mean value of 6.58%. These results align with previous studies (Beck *et al.*, 2013; Bitar *et al.*, 2017b; Zins and Weill, 2017). Moreover, these results, along with the mean score value of the profitability for both banking systems, support the argument stated by El-Ansary and Hafez (2015) that a bigger bank's size does not predict its profitability, this is since Islamic banks are only allowed to invest in areas that are considered to be consistent with Islamic principles.

However, the countries with the highest GDP rates received 19.5%, while those with the lowest received -27%. Finally, the gross domestic product does not significantly differ between conventional and Islamic banks. This disparity between the mean, median, and standard deviation for conventional banks and Islamic banks in MENA countries is because some countries have far more conventional bank observations than Islamic banks and vice versa.

Overall, the descriptive statistics show that, on average, GDP does not differ significantly between conventional and Islamic banks. While the profitability, credit risk, and corruption index are significantly higher in conventional banks than Islamic banks. On the other hand, Islamic banks experience significantly higher liquidity, loans, size, deposits, and governance index than conventional banks. Additionally, conventional banks hold a higher capital adequacy ratio than Islamic banks, and the difference between their mean values is significant at a level of 5%.

4-2 Cross-Sectional Regression Results and Multi-Collinearity Diagnostics

A pooled cross-sectional regression is employed to test the relationship between capital adequacy ratio (the dependent variable) and its drivers (the independent variables) for banks in the MENA region. Moreover, the Variance Inflation Factor (VIF) was calculated to test multi-collinearity among the determinants of the variables in the capital adequacy ratio models, because when independent variables are correlated in a regression model, multi-collinearity appears. Therefore, a VIF more significant than 10 is deemed high multi-collinearity, consistent with Stine (1995) and Turk-Ariss (2010a). The following Table 4.3 presents the results for the bank-level and country-level determinants of capital adequacy ratio with dummy and interaction variables.

Table 4.3: Regression Analysis: Model for the Determinants of capital adequacy ratio for the MENA region whole banks with Interaction Variables

Variables	Coefficient	t- value	Expected Sign
Profitability	0.203	1.85*	+VE or -VE
Liquidity	0.037	1.00	+VE or -VE
Credit Risk	-0.093	-1.58	+VE or -VE
Deposits	-0.128	-3.78***	+VE or -VE
Loans	-0.152	-3.32***	+VE or -VE
CI	-0.332	-0.32	+VE or -VE
WGI	3.842	1.44	+VE or -VE
Size	-4.832	-4.59***	+VE or -VE
GDP	-0.398	-3.26***	+VE or -VE
Bank Type	1.932	1.90**	+VE or -VE
Bank type X Profitability	0.480	2.46**	+VE or -VE
Bank type X Liquidity	-0.043	-1.07	+VE or -VE
Bank type X Credit Risk	0.210	3.42***	+VE or -VE
Bank type X Deposits	-0.271	-7.32***	+VE or -VE
Bank type X Loans	0.116	2.33**	+VE or -VE
Bank type X CI	-1.802	-1.57	+VE or -VE
Bank type X WGI	-9.591	-3.28***	+VE or -VE
Bank type X Size	0.592	0.52	+VE or -VE
Bank type X GDP	-0.173	-1.05	+VE or -VE
Constant	72.61	7.75***	+VE or -VE
Adjusted R Squared	.410		
F.Test	0.000		
Observations	2642		
Mean VIF	3.39		

As shown in Table 4.3, the adjusted R² value is 0.410, indicating that the independent variables can explain 41% of the capital adequacy ratio for banks in the MENA region. Furthermore, the model is significant at the significance level of 1%. The values of the mean of VIF across variables obtained are 2.39, confirming that the multi-collinearity problem in terms of capital adequacy ratio variables does not exist.

