REPUBLIC OF TURKEY
SAKARYA UNIVERSITY
INSTITUTE OF SOCIAL SCIENCES

ANALYSIS OF THE DETERMINANTS OF CAPITAL ADEQAUCY RATIO: THE CASE OF ISLAMIC BANKS IN THE GULF COOPERATION COUNCIL (GCC)

MASTER'S THESIS

Abdilatif Mao ALI

Department : Islamic Economics and Finance

Supervisor: Assist. Prof. Mustafa Kenan ERKAN

JULY – 2020

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"The examination was held online on 28/07/2020 and approved unanimously by the following committee members"

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Öğrencinin

Adı Soyadı	:	Abdilatif Mao ALI
Öğrenci Numarası	:	1660Y60013
Enstitü Anabilim Dalı	:	Islamic Economics and Finance
Enstitü Bilim Dalı	:	Islamic Economics and Finance
Programı	:	☑ YÜKSEK LİSANS ☐ DOKTORA
Tezin Başlığı	:	Analysis of the Determinants of Capital Adequacy Ratio: The Case of Islamic Banks in the Gulf Cooperation Council (GCC)
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ACKNOWLEDGEMENTS

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ABBREVIATIONS

AAIOFI : Accounting and Auditing Organization of Islamic Financial
  Institutions

ACE : Allowance for Corporate Equity

AIRB : Advanced Internal Rating-Based

AMA : Advanced Measurement Approach

ASA : Alternative Standardised Approach

AT1 : Additional Tier 1

BCBS : Basel Committee on Banking Supervision

BIA : Basic Indicator Approach

BIMB : Bank Islam Malaysia Berhad

BIS : Bank for International Settlements

BP : Breusch-Pagan

CAR : Capital Adequacy Ratio

CCB : Capital Conservation Buffer

CET1 : Common Equity Tier 1

CIBAFI : General Council for Islamic Banks and Financial Institutions

CR : Credit Risk

DA : Total Deposits to Total Assets

DAR : Deposit Asset Ratio

DEP : Deposits

EM : Equity Multiplier

EQR : Equity Ratio

FDR : Financing to Deposits Ratio

FEM : Fixed Effect Model

G10 : Group of Ten Countries

GCC : Gulf Cooperation Council

GCC-STAT : The Statistical Centre for the Cooperation Council for the Arab
  Countries

GDP	: Growth Domestic Product
GFC	: Global Financial Crisis
G-SIB	: Global Systematically Important Bank
IAH	: Investment Account Holders
IFSB	: Islamic Financial Services Board
IIFS	: Institutions offering Islamic Financial Services
INF	: Inflation
IRB	: Internal Rating-Based Approach
IRR	: Investment Risk Reserves
JB	: Jarque-Bera
KDensity	: Kernel density Estimate
LAR	: Loan to Assets Ratio
LCR	: Liquidity Coverage Ratio
LIBOR	: London Interbank Offering Rate
LOB	: Lines Of Business
LR	: Liquidity Risk
LRB	: Leverage Ratio Buffers
LTD	: Loan to Deposit Ratio
NIM	: Net Interest Margin
NPF	: Non-Performing Financing
NPL	: Non-Performing Loan
NPM	: Net Profit Margin
NSFR	: Net Stable Funding Ratio
OEOI	: Operating Expenses to Operating Income
OIC	: Organization of Islamic Cooperation
OLS	: Ordinary Least Squares
OPR	: Operating Efficiency
PER	: Profit Equalization Reserves
PLS	: Profit-and-Loss Sharing
PRM	: Pooled Regression Model
PSIA	: Profit-Sharing Investment Accounts

PSIA^R	:	Restricted Profit-Sharing Investment Accounts
PSIA^U	:	Unrestricted Profit-Sharing Investment Accounts
RAR	:	Risk Asset Ratio
REM	:	Random Effect Model
RIA	:	Restricted Investment Accounts
ROA	:	Return on Assets
ROE	:	Return on Equity
R-sq.	:	R-Squared
RVF	:	Residual-versus-Fitted
RW	:	Risk Weight
RWA	:	Risk-Weighted Asset
SA	:	Standardised Approach
SD	:	Standard Deviation
SdA	:	Standardised Approach for Operational Risk
SIFI	:	Systematically Important Financial Institution
SIZE	:	Bank Size
SMM	:	Standardised Measurement Method
SSB	:	Sharia Supervisory Board
TSA	:	Standardised Approach under IFSB
UIA	:	Unrestricted Investment Accounts
VAR	:	Value-At-Risk
VIF	:	Variance Inflation Factor

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Sakarya University
Institute of Social Sciences Abstract of Thesis

Unquestionably, capital adequacy ratio (CAR) remains topmost priority for regulators due to its capability to measure bank soundness. CAR measures the capacity of regulatory capital to soak up unexpected financial losses during financial distress. Therefore, the study objective is to analyze the effect of Return on Assets (ROA), Return on Equity (ROE), Financing to Deposit Ratio (FDR), Operating Expense to Operating Income (OEOI), Log Total Assets (SIZE), Non-Performing Financing (NPF), Gross Domestic Product (GDP), and İnflation (INF) on the Capital Adequacy Ratios (CAR) of the whole GCC Islamic banks between 2013 and 2018.

This study implements a statistical research design to run the analysis. The descriptive statistics summarizes that the overall bank performances is favorable except slightly weak operating efficiency. Similarly the economic indicators are also favorable. According to the correlation analysis, only FDR has direct relation with CAR while ROE, OEOI, SIZE, NPF, GDP, and INF have inverse relations with CAR. Lastly, the regression analysis demonstrates that CAR is strongly and directly influenced by OEOI and FDR, but strongly and inversely by SIZE. All the other variables are found to be insignificant. In the end, it is recommended that banks need to minimize operating expenditure to the lowest level possible to improve their efficiency, and to develop optimal financing policy considering the harmful effect of over-and-under-financing on the banks' liquidity position. Also, the banks are recommended to pursue growth with minimal acceptable risk and maximum overall performance.

Sakarya Üniversitesi
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Yüksek Lisans	X		Doktora	

Tezin Başlığı: Sermaye Yeterlilik Oranı Belirlenmelerinin Analizi: Körfez İşbirliği Konseyi'ndeki (KİK) İslami Bankaların Konusu

Tezin Yazarı: Abdilatif Mao ALI	**Danışman:** Dr. Öğr. Üyesi Mustafa Kenan ERKAN
Kabul Tarihi: 28/07/2020	**Sayfa Sayısı:** xi (Ön Kısım) + 136 (Tez) + 6 (Ek)
Anabilim Dalı: İslami Ekonomisi ve Finans	**Bilim Dalı:**

Şüphesiz, sermaye yeterlilik oranı (SYO), banka sağlamlığını ölçme kabiliyeti nedeniyle düzenleyiciler için en yüksek öncelik olmaya devam etmektedir. SYR, düzenleyici sermayenin finansal sıkıntılar sırasında beklenmeyen finansal kayıpları giderme kapasitesini ölçer. Bu nedenle, bu araştırmanın amacı Özkayna karlılığı (ÖK), Aktif Karlılığı (AK), Finansman Mevduat Oranı (FMO), Faaliyet Giderleri ile Faaliyet Gelirleri (FGFG), Log Toplam Varlık (BÜYÜKLÜK), Sorunlu Finansman (SF), Gayri Safi Yurt İçi Hasıla (GSYİH) ve Enflasyon (ENF) rasyolarının 2013'tan 2018'a kadar KİK'deki bütün İslami bankaların SYO üzerindeki etkilerini analiz etmektir.

Bu çalışma analizi yürütmek için istatistiksel bir araştırma tasarımı uygulamaktadır. Tanımlayacı istatistikler, biraz zayıf işletme verimliliği dışında genel banka performanslarının olumlu olduğunu özetlemektedir. Benzer şekilde ekonomik göstergeler de olumludur. Korelasyon analizine göre sadece FMO'ın SYO ile doğrudan ilişkisi varken, ÖK, FGFG, BÜYÜKLÜK, SF, SYİH, ve ENF rasyoları SYO ile ters ilişkileri vardır. Son olarak, regresyon analizi bankaların SYO'ni FGFG ve FMO oranların tarafından güçlü ve negatif bir şekilde etkilendiğini, BÜYÜKLÜK oranın tarafından da güçlü ve negatif bir şekilde etkilendiğini göstermiştir. Tüm diğer değişkenler etkisiz bulunmuşturç. Sonuç olarak, bankalara işletme maliyetlerinin verimliliğini artırmak için mümkün olan en düşük seviyeye indirmelerini ve aşırı ve yetersiz finansmanın bankaların likidite pozisyonu üzerindeki zararlı etkisini göz önünde bulundurarak optimal finansman politikası geliştirmelerini tavsiye edilmektedir. Ayrıca, bankaların büyümeyi minimum kabul edilebilir risk ve maksimum genel performans ile takip etmeleri önerilir.

Anahtar Kelimeler: İslami Bankalar, Bank Ödeme Gücü, Körfez İşbirliği Konseyi (KİK)

INTRODUCTION

Banks collect or receive money from surplus units, who intend to put their money into operation so as to earn a return or just for the sole purpose of safeguarding it, and transfer it to deficit units to accommodate their financial needs. As such, banking institutions are perceived to be the bloodstream of any economic system. However, banks perform other functions in the economy that makes them essential for the economic flow. Through capital accumulation function, banks mobilize small savings from the general public and make it available for investment lines by encouraging saving and investments using different attractive financial products. Henceforth, banks turn idle money into active capital and contribute to the flow of the economy. Another major function of banks is money remittance where banks move around money while taking the risk upon their shoulders. In today's world, remitted money contribute substantially to economic development and improvement of millions of lives in especially developing countries. Banks also functions as liquidity providers. When businesses and households face liquidity issues banking institutions provide them with funds as a protection against unexpected cash shortages and financial disturbances. From broader perspective, banks act as an international trade intermediator. The role of banks is crucial in international markets given that they establish a sort of trust between transacting parties in the global markets by ensuring stewardship of the subjects traded and also transparency in the flow of documents and payments. In addition to this, banks assist their customers in the procurement of capital goods from foreign markets, identification of viable markets for international trade, issuing international trade instruments, and also pre and post shipment financing products.

Given its immense role, the soundess of the banking system still remains an issue under continuous scrutiny and improvements. In the middle of 1988, for the first time the concept of capital adequacy ratio was introduced. A minimum ratio of eight per cent was introduced to be implemented by large international banks but shortly turned into a worldwide accepted standard. Since its introduction, there has been a constant development to this requirement. The capital adequacy requirement has since been essential for the banks. It is a legal obligation that forces banks to maintain a certain level

of capital cushion usable in the events of unforeseen financial distresses. The key motive behind the necessity of a minimal requirement is making sure that banks are managed in a proper way and that they establish an effective and safe market environment that safeguards not merely shareholders investments but also protects the wellbeing of customers, depositors, the federal government and the economy all together. Banks as a profit-oriented institutions strive for profit maximization while regulatory bodies are more occupied with the setting up and publishing of the most effective regulations, policies and standards in order to prevent financial instability. Undoubtedly, regulators consider capital adequacy standards as one of their chief priorities. Regardless of the wide acceptability of the ratio as a financial stability measuring tool for financial health, there is lack of a universal definition. There are numerous definitions in the literature, yet the Basel Committee on Banking Supervision's definition is most broadly used. Capital adequacy ratio measures the amount of capital needed against the risk-weigthed assets of a banks. Thus, riskier assets call for greater capital adequacy ratio. Hence, regulatory bodies coerce the banking institutions to hold capital that's equivalent or maybe more compared to the prognosticated risks in order to match their obligations in default occasions. Allocation of a sufficient level of capital is the main reason for setting capital regulations in the banking sectors so as to ascertain that banking institutions are capable of timely delivering their financial obligations in order that potential bankruptcy can be forestalled. At times of financial tensions, capital adequacy offers a cushion against financial shocks for banks in the event of a deficiency and it helps them settle their matured debts. Capital adequacy acts as a confidence-sustainer for the banks.

Voluminous researches focusing on the determinants of the ratio indicate that there are several factors effecting capital adequacy requirements of the banking institutions. Some researchers claimed that prior years' capital adequacy ratio determines the upcoming year's capital ratio. Others expressed asset management quality as a determinant of adequate capital. Additionally, factors like liquidity, profitability, management efficiency, total volume of the bank's assets, and other bank-level factors are considered to influence the determination of adequate level of capital. To broaden the scope, external factors beyond the bankers control are examined. Apparently, the risk levels proposed by the regulators insufficiently determines how much of adequate capital base banks should hold. As such, central banks impose a minimum capital adequacy ratio higher than that

of the Basel committee. Given the rapid growth and the distinctive form of Islamic financial system, development of capital rules intended to Islamic banks proved to be challenging. Due to complex nature of Islamic finance and difficulties faced by Islamic banks to compute a clear-cut capital adequacy ratio, regulatory bodies advocate for Islamic banks' sustainment of larger amount of regulatory capital unlike traditional banks. Despite the availability of substantial studies that focused on factors impacting capital adequacy ratio of conventional banks, similar studies on Islamic banks are very scarce. Therefore, there is tendency for further studies concerning Islamic banks.

Problem Statement

After performing a thoroughgoing review on the currently existing researches out there in the literature, it was revealed that the larger portion of such studies were carried out to have a thorough comprehension regarding the viability of implementing capital adequacy standards on the banking sector. Nonetheless, what exists there in the literature is a substantial research gap that needs to be addressed. Studies conducted on Capital Adequacy Ratio (CAR) are mainly divided into two main streams: The first stream focused on evaluating the applicability of using CAR and related regulations to handle risks while the second stream focused on developing models so as to examine elements influencing commercial bank CARs. Islamic banks in the GCC are outpacing their conventional counterparts and a rapid growth is experienced. Surprisingly, efforts to come across any or recently executed researches that measures factors impacting CARs of exclusively GCC located Islamic banks proved unproductive. Besides, what the present literature on the research topic offers are incongruous findings and wide-ranging deductions. In order to have a better grip on the functions of certain variables or factors, there exists a necessity to explore this phenomenon through empirical observations irrespective of the existing incertitude.

Researchers in the academic world mainly exerted their efforts on the conventional type of banking system. Likewise, conventional banking system has always been at the center-stage of discussions at regulatory assemblies such as the Basel committee conventions. As such, researches that focused on other types of financial institution or banking systems concerning capital adequacy requirement is extremely scarce or unavailable. Henceforth, there is an undeniable need to turn our attentions to this research gap and try to bridge it.

Objectives of the Research

The study aspires to analyze determinants of the GCC Islamic banks' capital adequacy ratios. The following specific objective are developed:

1. To evaluate the impact of Profitability (ROA & ROE) on determining GCC Islamic banks' CAR.
2. To evaluate the impact of Operating Efficiency (OEOI) on determining GCC Islamic banks' CAR.
3. To evaluate the impact of Bank Size (SIZE) on determining GCC Islamic banks' CAR.
4. To evaluate the impact of Asset quality (NFP) on determining GCC Islamic banks' CAR.
5. To evaluate the impact of Liquidity (FDR) on determining GCC Islamic banks' CAR.
6. To evaluate the impact of Economic Growth (GDP) on determining GCC Islamic banks' CAR.
7. To evaluate the impact of Inflation (INF) on determining GCC Islamic banks CAR.

Questions of the Research

1. To what extent does Profitability (ROA) impact the determination of GCC Islamic banks' CAR?
2. To what extent does Profitability (ROE) impact the determination of GCC Islamic banks' CAR?
3. To what extent does Operating Efficiency (OEOI) impact the determination of GCC Islamic banks' CAR?
4. To what extent does Bank Size (SIZE) impact the determination of GCC Islamic banks' CAR?
5. To what extent does Asset Quality (NFP) impact the determination of GCC Islamic banks' CAR?
6. To what extent does Liquidity (FDR) impact the determination of GCC Islamic banks' CAR?

7. To what extent does Economic Growth (GDP) impact the determination of GCC Islamic banks' CAR?

8. To what extent does Inflation (INF) impact the determination of GCC Islamic banks' CAR?

Significance of the Research

Even though the Basel Committee, the IFSB, and the Central banks impose a specific minimum requirement of capital ratios on banks, banks continue to display capital ratios higher than the minimum. This reality indicates that there are other factors behind this increase. Given the crucial role GCC Islamic banks play both for the GCC and for the entire Islamic financial system, this study is valuable to the banking industry, investors, regulators, scholars and researchers, etc.

The banking industry, particularly the Islamic one, shall find this study useful as it will add a new outlook to preceding studies by conveying the level of influence bank-specific and macroeconomic-specific factors under investigation have on Islamic banks' soundness. Benefiting from the outcome of this study, they shall be able to develop an ideal level of capital reserve and keep other factors at optimal level. This study shall be helpful to investors and the general public who are willing to invest in financially sound Islamic banks. Regulators of financial sector and central banks shall employ this study to develop regulatory policies that is intended to guarantee stability and to avoid financial distress in the financial sectors. Scholars, academicians, and researchers interested in similar studies or related area shall refer to this study to benchmark against their researches and to fill their knowledge gap. Based on the study, consultants shall be able to ease the worries of their clients and use the knowledge provided by this study as an advisory tool. But more importantly, this undertaking will undoubtedly contribute to the research conducting skills of the researcher himself and enable him to acquire insights on the region-the GCC.

Scope of the Study

GCC is a region where conventional and Islamic financial systems has long been co-existing. Thanks to buoyant economic activity, a booming Islamic finance sector and effective financial sector reforms, the financial systems of the region have gone through

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a substantial development. The financial institutions in the region are relatively large and contribute largely to the GDP. The regions' financial industry is dominated by the banks, whereas the non-banks – consisting of pension funds, investment companies, specialized credit institutions, insurance and others – remains quite very small. Remarkably, the GCC Islamic banks remains a crucial driver for the growth of the banking industry having developed products and instruments that meets the needs of investors and borrowers who refrained from engaging in banking transactions due to religious reasons given the fact that the GCC is a Muslim majority region. Islamic banks exhibited a remarkable growth higher than their conventional equivalents in terms of total asset volume and better capitalization base irrespective of their smaller number. Apart from local significance, the GCC Islamic banking industry holds a magnitude position in the global Islamic finance as it represents around half the assets of the industry.

Bearing the domestic and worldwide importance of GCC Islamic banks in mind, this study is conducted only on the Islamic banks operational in the region from 2013 to 2018. The core objective is to find out whether some pre-specified factors affects the stability of the GCC Islamic banks, whereas stability of these banks is represented by CAR. All the Islamic commercial banks in the region are considered for this study. Due to convenient accessibility, availability, and reliability, secondary data collected from the financial reports of the banks and global economic databases as well are used. Banks that offer both Islamic and conventional products are neglected in order to focus solely on full-fledged Islamic banks. To investigate the level of influence and connection between the predictors and the main variable (CAR), a panel data regression model is employed to generate descriptive analysis, correlation, and multiple regression analysis results. A panel data is a large multi-dimentional data set consisting of a number of observations that are repeatedly measured for each time-period. İt is a combination of cross-sectional and timer-series data.

Organization of the Research

Overall, the research is organised into three chapters. The first chapter gives an overview explanation of the concepts like adequate capital requirements in the banking industry including the term capital, its functions, the emergence and importance of capital adequacy requirement, its objective and its management, and the concepts of Basel

frameworks. The second chapter examines our main variable capital adequacy ratio, its components, influential elements, its various levels, and its role in the stability of banks. In the third chapter, conceptual framework, literature review, research methodology, operational definitions, hypothesis development, data collection procedure, study population, model specification, data analysis techniques, and outcome interpretations are discussed.

CHAPTER 1: CONCEPT OF ADEQUATE CAPITAL REQUIREMENTS

Since banking operations involve risks, banks are obliged to ascertain their clients that they hold sufficient amount of capital capable of mitigating risks exposable to their funds in case unpredicted financial blows occur. The significance of adequate capital requirement has been stressed upon by many authors, particularly subsequent to the global financial crisis (GFC). Li (2013, p. 11), found that one principal factor that prompted financial failures during the GFC was insufficient capital while Samad (2011, p. 109,) realized that the collapsed banks during the 2007 crises were under-capitalized in comparison to the well-capitalized banks that survived the financial flood.

This chapter is separated into three broad sections. In the first section, historical background about the term capital, its various uses in different disciplines, its functions, and inherent risks are presented. In the second section, the concept of capital adequacy requirement and its emergence, its importance for banks in general and Islamic banks particularly, its objective, and the role of management on capital requirements are discussed. In the last section, the Basel committee and relative Basel frameworks are discussed while the applicability of Basel standards on Islamic banks are detailed as well.

1.1. The Term Capital and Its Origin

Unlike money, whose sole purpose of usage is to buy goods and services for consumption, capital represents a broader term pertaining to its durability and capability of generating wealth through investments. The term capital has long been a source for controversy as it went through different stages carrying different meaning. Going back to history, initially capital meant nothing but the headcounts of cattle. Then in the era of the ancient Greece and Rome, the word 'capital' started to be viewed from a broader perspective as 'wealth' in general. But the progression of this word did not end there. From 1283, the Italians started to transform the word into a business terminology of a firm or a merchant's money, which spread all over the Western Europe. In the 16th century, English businesses started to use it in their accounting books while in the 17th century, the Italian and the French began to refer to it as the principle of debt (Hodgson, 2014, p. 2).

From the 13th century to the 18th century, even though there existed a secondary meaning for capital from its materialistic point of view as stock of goods or even any substance owned, the monetary definition of capital retained its primary position as money advanced to create a business venture put forward by its owners or shareholders. Nonetheless, with the emergence of economists like Adam smith, money could no longer represent the word capital since only silver and gold could accommodated this definition. Besides productive goods or stocks, the term 'human capital' which denotes labour force as an element of productive resource, became part of the term capital (Hodgson, 2014, p. 3). In modern economics, capital is one of the factors of production. Others being land or natural resource, labour and entrepreneurship. Hence labour is no more constituent of capital as in classical economy. Labour is defined as both mental and physical determinations put in by humans in the process of making products, whereas capital refers to all man-made productive assets utilized in the making of the products.

From finance viewpoint, capital is generally referred to as financial capital. Neva Goodwin (2003, p. 3) acknowledged five different concepts of capital and referred to financial capital as money or capital stock invested in some productive activities that will create more money for its owners. Other capitals being natural; human, social, and produced capital.

Due to the numerous different perceptions about its functions, it is problematic to find a universal definition of capital. From the perpective of banking and finance theory, Santoso (1999, p. 112) defined a bank's capital to be the combination of equity and debt, which is not under the guaranty of any deposit insuring institutions and has the ability to absorb losses. As such, capital plays the role of an internal insurance fund. Capital is capable of protecting depositors and creditors from losing their money due to bank insolvency problems by enhancing management skills, liquidity of the institution and market entrance. Capital is the amount of funds that a bank holds to support its business and also to protect itself from unpleasant adverse financial changes as mentioned by Athanasoglou, Brissimis, & Delis (2008, p. 127). Additionally, the authors expressed that capital entitles shareholders the right to reap future benefits of the business.

In banking literature, two close meanings of capital is demonstrated. First, capital is money in the form of shares issued and paid-up that initiates the banking operations. Then

over time, the bank's capital funds reflects the accumulated capital (Ikpefan, 2016, p. 1). Elliott (2010, p. 2), exemplified two forms of capital: The first and simple form of capital being the portion of bank's assets - after creditors' claims are settled- upon which the bank is not legally obliged to repay whereas the second and the more complicated form of capital is the part which is shelved for repayment but only in the far future. By the second form, the writer implies capital allocated to shield certain bank stakeholders from losses.

In a simple term, Getter (2014, p. 2) defined capital as the net balance between bank's resources and liabilities. Banks holding sufficient capital reserves can handle defaults on longer term loans or assets without failing to settle their short term repayments. The definition of capital which is most relevant to this study is given by Tarbert (2000, p. 1776) where capital refers to loss absorbing finances that can protect both depositors' money or the money of those who insure deposits. Regardless of the long-stretching controversies among economists, the word capital, from the 19th century till this day, maintained its initial definition as money in the world of business and finance.