Hypothesis 1.1 is accepted based on the results shown in table 4.3, as there is evidence of a weak positive relationship between capital adequacy ratio and profitability at level 10% for both banking systems in the MENA region this weak evidence is in the line with Unvan *et al.* (2020). The positive relationship indicates that when the profitability of banks increases, the capital adequacy ratio does. Unvan *et al.* (2020) suggested that as the bank's capability to generate profits improves, more funds will be assigned to raise capital, increasing the capital adequacy ratio. Moreover, Tran *et al.* (2016) argues that banks with a higher capital adequacy ratio are generating more profits due to their efficient management, which leads them to borrow less and engage more in prudent lending, decreasing their costs and increasing their profitability. However, this result is in the line with prior studies, particularly Akhter *et al.* (2017), Bitar and Tarazi (2019).

On the other hand, H1.2 is rejected because the results show that the relationship between liquidity and the capital adequacy ratio is positive, but insignificant for banks in the MENA region. The positive relationship between the liquidity and capital adequacy ratio is in line with Abusharba *et al.* (2013) and Bateni *et al.* (2014), who argue that a higher level of capital should compensate for higher liquidity risk. The insignificant coefficient contrasts with this research expectation, but it is in the line with results stated by Büyükşalvarcı & Abdioğlu (2011) in Turkish banks.

Similarly, hypothesis 1.3 is rejected because the results show that the relationship between credit risk and the capital adequacy ratio is negative, but insignificant for banks in the MENA region.

The explanation for this could be that banks in MENA have been highly capitalized (average 20%). Therefore, these banks are not subject to regulatory pressures as they do not have to comply with regulatory loan risk to meet the regulatory capital requirements. This insignificant finding is in line with the results found by Polat & Alkhalaf (2014) in Saudi Arabian banks. Additionally, this negative coefficient supports Al-Tamimi and Obeidat (2013) research findings in Jordanian banks and Masood and Ansari (2016) in Pakistani banks.

Hypothesis 1.4 is accepted because the ratio of the deposits has a significant negative impact on the capital adequacy ratio for banks in the MENA region at level 1% of significance. This inverse relationship indicates that the deposits decrease when the capital adequacy ratio increases and vice versa. Moin (2013) justified this negative association because reducing deposits that are considered cheaper will lead the banks to increase other financing sources that are costlier. Accordingly, increasing the cost will lessen the bank's profitability, and thus, banks will need to increase their capital to compensate for this decrease. Furthermore, Ahmad & Albaity (2019) state that the negative relationship between deposits and capital adequacy ratio indicates that an increase in capital adequacy ratio does not guarantee bank deposits.

Likewise, the results shown in Table 4.3 supports hypothesis 1.5. The ratio of loans shows a significant negative relationship at the level 1% of significance with the adequacy of capital ratio for banks in the MENA region. They indicate that increasing the loans to assets ratio will decrease capital adequacy and vice versa. Bitar *et al.* (2019) explained this negative relationship as higher loans share to assets decrease risk, because it needs fewer reserves to protect banks from credit risk and thus decrease the capital adequacy ratio. This negative coefficient for MENA banks is consistent with Bosnian and Indian banks, as found by Dreca *et al.* (2013) and Aspal *et al.* (2014).

Regarding the hypotheses of the institutional environment variables, namely the corruption index and the governance index, Table 4.3 shows an insignificant negative relationship between the corruption index and the capital adequacy ratio.

This negative coefficient indicates that in high-perceived-corruption environments, such as the MENA area, banks are more likely to extend credit to ineligible applicants or customers with weaker creditworthiness that is more likely to default. Thus, their risk level will increase. However, it is consistent with the findings of Chen *et al.* (2015), who finds that a higher level of corruption leads banks to engage in riskier activities of 1200 banks in 35 emerging economies. Accordingly, hypothesis 1.6 is rejected.

Meanwhile, the second institutional environment variable represented by the governance index shows an insignificant positive relationship with the capital adequacy ratio. This positive impact reveals that banks hold a higher capital adequacy ratio when they perform within the robust institutional environment regarding the rule of law, government effectiveness, regulatory quality, control of corruption, voice, accountability, and political stability. When these grades rise, asymmetric information and agency problems should fall. As a result, the capital adequacy ratio of these countries' banks has increased. However, this insignificant relationship contrasts with the expectation of the study but is consistent with the results found by El-Ansary *et al.* (2019). Thus, hypothesis 1.7 is rejected.

Otherwise, as shown in Table 4.3, the control variables' results show that size and GDP have a significant negative relationship with capital adequacy ratio at the same level of 1% of significance. The inverse relationship between size and the capital adequacy ratio indicates that larger banks have a lower capital adequacy ratio which is consistent with the perspective of “too big to fail” that has been approved by some previous studies such as Bateni *et al.* (2014) and Alajmi

and Alqasem (2015). Furthermore, the size of a bank could be considered a proxy for a bank's diversification in assets (Gropp and Heider, 2007), and accordingly, this diversification reduces the risk and then the level of capital. Additionally, Büyükşalvarcı & Abdioğlu (2011) and Bateni *et al.* (2014) argue that large sized banks can create more funds with lower cost and less risk from external sources by the large number of branches which lead to risk diversification and then a decrease in capital adequacy they hold.

The significant negative relationship between GDP and the capital adequacy ratio at level 5% reflects that economic activity impacts the capital level of banks because capital ratios may change during the downturn and the upturn periods. To absorb fluctuations in risk arising from variations in the economic environment (Ahmad & Albaity 2019), especially in such economies in the MENA region that had political instability during the period covered in the analysis of this study. The negative coefficient supports the argument that banks will head for reducing their level of risk within the recession periods by keeping a high level of capital by limiting the lending activity because of the lower interest rate and vice versa. This argument is in line with past studies (Octavia and Brown, 2009; Bokhari *et al.*, 2012).

The table shows that the coefficient for the bank type variable is significantly positive at level 5%. This significance suggests differences between the capital adequacy ratio of conventional and Islamic banks across the MENA region. The positive coefficient reflects that conventional banks hold higher capital adequacy ratios than Islamic banks. As a result, hypothesis 1.8 is partially supported as this study expected a difference in the capital ratio between the two banking systems with a higher ratio of Islamic banks. The insignificant coefficients concerning the interaction between the bank type variable and bank liquidity, corruption index, size, and GDP indicate no

significant differences between the two banking systems in terms of their capital adequacy behavior as impacted by these determinants.

The interaction between profitability and the bank type variable is significant and positive at 5%. This coefficient suggests that higher profitability leads to a higher capital adequacy ratio in conventional banks than Islamic banks. Likewise, the interaction between credit risk and the bank type variable is significant and positive at level 1%. This coefficient suggests that a higher level of credit risk leads to higher levels of capital adequacy ratio in conventional banks compared with Islamic banks.

In contrast, the interaction between deposits ratio and the bank type variable is significantly negative at level 1%. This coefficient indicates that the increase in deposits ratio results in lower capital adequacy levels in Islamic banks than conventional banks. On the other hand, the interaction between loans ratio and the bank type variable is significantly positive at 5%. This coefficient indicates that the increase in the ratio of the loan results in an increase in the level of capital adequacy ratio for conventional banks compared with Islamic banks.

Meanwhile, the interaction between the governance index ratio and the bank type variable is significantly negative at level 1%. This coefficient suggests that a higher score of this index leads to a decrease in the capital adequacy ratio for Islamic banks compared with conventional banks. The significance of coefficients between the interaction variable and profitability, credit risk, deposits, loans, and the governance index, in general, supports hypothesis 1.9 since these significance coefficients show that the effects of these independent factors on the capital adequacy ratio vary significantly between conventional and Islamic banks.

Overall, results shown in Table 4.3 state that profitability, deposits, and loans impact the capital adequacy ratios for banks in the MENA region. Accordingly, only H1, H4, and H5 are accepted. On the other hand, liquidity, credit risk, and the institutional environment variables do not show any significant impact on capital adequacy. Thus, these variables cannot be considered determinants of the capital adequacy ratio for banks in the MENA region.

However, as previously mentioned, conventional banks outperform Islamic banks in various indicators, including the long history and experience (Octavia and Brown, 2009).