1.1.1. Functions of Capital

In a bank's balance sheet, capital represents banks' net assets (assets – liabilities). Loans or financing granted to customers represent major portion of bank assets while deposits payable on a fixed date or upon demand take up large portion of bank liabilities. The most prevalent risks faced by banks is that of borrowers defaulting on their loans. Banks, in such incidents, count on their capital base. In general, Tarbert (2000, p. 1776), states that capital functions as a financial cushion which is capable of absorbing losses and protecting its depositors or deposit insuring institutions from such losses. The defaulting on payments by borrowers affects bank's capacity to meet their obligations towards their depositors or creditors. Hence, capital is employed to relieve such inconveniences. From technical aspect, capital functions to guarantee that bank's net assets always exceeds its net liabilities (Tarbert, 2000, p. 1777).

van Greuning & Bratanovic (2009, p. 122), classified the functions of capital into two primary and secondary functions. The primary function of capital for banks involves safeguarding and protecting the lending activities or operations of the banks whereas the secondary function is about promoting and advocating for more proficient banking

structure. The authors also claim that capital functions as a primary assessment tool for bank safety and soundness. Similarly, Mohammed (2018, p. 57), underlined the functional significances of capital for banks into three comprehensive phases of banks' lifecycle. In the first phase, capital serves as a cover for profit shortages and as a minimum base for regulatory purposes. In the second phase, as banks reach certain level of maturity, banks require supplementary capital as a cover for unanticipated additional losses arising from bank expansion. In the last phase where banks are at the verge of bankruptcy or liquidity shortages, additional capital functions as a protector against such circumstances. van Greuning & Bratanovic (2009, p. 122) stressed that capital influences almost the entire banking operations either directly or indirectly, thus making it indispensable resource for banks to continue serving its customers. However, capital is not seldom enough, as elements like good management, strong risk management, efficient corporate governance, and strong internal controls are also a requirement for smooth performance. According to Jasevičienė & Jurkšaitytė (2014, p. 123), in situations where there is an economic crisis, bank capital functions as a regulatory factor utilized by regulatory bodies to restore stability in the economy whereas in the wake of the crisis, capital functions like operational, renewal, and promotional contribute to the betterment and improvement of the banks.

1.1.2. Types of Risks Affecting Bank Capital Reserves

Banks operate in a more dynamic and complicated field making them susceptible to an assortment of risks exposures. Such risks pose substantial effect on the nature and amount of capital reserved by banks due to capital adequacy regulations. Risks related to capital reserves originate either from internal sources or from external sources.

One major internal risk exposure that can effect capital reserve of banks is operational risk that arise due to banks' operational inefficiency. Bank capital reserve face the likelihood of erosion, either in quantity or in quality, due to incompetent management decisions. According to Mohammed (2018, p. 20), uncalculated risky commitments authorized by banks' management team can lead the banks to a forced liquidation which in turn calls for utilization of bank capital. Thus, effective and qualified management head who can avoid such problems is required.

Poor bank performance is another source of risk for bank capital. A decline in profits accelerated by poor performance may force banks to use their capital reserves to pay for their matured debts. Another internally instigated risk is fraud or mismanagement of bank capital for personal benefits. Fraudulent activities within the bank can lead to capital exploitation, thus reduce expected returns as efficient use of capital can generate significant returns. Samuel (2018, p. 16), stated that bank capital base along with public confidence, and financial and economic performance are severely vulnerable to fraud- or insider abuse as he named. Banks' internal weakness often demotes their reputation in the market. Banks with reputational damages find it difficult to procure funds from the market to settle their payments, hence left with no choice but to use their reserves. However, whether reputational risk is a stand-alone risk or caused by other risks like operational risk is unclear (Yego, 2016, p. 12). Deutsche Bank (2019, para. 2), referred to reputational risk as risks that arise due to improper action by the bank or a third party or even inaction by the bank, with a potential to damage bank's brand; earnings, capital or liquidity.

As for external risks, credit risks and market risks pose serious impact on capital. As for credit risks, which arises due to default of borrowers on their loans hence limiting banks' ability to meet their financial obligations, banks use capital reserve to absorb default damages and to keep on performing efficiently. Similarly, market elements pose major risk on bank capital. Losses arising from market risk constituents like inflation risk and interest rate directly impact bank capital value and level. During high inflationary and interest rates, banks require additional capital to compensate for the capital value depreciation and for the expected higher return (J. A. Mohammed, 2018, p. 20). Economic conditions bear indirect consequences on bank capital. Kasman & Kontbay Busun (2016, p. 2), stated that banks increase or decrease capital buffers during economic recessions or economic expansions respectively due to counter-cyclical business fluctuations. Banks require additional capital to curb losses arising from market uncertainties during economic downturns.

1.2. The Concept of Capital Adequacy Requirements and its Emergence

To find solutions to the crises experienced in the 1970s and beyond, the BIS founded the BCBS in 1974, and delegated to it the development and publication of standards for banking industry. The standards established by the committee predominantly revolved

around adequate capital requirements and supervisory improvements, and have been the subject of many researches from the past to the present and have surfaced the way for many researches. However, it wasn't until early 1990s when the concept of banking regulations drew the attention of Islamic banking regulators. After nearly nine years, AAIOFI following suit BCBS's guidelines, took the first step in 1999 by developing the first and foremost capital adequacy framework for the Islamic banks' implementation (Bitar, 2006, p. 45). Later in 2003, IFSB emerged by developing capital adequacy standards and other principle and technical guidelines for the industry (IFSB, 2003, para. 1).

The concept of capital adequacy requirement emerged in mid-1970s when the traditional capital ratio of total capital to total asset ratio resulted in the unparalleled spreading of lending engagements of banks, hence triggering the worldwide debt crisis and the fall of the United States' Franklin National Bank (Bateni, Vakilifard, & Asghari, 2014, p. 108). As such, regulatory authorities were forced to implement more control processes and develop new criteria and methods to prevent bankruptcy as the original capital ratio was incapable of detecting the risk level of the bank capital. Banks undertake different transactions bearing unequal level of risks that require sufficient loss-absorbing capital. When bank's liabilities outweighs its assets, they face insolvency issues, tempting shareholders to change their decisions. In such cases, regulators encourage banks to hold enough capital buffers capable of minimizing insolvency risks effects (Thumbi, 2014, p. 5).

Tarbert (2000, p. 1771), stressed on the necessity of ample bank capital as a prerequisite for a strong economy, and stated that its role is to shield against significant financial damages to the banking system. Similarly, Wiley and Gardner (2010, p. 44), referred to capital adequacy as a final defensive approach against unforeseen financial burdens. Capital adequacy is not a requirement for only banks but for all types of firms. Businesses with poor capital buffer management usually turn out to be insolvent or suffer reputation damages and lose contracts. Customers refrain from dealing with banks that lack capital buffers realizing that they charge extra fees to cover for the additional risks (Tarbert, 2000, p. 1771). The direct objective behind this minimum capital requirement is primarily to ensure the shareholders of the banks that their banks hold sufficient capital to settle

their liabilities in time without getting exposed to urgent liquidation in case of a default. Indirectly, this requirement is expected to prevent negative effects on the economic system since banks are the turning wheels of the economy.

The conception of capital adequacy is a very significant one that requires careful and sharp management because it is one of the most crucial yardstick that quantifies the level of bank's efficiency and stability. This statement can be supported by the incident in 1970s whereby the international debt crisis and the tumbling of Franklin National Bank took place because of the expanded lending by banks with no equivalent expansion in capital volume (Azadinamin, 2013, p. 13). Prior to the international debt crisis, in 1954 Nigerian banking sector experienced a major blow when twenty one out of its twenty five local banks went out of business due to lack of adequate capital, mismanagement of assets, lack competent human capital, and also lack of regulations since the Nigerian central bank started operating only five years after the incident (Ogunleye, 2002, p. 3). More recently, in the 2008 financial crisis, the Lehman Brothers filed for bankruptcy. The pursuit for higher growth, targeting an aggressively higher revenue led Lehman Brother to hold a very insufficient level of capital as $700 billion of their total assets was financed with $675 billion of debt. So when the subprime crisis unfolded, Lehman Brothers became incapable to absorb the losses (Azadinamin, 2013, p. 13). Most economies of today take bank capitalization or capital adequacy very seriously as they believe adequate capitalization can resolve – among other functions- the issue of bank instability, improve banking management, positively affect profitability, ensure better management of quality assets, reduce banking risks, and place banks in a favorable position of liquidity to continuously manage customer obligations (Ikpefan, 2016, p. 2939).

The BCBS considered development and publication of banking supervision requirements as one of its primary functions, and as a consequence they established and implemented, with the help international parties, rules and guidelines in relation to capital adequacy requirements to insure healthy banking segment. Hence, capital adequacy requirement covers a broader spectrum of banking supervision and stability.

1.2.1. Importance of Adequate Capital Requirement for Banks

When it comes to the banking sector, adequate capital requirements becomes a matter of significant interest to a broad range of market participants as banks deal with money they

are entrusted upon. Capital adequacy requirement poses a substantial influence on bank capitalization, profitability and expenses, and as such banks need to set up a practically feasible capital adequacy system as per Ezike & Oke (2013, p. 148). Management discipline is a key element of capital requirement and requires banks to expand their capital volumes if they intend to grow customer deposits. The authors added that capital adequacy requirement is perceived to have an optimistic weight on bank performance since the required capital level maintained by the bank dictates the amount of lending they can make considering the risk absorbent capacity of the capital (Ezike & Oke, 2013, p. 148). According to Agbi and Ekundayo (2016, p. 756), for banks to decrease the possibility of failures, adequate capital standards are required. Provided that successful capital requirement is implemented, a positive lending behaviors by the banks are expectable. Tarbert (2000, p. 1779), emphasized on the implication of adequate capital requirements for banks. In his view, banks need optimal capital standards since holding larger capital cushion surely prevents short-term bank failures but most likely negatively effects profitability and raises cost of borrowing. Additionally, establishing a stiff capital requirement for banks also derails bank competitiveness in international arenas due to the harsh regulations limiting their activities.

Keeping adequate capital renders customers to have the confidence to continue their engagement with the corresponding financial institutions after realizing that capital buffers are allocated to protect their investments (J. A. Mohammed, 2018, p. 17). In extreme cases where banks are legally shutdown as a consequence of unsettled market debts, investors can still claim their principle amount against the reserved capital. According to Mohammed (2018, p. 18), sixty percent (60%) of global banking institutions used their reserved capital to cushion against failure and reclaim their market position. Capital requirement forces bank management to be less-risky oriented and invest in low-capital-requiring high-yielding assets rather than high-capital- requiring high-yielding assets as they fear to lose their capital due to failure of the latter contract. This sort of prudent behavior by the banks lures to investors and to board of directors as well.

1.2.2. Importance of Adequate Capital Requirements for Islamic Banks

Considering the nature and form of Islamic banking system, application of capital adequacy requirements in a similar way to conventional banking system would seem

impractical. Conceptually speaking, Islamic banks are different than their conventional peers due to their equity-based capital structure comprising mostly of profit-and-loss sharing (PLS) investments apart from shareholders equity. If only such concepts were true and Islamic banks were purely structured as a PLS-based organizations, capital adequacy requirements would not be needed for Islamic banking system (Muljawan, Dar, & Hall, 2004, p. 429). Nonetheless, in reality this is not the case. In the balance sheet of these banks, fixed claim liabilities exist resulting from the presence of informational asymmetry and risk averting investors. These conditions call for the imposition of adequate capital requirements on these type of banks.

In Islamic banking, capital adequacy requirement serves two fundamental purposes. First, capital regulations should force minimum capital cushion and optimal asset-liabilities structure to protect risk-averse depositors and ease their concerns. Second, these requirements should motivate shareholders in their quest for prudent bank behavior (Ghandour, 2017, p. 292). One major aspect distinguishing between Islamic banks and conventional banks is the investment account deposits. As conventional banks consider these accounts as liabilities, Islamic banks consider them as risk sharing deposits and make no guarantees for their principal amount nor their returns (Ozkan & Iqbal, 2015, p. 12). These accounts – officially referred to as profit-sharing investment accounts (PSIA) - are hence not included in the equity section of Islamic banks' balance sheet due to their lack of core or supplementary capital criteria. Similarly, investment account reserves like Profit Equalization Reserves (PER) and Investment Risk Reserves (IRR) are not considered to be capital of Islamic banks. PER is intended to accumulate profits accrued to PSIA beyond specific level so that it can be used to compensate for lower returns payable to investment account holders (IAH) during less profitable time. Similarly, the IRR involves quite similar processes however the purpose behind it is to mitigate the impacts of future losses arising from investments engaged on behalf of IAH (Shabsigh et al., 2017, p. 13). Essentially, these reserves are analogous to countercyclical buffers established in Basel III but funded by IAH rather than shareholders of the banks as in Basel III accords.

In reference to AAOIFI's standards of 1999, Islamic banks are recommended to implement capital adequacy regulations on three risks –normal commercial risk, fiduciary

risks[1], and displaced commercial risks[2]- inherent in their capital (Muljawan et al., 2004, p. 432). Islamic financial products like Murabaha, Ijarah, Salam, Musharaka, and Mudharaba are exposed to commercial risks like market risks and credit risks. For instance, Salam contracts are subject to counterparty risks whereby a third party indirectly involved in the contract will default on its obligation. Murabaha contracts carry similar counterparty risk since it's a non-binding contract (Ghandour, 2017, p. 294). Given that these bank types are not immune from risk exposures, the importance of capital adequacy regulations for Islamic banks is undeniable regardless of their varying nature.

1.2.3. Objectives of Adequate Capital Requirements

Banks' position as a financial intermediary explains the primary reason why bank capital requires adequate regulations in contrast to other non-banking entities. Capital adequacy requirement is mainly about maintaining sufficient and high quality amount of capital cushions to limit the likelihood collapses of banks individually and the banking industry to the most extreme. Tarbert (2000, p. 1780), stated four objectives for minimal bank capital advocated by regulators. First, banks experience bank runs when depositors rush to draw their money fearing that their banks will default on their payments. In such cases, capital cushion acts as an assurance for depositors and prevents precipitous bank runs. Second, governments require banks to reserve a certain fraction of capital with the speculation of reducing the risk of systematic bank failures resulting from the interconnectedness of the banking system. Third, adequate capital cushion preserves taxpayers money not to be used as bailouts for failing banking systems. Fourth, efficient capital standards can restrict over-leveraging of assets with borrowed funds. Banks insist to keep largely unnecessary capital volume on the ground that funding short-term loans with shareholder equity is highly expensive- a view underlined by Getter (2014, p. 12).

As a profit-seeking entity, banks strive to maximize their profits to retain their shareholders and depositors in the business by distributing them some portion of the generated income. To accomplish a higher profit margin, banks require capital to expand their profit earning capacity. According to Musyoka (2017, p. 6), better-capitalized banks

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[1] Fiduciary risks arise from Islamic bank' poor management of non-investment deposits – deposits whose principal is guaranteed (Muljawan et al., 2004, p. 432).
[2] Displaced commercial risks refers to the likelihood that depositors will switch to other banks that provide higher returns on their deposits (Muljawan et al., 2004, p. 432).

have the resources to expand the range of their profitable projects. On the contrary lower capital level puts limitations on the investment scope of under-capitalized banks. It is obvious that adequate capital requirement affects the performance of banks. According to the Buffer Theory of capital, banks that maintain excess capital buffers enjoy various investment ventures which in turn improves their financial performance (Muskoya, 2017, p. 5). On the other hand, capital adequacy regulations ensure clients that banking operations are conducted in a conservative manner. Given that depositors and shareholders entrust their money with the banks, Calem & Rob (1999, p. 2) argued that the intention behind stringent capital regulations are to limit moral hazards and unethical actions of banks that attempt to wrongfully take advantage of deposit insurance funds who provide insurance for the banks in exchange for a premium. Such stringent capital requirements are aimed at discouraging enormous bank risk-taking, precluding bank disasters, and assuring uninterrupted bank solvency. Banks that maintain sufficient capital base often remain solvent, thus adequate capital regulation contributes to the defensive strategies of bank to foil hostile takeovers (Olalekan & Adeyinka, 2013, p. 88). Considering the reality that undercapitalized banks always face insolvency and liquidations issues, management of such kinds of banks exert their time and effort in raising funds to prevent takeovers.

One major objective behind capital adequacy requirement is its imposition of minimum capital threshold on banks. Banks are obliged to maintain a minimum threshold of CAR to claim solvency and avoid the possible official shutdown by regulators should bank capital falls lower than the minimum threshold (Getter, 2014, p. 2). The Basel committee developed CAR as a measurement for capital adequacy requirements and a minimum 8% CAR must be well-kept. Any bank that goes below the minimum ratio will be considered undercapitalized and will face punishable measures from regulators including bank closure.

1.2.4. The Role of Bank Management for Implementing Capital Requirements

Capital adequacy requirements are developed by the BCBS and enacted by national authorities to improve the stability of financial institutions. However, it is the banks' obligation to ascertain that such regulations are respected and adequate level of capital is maintained. Banks are evaluated each year by regulatory bodies to assess their viability,

compliance with regulatory standards, capability of meeting their financial obligations, and also whether or not their operations might jeopardize banking system stability (van Greuning & Brajovic Bratanovic, 2009, p. 16).

In the banking domain, management (in this context, refers to senior managers and directors) is the ultimate entity responsible for bank operations and implementation of policies. One cardinal duty of bank managers is about reviewing and approving policies related to capital requirements for the safety of the bank. In essence, bank managers are required to establish a robust capital management strategy which can clearly define capital adequacy rules and targets, and procedures for identifying, measuring and reporting capital reserved to curb risks (van Greuning & Brajovic Bratanovic, 2009, p. 146).

In order to implement their risk management policies, management require the accounting department to measure and report elements which determine the quality and quantity of capital needed to curb damages, which might lead to shut down. However, sometimes accounting department apply accounting standards that give the banks a pass to reclassify their assets with the intension of reducing assets' fair value losses hence reducing required capital (BCBS, 2015, p. 19). For instance, Georgescu & Laux (2015, p. 24), concluded that the application of historical cost method and publication of financial statements on local GAAP[3] triggered the failure of three German banks during the GFC. Recording their assets at historical cost failed to prompt banks the need for refinancing. Without a doubt, accounting rules followed by banks significantly affect their financial results which in turn influences supervisory decisions based on such results (Schwarz, Karakitsos, Merriman, & Studener, 2014, p. 5). Accounting data produced by the accounting department serve as a main source of decision making for bank supervisors, hence carries colossal importance.

Banks generally use CAR as a measurement for solvency and financial soundness, and a minimum threshold is recommended. However, central banks often demand a higher ratio to further minimize the risk of financial distress. Given the fact that management run the daily operations of the banks, regulators and supervisors hold bank senior managers

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[3] GAAP refers to Generally Accepted Accounting Principles

accountable for bank's safety and stability. As part of risk management strategy, managers should be able to recognize the degree of their capital deterioration and the proper time to lift up their capital level as banks face difficulties to raise capital during unpleasant conditions- i.e. capital becomes expensive and limited. Therefore, it is in a bank's best interest to keep a minimum level of 8 % (van Greuning & Brajovic Bratanovic, 2009, p. 165). According to the authors, there are three steps for managers to analyze their capital adequacy. First step involves analyzing the structure of qualifying capital. Management should analyze the components of a bank's capital, especially those employed to curb bank risk exposures. Equally important is the shareholding structure, as demands for dividends by shareholders diminishes the level of bank capital. Second step is about analyzing bank risk profile. Each individual assets owned by the bank, either on or off the books carry specific risks, hence management are required to analyze the structure of their risk portfolios, and if or how such structures changed. The third and last of the step is evaluation of bank's current and future capital needs. After having analyzed the amount of qualifying capital and the level of risk exposures, banks need to calculate their capital adequacy ratios and check whether their ratios are equal to or above the minimum required 8 percent. In case the ratios are below the eight percent threshold, then management should evaluate the cause for such result. Some possible sources for below-minimum ratios could be an increased size of balance sheet items or a change in asset risk profiling. On another side, an increasing CAR trend overtime indicates potential future growth of banks (van Greuning & Brajovic Bratanovic, 2009, p. 151). Henceforth, expansion of bank volume calls for increase in required capital.

1.3. Basel Committee and Relevant Accords

When first established in 1974, the BCBS consisted of state bank governors from G10 states. However, the committee expanded overtime and currently consists of forty five (45) members from twenty eight (28) jurisdictions or countries including Muslim major countries (BCBS, 2016).

To improve effectual running of the economy as a whole, BCBS stressed on the dire need for consistent and systematic supervisions, timely intervention, and compliance with regulatory standards by the banks. Likewise, in order to regain a sustainable and balanced economic growth, the committee expressed the necessity to address resource

misallocations caused by strong financial booms and discovered only during subsequent financial failure (BIS, 2014, p. 20). Nonetheless, we should keep in mind that the directives and regulations of the committee are simply recommendations to enhance banking regulations and supervisions, but not a legally binding agreement or 'treaties' that cannot be modified as desired (Getter, 2014, sec. summary).

1.3.1. Basel I Accords

After an extensive discussions between the BCBS and the G10 state bank leaders in mid -1988, the Basel I capital adequacy framework was developed and presented in order to solve insufficient capitalization of banks (J. A. Mohammed, 2018, p. 24). Under this framework, the committee presented four pillars: First being the Constituents of Capital which introduced Tier 1 and Tier 2 regulatory capitals. Second pillar was the Risk Weighing Techniques to assign different weights to various assets. Third pillar was about a Target Ratio where the eight percent (8%) minimum required ratio was stipulated. The fourth and last pillar discussed mainly the Transitional and Implementation Agreements of the accord (Zubair, 2014b, p. 5). Basel I was aimed at promoting consistent safety and reliable standards while at the same providing a level-ground competition among banks in member countries. A major concern for the international regulatory bodies was an influx of international banks – due to unbalanced competition against safer banks - into countries that implement the most safety and soundness requirements and were pushing for harmonization of capital reserve requirement at a world-wide level (Getter, 2014, p. 2).

The regulation, effective from December 1992, was the first document to introduce a minimum 8% capital ratio. Tier 1 capital, Tier 2 capital, and risk-weighted assets (RWA) were also introduced. Tier 1 capital is the most prominent security capable of absorbing losses without forcing banks to liquidate and wind up whereas Tier 2 is less reliable secondary source of capital capable of taking up losses after the bank ceases to operate. The later capital form provides protection to depositors only to a lesser degree (Salgotra & Wadhwa, 2012, p. 56). Tier 1 capital consists of reserves, retained earnings, and equity whereas Tier 2 capital is made up of loss provisions, some preferred stocks, perpetual debts, undisclosed reserves and revaluation reserves. Both tiers represent half of the minimum ratio (Shabani, 2015, p. 35). RWA are bank assets put into four different

categories based on their credit or default risk level. Assets like government bonds and collateralized loans carried 0% and deemed risk-free assets while assets like private sector loans and real estate investment were deemed riskiest of all with a 100% risk level.

Table 1: Basel I RWA Classifications

%	Item
0	– Cash – Claims on OECD central governments – Claims on other central governments if they are denominated and funded in the national currency (to avoid country transfer risk)
20	– Claims on OECD banks and multilateral development banks – Claims on banks outside OECD with residual maturity <1 year – Claims on public sector entities (PSE) of OECD countries
50	– Mortgage loans
100	– All other claims: claims on corporate, claims on banks outside OECD with a maturity >1 year, fixed assets, all other assets …

Source: Balthazar, L. (2006). *From Basel 1 to Basel 3: The Integration of State-of-the-Art Risk Modeling in Banking Regulation*, 1st edition, p.18.

So to calculate the capital requirement for an asset to cover its risks, the value of the asset (let's say 1000$ mortgage loans) is multiplied by its relevant (50%) risk weight and the outcome (1000$ X 100% = 500$) is then multiplied by the 8% minimum capital adequacy ratio (500$ X 8%) to get 40$ adequate capital base.

With the use of CAR, regulators could tell how much capital a bank needs to keep by comparing its regulatory capital with its RWA. Thus, they could examine if the bank can absorb losses without negatively affecting the economy of the country. In addition to this, a specific CAR yardstick provided the general public with a tool to compare banks (J. A. Mohammed, 2018, p. 25). However, the Basel I came under criticism for many reasons mainly due to regulatory arbitrage. Basel I norms gave birth to capital regulatory arbitrage by fixing capital requirements within asset classes. Banks compare economic capital, which assists a bank's risk-taking actions based on their internal models and risk parameters using quantitative techniques, against regulatory capital. When regulatory type of capital exceeds the economic type, banks are forced to increase their regulatory capital level thereby diminishing shareholder's value. To avoid such incidents banks take advantage of 'capital arbitrage' and invest in riskier assets within the risk-weighted bands

(Balthazar, 2006, p. 33). Without considering the different level of counterparty risks that affect the credit portfolio of different organizations, the Basel I norms encourages a unanimous application of capital requirements on all assets in a single asset category (Caruana & Narain, 2008, p. 24). Another major shortcoming was the negligence of other risk factors like market risk and operational risk. Due to such capital-arbitrage, banks preferred to make loans to higher default risk associated companies with higher yields rather than companies with lower default risks and lower returns since both loans belonged to the same level of risk category under Basel I despite the risk is much higher in the first case (Emmons, Lskavyan, & Yeager, 2005, p. 12).