Furthermore, according to Bokhari *et al.* (2012), conventional banks can enter the Islamic banking sector since they have a large amount of capital, are extensively distributed, and have far more advanced technology. In addition, conventional banks accept interest which is a significant source of bank revenues, and deal with derivatives while Islamic banks do share the loss with clients, and their products must be backed by physical assets in the real economy, according to Sharia standards (Hewaidy & Alyousef, 2015).

In addition, in recent years, there have been some significant (both positive and negative) changes in banks policies. For example, numerous massive international conventional banks have officially started to contend by providing Islamic banking services. The number of Islamic banks has increased, resulting in contests between Islamic banks. As a result, Islamic banks have lower capital adequacy ratios than conventional banks. However, as long as the distinctive feature of this study is to comparatively investigate the determinants of capital adequacy ratio between conventional and Islamic banks. And in order to robust the results of the primary model. Therefore, a panel regression analysis ran separately for each bank type to determine if both banking have the same drivers for the capital adequacy ratio or not.

4.3 Hausman Test and Panel Regression Results

This study used Hausman’s test before running the regressions to verify which panel data model is the most suitable fixed effect model (FEM) or random effect model (REM). This coefficient could mitigate the possible issue with the pooled regression model (PRM), which suggests that the intercepts are consistent throughout all banks (Gujarati, 2017).

Although the magnitude of the coefficients could alter if the FEM or REM suppositions differ from the PRM assumptions, the signs and probability value are intended to remain static (Gujarati, 2017). The Hausman test detects whether the unexpected individual random effects (α_i) are significantly correlated with the regressors. If the value of the Hausman’s test (chi-sq statistics) appears to exceed 0.05, this indicates an increased match for the random effect model, but if the value does not exceed 0.05, it means more fit for the fixed-effect model.

The results in Table 4.4 show the coefficient is significant with values of 0.000 and 0.000 for both models. These values mean that the null hypothesis with no linkage is denied at the 1% level for both banking regression analysis models, indicating that the FEM is preferred instead of the REM (Brooks, 2014). Accordingly, the FEM is used to measure both models at which intercept term varies across banks and to control for bank differences.

Table 4.4: Hausman Tests for conventional and Islamic banks

	MENA region	Conventional Banks	Islamic Banks
Hausman Test	Prob>chi2=0.000	Prob>chi2=0.000	Prob>chi2=0.000

Note. H0: α_i are uncorrelated with X_{it} ; H1: α_i are correlated with X_{it} .

Accordingly, Table 4.5 presents the panel regression results of the conventional and Islamic banks models, using the fixed-effect model. The Table also shows F-test results that show that both models are significant at the 1% level. Moreover, the Variance Inflation Factor (VIF) was calculated to test multi-collinearity among the determinants of the variables in the capital adequacy ratio models, because when independent variables are correlated in a regression model, multi-collinearity appears. Therefore, a VIF more significant than ten is deemed high multi-collinearity, consistent with Stine (1995) and Turk-Ariss (2010a). Eventually, White (1984) cluster error terms are used in this chapter's regression models to monitor for heteroscedasticity and autocorrelation in residuals. The following Table 4.5 presents the regression results using the fixed-effect model of the conventional and Islamic banks separately.

Table 4.5 : Regression Analysis: Model for the Determinants of the CAR for Conventional and Islamic Banks with Control Variables

Independent Variables	Conventional Banks		Islamic Banks	
	Coefficient	t- value	Coefficient	t- value
Profitability	0.350	2.67***	0.338	1.44
Liquidity	0.046	1.31	-0.052	-0.93
Credit Risk	-0.031	-0.59	0.034	0.63
Deposits	-0.162	-2.82***	-0.171	-2.15**
Loans	-0.163	-2.59***	-0.171	-2.10**
WGI	5.791	1.88**	-5.10	-0.85
CI	-0.582	-0.72	1.27	0.94
Size	-10.81	-4.05***	-12.4	-4.67***
GDP	-0.192	-3.28***	-0.207	-1.93**
Constant	118	5.21***	179	5.42***
Adjusted R Squared	0.864		0.640	
F.Test	0.000		0.000	
Observations	2,151		491	
Mean VIF	2.38		2.71	