1.3.1.1. The 1996 Amendments

At the start of 1996, BCBS rectified its original accord and introduced market risk[4] as another source of risk for banks whose aim was to establish an explicitly protective capital for market related risks, which banks are exposed to (Prakash, 2008, p. 90). In terms of market risk, banks - subject to national regulators' approval - were given two options to estimate capital charge (BCBS, 2005, p. 2): The Standardised Measurement Method (SMM) which uses a building-block approach that calculates capital charges both for specific[5] and general market risk[6] exposures, and the Internal Value-at-Risk (VAR) model, which is risk measurement model developed with supervisors approval by the banks based on strict quantitative and qualitative standards. VAR is a risk measurement method that calculates the likelihood of losses arising from an investment or portfolio of assets for a certain time-range and at a pre-determined confidence level. Another significance of the 1996 amendment is the introduction of Tier 3 capital as additional capital cushion against market risk subject to authorities' approval (BCBS, 2005, p. 5).

1.3.1.2. Basel I Criticism

Notwithstanding the immense efforts put in by the committee, the accord attracted lots of criticisms including lack of risk sensitivy, limited collateral recognition, incomplete risk

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[4] The risk of losses due to market price movements of on-and-off-balance-sheet positions (BCBS, 1995, para. 1)

[5] Risk exposures specific to issuers of debt and equity instruments (BCBS, 2005, p. 3).

[6] Risk exposures due to general changes in general market conditions (BCBS, 2005, p. 9).

source coverage, one size fits all mentality, arbitrary measurement, and lack diversification recognition (Balthazar, 2006, p. 35).

Despite the flaws, the accord had its positive effects as well. Basel I is generally accepted to have largely stood firm against the dynamics of a constant financial tests, and succeeded in raising the bar of required capital of banks and in promoting equal circumstances for banks (Goodhart, 2011, p. 195)

1.3.2. Basel II Accords

Responding to Basel I drawbacks, BCBS, in 2004, published the Basel II accords. As the former framework was mainly blamed for capital arbitrage, the primary objective of Basel II framework was to allocate different capital ratios – while holding them close to the current level- to different banks considering their risk levels respectively (Balthazar, 2006, p. 39). The Basel II framework solves the 'one size fits all' standard issue and offers a wider variety of sophisticated options that is applicable to dissimilar banking and supervisory systems as claimed by the International Monetary Fund (IMF, 2005, sec. 2). Under this accord, banks and supervisors can select approaches they deem appropraite for credit and operational risks capital charge determinations, and suits best their businesses and the infrastructure of the market they engage (BCBS, 2004, para. 7).

According to Balthazar (2006, p. 40), Basel II norms represents an evolutionary shift for capital requirement standards from a narrower ratio-based regulation to a wider bank practice-based regulation where banks' internal data, practices, and models plays an integral part as opposed to Basel I.. This framework was based on three pillar:

1. **Minimum Capital Requirement:** This pillar discloses approaches for establishing the least capital requirement for credit, operational, and market risks. In addition to first two risk types, operational risk is also included in this framework.

➢ **Credit risk** refers to situations where a potential borrowers or a counterparties default on their obligation as per the terms. To calculate capital requirements for this risk type, banks could choose between the Standardized Approach (SA) and the Internal Rating-Based Approach (IRB). In an effort to improve the risk-sensitivity of capital requirements, SA distinguishes risk type from risk level of an exposure. The (SA) allows banks to use External Credit Assessment Institution's assessments, which

central banks considers eligible for regulatory capitalization purposes. For rated exposures, risk weights are 0%, 20%, 50%, 100%, and 150%. Exposures rated as AAA to AA- are given a 0% risk-weight implying risk free exposures while exposures below B- rate is deemed to be highly risky with 150% risk-weight. For unrated exposures, a 100% risk weight equivalent to 8% capital requirement is applied. Additionally, banks can employ risk scores published by individual Export Credit Agencies under recognition of the central bank (BCBS, 2011, p. 15).

Table 2: Basel II Standardized Approach RWA Classification

RWA	AAA to AA− (%)	A+ to A− (%)	BBB+ to BBB− (%)	BB+ to BB− (%)	B+ to B− (%)	Below B− (%)	Unrated (%)
Sovereign	0	20	50	100		150	100
Banks option 1	20	50		100		150	100
Banks option 2 (ST claims)	20 (20)	50 (20)		100 (50)		150 (150)	50 (20)
Corporate	20	50	100		150		100
Retail				75			
Residential property				35			
Commercial real estate				100			

Source: Balthazar, L. (2006). *From Basel 1 to Basel 3: The Integration of State-of-the-Art Risk Modeling in Banking Regulation*, 1st edition, p.50.

Under the IRB approach, provided that certain conditions are met, banks are given the liberty to make use of their own internal risk estimates to set a given risk exposure' risk weight and capital charge by classifying their assets into six broad categories with various credit risk features (BCBS, 2011, p. 48).

➢ **Operational risk** refers to damages that may arise due to inefficient operational procedures followed by the bank or negligence or even error; or because of external events (BCBS, 2011, p. 135). The operational risk measurement methods are: the Basic Indicator Approach (BIA), the Standardized Approach (SdA), and the Advanced Measurement Approach (AMA).

BIA practicing banks are obliged to hold a capital charge equivalent to a static 15% average of the past 3 years' annual gross income to mitigate operational risks. Under the SdA, bank activities are split into 8 lines of businesses (LOB) [7] and gross income is used to scale business operations and operational risk exposures. A multiplication of each business lines' gross income to its percentage factor gives its capital charge. The AMA approach allows banks to measure their exposure to operational risks using their own operational risk management system, but only on the condition that the quantitative and qualitative criteria stipulated in Basel II framework is followed (BCBS, 2011, p. 140).

➢ **Market risk,** as defined in Basel I, remained unchanged in the new accord. However, in 2009, the committee released a new revised version (Basel 2.5) after the financial crises in 2007 by adding default and migration risks into the previous VAR model (BCBS, 2009, p. 1). Default risk refers to the likelihood of losses due to default on financial obligation while migration risk refers to risks of possible default arising from either deterioration or improvement of the credit status of the issuer. Furthermore, Banks are required to base the calculation of the stressed VAR on the substantial losses of the nearest one-year observation to decrease the procyclicality of market risk capital requirements.

2. **Supervisory Review Process:** This pillar lays down a procedural framework for supervisors to oversee the effective implementation of pillar 1 by banks. Under this pillar, a number of principles for bank supervisors were outlined including a principle empowering supervisors to take various remedial actions to boost capital base of banks if they find it insufficient (Balthazar, 2006, p. 92). Most importantly, this pillar enables supervisors make sure that adequate capital for all risks is held, and to formulate effective techniques to monitor and manage those risks including risks that were overlooked in Basel I accord (BCBS, 2004, para. 720). The committee developed 4 important principles for supervisory review including power to review bank operations and remedial tools to fix capital issues such as dividend payment restrictions (BCBS, 2004, pt. 3).

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[7] The 8 LOBs and their respective factors (in parentheses) are corporate finance (18%), trading and sales (18%), payment and settlement (18%), commercial banking (15%), agency services (15%), retail banking (12%), asset management (12%) and retail brokerage (12%) (BCBS, 2011, p. 140).

3. **Market Discipline:** Under this pillar, the main focus is on requirements related to disclosures. The aim of the committee is to promote market discipline and restrict information asymmetry by formulating disclosure standards, allowing external users easily evaluate the overall risk management policies and applications of the banks as well as their capital levels. Primarily, this pillar is to present sophisticated qualitative and quantitative requirements set out in the first and second pillars in a more user-friendly manner so that informed decisions regarding which banks to invest can be made.

1.3.2.1. Basel II Criticism

Like its predecessor, Basel II framework attracted several criticism from the banking world. One of its main drawbacks is believed to be its implementation complexity. Basel II replaced the much simpler 1988 Capital Accord with an extremely complex framework required to support the highly complicated data processing capabilities of banks. This complexity have resulted unleveled playing field for banks, as larger banks have the means and expertise to implement the new framework while less-advanced banks lack these advantages, hence restrict or limit their access to credit (Prakash, 2008, pt. 104). Another source of criticism was the rating methods employed for credit risk measurement. According to the author, external rating agencies' ability to forecast default risk remained questionable due to their slow modifications of ratings in due-time (Prakash, 2008, p. 105). Similarly, the application of internal rating system created chaos as the rating range for one bank is dissimilar from that of another (Altman & Saunders, 2001, p. 26). Due to such drawbacks, banking industry will fail to fully comply with this framework.

Yet, some merits were given to the framework. Basel II is applauded for its compatibility with an ever-evolving and inherently complex banking systems. The new framework is argued to have removed the application of equal risk weights witnessed in Basel I accords and replaced it with a more compatible framework. In addition to that, banks and supervisors, were forced to invest in their employees and upgrade their IT and banking skills, which is a positive addition to Basel II (Prakash, 2008, p. 109).

1.3.3. Basel III Accords

Reacting to the GFC, BCBS released Basel III late in 2010. The GFC which started out as a housing market overvaluation phenomenon in the United States in 2006, shortly turned into a wide-spread global disaster (Chang, 2011, p. 26). Prior frameworks' limitations indirectly contributed to the GFC fallout due to their incapability to address the capital requirements for internationally active banks (King & Tarbert, 2011, p. 1). For Instance, Basel II risk management models failed to provide accurate risk assessments during abnormal economic conditions- financial downturns. On the other hand, Blundell-wignall, Atkinson, & Lee (2009, p. 2), explained that inconsistent liquidity practices influenced by global macro policies and very weak regulatory framework -which, instead of acting as preventive measures- actually accelerated the occurrence of the crisis. As a matter of fact, the reduction of required capital cushion for mortgages from 50% to as low as 15% depending on the applied credit risk measurement approach, was the main reason for the spread of mortgages in the U.S. markets as banks intensively granted low-capital-weighted with higher return mortgages to their customers.

Acharya (2013, p. 2), Stated that, despite the satisfactory capital bases reflected in the reports, commercial banks were struggling with liquidity issues in the form of increased short term debt dependencies, leverage issues inherent in derivatives, and inadequacy of micro-prudential rules of an individual bank's liquidity and capital. To remedy these issues, BCBS introduced enhancements and new rules while in its final reform, risk-weighted-asset regulations is revisited. Components of the initial Basel III framework are as follows:

1. **Improved capital quality**

   One major revelation from the crisis was inferior capital base quality held by banks as cushions. The crisis revealed that retained earnings was hugely used as a shield for credit losses and write-downs, while ignoring other components. Additionally, it was revealed that different jurisdictions defined and disclosed capital differently, making it problematic to compare the quality of the capital among institutions and full market assessment (BCBS, 2010, p. 2). To solve these issues, the committee filtered the components of the capital base. Tier 1 capital is reclassified into Common Equity Tier 1 (CET1) capital covering 4.5% of RWA, and additional Tier 1 capital taking up the

remaining 1.5%, includes elements not attributable CET1 capital. For Tier 2 capital, certain requirements are established in the new framework and its capacity is reduced. Tier 2 capital provides banks with cushiony equity only after they become insolvent. Tier 2 capital mainly consists of low level equities and junior liabilities.

The committee also eliminated innovative hybrid capital instruments[8], as well as Tier 3 capital from the new accord. Furthermore, the committee developed measures to improve transparency issues by requiring banks to disclose specific components of their capital, methods applied to calculate certain ratios, and to explicitly state elements of regulatory capital in the audited financial reports (BCBS, 2010, p. 27).
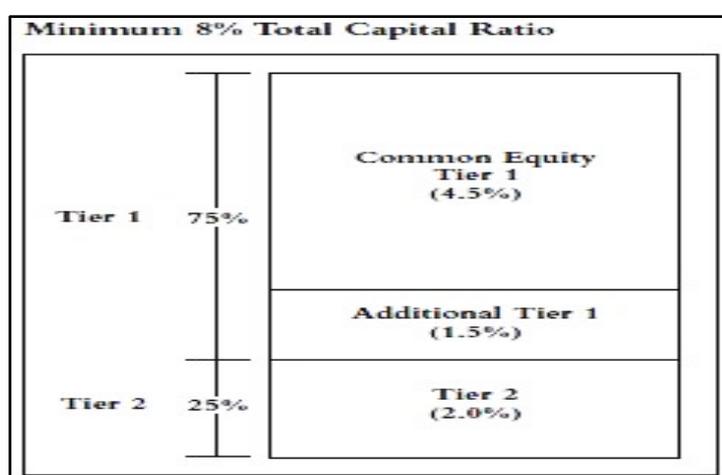
Figure 1: Basel III Minimum Capital Ratio

Source: King, P., & Tarbert, H. (2011). Basel III : An Overview. In *Banking and Financial Services Policy Report* ,Vol. 30, p.14.

2. Enhancing the Risk Coverage

Another key weakness revealed by the crisis is the inability of prior frameworks to effectively capture the magnitude of the risks in-play. Risks associated with derivatives and major on-and-off balance sheet[9] exposures easily escaped the radar during the crisis. To overcome these issues, the committee took major steps. Building up on the committee's 2009 amendment of Basel II framework, the BCBS raised

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[8] Hybrid capital is an instrument that bears the features of both debt and equity.
[9] Off-balance sheet exposures include risks arising from unconditionally cancellable commitments, standby letter of credits, unsettled securities acceptances, failed transactions. (BCBS, 2010, p. 63).

capital requirements for risk exposures stemming from trading books[10] and complex securitizations. Similarly, new measures were introduced to contain the effect of counterparty credit risks that emerge from financing activities like derivatives and repos.

3. Introducing Leverage Ratio

Numerous financial institutions managed to show a strong CAR before the GFC while piling up large amount of on-and-off balance sheet leverage. During the crisis, banks having disproportionate leverage were compelled to lower leverage levels, hence resulting an amplified asset price plummeting, capital decline and contraction of lending. Leverage is the amount of business funds financed through borrowings or debt. Leverage ratio is capital measure to exposure measure and should be no less than 3% (BCBS, 2010, p. 63). Asset based weighted risk could not detect exposures unrelated to assets, hence the committee developed this to support capital ratio in capturing on and off balance sheet leverage risks.

4. Requirement of additional Capital Buffers

Whilst the crisis was ongoing, distribution of dividend and bonus to deserving staffs by some banks remained undisturbed, thus contributing in the erosion of capital reserved to absorb additional losses (King & Tarbert, 2011, p. 2). To constrain these factors and others like procyclical intensification of financial shocks from the economy, the committee introduced two additional capital buffers (capital conservation capital and countercyclical buffer). The aim of these new buffers are to function as auxiliary loss absorbent in the future when aggressive credit growth is realized to be building up a system-wide risk (BCBS, 2010, p. 57).

➢ **Capital Conservation Buffer (CCB)**: BCBS requires banks to stock pile capital buffers above the minimum level during financial and economic growth and use them as additional protection when losses occur. Banks, to rebuild their capital buffers, have the choice to reduce their earnings distribution or fund them via capital raised from the private sector. However, the decision to either options should be discussed with the supervisors. Under this framework, banks are compelled to maintain an extra

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[10] Trading book refers to books where assets held by a bank for the sole purpose of trading is entered.

buffer (CCB) of CET1 form amounting to 2.5% of the total capital, thus pushing the ratio of CET1 to 7% (4.5% CET1 + 2.5% CCB) of risk-weighted asset (BCBS, 2010, p. 55). The underlying benefit of minimum CCP ratios are the restrictions that it imposes on the distribution of earnings by banks. Different CET1 and buffer levels allow banks to distribute certain dividend sums. The less the CET1 and buffer levels, the more the payment restriction.

- **Countercyclical Buffer (CB):** Unlike previous frameworks, accumulation of additional capital titled countercyclical buffer during high credit boom is required in order to limit the intensive lending transaction during credit growth so as to avoid the severe credit contractions during financial recessions. CB is a macro-level measurement, and as such national authorities should determine the existence of excessive lending in the economy to enforce CB on banks under their authority (King & Tarbert, 2011, p. 30). Once the authorities determine the likelihood of system-wide-risk outbreak arising from excessive credit growth, they can announce CB requirement between 0 to 2.5% of RWAs on banks applicable within 12 months (BCBS, 2010, p. 58). Banks subject to 2.5% CB rule face certain minimum CB corresponding to certain CET1 range. The less the CET1 the more CB imposed.

5. **Interconnectedness of Systematically Importance Banks**

Since the committee acknowledged the interconnections among systemically important financial institutions (SIFIs) as an important disseminator of financial shocks across financial systems, the requirement for a loss absorbent capacity above the minimum standard from these institutions deemed indispensable. In response to this absence of effective regulations, the committee developed indicators of SIFIs at global level, and the different level of additional loss absorbing capital they should maintain (BCBS, 2010, p. 7). The committee is in the view that the capital requirements established in the framework will also be able to indicate a systematic risk and interconnectedness among SIFIs.

6. **Introduction of Liquidity Measures**

As mentioned at the beginning of the Basel III section, liquidity issue was a major drive to the crisis- at least in the initial stages. The inability to secure short-term funds

impelled financial institutions to apply to central banks for such funds as it appeared almost impossible to liquidate their asset. However, central banks could no longer solve this liquidity problem due to shrinkage in central banks' eligible collateral accompanied by a severe devaluation of the fixed assets on the books of the ailing banks, hence leading to a rapid erosion of the banks' capital base (King & Tarbert, 2011, pt. 9). Admitting the equal importance of strong liquidity standards in combination with solid capital requirement standards, BCBS introduced two internationally harmonized liquidity standards (BCBS, 2010, p. 8).

> **Liquidity Coverage Ratio (LCR):** The committee introduced this ratio as an indicant of banks' maintenance of adequate and superior liquid assets against prodigious cash exits experienced over a one month lasting acute stress scenarios of both system-wide and institution-level financial distress. During this unpleasant period, banks need to stock unencumbered high quality liquid assets (HQLA), which are easily convertible to cash in private markets and acceptable by central banks (BCBS, 2010, p. 9).
  LCR is the division of Stock of HQLA to Total Net Cash Outflow over the next 30 calendar days equal or greater than 100%.
  During acute stress periods, unrestrained, low credit and market risk bearing, easily appraisable HQLA beyond or equivalent to total net cash outflows over a thirty-days-long period must be held.

> **Net Stable Funding Ratio (NSFR):** NSFR requires banks to maintain minimum amount of stable source of funding determinable by the liquidity level of their assets and on-and-off balance-sheet activities for a one year duration. The purpose for this requirement is to lessen the possible erosion of bank's liquid resources, which can lead to a financial meltdown emerging as a consequence of disruptions to the normal sources of funding (BCBS, 2014, p. 5). Under this framework, the amount of Available Stable Funding of a bank has to exceed or equate its Required Stable Funding over a one year's time. Thus, the ratio of Available Stable Funding to Required Stable Funding should be exactly or over 100 percent within one year.

Available Stable Funding include capital and liabilities deemed to be available over the next one year and is measured based on assigned metrics. On the other hand,

Required Stable Funding includes financial securities, foreign money and commodities under guaranteed future purchases, and excludes similar assets whose sales order is in-progress (BCBS, 2014, p. 5).

➢ **Monitoring:** Supplement to the ratios for liquidity assessment, the committee – with the intention to reduce the existing numerous and distinct metrics in-use worldwide-developed a set of common systematic measurements to assist supervisors extract a minimum required information from the bank's liquidity position. These metrics allow supervisors know more about the maturity mismatches of contractual commitments entered into by different institutions, sources of wholesale funding, amount of unrestricted assets available for secured funding, risks inherent in currencies, and market-related data (BCBS, 2010, p. 9).

1.3.3.1. Improvement of Risk-Weighted-Assets Measurement

Even though, the initial lengthy Basel III framework of 2010 responsive to the GFC provided precautionary and remedial measures to establish a more resilient banking system, it failed to note the unwarranted alterations of the RWAs stipulated in Basel II accords. In 2017, the BCBS released a finalized version of its initial reforms after an empirical analysis and realized that there was a concerning variations on how banks calculated their RWAs (BCBS, 2017a, p. 1). Some of the major amendments are summarized below.

1. **Improved Treatment of Credit Risks:**
   The role of credit risk in the calculation of CAR for banks is immense as it accounts for the most part of denominator -i.e. the RWAs. Credit risk represents the biggest thread to banks' assets and can immensely effects the level of regulatory capital. BCBS made some changes to the two commonly used approaches for computing credit risk (BCBS, 2017b, p. 1):

➢ **Standardised Approach (SA):** The committee made two major enhancements to the calculation of RWAs using this approach. First, risk sensitivity level is improved and simplified by replacing the flat risk weights set in Basel II standards with a more comprehensive risk weighting methods. Second, banks are required to do their own evaluations on external rating rather than accepting it blindly to reduce reliance on external ratings.

➢ **Internal-Ratings-Based Approach (IRB):** BCBS eliminated options to use the Advanced-Ratings-Based Approach (AIRB)[11] to estimate credit exposures to certain assets of different entities like large and mid-sized corporates with a consolidated revenue above certain amount, and banking and non-banking institutions. Additionally, banks are required to provide more details concerning the way they estimate their model parameters given in Basel II reforms.

2. **Simplification of Operational Risks:**

Two major limitations of Basel II operational risk regulations learned during the financial crisis was the insufficiency of capital charges set aside for the risks stemming from some banks' operations, and the inconvenient nature of banks' internal models applied to asses those risks (BCBS, 2017b, p. 8). To terminate the headache brought by the former framework, the BCBS replaced all prior operational risk measurement approaches with a single risk-sensitive standardised approach. This approach postulates banks to calculate capital charges for their operational risks by looking at the trends of the bank's income and losses over a ten year period. The committee assumes that operational risks increase with increase in bank's income, and that operational risks decrease in relation to the losses experienced in the past. Because experienced banks take precautionary steps to avert such risks again.

3. **Extra Leverage Buffers for Big Banks:**

Global systematically important banks G-SIBs received special attention under the revised framework. The committee introduced leverage ratio buffers (LRB) above the common minimum 3% requirement established in Basel II to further limit leverage build-ups of the G-SIBs. The new LRB acts as a fence to risks arising from bank leverages and complements to the objectives of prior leverage ratio (BCBS, 2018, p. 6). LRB carries similar features as capital buffers discussed in sub-section 4 of Basel III, thus applicable to restrict capital distributions of the G-SIBs. A Tier 1 capital amounting to half of the risk weighted higher-loss absorbency requirement is to be maintained by big banks as a requirement. For instance, G-SIBs with a 2% RW

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[11] The AIRB allows banks to measure certain exposures and its maturity for specific asset classes whose modelling cannot be conducted in a prudent and robust way (BCBS, 2017b, p. 5).

higher-loss absorbency requirement must establish 1% (which is half of the required 2%) LBR to be extra prudent. The capital volume or earnings distribution that can be made by G-SIBs is determined by its CET1 to RWA and Tier 1 to leverage ratios unlike the limits of capital conservation buffer (CCB). For example, G-SIBs with 4.5% to 5.375% CET1 ratio, and 3% to 3.125% Tier 1 to leverage ratio are totally restricted from paying their shareholders dividends and are required to hold all earnings in the bank. On the contrary, G-SIBs that comply with the minimum requirements (those with >8.0% CET1 and >3.5% Tier 1 to leverage) are free to distribute their earnings a dividends or bonuses.

1.3.3.2. Basel III Criticism

Regardless of the enormous improvements to Basel II accords and introduction of new risk controlling elements to further enhance the health of financial systems, weaknesses related to Basel III norms were already up in the air. According to Amorello (2016, sec. 2), immediately after its introduction, the feasibility of Basel III to handle idiosyncratic and systematic level risks attracted criticisms from several scholars and regulators basing their arguments on four aspects: First, the complexity of the framework which arises due to numerous estimated risk weights. The larger the banks the endless the number of calculations required. Second, continued reliance on internal model-based regulation to calculate capital requirement. Application of internally developed risk estimation models implies that banks can manipulate and lessen the amount of capital needed. Third, inability to fully incorporate several on-and-off balance sheet risks. Even though Basel III detects the substantial build-up of idiosyncratic risks like credit risks, market risks, and operational risks, it failed to address risks emanating from residual risks. Fourth, incomplete disclosure requirements upon which Basel III pillar 3 disclosure framework lacks the competency of delivering information related to banks' internal models, validation of bank risk metrics, and unavailability of a plethora of ratios related to bank performance and profitability creating market uncertainties.

Additionally, König & Pothier (2016, p. 258) outlined that deteriorated liquidity risk management which eventually led to the development of Basel III liquidity rules (1) fails to provide justification on the need for different definitions of funding stability and liquidity (NSFR and LCR), since a single coherent definition would suffice to realize a

consistent weighting scheme, (2) provides no clear interaction between the new liquidity standards and the standing bank capital regulations, (3) proposes no transparent measures with regards to banks that fail to abide by the minimum coverage ratios. Apparently, there is no regulatory framework that can last forever as the ever-changing banking and financial environments bring along a variety of brand new complications which will require additional remedial rules and regulations. Amorello (2016, p. 29) uttered on the rumors that a new Basel IV reforms is inevitable to emerge in the coming years.