The adjusted R² coefficients are 86.4%, 64% for conventional and Islamic banks respectively. The adjusted R-squared calculates the percentage of variance that can be clarified by only the independent variables that influence the dependent variable. Thus, the higher the R-squared is, the greater the explanatory power related to the dependent variable's changes (Everitt and Skrondal, 2010). Accordingly, Table 4.5 reports that the profitability, loan risk, liquidity, deposits, loans, CI, WGI, size, and GDP can explain 86.4% and 64% of the capital adequacy ratio for conventional and Islamic banks, respectively. However, the adjusted R² values for conventional banks are greater than for their Islamic peers, indicating that the model of traditional regression is more capable of capturing variance in the dependent variable CAR. These higher values of the adjusted R² are consistent with Bateni (2014) and Bashir *et al.* (2017). The values of the mean of VIF across variables obtained are 2.38 and 2.71 for conventional and Islamic banks, respectively. A multi-collinearity problem is defined as a VIF value greater than 10. VIF values from 5 and 10 are possibly reflective of multi-collinearity. Therefore, the multi-collinearity problem in capital adequacy ratio variables does not exist.

Table 4.5 indicates a clear positive and substantial relationship between profitability and capital adequacy ratio for traditional banks at the 1% level. According to the coefficient of ROA, a one-unit gain in profitability increases bank capital by 0.350 units for traditional banks, because the better the bank's ability to make profits is, the more funds will be allocated to grow capital, increasing the value of CAR. This result is consistent with previous studies (Bateni *et al.*, 2014; Bitar *et al.*, 2018; Bitar and Tarazi 2019; Unvan *et al.*, 2020).

In contrast, the impact of the ROA on Islamic banks' capital adequacy ratio is positive but insignificant. However, the insignificance of the profitability coefficient for Islamic banks' capital adequacy ratio follows the results found by Kusmayadi (2018), who found that profitability has no

impact on the capital adequacy ratio for Indonesian Islamic banks. In addition to Ndoka and Islami (2016) pointed the absence of influence between the profitability and the capital adequacy ratio in Albanian banks. Accordingly, profitability is not considered a determinant for Islamic banks' capital adequacy ratio, but it is a determinant for conventional banks. Moreover, liquidity results do not show the same coefficient between the liquidity and the capital adequacy ratio for both banking models. The coefficient is positive with conventional banks but negative with Islamic banks, and the coefficients are insignificant in both models. Although this finding is in contrast with the expectation of this study, it is consistent with Olarewaju & Akande (2016), Yuanjua and Xiao Shishun (2012), and Shingjergji and Hyseni (2015). Furthermore, Mohammed *et al.* (2020) stated that as the number of bank loans that its equity must cover, is determined by capital adequacy, it prevents them from excessive leverage to prevent insolvency risk. That suggests the potential for banks to face liquidity risk may be limited by significant limitations on the capital sufficiency ratio and a negative association with its financing gap.

Even though the indicator of liquidity used in this study appears to have no significant influence on the capital adequacy ratio for Islamic banks, this result is in line with results stated by Büyükşalvarcı & Abdioğlu (2011) in Turkish banks. Similarly, credit risk measured for conventional banks as the percentage of nonperforming loans or finance to total loans appears insignificant for both models with different coefficient directions. However, credit risk is in a negative direction with the capital adequacy ratio with a value of (-.032), which means that decreasing one unit in nonperforming loans will increase the capital adequacy ratio by (.034) units. This result is consistent with Kumar and Kishore's findings (2019) at UAE banks, supporting the rational assumption that fewer banks' bad debts will increase their capital. In addition, this result is similar to the findings of Klein (2013) and Makri *et al.* (2014), who stated that banks with higher

capital ratios would cover the bad debts from their equity; accordingly, their ratio of nonperforming loans will decrease. While the coefficient of the credit risk for Islamic banks is optimistic with the capital adequacy ratio, this result is consistent with the results found by El-Ansary *et al.* (2019) and Polat & Alkhalaf (2014), yet contrary to Sukmana & Raditya (2015), who stated that the impact of nonperforming finance on capital adequacy ratio is a significant negative for Islamic banks in Indonesia. Therefore, it is clear that credit risk is not a determinant of MENA's conventional or Islamic capital adequacy banks.

By looking at the deposit results, the regression analysis reveals a significant negative relationship between deposits and capital adequacy ratio at the significance level of 1% and 5% for conventional and Islamic banks, respectively. This adverse relation denotes that bank deposits are not necessarily secured by an increase in the ratio of capital adequacy (Abba *et al.*, 2018). Furthermore, these results follow the expectations of this study in addition to results revealed by Alsabbagh (2004) in Jordanian banks and Bokhari *et al.* (2012) in Pakistani banks, who state that deposits are considered as the less expensive source of funds in comparison to borrowing and comparable financing instruments such as securitization loans and syndication. Accordingly, it is less risky than other fund sources, which decreases the need for banks to keep a high level of capital.

Additionally, this negative coefficient is in the same line with some past studies conducted by Büyüksalvarc & Abdiolu (2011) for Turkish banks, Masood & Ansari (2016) for Pakistani banks, and Hewaidy & Alyousef (2018) for Kuwaiti banks. These studies explained this negative relationship because when banks invest more in the loan portfolios rather than invest in derivatives and other types of securities, these banks will face less risk then, and accordingly, there is no need for them to hold higher capital ratios.

For the governance index, Table 4.5 shows a significant positive relationship with the capital adequacy ratio for conventional banks at the significant level of 5%. This positive association is consistent with the expectation of the study and the results found by (Albaity *et al.*, 2020), who stated that the higher governance indicators led to higher bank risk-taking behavior in the MENA region countries. Additionally, Bitar & Tarazi (2019) declared that world governance indicators positively impact bank capital adequacy and core capital for banks covered in their study within 24 different countries.

Nevertheless, the results of the Islamic banks showed an insignificant negative relationship between the world governance index and the adequacy ratio of capital, and this inverse relation approves the general belief that higher governance reduces banks' risk-taking behavior and accordingly reduce the ratio of capital adequacy (Anginer *et al.*, 2016). Moreover, this study believes that the effect of the governance index on the capital adequacy ratio for Islamic banks is statistically insignificant because of the additional restrictions mandated by Islamic jurisprudence. Similarly, the corruption index shows mixed results as it has a negative impact on the capital adequacy ratio for conventional and a positive impact for Islamic banks, yet it is insignificant for both banking systems. These results are not consistent with the expectations of this study. However, literature provides some shreds of evidence. For example, Chen *et al.* (2015) found a significant negative relationship between corruption and the stability of 1200 banks in 35 emerging economies during the period 2000–2012, suggesting that a higher level of corruption leads banks to engage in riskier activities. Moreover, Hasan & Ashfaq (2021) reported a negative relationship between corruption and nonperforming loans, which is in line with few studies conducted in this context. On the other hand, (Bougatef 2015) states a significant positive relationship between corruption index and nonperforming finance for the Islamic banks in 16 high corrupt countries,

indicating that corruption increases the problem of poor financing by allocating funds to poor ventures rather than good ones.

The size as a control variable shows a significant negative coefficient at level 1% for both banking systems. These results are consistent with the majority of past studies that pointed that larger banks have lower capital adequacy ratios because larger banks are more experienced, reputable and can take advantages of scale economies and diversification of portfolios, which reduce their risk exposure (Bateni *et al.*, 2014; Alajmi and Alqasem 2015; Bitar *et al.*, 2018). Additionally, the literature of Islamic banks confirms the same inverse relationship between size and the adequacy ratio of capital as stated by Beck *et al.* (2013) and Abedifar *et al.* (2013) that Islamic banks have advantages concerning reputation, risk management, as well as better access to Shari'a compliant debt instruments, accordingly, they have lower capital ratios as well. Likewise, for the second control variable, the GDP shows a significant negative relationship with the capital adequacy ratio for both banking systems but at a different level of significance 1%, 10% for the conventional and Islamic banks, respectively. However, these results are in line with past studies, for example, Octavia and Brown (2009) in some developing countries, Bokhari *et al.* (2012) in Pakistan, and Bitar *et al.* (2018) in OCED countries. These studies reported that banks tend to reduce their level of risk during recessions periods by keeping a high level of capital by limiting the lending activity because of the lower interest rate and vice versa. While, in the expansion periods of the economy, the liquidity constraints decrease, and accordingly, the liquidity risk exposure declines. Therefore, banks do not need to hold a higher level of capital.