1.4. The Implications of Basel Accords on Islamic Banking Institutions

One might be wondering the implication of Basel standards, which at its core are developed for non-Islamic financial institutions, on Islamic banks given its principle norms and morals being widely different from conventional banking institutions. Islamic banks are perceived to be more immune to financial shocks in comparison to conventional counterparties because of the *Gharar* principle which prohibits Islamic banks from engaging in speculative or excessively risky transactions. Similarly crucial for the resilience of Islamic banks to financial distresses are the risk-sharing nature of Islamic banks with its customer; asset-based financing model of Islamic banking undertakings which as expected limits extreme leveraging, prohibition of interest-based transactions which lessen their vulnerability to risk arising from interest rates, and the highly prudential manner that the institutions conduct their businesses (Hussain, Shahmoradi, & Turk, 2015, p. 21). However, this does not imply they are entirely insusceptible to the general risks experiences in the banking industries. Hussain et al. (2015, p. 21), indicated that, despite being insulated from the initial shocks of the GFC, these banks were negatively impacted in the second-phase when the crisis went global. During this stage, the real economy plummeted, asset, real estate and property price all went down, the number of poorly or non-performing Islamic banks went up which hit a handful of Islamic banks with substantial financial losses.

Evaluating whether or not internationally recognized standards are appropriate for Islamic banks whilst upholding *Shariah* financial tenets, Chapra & Khan (2000, p. 43) argued that practicing capital adequacy will enhance the credibility and growth of Islamic banking system globally given that this practice is an internationally recognized systematic safety promotor. To exhibit the applicability of Basel frameworks in Islamic banks, Zubair

(2014b, p. 13) stated that Islamic banks should not be viewed to be completely unrelated to the international Basel norms since they are integral part in the global finance system, and the BCBS objectives to improve the financial stability goes in line with the doctrines of Islamic Shariah. He further added that Basel accords are flexible to some degree allowing it to meet the local and Islamic standards, and Islamic financial industry should benefit from the greater role given to the regulators by the Basel accords. Errico & Farahbaksh (1998, p. 3) expresses the need for regulatory framework tailored for Islamic banks since the traditional framework are not always applicable unto Islamic banks. In response to such calls, the AAOIFI and IFSB took the initiatives. Nonetheless, both organizations based their standards on that of the Basel committee with few modification to fit the norms of the Islamic financial institutions (Iqbal & van Greuning, 2008, p. 220; Sharbatly, 2016, p. 27).

1.4.1. Basel I and Islamic Banks

There is scarce literature elaborating Basel I accord's influence on Islamic banks, since this accord was mainly concentrated on countries that had no Islamic banking sector in their financial system during that time (Zubair, 2014a, p. 10). However, it is documented that in 1999 the AAOIFI published its first capital adequacy framework for these banks replicating methodologies implemented by the BCBS in Basel I accord (Bitar, 2006, p. 45). Cornford (2010, p. 74) stated somewhat similar fact, claiming that the classification of capital established under AAIOFI proposed a CAR calculation method following the classification of Basel I which remained the same in Basel II as well. Nevertheless, in this framework, AAOIFI excluded hybrid capital accounts bearing both debt and equity features, as well as profit-sharing investment account (PSIA) from its capital classification while assets bought with banks' capital and non PSIA liabilities including half of PSIA financed assets were classified as risk-weighted assets. See the table for comparison between Basel I and AAOIFI capital ratios.

Table 3: Basel I and AAOIFI Capital Ratios

Conventional banks	Islamic banks
First Basel agreement proposal (1988)	*First AAOIFI agreement proposal (1999)*
$$CAR = \frac{Tier1 + Tier2}{[0,10,20,50,100].RWA} > 8\%$$	$$CAR = \frac{Tier1 + Tier2}{[E+CA].RWA + RWA_{UIA}.50\%}$$
- 0 RWA (e.g., cash, gold, OECD obligations, and U.S. treasuries). - 20 RWA (e.g., claims on OECD banks, U.S. securities). - 50 RWA (residential mortgage loans). - 100 RWA (e.g., claims on non-OECD countries).	- ULAs lie *"in between"* equity and deposits and therefore it should be integrated in CAR risk weighted assets. - Islamic banks' capital largely consists of *tier1 capital*. - Tier2 is almost non-existent (no debt). - E represents equity and CA represents current and savings accounts.

Source: Bitar, M. (2006). *Banking Regulation, Stability and Efficiency of Islamic Banks: What Works Best? A Comparison with Conventional Banks (Phd Dissertation)*. Université de Grenoble, p.69.

1.4.2. Basel II and Islamic Banks

To Illustrate the influence of Basel II norms on Islamic banks, Hassan & Chowdhury (2004, p. 84) stated that several issues such as stability, capital adequacy, and risk management technics relatable to such banks were already underlined in the Basel II accord, and further stressed on the requisite for adherence to it by these banks to achieve international recognition – but this should be done without violation of the Shariah. Indeed, this does not imply that Basel II standards, as it is, are perfectly compatible to Islamic financial Institutions. To address the elements specific to Islamic banks, the IFSB, by complementing on the Basel II guidelines, issued several standards relevant to risk management of Islamic financial institutions (Diaw & Mohamed, 2011, p. 5). One key distinguishing factor between Islamic and traditional banks is the usage of PSIAs by the former, influencing highly determination of their CARs. Theoretically, Islamic banks should use RIA and UIA, which are both PSIA, to fund Mudaraba and Musharaka investments. However, since IAH are treated like investors fully aware of the risks involved in the projects financed with their deposits, Islamic banks are required to treat such projects (assets financed with IAH's money) differently to determine the appropriate risk weighs (Bitar, 2006, p. 49). In principle, IAH bear no risk burden on shareholders' capital, hence no regulatory capital is required to be allotted to losses arising from assets

funded via profit-and-loss sharing indentures. Yet, due to some commercial risks affecting PSIA-financed assets which calls for proportionate risk sharing by both the UIA holders and banks shareholders - Islamic banks must include some UIA in their RWA to determine their capital adequacy ratio. Under the discretion of some regulatory supervisors who fear that IAHs' withdrawal of funds would lead to a systematic risk, inclusion of specific PSIA-financed assets percentage to establish their CARs using a specific parameter 'alpha' is a requirement for Islamic banks (IFSB, 2005, p. 20). A comparison of CAR between Basel II and IFSB is given in Table 7 below. On the other hand, the AAOIFI suggested 50% risk weight for assets financed through PSIA were to be elevated to a 100% risk weight similar to Basel II designation. The reason for the elevation was to raise their capital ratios of Islamic banks to boost their credibility in the international financial markets; to safeguard the proportionally larger demand deposits in their banks; to promote confidence in smaller banks' sustainability given their lack of assets diversifications; to protect demand and investment deposits knowing that a large portion of investments are placed under PLS modes of Mudaraba and Musharaka which are riskier and require greater amount of capital (Hassan & Chowdhury, 2004, p. 85). Accordingly, Bakar (2008, p. 25) explained the reason for higher capital requirement from Islamic banks is due to non-financial assets like copper, cars, and houses under their custody over which Basel II accords was not designed for. On the drawback side, Zins & Weill (2017, p. 633) concluded that Basel II standards can potentially hamper Islamic banks' stability and make them comparatively riskier than conventional ones since such standards do not cover risks pertinent to Islamic banks.

Table 4: Basel II and IFSB Capital Ratios

Conventional banks	Islamic banks
Basel II agreement proposal (2004)	*First IFSB agreement proposal (2005a)*

$$CAR = \frac{Tier1 + Tier2 + Tier3}{[CR + MR + OR].RWA} > 8\%$$

$$Core\ tier1 = \frac{Core\ Tier1}{RWA} > 2\%$$

$$Tier1 = \frac{Tier1}{RWA} > 4\%$$

- CR, MR, and OR represent credit risk, market risk, and operational risk, respectively.

$$CAR = \frac{Tier1 + Tier2}{[CR + MR + OR].RWA - [CR + MR].RWA_{RIA} - (1-\alpha)[CR + MR].RWA_{UIA} - \alpha.RWA_{PER\&IR.}}$$

- RWA includes all investments financed by the RIA and UIA supported by investment account holders (IAH)
- Projects financed by the RIA and the UIA of IAH must be excluded from the calculation of the CAR denominator.
- PER and IRR represent Profit Equalization Reserve and Investment Risk Reserve, respectively.
- α represents the proportion of assets funded by UIA. Its calculation depends on the banking stability in each country.

Source: Bitar, M. (2006). *Banking Regulation, Stability and Efficiency of Islamic Banks: What Works Best? A Comparison with Conventional Banks (Phd Dissertation)*. Université de Grenoble, p.70.

1.4.3. Basel III and Islamic Banks

As stated by Boumediene (2011), this framework is a reinforcement for earlier framework rather than a third version of capital requirement publications and hence introduces capital buffers and liquidity risk managing protocols. Yet, it fails to account for the peculiarities of the Islamic banks' business models. Furthermore, Spinassou & Wardhana (2018, p. 2) added that in more than a few jurisdictions where Islamic banks exist, the Basel capital adequacy framework is implemented. Bitar (2012, p. 6) stated that Islamic banks can conveniently relate to standards provided in Basel III in terms of capital ratio determination, considering that PSIA are excluded from Tier 1 capital which makes up almost entirely their regulatory capital. Kara (2011, para. 21) stated that the regulatory framework stipulated in Basel III will give Islamic banks the chance to flourish and reinforce their market positions. Holding similar perception regarding Islamic banks' higher capital ratios, Ozkan & Iqbal (2015, p. 21) further added that the newly introduced liquidity requirement of Basel III – the LCR - holds the biggest challenge for Islamic

banks as the supply for short-term HQLA and the inexistence of secondary markets, and interbank and money markets restricts their ability to obtain high quality Sharia-compliant instruments. The authors also indicated that national regulators will face hurdles in the assignment of LCR for Islamic banks' PSIAs specifically the run-off rates realizing that Islamic banks could be effected negatively or positively due to small changes in this rate. In addition to LCR, Bitar (2012, p. 19) mentioned that NSFR represents another issue for Islamic banks. Acknowledging the need for larger liquidity buffers for Islamic banks, the author suggested that the IFSB should implement the liquidity risk management framework in the Basel III while accounting for these banks' balance sheet structure peculiarity and *Sharia* compliance principles. A comparison of NSFR applicable to conventional and Islamic banks is provided in table below.

Table 5: Basel III NSFR Computation for Conventional and Islamic Banks

Conventional Banks	Islamic banks
$$NSFR = \frac{\sum_i W_i L_i}{\sum_j W_j A_j} \geq 1$$	$$NSFR = \frac{\sum_i W_i L_i}{\sum_j W_j A_j} \geq 1$$
- NSFR is the sum of Weighted (W_i) Liabilities (L_i) divided by the sum of Weighted (W_j) Assets (A_j). - Weights are between 0 and 1. On the asset side larger weights imply a less liquid position. On the liabilities side, larger weights imply more stable funding sources. - A higher value of NSFR signifies that a bank is more stable. $$STFR = \frac{\text{Liabilities} < 1 \text{ year}}{\text{total Liabilities}}$$ - A higher value of STFR implies a higher reliance on short-term funding and greater financial fragility (Vazquez and Federico, 2012).	Computing NSFR for Islamic banks is very different due to their particularities: - On the liabilities side, Islamic banks use unguaranteed investment accounts to finance their activities. Depositors may also withdrawal their deposits in a very short period (withdrawal risk). Also, Islamic banks possess specific reserves (PER and IRR). - On the asset side, Islamic banks use inventory, asset-backed transactions, profit sharing transactions, and fee-based services. Therefore, assigning weights must be different from those calculated for conventional banks. - Basel III ignores that Islamic banks suffer from a lack of *Sharia'a* compliant short-term instruments. Hence, it is quite difficult for Islamic banks to cover short-term funding gaps within a 30-day period in case of a liquidity shortage.

Source: Bitar, M. (2006). *Banking Regulation, Stability and Efficiency of Islamic Banks: What Works Best? A Comparison with Conventional Banks (Phd Dissertation)*. Université de Grenoble, p.73.

The NSFR provided is the one simplified by Vazquez and Federico is the table. Based on some limitations, the authors declared that some departures from Basel III details are assumed (Vazquez & Federico, 2015, p. 4). Overall, Harzi (2012, p. 18) suggested that Basel III pose trivial effect on Islamic banks since these banks already engage conservatively and risk bearing elements like derivatives and short-selling are prohibited in their business. For instance, under the Basel III, banks should hold a 0 to 2.5 percent CB to curb excessive credit granting preceded by a downturn, but since Islamic banks use different financing tools like Musharaka, Mudaraba, Istisna, Salam, Ijarah, and Murabaha rather than giving loans to its customers, Islamic banks should be less concerned with excessive credit growth (Boumediene, 2011).

Equally worth mentioning is the implication of leverage ratio of Basel III on Islamic banks. Harzi (2012, p. 11) underlined that leverage ratio of minimum 3% should hold no problems to Islamic banks given that these banks already maintain leverage ratios (Tier1 / Total exposure) above the minimum threshold in contrast to conventional banks' weaker leverage ratios. Studying the effect of Basel III norms on the banking industry in the GCC, Alsharif, Md Nassir, Kamarudin, & Zariyawati (2016, p. 558) concluded that since the Basel III standards is put into practice in the region, CARs of Islamic banks declined while those of conventional banks displayed a hike. However, Islamic banks continued to depict capital ratios higher than conventional counterparties despite their improvement.

1.5. Summary

In this chapter, many aspects regarding capital adequacy requirements were discussed. First, the definition of the term capital in different disciplines is provided. In the world of finance and banking it is presented that capital generally implies two things: money invested into productive businesses with the intention of earning returns, and money used as a protection against unfavorable losses. It is also mentioned that there are endogenous and exogenous risks influencing capital accumulations of banks. Second, the emergence of adequate capital requirements, its significance, and roles played by managers in managing capital is presented. The concept of adequate capital requirement was introduced to the conventional system in the midst of 1970s where as in the Islamic banks the introduction took place only at the end of 1990s. Capital regulations is important for both systems as it mainly limits excessive risk-taking and careless actions. Lastly, the

evolution of the Basel norms. İts amendments, and criticisms are discussed. It became apparent that capital regulations evolve as financial circumstances change. The applicability of Basel guidelines for the Islamic banks is also reviewed and found to be relevant even though the challenges are enormous.

CHAPTER 2: CAPITAL ADEQUACY RATIO AND ITS ROLE

In this chapter, the main element of our study - capital adequacy ratio - is explained in detail including its definitions and components. Internal and external factors influencing capital adequacy ratio, problems experienced in its implementations by Islamic banks, and the impact of different CAR levels on banking institutions' stability and operations are discussed as well. Additionally, theoretical frameworks related to the capital adequacy ratio is discussed.

2.1. Capital Adequacy Ratio (CAR)

The use of capital ratios remained informal for nearly a decade until the release of the capital standards in 1988. CAR is ratio that is employed to measure solvency levels of banks. This ratio shows if a certain bank maintains sufficient amount of capital that can absorb unexpected losses. Adequate capital is a requirement that preserves confident of depositors in the banks and bars bank ruins (Salgotra & Wadhwa, 2012, p. 55). Hadjixenophontos & Christodoulou-volos (2018, p. 94) argued that understanding the dominant role played by capital adequacy ratios as a preventive measure and factors influencing decisions made by banks in connection with their capital structures are imperative. Having went through numerous studies over the past years, this ratio developed different but somehow close definitions in academia. According to Shaddady (2015, p. 2) there are no clearly unified definition of the functions of CAR despite being widely accepted as a tool for financial stability measurement. Ariss & Yolla (2007, p. 48) defined CAR as a ratio measuring how much capital banks should allot against their risky asset (RWA). To further elaborate on the type of risks that requires capital cushion, Matthews (1996, p. 135) defined CAR as a measurement of bank capital needed to offset credit risk exposures presented as a percentage. What this definition omits is market and operational risks that was overlooked as influencing risk exposures for banks until later on by the BCBS. Over the years, other authors adapted to the expanded definition of CAR. As mentioned by Yüksel & Özsarı (2017, p. 2), BCBS set an 8% floor limit on banks which are needed to account for the credit, market, and operational risks they face. Thus, CAR is an indicator of the internal strength of banks to tolerate losses in the events of financial crisis.

A clear definition is provided by the BCBS: "*capital ratio is the amount of regulatory capital divided by the amount of risk-weighted assets. The greater the amount of risk-weighted assets, the more capital is needed, and vice versa* " (2018, p. 3), which is the one used in this study.

CAR is more capable of predicting bank failures than traditional ratio (Equity/Total Asset). Henceforth, efficient measurement of CAR's components is vital. Moreover, Olalekan & Adeyinka (2013, p. 89) referred to CAR as the level of adequate bank capital required for a deposit insuring agency to breakeven for the purpose of guaranteeing individual bank deposits plus premiums they pay. Pham & Nguyen (2017, p. 27) defined CAR as one primary indicator of a commercial bank's safety continuance, and any bank that can assure minimum CAR portrays to maintain a concrete cushion against financial blows and guarantees protection for itself and its depositors as well.

From the view point of regulators, CAR is primarily established and mandated by the regulatory authorities as a scale to measure the healthiness and loss absorbency capacity of the banking sector (Workneh, 2014, p. 1). According to the international standard setters like BCBS and IFSB, the required minimum CAR is 8% for a bank to be considered solvent (BCBS, 2010, p. 12; IFSB, 2018b, p. 6). However, state banks can set minimal ratios they assume to be efficient to assure banks behave prudentially. Except for Saudi Arabia, which sets different boundaries for each individual bank, regulatory bodies in the GCC member states enforce minimum threshold higher that the global standard (11 % Oman, 13.5% Bahrain, 13% Kuwait, 14.2% Qatar, and 12.5% UAE) (KPMG, 2019). Bokhari, Ali, & Sultan (2013, p. 3) referred to CAR as a ratio set and mandated by the regulatory bodies to test the well-being of the banking system. The fact that CAR is imposed by national regulators, it is apparent that this ratio is of a valuable importance. Aspal & Nazneen (2014, p. 30) affirmed such significance, but likewise indicated that regulators and bankers have different opinion on the optimal level of adequate capital banks should maintain. According to Posner (2015, p. 1855), prior to 1980s, the significance of capital adequacy was underrated and considered as a simply one element to evaluate overall banking stability, whereby no specific rules and regulations for capital adequacy such as minimum capital adequacy ratios and commonly accepted definitions were developed. Since then, CAR remains a key indicator of banking

stability and soundness. As stated by Estrella et al. (2000, p. 33), the most effective prognosticator and indicator of financial failure over the long time horizon is CAR. However, in the short-run other simpler ratios are important too.

2.2. CAR Components

Islamic and conventional banks recognize elements like sources of funds, regulatory or eligible capital, and risk weighted assets differently. Yet, the way they calculate CAR is similar (Shabsigh et al., 2017, p. 24). CAR is made up of a numerator (eligable or regulatory capital) and a denominator (RWA). Eligable capital is the capital amount a bank is expected to maintain and is generally made up of Tier 1 (core) capital and Tier 2 (supplementary) capital. Since the third capital form (Tier3) is revoked under Basel III standards and is already not recognized under Islamic financial standards due to its debt-like nature, this capital is disregarded in this section. RWAs are bank assets whose risk exposures are to be cushioned with the eligible capital held by the banks. Dissimilar to conventional banks, Islamic banking institutions face difficulties in defining the denominator (RWA) because of the distinctive risk profile nature of their products and services, which requires to be in compliance with *Sharia* laws (Basher, Kessler, & Munkin, 2017, p. 2). Likewise, defining the composites of the numerator (regulatory capital) of CAR is quite different than that of BCBS. Since, IFSB is the agency mandated to establish prudential standards including capital adequacy for Islamic financial institution, this section will use the elements of the CAR stipulated in the IFSB-15 paper (IFSB, 2013). It is worth noting that the AAOIFI was the first to draft basic Islamic capital adequacy standards. However, they were further improved by the IFSB in December 2006 (Iqbal & van Greuning, 2008, p. 220).

2.2.1. Eligible (Regulatory) Capital:

2.2.1.1. Tier 1 Capital (Core Capital)

This is the first-line of defense used by banks, either Islamic or conventional, against unforeseen losses. It is the primary source of funds available to provide banks the means to imbibe unexpected losses while simultaneously allowing them to continue operations. Tier 1 capital facilitates banks' capability to measure their financial health in the going-concern, i.e. while the bank is in operation. According to Conlon et al. (2018, p. 18), Tier 1 capital remains a fundamental capital which is the backbone to the Basel II frameworks.

For Islamic banks, this capital represents the majority of their regulatory capital as supplementary capital like preferred stocks and subordinated debt does not exist (Ariss & Yolla, 2007, p. 61). Moreover, Ozkan & Iqba (2015, p. 15) stated that, because of rich Tier 1 capital in Islamic banks' capital structure, Islamic banks can easily exercise the minimum capital. Therefore, the demand for higher quality and larger capital proposed by Basel III would not cause any problem for Islamic banks.

2.2.1.1.1. Common Equity Tier 1 Capital (CET1)

This is the most qualitative capital for Islamic banks and mainly made up of common shares, retained earnings and some other reserves, which are the most reliable source of funds for Islamic banks. To be included in this category, a financial instrument must fulfil certain conditions set for Islamic financial institutions to ensure its 'permanence' and loss absorbance capability. Key conditions set by the IFSB state that: First, Instruments should be the first source of equity to absorb losses on the on-going basis. Second, instruments should not be redeemable, cancellable or re-purchasable howsoever. Third, the principle amount of the issued common shares is perpetual or permanent and only repayable under liquidation or in specific situations upon approval by the supervisory authority. Forth, dividend on such instruments are payable only under the banks' discretion and is not obligatory. Fifth, it should be recorded as equity in the books. Sixth, the amount of the instrument is not secured or insured by the issuing IIFS or related entities. Seventh, it should be clearly disclosed in the books.

Under the IFSB capital adequacy standards, the following elements comprise CET1 capital after deducting regulatory adjustments like intangibles; minority interests, unrealized benefits and losses, net assets of the banks' pension fund, investment in banks' own shares, deferred taxes, investment in the capital of other banking, financial and *takaful* entities, and zakat obligations in order to make the computation of the underlying elements more prudent and easily obtainable (IFSB, 2013). Refer to appendix 2 for details.

Common Equity Tier1 Capital (CET1) Instruments:

a) Common/ordinary shares issued by Institutions offering Islamic Financial Services (IIFS). These instruments should be fully paid and meet all the criteria of CET1.

b) Stock surplus or share premium from common shares issued.

c) Retained earnings carried over from previous periods including interim profit or loss.

d) Other disclosed reserves and comprehensive incomes.

e) Common shares issued by consolidated subsidiaries of IIFS and held by third parties as minority interest.

Similar to Basel III CET1 requirements, the IFSB requires that a 4.5% CET1 ratio to be practiced. After studying the effect of CAR on the global financial crisis, Buehler, Samandari, & Christopher (2009, p. 2) concluded that CET1 to RWA ratio gives a more transparent picture of the future banking crisis and acts as a better anticipator of a financial crisis in contrast to Tier 1 / RWA ratio and CAR.

2.2.1.1.2. Additional Tier 1 Capital (AT1)

Financial Instruments that fail to fulfil criterion laid down earlier, but still maintain a significant loss absorbency gradation are included in the AT1 capital category.

Similar to CET1, there are certain criteria set by the IFSB for this category. Main additional criteria for AT1 capital are summarized as follows: (i) The instruments should be capable of absorbing losses, (ii) the instrument had been issued and paid-up, and the principal of the instrument is repayable only through buy-back options under supervisory approval, (iii) non-distribution of profits should not render default of the issuer, and (iv) instruments (Musharaka Sukuk) are only recallable with fulfillment of certain requirements after a minimum of five years.

AT1 Capital Instruments:

a) IIFS issued instruments that are excluded from CET1 group.

b) Premiums received from the (a) instruments.

c) Qualifying capital issued by a consolidated subsidiary of an IIFS and held by third party investors as minority interest.

To follow the capital requirement of the IFSB, Islamic banking entities should have a minimum of AT1 capital to RWAs of 1.5% after deduction of regulatory adjustments applicable. Beside the mentioned AT1 instruments, these banks are allowed to boost their AT1 capital by issuing perpetual S*ukuk* instruments, which uses similar logic to perpetual bond. Perpetual *Sukuk* is an instrument with no maturity date implying that perpetual *Sukuk* holders cannot redeem their principle amount, but receive perpetual coupons or endless cash flows.

2.2.1.2. Tier 2 Capital (Supplemental Capital)

This is secondary source of funds available to banks as a support against losses after Tier 1 capital is completely exhausted. This additional capital protects banks on a gone-concern basis, implying that banks utilize Tier 2 capital after they become insolvent and operations are ceased. This capital type is arguably low quality than core capital, considering the limited incentives and protections it offers banks in the going-concern and gone-concern basis respectively (Fic & Karim, 2011, p. 2). Furthermore, the researchers found that Tier 2 capital bears an adverse effect on bank risk level, as an increase in subordinate debt –a major supplementary capital composite of conventional banks- would proportionately result in increased loss provisions and charge-offs (Fic & Karim, 2011, p. 16). Bearing such facts in mind, the reduction of Tier 2 capital to RWAs from 4% in Basel II to 2% in Basel III regulations would not strike as a surprise. However, such adverse effect does not exist in Islamic banks due to non-existence of debt-like instruments. Under the Islamic financial standards, supplemental capital like hybrid capital and subordinated debts are not permissible due to their interest-bearing nature which is a violation of Islamic finance principles (Iqbal & van Greuning, 2008, p. 223).

There are few instruments that are considered to be Tier 2 level capital by the IFSB provided that some conditions are met. The criteria set by the IFSB are: First, financial instruments initially issued by the IIFS as a Mudaraba or Wakalah Sukuk should not serve short and long term creditors' claims before such Sukuk are changed into ordinary shares if insolvency occurs. Second, instruments must be issued and not purchasable by the IIFS itself or its subsidiaries. Third, the original maturity period of the instruments should be not no less than five years post issuance. Forth, payments of profit to instrument-holders should be unassociated with the lending ability (credit rating) of the IIFS. Fifth, the amount paid on the issued instrument at the point of payment should not be guaranteed by the IIFS. Sixth, the issued instruments should not yield a priority claim for the holder in case the IIFS is liquidated.

Tier 2 Capital Instruments:

a) IIFS issued instruments that do not meet the criteria of Tier 1 capital

b) Premiums paid on the issuance of Tier 2 capital instruments.

c) Reserves or provisions for future and currently unidentified losses maintained by the IIFS.

d) Instruments that are issued by an amalgamated subsidiary of an IIFS to another third-party.

After deducting regulatory adjustments laid down for Tier 2 capital, Islamic banks must hold at least 2% Tier 2 / RWA to further absorb losses during insolvency. Islamic banks usually maintain a lower Tier 2 capital ratios as engagement in interest-paying instruments like subordinated debt is prohibited for Islamic banks, leading to a capital ratio composed of almost entirely Tier 1 capital (Bitar, Kabir Hassan, & Hippler, 2018, p. 17).

2.2.2. Risk Weighted Assets (RWA)

RWA refers to the assets and off-balance-sheet exposures of a bank measured or 'weighed' according to their risks. On this note, it is obvious RWA defines how much capital to be held. The distinctive nature of Islamic banks' activities and inherent risks differentiates it from the conventional ones. Since the range of assets of Islamic banks vary, so as their risk nature. According to Iqbal & van Greuning (2008, p. 225), Islamic banks follow a different form of determining risk-weights for their assets due to different reasons. First, the assets held by Islamic banks for trading purposes carry risks beyond credit and market risks as such assets are not actually financial assets. Second, assets like real estate, commodities, *ijarah* and *istinah* contracts – non-financial type of assets- bear special risk features that is unaccounted for in the conventional banking spectra. Third, unlike conventional counterparts, Islamic banks carry in their books assets funded through partnerships like *Mudaraba* and through PLS agreements like *Mudaraba,* which involve higher risks. Forth, absence of clear-cut risk hedging tools like derivatives elevates the general risk grade of Islamic bank assets.

Incremental to credit, market, and operational risks, the IFSB recognizes additional risk types for the different types of instruments, both assets and liabilities, carried in an Islamic bank's books. The sort of risk or risks exposed to each instrument held by an Islamic bank determine the risk weight assigned to it and the capital charge required to be held upon it. Some of the additional – or somehow differently defined – risks applicable to Islamic financial instruments include profit rate risk, counterparty credit risk, price risk, sharia

non-compliance risk, and others already defined in the footnotes of section one, chapter one. Profit rate risk - an analogous to interest rate risk - refers to a risk exposure on profit rates arising from a change in the reference rates like London Interbank Offering Rate (LIBOR), which Islamic banks use to benchmark the difference between returns from customers and payment to depositors and PSIA holders (Ariss & Yolla, 2007, p. 52). While, interest is completely prohibited in Islamic financial transactions, Islamic banks are still effected -to some degree- by interest rate risk due to reliance on non-Islamic rate setting establishments like LIBOR to benchmark their return rates. Counterparty credit risk (CCR) is a credit risk type where a counterparty or a third party's possible default to a transaction affects both the Islamic banks and another party to lose their funds.

Unlike traditional banks, which record assets intended to be traded in the trading books, Islamic banks are obliged to record such assets in the banking book[12] as well since the S*haria* law prevents the selling of items not owned by or in the possession of the seller (Ariss & Yolla, 2007, p. 53). Hence, the inclusion of physical assets in both books enforces Islamic banks to assign higher risk weights on such assets. One confusing risk is sharia non-compliance risk, which arises due to violation of sharia in financing and investing activities. The unavailability of a uniform decision among Islamic religious scholars on the permissibility of certain financial arrangements make Islamic banks prone to sharia non-compliance risk (Hussain et al., 2015, p. 17). Hence, Islamic banks should remain vigilant and deeply analyze the instruments their engaging in. The IFSB laid down some but not all-inclusive requirements for financial contracts to be entered by Islamic banks. However, the organization clearly stated that such requirements may vary across sharia boards and no measurement for losses originating from breach of such requirements are presented (IFSB, 2013).

2.2.2.1. Assignment of Risk Weights on Islamic Financial Instruments:

IFSB incorporated certain credit and market risk-weights for nine broad financing and investing assets such as *Murabaha; Ijaraha & Ijarah Muntahia Bittamlik, Musharaka & Diminishing Musharaka, Salam, Mudaraba, Istisna, Qard, Wakalah, and Sukuk*. Since operational risk is unrelated to specific financial goods or services but rather to the

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[12] Banking books are the original books where banks register assets that are to hold till maturity at their acquisition value.

operations of the banking institutions, no risk-weights were assigned to individual instruments but a capital charge was calculated.

The IFSB recognized accounts receivable risks and counterparty risks arising from different modes of financing like *Murabaha, Salam, Istisna', Ijarah,* and *Sukuk* contracts as credit risks faced by IIFS. Generally, the IFSB prefers that the Basel II standardised approach is used it uses external agencies' ratings to assign risk-weights, except for *Mudaraba* and *Musharaka* related risks that creates credit and capital impairment risks (IFSB, 2013). The table below displays the proposed credit score of each credit risk category applicable to individual counterparties and their appropriate risk weights (RW). For instance, instruments issued by corporates rated AAA to AA are considered safest with a RW of 20% whereas corporates below B- are the most unsafe one with a RW of 150%. Assets weighed at 100% credit risk require CAR of 8% while risk weights greater or lower that it requires higher or lower CAR relatively.

Table 6: IFSB Risk Weights for Credit Risks

Rating/Risk Score[48]	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
ECA Country Risk Score[49]	1	2	3	4 to 6	7	
Counterparty	Risk Weight (RW)					
Sovereigns and central banks[a]	0%[b]	20%	50%	100%	150%	100%
Non-central government public sector entities (PSEs)[c]	Subject to supervisory authorities' discretion to treat as either IIFS, banks and securities firms (Option 1 or 2a) or as sovereigns					
Rating/Risk Score[48]	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
ECA Country Risk Score[48]	1	2	3	4 to 6	7	
Multilateral development banks (MDBs)[d]	20%[50]	50%	50%	100%	150%	50%
IIFS, banks and securities firms Option 1*	20%	50%	100%	100%	150%	100%
Option 2a**	20%	50%	50%	100%	150%	50%
Option 2b**/@[e]	20%	20%	20%	50%	150%	20%
Rating/Risk Score	AAA to AA-	A+ to A-	BBB+ to BB-		Below BB-	Unrated
Corporates[f]	20%	50%	100%		150%	100%

Source: IFSB. (2013). Revised Capital Adequacy Standard for Institutions Offering [Excluding Islamic Insurance (Takāful) Institutions and Islamic Collective Investment Schemes] (IFSB-15). In *IFSB Standards*, p.32.

As for market risks, losses arising from four sources must be measured (IFSB, 2013, sec. 3.2). First, losses originating from holding equity in certain investments –i.e. equity position risk should be given 100% RW and 8% capital charge both at specific and general market level. Second, benchmark risks arising from the trading positions of *Sukuk* instruments. To curb losses from benchmark losses, Islamic banks are given two different

capital charges and risk-weight measurement methods on specific risks as well as on general benchmark risks of the market. Third, risks related to holding foreign currencies, golds and silver. Similar to equity position risk, a risk weight and capital charge of 100% and 8% should be assigned respectively. Forth, commodity and inventory risks stemming from holding commodities like precious metals and inventory items for resale purposes. To cover specific risks related individual Sukuk issuer against disturbing price movements of the Sukuk that is held for trading purposes, the IFSB produced specific capital charges for each category.

Table 7: IFSB Capital Charge for Specific Market Risks

Categories*		Capital Charge
Government	AAA to AA-	0%
	A+ to BBB-	0.25% (residual term to final maturity <= 6 months) 1.00% (residual term to final maturity >6 and <= 24 months)
		1.60% (residual term to final maturity >24 months)
	BB+ to B-	8%
	Below B-	12%
	Unrated	8%
Investment grade[72]		0.25% (residual term to final maturity <= 6 months)
		1% (residual term to final maturity >6 and <= 24 months)
		1.60% (residual term to final maturity >24 months)
BB+ to BB-		8%
Below B-		12%

Source: IFSB. (2013). Revised Capital Adequacy Standard for Institutions Offering [Excluding Islamic Insurance (Takāful) Institutions and Islamic Collective Investment Schemes] (IFSB-15). In *IFSB Standards*, p.51.

Operational risks of IIFS arise mainly from general operational inadequacy, non-compliance of the institutions' functions on S*haria* governance mechanisms, and legal risks that can lead to pecuniary penalties. To limit such risks, Islamic banks can choose from three methods: The Basic Indicator Approach (BIA), the Standardised Approach (TSA), and the Alternative Standardised Approach (ASA) (IFSB, 2013, sec. 3.3). The methods proposed by the IFSB are exceedingly similar to that of Basel committee. For instance, under BIA, both the BCBS and the IFSB evaluate a capital charge corresponding to a fixed average of 15% on the last three years' positive gross returns. Similar to Basel II SdA method, IFSB developed three percentage factors of 18%, 15%, and 12% for eight (8) different lines of businesses (LOB) under the TSA method. To calculate a capital

charge for each LOB, an IIFS multiplies the annual gross income of that business line with the factor assigned to it. The IFSB allows IIFS to associate different percentage factors to the additional business lines applicable in their jurisdictions. As for the ASA, operational risk evaluation differs from Basel II AMA. Under the ASA, the capital charge calculation for the LOB resemble the TSA, except for retail banks whose calculations are based on the amount of respective financing and a stationary percentage factor of 3.5 percent (IFSB, 2013, p. 60).

Here is a summarized illustration of how an Islamic bank calculate CAR based on the computed risks as well as on the capital classification. Islamic banks normally put less emphasis on Tier II capital, thus making their Tier I Ratio very close to their Total CAR.

Table 8: Illustration of CAR Calculation of Banks

	2018 SAR' 000	2017 SAR' 000
Credit Risk RWA	55,268,406	49,050,813
Operational Risk RWA	5,572,623	4,899,270
Market Risk RWA	231,436	1,512,788
Total Pillar-I RWA	61,072,465	55,462,871
Tier I Capital	7,890,012	7,588,793
Tier II Capital	2,690,855	2,693,286
Total Tier I & II Capital	10,580,867	10,282,079
Capital Adequacy Ratio %		
Tier I ratio	12.92%	13.68%
Tier I + Tier II ratio	17.33%	18.54%

Source: Bank Albilad. (2018). Albilad Annual Report 2018, p.51.

2.3. CAR Influencing Elements

Assessment of factors that influence this mandatory ratio needs an understanding. Such factors are assorted into internals and externals. Bitar, Hassan, & Hippler (2018, p. 4), followed similar classification of factors and established that factors and capital theories affecting Islamic financial system are similar to those applicable in the wider finance literature. Heider & Gropp (2009, p. 7) suggested the existence of quite structural resemblances of banking and non-banking entities' capital. Thus, factors influencing adequate capital ratio determination of non-banking institutions pose similar impact on banking institutions. Even though, Islamic banking system operates differently than its conventional counterparts, both systems are exposed to similar effects due to interconnectedness of the global banking systems.

2.3.1. Internal Factors:

2.3.1.1. Risk Level

One key factor influencing banks' decision towards capital adequacy requirement is actually the level of risks banks take. A capital amount that exceeds the magnitude of risk assumed must be maintained. The aptitude of banks to be involved in risky contracts is a determinant of the capital level they keep. Providing that due diligence is practiced, banks with high-level capital can easily invest in debt-dominated investments without jeopardizing their shareholders' equity. On the opposite site, banks with low-level capital base (both qualitatively and quantitatively) are obliged to refrain from such risky investments that might expose them to severe liquidation. Peura & Jokivuolle (2004, p. 1819), observed that banks with highly risky portfolios maintain larger capital cushions. They also stated that banks with investment banking divisions usually keep more capital as compared to banks with pure commercial services. In terms of the less-experienced Islamic banks on managing risks, it is argued that they face bigger moral hazard risks from imperfect markets and asymmetric information (Bitar et al., 2018). Abedifar et al. (2013, p. 37) established that these banks face extra hazardous risk because of their complex financing modes, limited funding, investment and risk management.. Yet, they enjoy loyal Muslim customers who are more concerned of their religious beliefs.

2.3.1.2. Cost of Capital

In scenarios where bank capital falls below the required level, banks are forced to restore their capital level which itself requires additional costs for its procurement or face severe consequences from the authorities. To avoid becoming a victim to such unpleasant incident, banks prefer to hold larger capital volume above the minimum level rather than suffering from the additional costs needed for their capital reconstructions (Jasevičienė & Jurkšaitytė, 2014, p. 122). van Greuning & Bratanovic (2009, p. 42) argue that good corporate governance can at some level cut the cost of capital incurred by banks in a way of promoting lower risk-taking banking behavior which can boost shareholders' willingness to receive lower returns. Accordingly, prudent banks prefer maintaining reasonably less-risky portfolios, which in turn lowers their capital adequacy ratio. Concerning financial stability, Ben Zeineb & Mensi (2018, p. 9) stated that the presence of *Sharia* Supervisory Board (SSB) members that have good accounting, finance, and

Islamic knowledge can positively and substantially influence Islamic banks' financial stability. Moreover, the authors claimed that Islamic banks poses a unique agency responsibility to their clients because of the different nature of some of their financial instruments that leads to agency issues. As such, Islamic banks with larger SBB size normally face lower agency costs (Farag, Mallin, & Ow-Yong, 2018, p. 75).

2.3.1.3. Lending Activities

Banks who engage in large lending or financing activities require larger capital volume as a backup for such undertakings in case of undesirable outcomes. According to Siklos (2016, p. 2), a growth in bank lending volume effects bank's capital requirement strategy to uplift their capital cushion against possible defaults or financing failures. The amount of debt carried in the banks' books calls for capital volume larger than their debt or financing volume to ensure creditors that their contracts will be honored. In a more extreme fashion, van Greuning & Bratanovic (2009, p. 122) argued that the lending capacity of any loan offering bank is 'ultimately' determined by the volume of its capital, and based on existing capital adequacy ratio banks determine to what degree they can enlarge their balance sheet.

2.3.1.4. Bank Assets

Assets owned by banks, particularly their quality level, need management attention. The quality of bank assets dictate the amount of capital required as provisions to hedge against asset value deteriorations. Banks that overstate the quality of their assets usually set aside inadequate capital for their assets. Due to inefficient asset quality assessment, such banks become a victim of insolvency issues (van Greuning & Brajovic Bratanovic, 2009, p. 146). Maintaining accurate asset quality measurement is pivotal to evaluate monetary risks related to bank resources like lending. Clearly, the inner bank factors influencing CARs are numerous since factors such as profitability; liquidity, size, performance, efficiency, loan loss provisions, capital mixture, and management all have influential elements in the ratio development. Due to its broad dimension, banks should have efficient strategy that can define their capital adequacy targets, policies, measurements as well as capital assessment procedures that can relate their capital to their risk exposures as well as internal control systems that can ensure the implementation of such strategy as added by the authors (2009, p. 146).

2.3.2. External Factors:

2.3.2.1. Capital Regulations

In terms of extraneous effects, regulatory authorities play a key part. Concerned about the safety of claimants' money, regulators require assurance that financial institutions reserve optimal capital capable of imbibing risk exposures (Paudel & Khanal, 2015, p. 2). Such special consideration directed towards banks clearly exhibits the dense responsibility they carry for an economy. Heider & Gropp, (2009, p. 18) expressed that regulatory authorities can under their discretion demand banks to embrace larger capital volume once they find them to be riskier. Notwithstanding that the requirements set by the BCBS is implemented globally to the highest extent, national regulators have the utmost power to enact the requirement they assume appropriate on their banking sector. On the other hand, Barth, Dopico, Nolle, & Wilcox (2002, p. 185) argues that financial firms operating in states that have more than one supervisory bodies to oversee their stability generally tend to exercise lower capital ratios and face insolvency risks in contrast to systems with one supervisory authority. As per the authors, the competition among the multiple supervisors that is to satisfy the interests of their clients leads to reduced capital ratios of the banking institutions in systems where multiple supervisors dictate the banks. As the traditional capital to asset ratio can most of the times lead to incorrect conclusions regarding bank capital structures because of off-balance sheet obligation inconsideration, bank regulators enforce banks to convert such obligations into weighted liabilities in order to compute a valid capital ratio (Posner, 2015, p. 1864). These kind of commitments appears not on bank books until actually issued by both parties.

2.3.2.2. Economic Conditions

Economic conditions, especially capital market imperfections that are experienced severely in economic recession accompanied with liquidity issues pose an influential consequence on the capital requirements of banking sector. In situations like these, maintaining additional capital is instrumental for banks to survive the adverse effect (Peura & Jokivuolle, 2004). According to Osborne (2012, p. 2), banks raise their capital ratios to cover for the expected higher costs experienced during periods of financial distress. Hence, capital ratios are influenced by economic cycles. Similarly, Wong, Choi, & Fong (2007, p. 17) stated that bank capital levels are very likely to fall during economic

downturns due to increasing number of possible write-offs and provisions. In such instances, banks take precautionary steps and hold more capital leading to a higher capital ratio. On the contrary, during economic upturn or growth, material risks hardly occur and banks can safely hold less capital. Hence, lower capital ratio. Yet, measures sanctioned by central banks like raised bank reserve requirement ratios or interest rates impact their capitalization decisions.

2.3.2.3. Monetary Policies

Some researchers endeavored to establish a relationship between monetary policy, which is aimed at controlling the money supply in an economy, and capital adequacy requirement. Eickmeier, Kolb, & Prieto (2015, p. 19) stated that when capital requirements are tightened, central banks considerably reduce the monetary policy rates in an attempt to diminish the negative effects arising from such constricted rules on the lending and real economic expansion. Hence, monetary policies serve banks the means to adjust their capital ratios and stabilize the economy. Furthermore, Van den Heuvel (2002, p. 169) put forward that as interest rates on loans are increased bank equity level drops which forces banks to trim down their lending volume so as to limit risks stemming from capital inadequacy. For instance, when central banks raise interest rates banks face possible credit defaults since the additional cost of increased interest rates adversely affects creditors' capacity to settle their debts. Similarly, new borrowers refrain from taking loans due to the higher costs of higher interest rates leading to profitability issues. During such periods banks tend to hold extra capital to remain cautious against financial shocks.

2.3.2.4. Taxation

Similarly, scarcely researched area is the impact of taxation on bank capitalization. Chronopoulos, Sobiech, & Wilson (2017, p. 4) acknowledged that taxation can improve bank capital ratios and the overall financial soundness given the fact that taxes imposed on bank liabilities induces banks to hold lesser amount of debts and larger amount of equity. As demonstrated in some studies, banks prefer transferring their tax burdens arising from debt acquirements to their customers instead of building their capital structure with equity. On the contrary, interest payable on bank debts serve as a deductible against corporate income tax which encourage banks to hold more debt than equity

(Chronopoulos et al., 2017, p. 11). This latter view of debt tax deductibility follows the generally recognized outlook that bankers prefer more debt because of its business tax reduction incentives in contrast to equity, which offers no such remuneration on dividends distributed. However, the emergence of tax shield on equity seems to have delivered a somehow equal treatment of both debt and equity. As stated by Schepens (2016, p. 8), Allowance for Corporate Equity (ACE) – a tax shield for equity – can create a proportional preference for both debt and equity as such allowance enables a notional interest rate to be deducted on equity.

2.3.2.5. Deposit Insurance

Deposits collected by banks represent liabilities on the banks' books and require repayment to its owners at some point. Banks use deposit insurance coverage to insure settlement of debt to depositors during downturns. Cooper & Ross (2018, p. 60) referred to deposit insurance as a government established contract whereby depositors of a bank are guaranteed to receive their deposits if a bank fails. On the contrary, Nachane (2019, p. 155) stated that this might seduce banks to limit their regulatory capital since deposits insured under deposit insurance contract will not need to be covered with bank capital. Still, appropriately designed capital requirement and deposit insurance can avoid bank runs without leading to serious moral hazards due from banks' risky investment strategy and lessened depositors monitoring decisions (Cooper & Ross, 2018, p. 155). Deposit insurance coverage give banks greater leverage in the market assuring depositors the safety of their money which in turn affect their capital (Heider & Gropp, 2009, p. 24). The IFSB stressed on the need for sharia-compliant deposit insurance to provide protection to PSIA holders' deposit in Islamic banks and reduce potential shift of PSIA holders to conventional banks.

2.3.2.6. Banking Sector's Average CAR Level

Investors use information related to average capital standing of the banking sector so as to decide how much or where to put their money. According to Mohammed (2018, p. 19), the larger the capital volume held by banks the proportionate larger investments they attract. Hence, the exhibition of larger average capital volume by the banking sector in an area reflects on their strong solvent capacity, which steers investors to their benefit. On the contrary, Jasevičienė & Jurkšaitytė (2014, p. 130) suggested that when bank capital

ratio is more or less similar to that of the market, bank management prefer utilizing their profits for risky projects or on unreliable debtors rather than using it to revive their capital base.

2.3.2.7. State of A Jurisdiction

Looking at the overall environmental conditions surrounding bank, the decision of a bank on its CAR is associated with nation-wide factors like democracy, legal backgrounds, political system's stability, and market discipline (Bitar et al., 2018, p. 4). It is also argued that businesses operating in countries with stable institutional laws incline to raising more debt than equity courtesy of trust in the system which leads to the likelihood of investor extension of credits. Even though Islamic banks are governed by *sharia* law, they too are affected by the environment under which they run their businesses. The BCBS (2010, p. 2) advocates that national jurisdictions should have consistent definition and disclosure of capital to avoid the credit losses and write-downs suffered in the GFC. In markets where greater market restrictions are imposed on banking activities, banks with low market share tend to raise their capital ratios unlike markets with smaller amount of restrictions (Shaddady & Moore, 2015, p. 17). Similarly, the rise of financial conglomerates and competitions in a market results in an increased level of bank capital ratios as proclaimed by the authors.

2.4.   Impediments to Implement CAR by Islamic Banks

Islamic banks officially did not exist in 1974 when the BCBS was created, thus not considered in the convention. It wasn't until a year later when the first formally recognized Dubai Islamic Bank was established in 1975, accompanied by the launching of others in other Muslim-Majority countries. However, the possibility of establishing Islamic banking system was under immense study since the end of 1940 (Blasig, 2016, p. 7). One main reason for such emergence of Islamic banks during the 1970s is believed to be the rebirth of Islamic governments after gaining independent from their colonial powers as mentioned by the author (Blasig, 2016, p. 8). The core role of conventional way of banking is agreed to be of financial intermediation where it connects suppliers and demanders. Yet, from Islamic banking system perspective, the roles are broad depending on the demand of the customers and the appropriate form of the contracts. Within each role played or contracts entered by the Islamic banks, certain type of risks which are

mostly uncommon in conventional banks emerge, hence making the typical capital adequacy ratio hardly compatible (Smolo & Hassan, 2010, p. 62).