In conclusion, the results of the panel regression analysis (Table 4.5) are generally in line with the pooled cross-sectional analysis findings (Table 4.3). This panel analysis provides the same effect with the same direction and significance of the liquidity, credit risk, deposits, loans, the corruption

index, size, and GDP for both banking systems. On the other hand, it provides contrary and various results in profitability and the governance index that were found to have a different impact on both banking systems. Furthermore, to test the eighth hypotheses that expect a statistical difference in capital adequacy ratio between Islamic and conventional banks and Islamic banks hold higher capital ratio. An independent t-test is employed to compare the mean value of the capital adequacy ratio for Islamic and conventional banks. The following Table, 4.6, shows the result of the test.

Table 4.6: T.test for Mean Difference

Dependent Variable	Mean		T-test	Significance
	Islamic	Conventional		
Capital Adequacy ratio	20.64	22.59	(2.43)**	5%

Table (4.6) shows a significant difference between the mean of the capital adequacy ratio in Islamic banks and conventional banks that hold higher CAR at the level of 5% significance.

Moreover, these results are inconsistent with the findings of the study conducted by Sun *et al.* (2016) in the organization of Islamic countries (OIC), who stated that there is no significant difference between conventional and Islamic banks in dual banking countries. In addition, Louati *et al.* (2015) conducted their study on twelve MENA and Southeast Asian countries and found no significant difference in capitalization between conventional and Islamic banks. However, Islamic banks are highly capitalized than conventional banks in these countries. Furthermore, the result shows that conventional banks hold more capital than Islamic banks, which is inconsistent with the expectation of this study. In addition, it contrasts with the results of Bitar and Tarazi (2019), who found that Islamic banks hold more capital than conventional banks across 24 countries. Thus, hypothesis 1.8 is partially accepted. This could be justified because the number of conventional

banks observations in this study is threefold the number of Islamic banks observations due to data unavailability.

Table 4.7 summarizes which hypotheses of this study are either approved or denied according to the results of regression analyses presented in this chapter.

Table 4.7
Summary of results for Model I analysis

Hypothesis Number	Accept / Reject
H1.1	Accepted
H1.2	Rejected
H1.3	Rejected
H1.4	Accepted
H1.5	Accepted
H1.6	Rejected
H1.7	Rejected
H1.8	Partially Accepted
H1.9	Accepted

Table 4.7 shows that the research results support H1.1 about profitability, H1.4 about deposits, H1.5 about the loans, H1.8 about the differences in CAR between the two banking systems, and H9 about the difference in the impact of the independent variables on CAR for both banking systems. In contrast, H1.2 about liquidity, H1.3 about credit risk, H1.6 about corruption index, and H1.7 about the governance index are not supported because the variable coefficients involved are insignificant.

5- Research Limitations and Recommendations

The study's main limitation was the data availability because the Fitch database lacks regulatory capital measures for banks. Thus, this study relied heavily on financial data from annual reports that also remarkably lack capital ratio data. Moreover, while the ten-year period (2010 to 2019) was sufficient to address the research objectives, additional years after 2019 could have been

included, but the Covid-19 pandemic effect on the global economy was a constraint for the period after 2019, as it could distort the results. Furthermore, even though this study were only interested in the MENA region, expanding the sample size could be a valuable tool for increasing validity and credibility. As a result, future research should broaden the sample to include Asian countries with dual banking systems, such as Malaysia and Indonesia, and compare the capital adequacy ratio and efficiency of banks in this region to those in the MENA region. Additionally, future studies should examine and compare banks in GCC and non-GCC countries as majority of Islamic banks are operated in the GCC countries.

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