To find a solution for this incompatibility issue, numerous attempts have been made to come up with a similar ratio, which is applicable to Islamic banks. The first attempt was made by AAOIFI in 1999 by proposing a method built upon the standards of Basel II framework. Following up on this, the IFSB developed another similar proposal. As the liability side was the focus of the former, the later focused on both liability and asset sides (Smolo & Hassan, 2010, p. 62). The reason behind the focus of both organizations on the liabilities side is due to its structure. Unlike conventional banks, Islamic banks have 3 kinds of deposit accounts on the liability side. The deposit accounts of non-investment like current accounts and saving accounts whose principal amount is guaranteed by the bank but provision of returns on such accounts is only upon the willingness of the banks, and the restricted profit-sharing investment accounts ($PSIA^R$) and the unrestricted profit-sharing investment accounts ($PSIA^U$). $PSIA^U$ holders give Islamic banks full control over their investment and share any profit or loss outcomes with the banks. Contrarily, the $PSIA^R$ users control their investments and banks act only as an administrative services and information provider (Muljawan et al., 2004, p. 6). The fact that investment accounts (the $PSIA^R$ and $PSIA^U$) lack the intrinsic characteristics of normal deposit accounts poses a problem for the calculation of CAR for Islamic banks. These accounts on one hand provide its holders a share in the profits generated through their accounts, yet, denies them any voting rights available to equity accounts holders. Also, these account holders have the right to withdraw their deposits upon maturity. On these grounds, AAOIFI recommends Islamic banks to disregard the inclusion of $PSIA^R$ in the CAR calcuations since holders of these accounts bear all the resulting risks from their investment decisions. The institutions also recommend that $PSIA^R$ to be recognized as off-balance sheet item rather than a source of funds for the banks. On the other extreme, AAOIFI proposes the inclusion of $PSIA^U$ in the CAR of Islamic banks as $PSIA^U$ holders are considered to share part of the risks with other shareholders. As such, AAOIFI requires banks to assign a 50% risk-weight on such deposits to account for the equal profit-and-loss sharing element agreed by $PSIA^U$ holders (Ariss & Yolla, 2007, p. 50). According to Muljawan et al. (2004, p. 9), the reason for this requirement is to compensate for the possible damages sufferable by the depositor due to malpractice and negligence from the side of the bank.

Additionally, the organization requires every bank assets acquired through borrowed funds and shareholder financing to be part of the risk-weighted assets, and that all PSIAs be omitted from the eligible capital base.

On other hand, IFSB in a similar fashion concluded that PSIAs alongside reserves such as PER and IRR, which are owned investment account holders, should omitted from regulatory capital under the IFSB capital adequacy standards (Ozkan & Iqbal, 2015, p. 12). Unlike AAOIFI which attaches a fixed 50% risk-weight to $PSIA^U$, the IFSB requires banks to use an alpha factor which is an indicator of what proportion the investors or the banks bear the risk, to assign different alpha values to their risk-weighted assets (IFSB, 2013). The requirement to assign varying risk weights to different asset pools based on differing alpha values challenges the ability of Islamic banks to swiftly device a strongCAR. Spinassou & Wardhana (2018, p. 14) found that preference for PSIA among Islamic banks is dependent on the magnitude of their assets to generate returns. In essence, Islamic banks with moderate ROA encouraged their customers to invest more in PSIA to reduce abundance of deposit accounts whereas Islamic banks with high or low ROA favored raising funds through conventional interest-bearing deposits. The preference of PSIA by intermediate Islamic banks is justifiable given the fact that deposit account holders expect full protection for their deposits.

On the asset side of an Islamic bank's books, the structural format of Islamic financial instruments or contracts are centered in modes of financing like profit and loss sharing or lease sharing that cater to Islamic banks. More importantly, the characteristics of each instrument – in addition to the three main risk elements covered in Basel II - elicits a host of risk exposures throughout the different stages they go through which enforces Islamic banks to establish a more robust and all-accommodating risk profiles in order to have an adequately measured capital ratios (Smolo & Hassan, 2010, p. 63). To exemplify this issue, we can take the capital charge assessment for the most prevalent financing item of Islamic banks – *Murababah*. Under the IFSB, Islamic banks should set a 15% and 0% capital cushion to shield market risk and credit risk respectively at initial agreement point. At this stage, the customer does not receive full ownership of the underlying asset and no accounts receivable is recorded, thus no loss arising from customer default. On the other hand, since the price is fixated on the prevailing price of the contract date, the bank may

face a backlash from market price change. In the second stage, after ownership is transferred to the customer and payments are expected, banks need to anticipate possible non-collectability of payments. However, market price change would impact the contract (see table below).

Table 9: Murabaha Contracts Capital Charges

	Applicable Stage of the Contract	Credit RW	Market Risk Capital Charge
1	Asset available for sale (asset on balance sheet)*	Not applicable	15% capital charge (187.5% RW)
2	Asset is sold and title is transferred to a customer, and the selling price (accounts receivable) is due from the customer	Based on customer's rating or 100% RW for unrated customer (see section 4.1.5.1)	Not applicable
3	Maturity of contract term or upon full settlement of the purchase price, whichever is earlier	Not applicable	Not applicable

Source: IFSB. (2013). Revised Capital Adequacy Standard for Institutions Offering [Excluding Islamic Insurance (Takāful) Institutions and Islamic Collective Investment Schemes] (IFSB-15). *IFSB Standards*, p.72.

Practicing external rating agencies' risk rating standards introduced by BCBS is another obstacle for Islamic banks by itself. Under the standard, conventional banks use ratings provided by external agencies, however, such liberty is limited for Islamic banks since external agencies develop the rating based on conventional banks' risk exposures (Smolo & Hassan, 2010, p. 63). In addition to that, application of such ratings would bias risk exposures to Islamic banks. Even though CAR are formulated using similar numerators and denominators by both banking groups, the application of form-over-substance preferring AAOIFI standards by Islamic banks and substance-over-form preferring International Accounting Standards (AIS) standards by conventional counterparts confines the possibility of comparing banks of both systems (J. A. Mohammed, 2018, p. 23).

Besides the above mentioned issues, the calculation of CAR by Islamic banks is disrupted by regional differences and the lack of unanimous *sharia* norms across banks. Islamic scholars hold varying views regarding the acceptability of certain Islamic financial product as *sharia*-compliant (Smolo & Hassan, 2010, p. 64). This sort of principle disparity is further ignited by the freedom given to national regulators to make

adjustments to the IFSB capital standards in accordance with their local norms as most of these regulators prefer tweaking Basel capital requirements in favor of their domestically established Islamic banks (Spinassou & Wardhana, 2018, p. 2).

2.5. Analysis of Adequate Bank Capital:

A endless argument about how much capital is actually 'adequate' continues to exist. Keeping in mind the opportunity cost related to holding capital, bank managers prefer to hold capital amount lower than the regulatory authority required threshold. Ratnovski, an economist at the research department of IMF, stated the inexistence of any commonly ackowledged optimal level of bank capital. Hence, conclusions made regarding this issue differs in accordance with the model employed which is judgment driven – at some degree (2013, para. 1). The question of how much capital would suffice to bolster bank safety stood at the epicenter of discussions among financial experts, as holding excessive capital could lead to unprofitable banking business whereas too little capital might expose banks to failures.

2.5.1. Higher Capital Adequacy Ratios

Regulators, in the pretext of maintaining healthy financial environment, advocate for higher capital requirement – larger capital cushions. However, Ho (2012, p. 5) stated that capital levels derived through regulatory requirements can lead to substantial overcapitalization as well as undercapitalization. Overcapitalization refers to situations where a firm and business possesses capital bucket exceeding the level needed by its activity and requirement. It is about keeping more capital than actually required leading to idle funds (Paramasiva & Subramanian, 2009, p. 43). The key demand for higher capital requirement is to lower the likelihood occurrence of banking crises. Yet, such higher requirement would have severe repercussions like increased bank lending rates, diminished investments, and a hike in the cost of capital in the economy (Cline, 2016, p. 2). Banks pass on costs associated with the extra capital acquirements to the clients as an additional lending charge, which reduces their borrowings and lowers economic growth consequently. Almenberg et al. (2017, p. 10) conducted similar cost-benefit analysis of imposing higher capital ratios on banks, and came to the conclusion that additional capital serve as a shield against possible financial crises but might negatively affect the economy. Since banks transfer additional capital costs to the borrowers, borrowers refrain from

taking loans from banks which in turn lowers the GDP in the long term. Acknowledging the adverse consequences of increased borrowing costs, Buehler et al.(2009, p. 3) added that such extra costs on customers leads to a declined profit earning capacity of bank equity, and most importantly, a dimunition in the willingness of investors to supply equity to banks with unconvincing profitability rates. Hence, higher capital requirement affect both the banking industry and society of an economy – either in good way or in bad way.

In an attempt to raise their capital ratios which could intensify borrowers' funding costs, banks with capital raising inabilities either from own profits or from issuance of new shares are forced to restrain lending or undertake fire-sale (Caruana, 2014, p. 4). Banks prefer tightening asset growth by retaining their earnings or selling their assets instead of cutting dividend payments or issuing new shares as this option will lower the value of their shares. In essence, the effect of lending constraint and rapid asset sales on the economy is destabilizing. Other writers complemented other drawbacks of regulatory required higher ratios. Posner (2015, p. 1862) stated that higher capital ratio bears two effects on banks. First, banks lose the appetite for taking risks. Second, bank shareholders become prone to larger losses since regulators require shareholder equity to be expensed to absorb losses. Hence, the more the shareholder equity the larger the losses they absorb, and vice versa. From a broader sense, enforced higher capital requirements have the undesirable effect of impeding the developments on start-up by blocking potential entrepreneurs desire to initiate their own businesses rather than seeking employment (The World Bank, 2013, p. 3)

Apart from the main 'banking failure prevetion' aspect of higher capital ratios, some other benefits for maintaining such higher ratios are reported as well. Beerger et al.(2008, p. 7) highlighted some possible reasons as to why banks maintain higher capital ratios:

1. Earnings retention: Due to uncertain need of capital in the future, banks tend to hold their earnings in today's time rather than urgent raising of capital, which might not be a simple task for banks in the future.
2. Economic capital: the stance of banks in the credit market is crucial, and higher ratio reflects on the bank's ability to withstand perceived risk exposures in the market.

3. Acquisition plans: banks with acquisition agendas prefer maintaining larger capital bases to boost their candidacy and display strong capitalization when profitable acquisition opportunities arise.

2.5.2. Lower Capital Adequacy Ratios

Banks that hold capital volume below the required minimum to shield themselves against possible losses are defined as undercapitalized or poorly capitalized banks. Estrella et al. (2000, p. 34) determined banks which fall under the minimum adequate capital level as severely undercapitalized banks that call for immediate closures. Furthermore, Saddiq (2017, p. 50) stressed on the fact that lower capital ratios, which is reducing capital base relative to corresponding assets, might render banks to fail and eventually cause financial distress. After undercapitalization is experienced, banks are advised to embrace restoration plan for capital, suspend dividend and management fees payments, and limit their expansion (Peek & Rosengren, 1997, p. 44). Generally, in the short-run, lower CAR is believed to have no detrimental effect on banks that fall below the threshold required by the state banks. However, a prolonged lower CAR would inflict a bank-run whereby depositors rush to take out their money (Perchstone & Graeys, 2016, para. 4). Alongside unethical behaviors, excessive risk-taking, incompetent, and risk management, maintaining inadequate capital level which can lead to amplified systematic instability results out of weak corporate governance formed by state's limitation of key decision-makers liabilities (Dowd, 2011, p. 6). Governments bail out failing banks to protect the welfare of the economy, which in turn lessens the burdens on bank decision-makers to act prudently. According to Osborne, Fuertes, & Milne (2012, p. 10) highly profitable banks incline to maintaining lower capital ratios considering their ability to finance future projects with the retained profits. Another cause for lower capital preference is said to be business plans of banks. Banks that are planning to gain larger market share hold less capital and leverage up quickly in a bid to expand their lending volume.

Mendoza & Rivera (2017, p. 87) established two side-effects of low capital ratio for banks: an increased leverage – larger debt than equity - and greater costs related to borrowing funds. Assuming that low capital ratio is the requirement, regulators would fail to detect potentially infeasible businesses. Plus, such low requirement would equip business to maintain less capital which would not suffice to protect creditors' money (The

World Bank, 2013, p. 43). Ho (2012, p. 5) outlined several negative effects of undercapitalization. First, firms or banks fail to meet their obligations due to insuffient capital base. Second, shareholders, investors and creditors suffer from severe financial losses because of bank failures. Third, government funds and taxpayers money are used to revive nearly-failed banks. Fourth, credit rating agencies that rated such failed banks as credible lose their reputations and crediblity. Fifth, the failure of some banks causes counterparties that had relation with these banks to lose their trade, profits, assets, and also risk protection. Generally, insufficiently capitalized banks can barely endure unexpected losses or downswing in the economy which will boost their chances to fail. Consequently, they will engage in an agressive and speculative growth to recover from the financial wounds.

2.5.3. Optimal Capital Adequacy Ratio

Since higher and lower capital ratios bear some favorable and unfavorable impacts on banks, a beneficially optimum capital level both bankers and regulators is needful. Kragh-sørensen (2012, p. 23), defined optimal capital ratio as the ratio where the marginal costs of increasing capital ratios is equivalent to the expected marginal benefits. In a more transparent way, Cline (2017, sec. Preface) referred to optimal capital ratio as a condition where the marginal benefits to the economy of crisis evasion and the marginal cost to the economy of sacrificed output due to reduced capital stock accumulation in the economy is evenly equal. As per the corporate finance theories, a bank in a sense of balance prefer holding internally assessed optimal capital level that can tradeoff the costs and benefits on bank returns. However, regulators enforce banks to maintain a capital ratio above banks' internally developed optimal capital (Osborne et al., 2012, p. 2). The preference of the regulators is genuinely justifiable considering the immense preventive body they represent in maintaining a healthy economy. Conducting a cost-benefit analysis, the BCBS came to the suggestion that optimal capital ratios are higher than the minimally required ratio imposed by regulators. Yet, on the other extreme, academicians suggest even greater ratios (Posner, 2015, p. 1880). Considering the reward and restriction approach utilized by regulators to reward well capitalized and punish poorly capitalized banks, academicians failed to reach a clear consensus on how much capital is actually optimal (Peek & Rosengren, 1997, p. 42). In spite of the fact that optimum capital

maximizes –at least theoretically- some bank owners' sought after objectives, in practice such ideal capital level is hard to determine (Estrella et al., 2000, p. 35).

A variety of researchers recommended varying capital ratios that they deemed to be optimal. Miles, Yang, & Marcheggiano (2011) assessed and suggested an optimal capital ratio ranging between of 16% and 20% for UK banks. As for Swedish banks, Almenberg et al. (Almenberg et al., 2017) recommended a socially ideal capital ratio should be between 5% and 12%. Similarly, the BCBS stressed that a 10% to 15% capital ratio is optimal. Yet, relating such ratio to the United State's banking system, the regulators realized that a 12% mid-range capital ratio translates to a 15.6% optimal capital level for the U.S bank (Posner, 2015, p. 1878). Hence, we can observe that optimal capital level is a matter of individual coverage rather than a one-fits-all aspect.

Considering that higher optimal level of bank capital can overcome higher estimates of costs resulting from financial crisis, Kragh-sørensen (2012, p. 4) indicated that the calculation of optimal capital ratio is ambiguous since such calculations does not account for the possibility of such level of capital to reduce the value of government guarantees. However, the fact that economic costs will decrease due to borrowing costs passed on to customers or due to reduction in the cost of securing loans facilitated by higher capital ratios would entail that an optimal CAR should be higher. Firestone, Lorenc, & Ranish (2017, p. 10) concentrated on the experiences of U.S banks and acknowledged that (1) the estimation of marginal benefit and marginal cost to establish optimal level of capital for banks vary due to different models implemented, and (2) analytical frameworks employed to determine such ideal capital levels are schematic and built around abstracts from a handful of real world reflections. It is apparent that bankers, regulators, researchers, and academicians as well could not succeed in determining a unanimously applicable optimal capital ratio for the banking industry in spite of the immense studies and researches carried out. Undeniably, there are numerous conflicting elements that need to be well adjusted to achieve an optimal CAR.

2.6.   Theoretical Framework of the Study

Theoretical framework allows researchers conducting studies and readers who put their time and energy to comprehend clearly the aim and contribution of the study, the possibility to observe how the outcomes of the study precisely relates to the questions and

hypothesis of the study. Theoretical framework enables us to explain and justify reasonably the connection between our expectation from the study and the findings arrived. Lederman & Lederman (2015, p. 597) claim that theoretical frameworks are undeniably essential for any sort of academic work, be it qualitative, quantitative or a mixture of both methods. Henceforth, to justify the importance and implication of research endeavors, researchers should have a valid theoretical framework in place. Given that capital adequacy relates to the wise assessment and management of regulatory capital required to offset the inherent risks of certain assets, theories of corporate capital structure in the literature are widely used to associate research outcomes and perceptions related to capital adequacy ratio.

2.6.1. Buffer Theory

Buffer theory signifies that in incidents where banks capital adequacy level declines close to limit, banks raise it to prevent the incurrence of costs resulting from the breach of regulatory requirement. Wong et al. (2007, p. 15) stated that banks prefer holding capital buffers since they view that capital requirement set by the regulators is inadequate to insure them protection against risks. Consequently, banks prefer maintaining additional capital over prudential boundary to lessen the possibility of going below the legally required capital level. The difference between the total CAR level maintained by banks and the required 8% limit applicable in some countries refers to capital buffer (Roulet, Distinguin, & Tarazi, 2012, p. 9). Wong et al. (2007, p. 18) found that excess capital or capital buffer emerges out of banks ambition to finance their long-term strategy. The authors further added that in addition to regulatory discipline, market discipline arising from imperfect market information and the tendency of banks to contest to acquire funding resources could play a part in the maintenance of capital buffers by banks (Wong et al., 2007, p. 22). However, Heider & Gropp (2009, p. 9) underlined that capital buffers held by banks as insurance against deteriorating capital below the minimum requirement has nothing to do with higher regulatory capital of banks. Rather it is the price of raising equity in short notice that dictates holding larger regulatory capital. Discussing the uninsured debtholders' sensitiveness toward the probability of bank defaults, Roulet et al. (2012, p. 16) stated that when banks operate with CAR which is near the minimum threshold, such unprotected debtholders lose confidence and tend to increase their monitoring efforts on the banks. In such scenarios, banks prefer to hold capital beyond

minimum level to avoid being monitored and disciplined by debtholders, especially when the banks rely highly on subordinated debtholders. According to Basher et al. (2017, p. 4), banks initially raise their regulatory capital level so as to reduce risks inherent in the asset. However, immediately after attaining their preferred capital buffer, they uniformly increase their capital and risk level. This implies that after a certain threshold, such banks take in assets with higher risk exposures. Hence, capital buffer poses favorable and unfavorable impact of bank behaviors.

2.6.1.1. Buffer Theory on Islamic Banks

This theory is applicable to our study given that Islamic banks are generally better-capitalized entities, and excessive capital can eliminate penalty costs when regulatory requirement is violated as well as takes part in the improvement of financial performance. To support this theory, Bitar et al.(2018, p. 3) mentioned that the reason why Islamic banks prefer internal funds and equity is due to *Shariah* imposed constraints commanding these banks to raise their capital buffers. Besides *Shariah* requirement, certain PSIA instruments offered by Islamic banks contribute to their larger buffer holdings. Muljawan et al. (2004, p. 15) stated that as the proportion of unrestricted PSIAs in total deposits increases, the quantity of capital buffer increases as these banks are required to take up half the risk exposures inherent in unrestricted PSIAs, hence hold extra capital beyond the capital earmarked to cushion shareholder equity. Moreover, Rosman, Wahab, & Zainol (2014, p. 88) indicated that excessive capital provides protection against future financial losses and improves efficiency of Islamic banks that hold less debt in comparison to equity. All these indicate that extra capital or capital buffer beyond the minimum threshold is significant for banks' overall efficiency and soundness.

2.6.2. Trade-Off Theory

The founders of this theory Miller & Modigliani (1963, p. 441), established the notion that firms build their capital structures with a mixture of both debt and equity in the long run. However, in any particular year, only one form of capital may be raised. Thus, firms should be cautious regarding which type to raise. Firms benefit from tax savings of debt financing, but limitations imposed by lenders deny them to form a capital structure of entirely debt-based. On the other hand, firms cannot finance their capital completely with equity since they wish not to sacrifice the benefits of tax savings and sometimes financing

with retained earnings is much cheaper source for capital structuring (Miller & Modigliani, 1963, p. 442). Osborne et al. (2012, p. 3) stated that under strained situations, banks hold larger capital trading-off earnings from risky loans hence lowering their likelihood of defaulting, which abides with the trade-off theory. On the other hand, Mutairi & Naser (2016, p. 969) indicates that higher risk levels lead to lower debt financing and higher capital financing. Generally, firms prefer debt financing over dividend payments as its tax deductable. Hence, debt financing enables firms to reward their investors with higher returns while reducing tax payments to the authorities.

2.6.2.1. Trade-Off Theory on Islamic Banks

As for Islamic financial firms, trade-off theory has an impact on the capital structuring decisions as well. Thabet & Hanefah (2014, p. 3) stated that Islamic goods and services offering firms prefer using debt over equity as debt financing lowers their *Zakat* payments given that debts are allowed to be deducted from the *Zakatable* capital of the firms. Even though a second opinion among scholars holds that only the current due amount be deducted from *zakat* obligations, firms still reap the benefits of *zakat*-deductibles. Sakti, Tareq, Saiti, & Akhtar (2017, p. 297) underlined that trade-off theory is more suitable to Islamic banks as agency and bankruptcy costs among shareholders and debtholders are lower motivating them to favor debt financing. In contrast, lower information asymmetry and agency costs between shareholders and bank runners encourage Islamic banks to choose financing with equity. Arguing the debt preference of Islamic banks, Aggarwal & Yousef (2000, p. 94) stated that Islamic banks, in very fewer cases, offer long-term equity financing to entrepreneurs who need capital. In real-world situations, financing activities of Islamic banks are dominated by debt-like instruments like *Murabaha* contracts rather than PSIAs.

2.6.3. Pecking Order Theory

This theory attempts to clarify the reason firms tend to prefer one source of financing to the other. This theory states that corporate managers, for investment purposes, prefer utilizing internal funds first, then debt funding from equity funding which are both external source of funding due to costs inherent in external funding. According to the founders of this theory Myers & Majluf (1984, p. 6), corporate behavior's tendency to rely on internal funds, and – if that is unattainable prefer debt financing over equity

financing -- stems from asymmetric information and management's protection of existing shareholders' interests. Asymmetric information forces investors to demand higher returns on their investments when less is known about the prospects of the company, thus encouraging firms to fund new projects with internal sources, probably retained earnings. In terms of external source of funding, managers try to avoid issuing new shares since this would lead share prices of the firm to decline whereby debt security issuance poses insignificant effect on stock price (Myers & Majluf, 1984, p. 6). Another reason for shareholders discomfort with new equity issuance is to retain control of the firm as new equity shares means increased shareholder numbers and decreases influence on company affairs by current shareholders.

As mentioned by Sibindi (2017, p. 23), firms that follow this theory normally do not define a target debt-to-equity ratio implying that managers in such firms prefer choosing the least cost financing vehicle which is generally debt financing. Businesses follow a hierarchy of preference where retained earnings is favored over debt financing, short-term debt against long-term debt, and debt funding against equity. Financing with retained earning involves no third party influence thus no asymmetric information whereas equity financing involves the highest asymmetric information between insiders and outsiders and should seek debt financing in order to circumvent issuing underpriced equity shares (Chen, Jung, & Chen, 2011, p. 93). According to Abosede (2012, p. 6), companies choose financing sources considering the amount of cash under their disposal and the restriction level of external funds rather than the magnitude of tax benefits from other sources of funds.

Empirically speaking, Antoniou, Guney, & Paudyal (2009, p. 25) found an inverse association between leverage and profitability, suggesting that profitable firms issue less debt securities as they can utilize their internally accumulated funds. This preference for internal funding goes in conformity with the pecking order model. Baltaci & Ayaydin (2014, p. 53) and Frank & Goyal's (2003, p. 224), indicated that larger firms can without any hurdles borrow funds given their diversification and better reputation in the debt market.

2.6.3.1. Pecking Order Theory on Islamic Banks

As for *Sharia*-comliant firms, Thabet & Hanefah (2014, p. 1) indicated that such firms abstain from debt-financing and prefer using idle internal funds to finance projects since they are prohibited from engaging in interest-based revenues, thus fortifying the applicability of pecking order in Islamic firms. However, small sized Islamic firms with a potential to grow tend to finance their future growth opportunities with exchange-based S*ukuk* – an analogous instrument to conventional fixed-claim debt instrument but backed by S*hariah*-complaint assets - considering the higher information costs and inability to raise equity with ease (Mohamed, Masih, & Bacha, 2015, p. 248). This is in comformity with pecking order theory's preference for debt over equity.

2.6.4. Agency Cost Theory

This theory is centered on the conceptual existence of principle-and-agent conflict of interest. Principal-Agent contract involves delegating authority to an agent on behalf of a principal which might trigger agency problem stemming from the likelihood of conflict of interest between both parties, particularly when both the principal and the agent have their own agenda to increase their value inside the firm (Nyoka, 2017, p. 20). The agents, here, are senior managers and board members delegated representing shareholders who are the principals in the firm. Yet, Raharjo, Hakim, Manurung, & Maulana (2014, p. 400) expanded the dimension of the relationship to those between shareholders and bank managers, borrowers and bank managers, and also the relationship between the regulators and the bank as an agent. As stated by Harun (2016, p. 92), this contract creates three costs. Monitoring costs, which are incentives provided by the principal to the agent incentivizing the later to serve in his/her best interests. Bonding expenditures, which are the additional costs incurred by the agent to assure that his/her actions does not contradict the interests of the principal. Residual loss, which are losses arising from the diminution of the principal's financial wellbeing. On the other hand, Ye Ekström & Kanaporyte (2015, p. 10) stated the reasons that these costs are incurred is to align shareholders' (principal) interests with the management (agent) and reduce the level of agency-principal dissonance.

Sibindi (2017, p. 28) stated that, to discipline firm managers who overvalue their interest over that of their principals, debt financing should be used since non-payment to creditors

empowers them to enforce firm liquidation. Generally, extremely leveraged firms make regular interest payments to their creditors, which in turn reduces the volume of income and cash available for the manager's own use. In addition to this, creditors as a third party, monitor the behavior of the managers which serves to reduce agency costs (Naser, Al-mutairi, Kandari, & Nuseibeh, 2015, p. 981). Mutairi & Naser (2016, p. 961) stated that, by minimizing the costs emerging due to clash between agent and principle, agency cost theory can allow firms to determine an optimal capital structure that suits their business. Heider & Gropp (2009, p. 27) underlined the possibility that agency costs are a promising factor to explain why banks are highly leveraged rather than non-financial firms. On the contrary, Wong et al. (2007, p. 18) acknowledged that bank managers do not favor engaging in larger leverage volume as it requires greater effort to manage the immense high-risk level of highly leveraged banks, hence prefer to hold excess capital to pursue a moderate banking practice at the expense of the shareholders who favor debt over capital accumulation.

2.6.4.1. Agency Theory on Islamic Banks

Numerous researches seem to approve the disciplinary role of debt financing for *Shariah*-compliant institutions. Thabet & Hanefah (2014, p. 9) indicated that *Shariah*-complaint firms incline to utilize debt financing as it maximizes the wealth of management when higher managerial ownership element exists in the firm. The more managerial ownership the greater the influence of firm managers on firm capital structure. According to Short & Keasey (2002, p. 80) managers tend to be less inclined to divert firm resources contrary to firm value maximization given that managerial ownership increases uniformly with firm performance. Pratomo & Ismail (2006) found that Islamic banks in Malaysia are highly leveraged with lower equity to assets ratio leading to higher profit efficiency. Furthermore, Sakti et al. (2017, p. 297) supported the tendency for debt instruments to dominate in Islamic banks with the economic reality of increased agency problems created by equity instruments and the short-term nature of debt instruments which are favored by Islamic banks. Fayed & Ezzat (2017, p. 10) emphasized on the significant concern of agency problem for Islamic finance corporate governance due to three elements. First, PLS contracts available on the asset and liabilities sides alerts IAHs to demand for greater transparency since losses on their investment is solely borne by them. Second, rate of return smoothing practices by Islamic banks is not favored by equity

holders of the bank. Third, conflict of interest between top managers and *Shariah* board members that are appointed by shareholders who might have disagreement with bank managers. Other researchers like Sarker (1999, p. 26), Shamsuddin & Ismail (2013, p. 542), and Hamza (2016, p. 32) have all asserted on the concerning nature of agency-related issues on Islamic financial institutions.

2.7. Empiric Studies of CAR on Bank Stability

Determining factors influencing CAR of banking institutions require careful investigation as insufficient capital ratio can expose banks to bank-runs where bank depositors feel that such insufficiently capitalized banks are in distress and haste to withdraw their money. It can likewise lead to face severe scrutiny from regulators to the point that the said banks are shut down if capital ratios are not increased to assure regulators that financial obligations will be met to prevent idiosyncratic and systematic risks. Yet, excessively set CAR carries its downsides as well even though it is commonly believed to prevent bank failures in most cases. With regards to imposing increased capital adequacy requirement on banks to increase their capitalization level, Cecchetti (2014, para. 1) stated that long-term economic expansion will be subjected to permanent decline. Martynova (2015, p. 1) further elaborated on the phenomenon and illustrated that banks reduce their credit supply and credit demand hence lowering economic expansion. Yet, the author indicated financial stability and loss avoidance are improved under better capitalization. As stated by Hadjixenophontos & Christodoulou-volos (2018, p. 104), the level of CAR is influenced by a number of factors and partially by requirements imposed by regulators. In order to raise their capital ratios, reduction of loan assets; enlargement of retained earnings volume, issuance of new securities, and shifting financial portfolios to less risky assets are some of the effective means available to banks (Dhumale, 2000, p. 29). However, banks try to avoid issuing new securities as the rate of return payable on such securities are higher than bonds and deposits. Attempting to establish a connection between capital inadequacy and banks failures, Samad (2011, p. 109) argued that failed banks maintained lower capital adequacy ratios during the GFC whereas survived ones maintained higher capital ratios which contributed to their resistance. Ghosh (2014, p. 150) measured the relation between risk level and capital of GCC banks pre and post GFC and found that their Islamic banks raise their capital base during financial crisis showing that increased CAR serves to improve bank stability. Nguyen & Nghiem (2015, p. 525)

studied the banks in India and found an inverse correlation between insolvency and CAR, implying the increased CAR leads to lower insolvency risk and increased profit efficiency. Martynova (2015, p. 18) argued that when banks increase their capital their financial stability improves substantially as well since risk-taking incentives of the banks are reduced and buffer against losses is raised. However, some researchers presented different views on the influence of capital on bank stability. Calem & Rob (1999, p. 4) stated that banks with large capitals tend to take on risky portfolios that is more than they did before due to reliance on the additional capital they set aside for regulatory compliance. Koehn & Santomero (1980, p. 1244) argued that intention of strict capital regulation might actually lead to negative repercussions where banks will take on higher risks when higher capital ratios are imposed. Delis, Tran, & Tsionas (2012, p. 57) argued that regulatory capital is not sufficient to promote financial stability, and alternative measures should be indorsed to have stable banking system. Similarly, it is argued in Saddiq's study (2017, p. 20) that responding to stringent higher capital ratios does not necessarily translate to withstanding against undesirable financial downturns. Despite the varying perceptions, the importance of adequate capital regulation is not one that can be overlooked. Liljeblom, Mollah, & Sikder (2016, p. 2) stated that the key objective behind adequate capitalization against risk exposures specified in the Basel guidelines is to have improved stability in the global banking industry and protect them from financial instability and insolvency.

2.8.   Summary

In this chapter, we provided detailed explanation and definitions pertaining to our primary element – capital adequacy ratio; the internal and external factors having influence on a bank's decision-making procedures related to capital ratio. We also pointed out that differences among Islamic scholars on bank-related matters derails the applicability of uniform capital adequacy standards. On the other hand, we touched varying levels adequate capital ratios, and that an optimal CAR where marginal benefits is equivalent to corresponding marginal costs is the desired one for banks. In the last section, we provided a review of prior studies concerning how CAR affects bank soundness..

CHAPTER 3: INFLUENCIAL CAPITAL ADEQUACY RATIO DETERMINANTS OF THE GCC ISLAMIC BANKS

This chapter encompasses the epicenter of this research including: conceptual framework, literature review, research design, operational definitions, hypothesis development, data collection method, study population, research model specification, data analysis technique, diagnostic tests, descriptive statistics, correlation analysis, and analysis of the study regression and subsequent interpretations.

3.1. Conceptual Framework of the Study

The figure below is an illustration of the conceptual framework that is be followed when analyzing the relationship between the variables. Bank-level factors selected include profitability (ROA and ROE); Operating Efficiency (OEOI), Liquidity (FDR), Bank Size (SIZE), and Asset Quality (NPF). On the other end, Economic Growth (GDP) and Inflation (INF) is selected to represent macro-economic level factors. The framework is built on prior studies that followed similar patterns, particularly for Islamic banks.
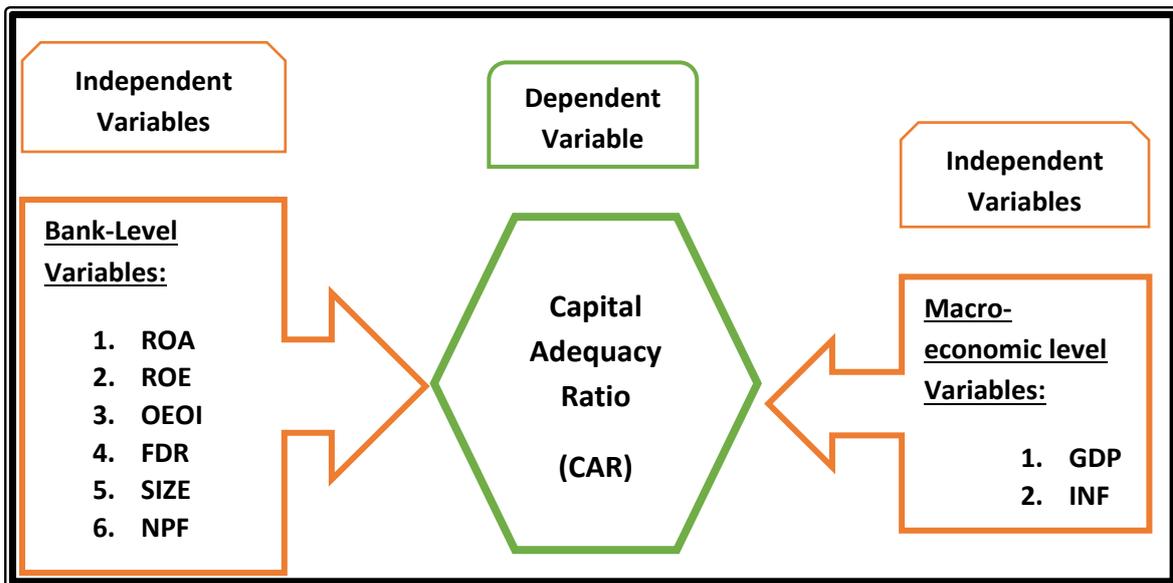
Figure 2: Conceptual Framework

Source: Developed by Author

3.2. Literature Review

A plethora of researchers have studied the impact of different factors on the determining CAR for the banking institutions, mostly conventional banks. Nonetheless, a few number of researchers have endeavored to conduct similar studies on entirely Islamic banks

whiles others performed a comparative studies on a mixture of both conventional and Islamic banks. In this section, studies on pure Islamic banks will be presented first followed by researches on mixed banking institutions and lastly studies on conventional banking institutions.

The first leading researchers who conducted a study on the CAR determinants of Islamic banks are Abusharba, Triyuwono, Ismail, & Rahman (2013). The authors investigated determining factors of the variable of Islamic commercial banks in Indonesia from 2009 till 2011. They established a strongly direct relationship of CAR with Return on Assets (ROA) and Financing to Deposit Ratio (FDR), and a strongly inverse association between dependent variable (CAR) and Non-Performing Financing (NPF). Nonetheless, Operating Expense to Operating Income (OEOI) and Total Deposits to Total Assets (DA) showed insignificance. Bateni, Vakilifard, & Asghari (2014) carried out similar study using somewhat different variables on Islamic banks in Iran. Performing analysis on the aggregated data from six private banks' annual reports for periods between 2006 and 2012, the authors associated CAR positively to Loan Asset Ratio (LAR), Return on Equity (ROE), ROA and Equity Ratio (EQR) as independent variables, and negatively to log total assets. Risk Asset Ratio (RAR) and Deposit Asset Ratio (DAR) failed to indicate any significance. Likewise, Valipour Pasha (2015) examined the causal-effect between Non-performing Loans (NPL) and CAR in the Iranian banks and found an inverse nexus between them. So when banks raise CARs, they lowered their NPLs. in Malaysia, Asma & Khadidja (2015) studied sixteen Islamic banks between 2006 and 2011 and realized an inverse association of CAR with Credit Risk (CR) and ROE, a positive association with ROA. Insignificant variabels were Liquidity Risk (LR), Operating Efficiency (OPR) and Bank Size (BS).

Yolanda (2017) studied CAR determinants of 11 Indonesian Islamic banks from 2012 to 2016. The author endeavored to establish a relationship between CAR and Net Interest Margin NIM, ROA, ROE, FRD. With a regression analysis, a positive and significant association of all explanatory variables with CAR is found. On the other end, Darwanis, & Mursal (2019) studied Indonesia's entire Islamic banks from 2015 to 2017. The author attempted to examine the effect of ROA, FDR, Bank Size, NIM, and Deposit (DEP) on CAR. ROA, FDR, NIM, and Size are revealed to inversly impact CAR. DEP positively

influenced CAR, implying that as DEP increases CAR goes up in parallel. A faction of rural customers sarving fifty five Indonesian Islamic banks during a short period from 2015 to 2016 were tested by Sutrisno (2018). The author analyzed the degree and direction of ROA, Net Profit Margin (NPM), FDR, asset management quality (NPF), and operating efficiency (OEOI) with CAR using quarterly. The multiple linear regression analysis revealed that NPM, FDR, and NPF strongly and direclty impacted CARs of the banks, except ROA and OEOI.

From bank behavioral perspective, Ayub & Javeed (2016) examined the effect of CAR on five Pakistani Islamic banks' financing activities between 2004 and 2014 and found that CAR have a profound negative impact on Islamic banks' financing behavior, implying that as CAR increases financing activities declines. It is revealed in the study that the banks were left with the option to either invest their funds in a lower risk government instruments or decrease their asset portfolio so as to live up to the capital requirements. The intention behind financing activites' contraction and asset portfolio shifting is to redeem themselves as highly capitalized banks since acquision of new capital proved costly. As a remark, the authors recommended that Islamic banks in Pakistan should increase their CAR with retained earnings and new equity issuance to follow the Basel III standards. Unlike predominant researchers who used panel data method, Ismail & Shahimi (2003) applied a time-series data analysis technique on a number of variables collected from Bank Islam Malaysia Berhad (BIMB) annual report between 1997 and 2001. After a comprehensive analysis, the author determined that Islamic banks active in Malaysia increase their CAR either by reducing their 100 percent RWAs or by lowering their financing portfolio volume taking advantage of the well-developed financial markets in the country. The authors also indicated that loan loss provisions postively influences CAR. However, the fact that Islamic banks share losses with their stakeholders like *Mudarabah* and *Musharakah* account holders, can suggest that such banks maintain a lower CAR since losses arising from these portfolios are partly abrosbed by their depositors.

On another dimension, a number of researchers studied factors affecting CAR in a mixture of Islamic and traditional banking systems. Ansary & Hafez (2015) studied deteminants of CAR on a total of thirty six (36) commercial banks operating in Egypt

including four Islamic banks between 2004 – 2013, and found that profitability, liquidity and management quality directly and singificantly correlates with CAR, but the relation with bank size and credit risk was significant and inverse. However, the outcome are found to alter as the time period is changed from whole-period to pre-and-post crisis period.

Hewaidy & Alyousef (2018) studied all the listed banks in Kuwait (40 conventional and 37 Islamic banks) from 2009 to 2016 including macro-economic factors. Notably, Bank Type showed insignificant effect on CAR, which means that bank type is irrelevant for capital decisions. Apart from which are found to be insignificant, factors like Bank Size, Loan Loss Reserves to Total Loans and Net Loans to Asset negatively and substantially effected CAR. But, Loans to Deposits positively and significantly influenced CAR. Beside bank-specific factors like ROA, ROE, and NIM, macro-economic factors like GPD and inflation also remained weak influencers of CAR of banks in Kuwait.

Abdul Karim, Hassan, Hassan, & Mohamad (2014) tested the correlation between CAR and banking behaiviors of a mixture of banks in fourteen OIC member states between 1999 and 2009, and a strong positive CAR relation with lending and depositing of the banks is found. Nonetheless, under the capital crunch hypothesis where a system-wide financial crisis is considered, under-capitalized Islamic banks is revealed to suffer greater contraction when higher capitalization is required by regulators whereas such effect does not hold true for conventional counterparties. Mohammed (2018) examined how certain bank-specific factors influence the CARs of 25 tradintional and 25 Islamic GCC banks from 2006 to 2015. The multiple linear regression disclosed that profitability, asset quality, and management quality significantly and directly impacts CAR of Islamic banks while liquidity and bank size inversley and strongly impacted their CARs. The influence of net interest income and credit risk was weak and negligible. Nevertheless, findings differed when the scope was altered.

In terms of entirely conventional banking system, a number of researchers endeavored to study this subject. Shingjergji & Hyseni (2015) tested if some bank level variabels influence the Albanian banks' CARs from 2007 till 2017. WIth ordinary least square (OLS) regression analysis on a set of quarterly data, its found that NPL, loan to deposit ratio (LTD), and equity multiplier (EM) all influence CAR negatively and significantly,

while bank size directly and strongly influences CAR. However, ROA and ROE showed insignificant effect on CAR. Yüksel & Özsarı (2017) engaged in similar analysis on the deposit banks in Turkey from 2005 to 2016 using both bank-level and macro-economic variables. The authors said that GDP and Inflation have a strong negative and positive relation with CAR, which means that deposit banks in Turkey raise their capital ratios when the economy is experiencing a decline and uncertainty. Nonetheless, exchange rate proved to have no substantial effect on the main variable. In terms of bank-specific variables, only Net Balance Sheet Position and Fixed Assets to Fixed Liabilities presented an inverse correlation with CAR implying that the decline of these elements results in an increase in sensitivity to market risk thus forcing banks to raise their capital levels. In the work of Workneh (2014), eight commercial banks in the Ethiopia was observed using OLS method from 2002 to 2013. The author found a statistically significant connection between CAR and four predictors, vis-à-vis, deposits, liquidity, leverage, and loan loss reserve. However, management quality, profitability, and bank size all failed to demonstrate a compelling effect on the main variable.

As for studies on the conventional banks in the Gulf member states, a few number of researches have been published. Polat & Al-khalaf (2014) studied commercial banks traded in the stock market of Saudi Arabia from 2008 to 2011. Despite using different estimation models, a strongly inverse relation of CAR with Loan to Deposit Ratio, Loan to Assets Ratio; and strongly direct relation with Leverage, ROA and Bank Size are revealed. NPL could not establish a strong influence on CAR in all estimation models. Similarly, Alajmi & Alqasem (2016) examined CAR influencers of five Kuwaiti banks from 2005 to 2013 using seven bank-specific variables. The regression analysis discovered a significant and inverse relationship of CAR with SIZE and ROA. Nevertheless, the random effect model revealed a showed a strongly positive association of CAR with Loan to Deposit Ratio (LDR). Besides these variables, all the other variables, including Dividend Payout Ratio, loan to asset (LAR), NPL, and ROE, failed to establish a significant relation with the main variable CAR. A quite broader study covering all six member states of the GCC was conducted by Shaddady & Moore (2015). Besides bank-specific and macro-economic factors, the authors also examined the effect of market contestability on eighty-nine (89) banks' CARs operating in the GCC, 1998 till 2013. The overall outcome of the study indicated a strong correlation between CAR of

the banks and market contestability factors whereby capital ratios increased with market activity restrictions, limitation on foreign bank and entry requirement in a positive direction, and financial conglomerates in negative direction. In terms of bank-specific factors, liquidity and profitability ratios are determined to have a significant impact of GCC banking sectors before the crisis whereas deposit ratios of these banks proved to be a significant determinant of CAR on post-crisis level. Bank size, leverage, loan loss provisions, RWAs, current ratios, GDP, inflation, interest rate, money supply, and oil prices are disclosed to strongly impact CARs of GCC banks.

3.3. Research Methodology

Research methodology is the general approach researchers apply to perform a research project (Williams, 2007, p. 66). It refers to the specific procedures implemented by researchers in identifying, selecting, processing, and analyzing the research information. According to Leedy & Ormrod (2006, p. 6), research methodology is the underlying and unifying element of any research projects as it directs the entire research endeavor. Depending on the research problem type, researchers choose qualitative research methodology or quantitative research methodology. As remarked by Singh & Chhabra (2001, p. 4) qualitative and quantitative are similar, however, quantitative methods are predominantly respected in many social sciences and the general academia's tendency to consider science as related to numerical figures and precision seems to reflect on the preference for quantitative research methodology. Simion (2016, p. 7) referred to qualitative research as a research method that focuses on the feelings of people, their perceptions and experiences for the purpose of exploring and understanding an individual or a groups' view about a social issue. From a more general view point, qualitative research refers to any type of research that relies mainly on non-numerical data (Golafshani, 2003, p. 600; Jackson, Drummond, & Camara, 2007, p. 13). Qualitative research, however, has some inherent drawbacks. According to Golafshani (2003, p. 601), qualitative research lacks reliability due to the fact that reliability is concerned with quantitative measurement, which is irrelevant in a qualitative form of research.

Unlike qualitative research methods, qualitative research methods apply numerical data to conduct a research. According to Astalin (2013, p. 119), quantitative research attempts to apply objective methods of data collection, which involves removing the researcher

from the research in order to furnish information about relations, comparisons, and predictions. The separation of the researcher from the research contributes highly into the objectivity aspect of quantitative research methodology. In addition to that, results generated through quantitative research methods often provides the possibility to be replicated, analyzed and compared with similar prior studies whereby such feasibility is not possible under qualitative studies. Mohammed (2018, p. 78) argued that in contrast to the results of qualitative research which are exclusive to specific population only, the results of quantitative research can be generalized on the larger population from which the researcher drew the study sample. Quantitative research generally follows the deductive approach whereby the researcher sets about with a theory and attempts to examine it (Chesebro & Borisoff, 2007, p. 10). Under the deductive approach, categorical system suggested by a theoretical outlook and documents are employed by the researcher to serve as tools to measure the hypothesis of the study (Berg, 2001, p. 245).

Since this study aims to analyze CAR determinants of the GCC Islamic banks and is mainly numerical, a quantitative research will be applied.

3.3.1. Research Design

A guideline for researchers for the identification of the most suitable approach of collecting and analyzing data in a systematic and organized format is called a research design. İt is the overall plan, which specifies what methods and techniques needs to be implemented to collect and analyze the information required (Akhtar, 2016, p. 68). As stated by Driessnack et al. (2007, p. 503), quantitative research designs are mainly classified into experimental designs and non-experimental designs. Experimental design involves random assignment of variables, manipulation of independent variables and the application of severe controls whereas non-experimental design is strictly observational and involves no manipulation of research variables or any intervention. Non-experimental designs are further divided into descriptive and correlational designs. Descriptive designs refers to describing a phenomenon in the way it exists, determining frequency of occurrences, and categorizing related information. Correlational research designs is a systematic examination on the nature of relationship between variables and its generalization. The primary objective of a correlational study dwells in its determination of association between variables, and the determination of a regression equation

employable to produce predictions to a population in the events where association between variables exits (Simon & Goes, 2013, p. 258). İn line with the study objectives, both descriptive and correlational studies will be applied to showcase the performance of the banks and the economy, and to analyze the degree and direction of association between the variables of the study.

3.4. Operational Definitions

3.4.1. Outcome (Dependent) Variable

A dependent variable or an outcome variable is any variable that goes under investigation in a scientific experiment and whose variance is the outcome of an altered independent variable. Thus, a dependent variable is simply dependent from other variables, i.e. independent variable(s).

1. **Capital Adequacy Ratio (CAR)**

CAR is a measurement for bank solvency and stability where higher ratio implies more solvency and stability. As a regulatory measure, a minimum 8% CAR is enforced. However, majority of state banks impose a minimum CAR higher than the BCBS or IFSB requirement of 8 percent.

$$Capital\ Adequacy\ Ratio\ (CAR) = \frac{Tier\ 1\ Capital + Tier\ 2\ Capital}{Total\ Risk\ Weighted\ Assets}$$

3.4.2. Explanatory (Independent) Variables:

Variables that cause variations in dependent variabels and are not influenced by researcher manipulations. During an investigation, researchers usually choose certain variables they believe will have an influence on the dependent variables. The following bank-level and macroeconomic-level variables are employed following previous works of in the literature.

1. **Return on Asset (ROA)**
   ROA demonstrates how much profit is generated from a dollar invested in business assets. Equally important is the potentiality of ROA to reflect management's capability to generate profit while employing the financial and real resources of the business (Bashir, 2003, p. 39). Higher ROA means more profit. Furthermore,

companies with higher ROA reap the benefits of attractiveness to investors, as investors prefer greater return generating companies. ROA formula is given below. Net income after-tax is the net operating income of an entity deducted for impairments, provisions, other expenses and income tax. In terms of Islamic banks, few Islamic jurisdictions require Islamic banks to include zakat expenses as a deductible from their net income. However, such practice is rare since most of Islamic banks impose Zakat payables on financial statement items other than the annual net earnings of the bank, i.e. statutory reserve, retained earnings, general reserve, and shareholder equity, as demonstrated by Ismail, Tohirin, & Ahmad (2013, p. 11). Total assets refers to all economic resources under the control of an IFI that is financed either by the owners of the institution or by its investment accountholders or by both, providing them with present or future benefits (AAOIFI, 2010, p. 15).

The formula for ROA used in this study is provided by Paudel & Khana (2015, p. 7).

$$Return\ on\ Assets\ (ROA) = \frac{Net\ Income\ after\ tax}{Total\ Assets}$$

2. **Return on Equity (ROE)**

This ratio measures earnings or profit generated from shareholders' equity. As a profitability measure, ROE specifically gives a picture on how effectively shareholders' funds are utilized by the management of a bank (Sufian, 2008, p. 95). According to Javaid & Alalawi (2018, p. 41), ROE, with higher accuracy, demonstrates a bank's profitability and growth potential. ROE. Furthermore, ROE is utilized as a measurement for a company's ability to use its own capital in order to generate profit for both common stockholders and preferred stockholders (Saragih, 2018, p. 351). Unlike ROA which gives a broader view of profitability, ROE provides investors with a narrower glimpse on the profit generating capacity of their investments or equity. As per Daniëls & Kamalodin (2016, p. 34), from an international perspective, a double-digit ROE target between 10% to 12% is believed to be a necessity for long term progress. However, certain banks believe that a single-digit ROE – a digit below 10% - is enough to compensate bank shareholders. Generally speaking, the higher the ROE, the more profitable the business becomes.

ROE is arrived by fractioning net income for the year ended to the shareholders' equity or total equity. Net income is the after-tax net profit deducted for zakat expenses - only under some Islamic jurisdictions. According to the definition of the AAOIFI (2010, p. 16), shareholders' equity of an IIFS refers to the resources (assets) left after subtracting all creditor and PSIA holder claims.

ROE ratio utilized in the work of Paudel & Khanal (2015, p. 7) is used.

$$Return\ on\ Equity\ (ROE) = \frac{Net\ Income\ after\ tax}{Total\ Equity}$$

3. Operating Efficiency (OEOI)

OEOI is the division of expense to income, which shows whether or not a bank is managing their operational costs efficiently and its impact on the banks profitability (Khan, Chaudhry, Asad, Khan, & Naqvi, 2013, p. 661). It measures input against output of a bank, and a higher OEOI indicates that expenditures are increasing, which is causing reduced income (Lotto, 2018, p. 7). Sarker (2005, p. 11) states that a highly increased expenses in proportion to income signals operating inefficiency experienced as a resultant of management weaknesses. Thus, bank management should strive to lower their expenditure to profit ratio to be efficient. Pancheva (2013, p. 82) argued that, alongside bank size represented by its assets, the level of operating costs which is a proxy for operating efficiency are the factual indicators for a good institutional management, and that both the factors have an influence on the overall efficiency. This study uses the ratio of operating expenses to operating income of Abusharba et al. (2013, p. 163) and (Lotto, 2018, p. 6). OEOI formula is given below. All expenditures for the normal operations of the banks except provisions for impairment and income taxes are operation expense. Profits generated from all the normal activities of a bank is called operating income.

$$Operating\ Efficiency\ (OEOI) = \frac{Operating\ Expense}{Operating\ Income}$$

4. Liquidity (FDR)

Liquidity refers to the capability of banking institutions to meet their financial commitments when they are due. It states the availability of sufficient liquid assets for the institution to meet their short-term obligations on time. Liquidity is an indicant of a financial firm's propensity to continuously balance between their financial inflow and outflow. The ratio given below that is applied by Abusharba et al. (2013, p. 164) and Ibrahim et al. (2019, p. 3) and in KPMG report (2019, p. 4) will be used despite the number of liquidity metrics available. According to the KPMG's report, customer deposits include unrestricted investment accounts or otherwise called Equity of Investment Accountholders as presented in some of the banks' reports. Unrestricted investment accounts is a Mudarabah contract that gives banks full control over its use and is similar to fixed deposit accounts of conventional banks (KLM Group, 2019, para. 5). FDR shows the proportion of financing made by banks using customer deposits. A bank's total financing include receivables and all finances offered to customer using instruments like Murabaha, Mudaraba, Musharaka, Ijarah etc. Total deposits under Islamic banking practices comprise usual customer deposits and equity of investment accountholders. A lower FDR ratio indicates poorly exploited depositor funds leading to idle money and lower profits while extremely high FDR close to 100% signifies that banks will have inadequate amount of funds for expected and unexpected emergencies. Hence, an ideal FDR is said be around 80% or 90%.

$$Liquidity\ (FDR) = \frac{Total\ Financing}{Total\ Deposits}$$

5. **Bank Size (SIZE)**

Bank size is the all the economic resources or assets of a bank combined. Size is vital to determine stability as larger banks are perceived to be safer than smaller ones in terms of risk absorption. Due to its association with bank ownership attributes and equity market accessibility reflecting on the significance of avoiding bankruptcy and managerial risks, bank size is regarded to be an important element (Asma & Khadidja, 2015, p. 57). As claimed by Saddiq (2017, p. 54), a number of various are used to represent bank size. Yet, one viewed to be comparatively broad representative and unwavering than the others is the log total assets. A significant number of researchers (Akbas, 2012; Haan & Poghosyan, 2011; Laeven, Ratnovski, & Tong, 2016) have

used this metric. Thus, log total assets, where the assets are converted to US currency for comparability, will be applied to represent our independent variable of bank size (SIZE). Since the financial reports are prepared in local currency basis, the values of each bank's total assets are converted to US dollars using year-end exchange rates prevailing in each financial year in order to achieve comparable bank sizes.

$$Bank \; SIze \; (SIZE) = Log(Total \; Assets)$$

6. **Asset Quality (NPF)**

The quality of a bank's assets signifies risks inherent in bank assets and the overall financial health of a bank. Asset quality pertains to default risks exposed to individual assets, and banks use this term to decide on the number of assets exposed to financial risk and the amount of allowance required to offset potential losses (Hewaidy & Alyousef, 2018, p. 11). In the Islamic banking sphere, non-performing financing (NPF) - synonym to NPL - is used to reflect on the losses resulting from credit risks. Thus, for Islamic banks, NPF is the division of non-performing financing to total financing (Nugraha & Setiawan, 2018, p. 30). NPF consist of loans granted to borrowers who is incapable of fulfilling the requirements of the loan contract entered into because of several causes, which need to be reviewed and revised (Raniah, Khairunnisa, & Triyanto, 2016, p. 87). As stated by Indriastuti & M. Ifada (2019, p. 152), a below 5% NPF is satisfactory. Therefore, banks should try to keep their NPF ratio under this threshold to display efficient asset quality management. In this study, the NPF ratio employed by Sutrisno (2018, p. 86) and Raharjo et al.(2014, p. 404) is used as a measurement for asset quality of banks.

$$Asset \; Quality \; (NPF) = \frac{Non - Performing \; FInancing}{Total \; Financing}$$

7. **Economic Growth (GDP)**

Economic growth, commonly denoted with GDP, refers to a country's expansionary economy within a certain time dimension, usually a year. As stated by (Ye Ekström & Kanaporyte (2015, p. 29), GDP growth often results in higher profitable activities

and further investment opportunities for firms creating an increased demand for financing by firms. On the contrary, during economic recessions where GDP slows down, it is predicted that credit quality will decline, leading to increased default incidents and reduction in profits (Wasiuzzaman, 2018, p. 59). In the remarks of Akbas (2012, p. 104) , GDP bears unignorably a vital influence on a plethora of dynamics that directly interferes with demand and supply of funds of an economy. Similar to the economic metrics used in prior studies (Mili, Sahut, Trimeche, & Teulon, 2014, p. 14; Shaddady & Moore, 2015, p. 7), this study uses annual GPD growth rate as metric for economic growth in the subject area of this research.

$$Economic\ Growth\ (GDP) = Annual\ GDP\ Growth\ Rate$$

8. **Inflation (INF)**

A general increment in the prices of goods and services of an economy over time due to devaluation of the currency is called inflation. Haberler (1960, p. 3) defined inflation as the expansion of monetary circulation in the economy, more explicitly, the quantitative increase of money relative to the velocity of circulation. Henceforth, it is the abundance of money supply in the economy leading to a devaluation and general price hike. From an economic perspective, inflation bears the risk of affecting many factors which can translate into economic problems whereby a particular state can experience a decline (Rabiul, 2017, p. 358). According to Gursida (2018, p. 23), a surge in inflation rate represents an adverse indicator for investor decisions; a decreased consumer purchasing power for customers; and a drop in profitability rate for businesses when the increase of input cost is greater than the increase in price. Consumer price index (CPI) is widely used as inflation metric, where the percentage change of CPI over the previous year gives the current inflation rate. A number of researchers (Alper & Anbar, 2011, p. 145; Kakilli Acaravci & Ertuğrul Çalım, 2013, p. 32; Masood & Ashraf, 2012, p. 260) have used CPI as an indicator for annual inflation rate in their studies which serves our study as well.

$$Inflation\ (INF) = Annual\ CPI\ Rate$$

3.5. Hypotheses Development

As evident in the last section of chapter two (2) and in the literature review of this chapter, numerous authors and researchers have studied CAR determinants of banks. On that note, the hypothesis given below are developed adherent to the research questions provided in the introduction section respectively.

Null Hypothesis H_0: $\beta = 0$ (Nonexistence of impact between variables).

Alternative Hypothesis H_1: $\beta \neq 0$ (Existence of impact between variables).

Henceforth, the first hypothesis is:

H_0: The impact of ROA on the CARs of the GCC Islamic banks is insignificant

H_1: The impact of ROA on the CARs of the GCC Islamic banks is significant.

The second hypothesis is:

H_0: The impact of ROE on the CARs of the GCC Islamic banks is insignificant.

H_1: The impact of ROE on the CARs of the GCC Islamic banks is significant.

The third hypothesis is:

H_0: The impact of OEOI on the CARs of the GCC Islamic banks is insignificant.

H_1: The impact of OEOI on the CARs of the GCC Islamic banks is significant.

The fourth hypothesis is:

H_0: The impact of FDR on the CARs of the GCC Islamic banks is insignificant.

H_1: The impact of FDR on the CARs of the GCC Islamic banks is significant.

The fifth hypothesis is:

H_0: The impact of SIZE on the CARs of the GCC Islamic banks is insignificant.

H_1: The impact of SIZE on the CARs of the GCC Islamic banks is significant.

The sixth hypothesis is:

H_0: The impact of NPF on the CARs of the GCC Islamic banks is insignificant.

H_1: The impact of NPF on the CARs of the GCC Islamic banks is significant.

The seventh hypothesis is:

H_0: The impact of GDP on the CARs of the GCC Islamic banks is insignificant.

H_1: The impact of GDP on the CARs of the GCC Islamic banks is significant.

The eighth hypothesis is:

H_0: The impact of INF on the CARs of the GCC Islamic banks is insignificant.

H_1: The impact of INF on the CARs of the GCC Islamic banks is significant.

3.6. Data Collection Method

The study utilizes secondary type of data gathered from the yearly financial statements of the selected banks via their respective websites for bank-specific variables and from the international database like WorldBank for macro-economic variables covering the periods of 2013-2019. For analytical purposes, this study will utilize STATA software package given its preference among econometrists and professionals, and its robustness in handling and manipulating larger data sets of both panel and time-series format (Lembcke, 2010, p. 5).

3.7. Study Population

Domestic commercial banks operating in GCC are 79 in total of which the full-fledged Islamic banks are 28 (refer to appendices). Therefore, the study target population is the 28 banks offering Islamic banking services in the GCC, making it a census study that covers the entire targeted banks similar to the work of Surow (2014, p. 28). Žmuk, Lutilsky, & Dragija (2016, p. 21) argue that as the number of target population (in our case, banks) gets smaller, taking a sample size from it will make it even smaller, consequently affecting the finding of the survey and the sampling method to be applied. Regardless of whether a sample survey or a census is conducted, the sampling frame which usually relates to the listing of population units or the structure from which samples are taken is a central part of the research methodology (House, 2010, p. 63). Thus, representativeness of the selected units on the population should remain the utmost

concern for researchers. Censuses often proved to be better than sample surveys with regards to obtaining superior coverage as they are more inclusive in the reach of the population (Kish, 2006, p. 101). In the table below, banks considered for this study is given:

3.8. Research Model Specification

This study uses multiple linear regression model applied by Mohammed (2018, p. 111) in his study but with minor modifications on the specification to present how the main variable and the explanatory variables are related. A statistical model that measure potential cause and effect relation of several independent variables on a dependent variable is refered to as multiple linear regression. Abusharba, Triyuwono, Ismail, & Rahman (2013, p. 164) argued the significance of regression model to their study as it can explain the inter-relationship between the studies variables. Thus, the general research model specification is:

$$CAR_{bit} = \alpha + \beta_1 ROA_{bit} + \beta_2 ROE_{bit} + \beta_3 OEOI_{bit} + \beta_4 FDR_{bit} + \beta_5 SIZE_{bit} + \beta_6 NPF_{bit} + \beta_7 GDP_{bit} + \beta_8 INF_{bit} + \varepsilon_{bit}$$

Where:

CAR$_{bit}$: Capital adequacy ratio of bank i in country b at time t

ROA$_{bit}$: Return on assets of bank i in country b at time t,

ROE$_{bit}$: Return on equity of bank i in country b at time t,

OEOI$_{bit}$: Operating expenses to operating income of bank i in country b at time t,

FDR$_{bit}$: Financing to deposit ratio of bank i in country b at time t,

SIZE$_{bit}$: Log total assets of bank i in country b at time t,

NPF$_{bit}$: Non-performing financing of bank i in country b at time t,

GDP$_{bit}$: Growth domestic product of country b at time t, effecting bank I,

INF$_{bit}$: Inflation rate of country b at time t, effecting bank I,

α : The intercept or constant of the equation,

i : The 28 banks analyzed,

t : The study time span (2013 - 2018),

b : The six member countries of the GCC,

ε : The error term or residual term reflecting all other factors affecting our

dependent variable besides the independent variables.

3.9. Data Analysis Technique

In the coming sections, our research follows a more logical pattern where diagnostic tests to check whether our data violated the assumption of linear regression like normality, multi-collinearity, and heteroscedasticity which all have a meaning influence on the robustness of our analysis will be carried out. In the next step, descriptive analysis of the gathered data is presented first to provide a description of the overall performance of the variables selected for this research. Lastly, analysis of correlation and regression are performed. To perform the stated statistical procedures, the widely used statistical package of STATA is employed to run and explain the outcomes of the analysis. STATA is a highly integrated statistical analysis package made for professions in the field of research making it a widely preferred statistical package among lots of people for applied econometric works (Lembcke, 2010, p. 5).

3.10. Diagnostic Tests

Before running any analysis, diagnostic tests are performed to confirm that some underlying assumptions are adhered to and the model is accurate. In case the output of our test indicates a violation of the assumptions, an in-depth investigation of the faults and corrective measures will be taken. Violation of regression assumptions can lead to inaccurate and unreliable conclusions, hence a researcher must view them seriously (Ghasemi & Zahediasl, 2012, p. 486).

3.10.1. Test for Normality

This test determines if the data fulfills the normality assumption or not. This assumption says that the sampling distribution of the means across different samples is normal.

However, the importance of this assumption is a matter of disagreement among scholars. While some authors (Ghasemi & Zahediasl, 2012, p. 486) support the necessity of this assumption, others (Habeck, Cristian & Brickman, Adam, 2014, p. 8; Lumley, Diehr, Emerson, & Chen, 2002, p. 152) claim it to be merely a preference not a requirement. Technically speaking, the normality assumption pertains to the normal distribution of the residual or errors terms rather than the variables themselves. Difference between the predicted value and the observed value of a dependent variable is called residual. To test the normal distribution of the residual, Jarque-Bera (JB) and kernel Density Estimate (Kdensity) plot as a numerical and graphical methods are employed respectively. JB is compares the skewness and kurtosis of sample data to measure the level of departure from normality with null hypothesis indicating a normal distribution. Kdensity plot is an improved type of histogram that is used to test normality using a probability density function to measure the smooth distribution of a continuous variable.

Table 10: Jarque-Bera (JB) Normality Test

Mean	1.85e-11
Std.	.0484293
Min	-.1276311
Max	.2069556
Variance	.0023454
Skewness	.8193262
Kurtosis	5.6572
Jarque-Bera	68.22

Source: Author's Computation

94
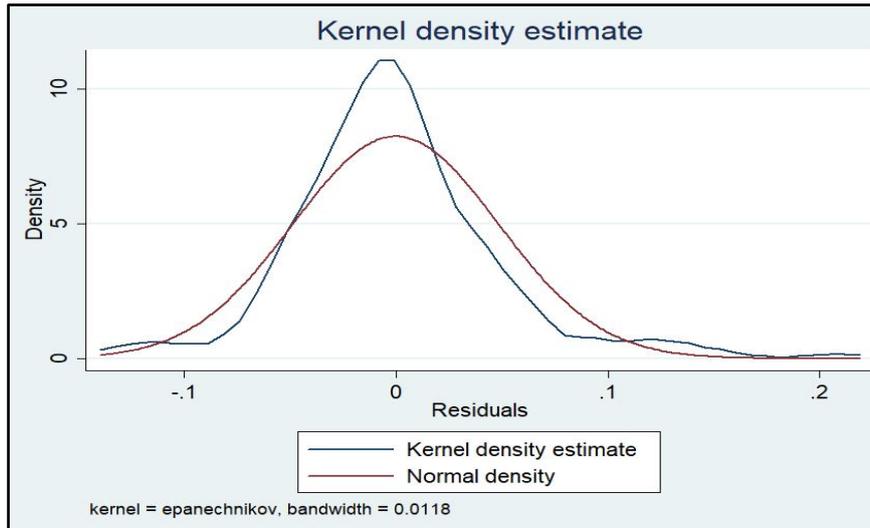
Figure 3: KDensity Graphic Normality Test

Source: Author Computation

As visible from the table and figure, the outcome is not in consistent with the normality assumption since the value of skewness, kurtosis, and JB of the residual all deviate from the required zero skewness, a kurtosis of three, and a JB of zero as outlined by Gujarati (2004, p. 148). In addition to that, Jarque-Bera has a significance value below 0.05 further affirming rejection of null hypothesis of normality. A graphical visualization is another way examining normality assumption. As depicted in the Kdensity plot, our residual is asymmetrical pushing its edges beyond the normal density line. For a normally distributed error terms, both lines in the Kdensity plot fall upon each other showing a smooth curve of data points. Having investigated the cause for such phenomenon, it is found that the data suffers from extreme observation or outlier (Refer to appendices). In such incidents, some researchers follow methods like winsorization or transformation while others prefer trimming the outlying data points. Nonetheless, these sort of manipulations have a high tendency of biasing the results as stressed by (Schmidt & Finan, 2018, p. 3). In this study, the outliers are kept as it is to avoid manipulating with our end results as done by Ye Ekström & Kanaporyte (2015, p. 39). In spite of non normal distributions of residuals, regression analysis remains resiliant and robust and conclusions drawn from the analysis hold valid (Yang, 2012, p. 33). On the other, our sample size (number of observation) is large enough to discard normality assumption as mentioned by some authors (Ghasemi & Zahediasl, 2012, p. 486; Gujarati, 2004, p. 110). Overall, our data set is expected to

generate a valid and meaningful outcome regardless of the non-normal nature of the data set.

3.10.2. Test for Multicollinearity

Multicollinearity pertains to situations where there is a linear relationships among the predictors of the model. This test examines the existence of such inter-collinearity or multi-collinearity assumption. Only variables lacking any one-dimensional functions of one or several variables should in a model include to claim multi-collinearity-free model (2004, p. 205). However, such precautions are almost impractical to undertake. Generally, multi-collinearity occurs when many explanatory variables are added into a model. Multicollinearity should be taken seriously, as the existence of collinear variables can affect the estimation of the model and the subsequent interpretation as well. Wang stated that multicollinearity have the tendency to cause major prediction errors and complicate the possibility to evaluate the relative significance of each predictor (1996, p. 23). In a multiple regression analysis, the influence of a single explanatory variable on the outcome variable is interpreted while holding all other variables constant. Thus, no correlation among variables is crucial. Multicollinearity is widely tested with Variance Inflation Factor (VIF) with a number above 10 shows colinearity issue in a model. Below is the table of multicollinearity test:

Table 11: VIF Multicollinearity Test

Variables	**VIF**
ROA	11.93
ROE	5.27
OEOI	5.91
FDR	1.67
SIZE	1.38
NPF	1.10
GDP	1.10
INF	1.20

Source: Author Computation

As shown in the above table, one variable has a VIF value greater than the minimum 10, thus indicating a multicollinearity problem. The higher inflation factor of ROA is reasonably justifiable with the example of the height provided above, since there is another profitability ratio in out model which is ROE. Following the work of Abdul Karim et al., this thesis drops ROA from the variable list and check if the problem fixed. After omitting ROA, the issue of multicollinearity is no longer experienced and all other variables showed VIF values of less than 10. Thus, this thesis proceeds with seven explanatory variables rather than the initial eight.

3.10.3. Test for Heteroscedasticity

When variances of the residuals are creation of the predictors in the model then heteroscedasticity exists even though the classical assumption is equal variance (homoscedasticity) across the observations. The presence of heteroscedasticity leads to a smaller p-value production. Despite not distorting the estimates of Ordinary Least Square (OLS), heteroscedasticity renders the usual tests of significance unfitting and can lead to wrong conclusions (Agunbiade & Adeboye, 2012, p. 19). Hence, researchers should attentively take it into account. Notably some methods are developed to treat heteroscedastic data-set. Breusch-Pagan (BP) test and Residual-versus-Fitted (RVF) graph are normally used to do this tests. For the BP test, a null hypothesis greater than 0.05 represents homoscedasticity which is required. Whereas, an evenly spread of data points below and above the fitted line indicates absence of heteroscedasticity.

Table 12: Breasch-Pagan (BP) Test

Ho	Constant Variance
Variables	Fitted Values of CAR
Chi2(1)	1.54
Prob > chi2	0.2152

Source: Author Computation
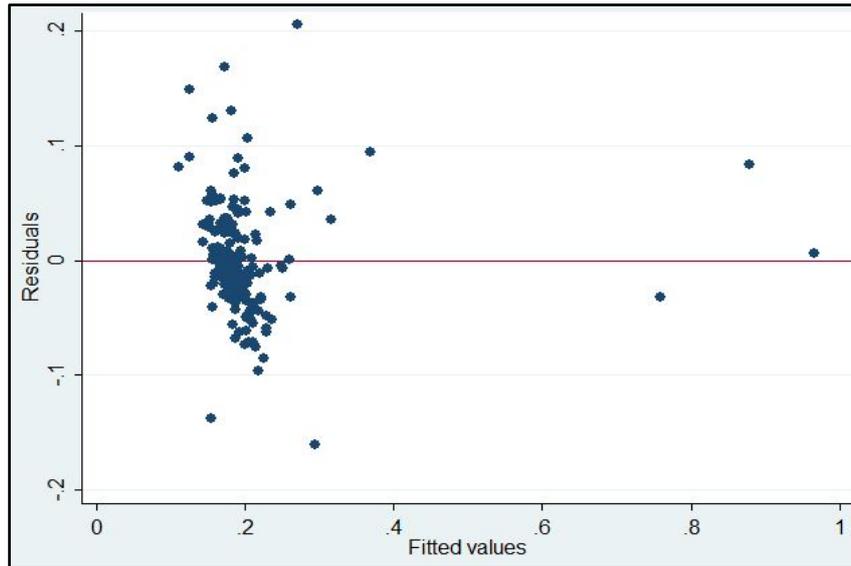
Figure 4: Residual-Versus-Fitted (RVF) Plot

Looking at the BP test, we can observe significance (Prob > chi2) of 0.2152 greater than 0.05, which indicated homoscedastic data. The RVF plot examines our data by measuring the residual against the predictors and displays a residual variance spreading almost equally below and above the zero line which signifies the homoscedasticity of our data set. Hence, our model is free from any heteroscedasticity problem.

3.11. Descriptive Statistics

Table provided below presents the descriptive statistics of the variables of our study including the mean, minimum, maximum, and standard deviation of each variable. Such results demonstrate the general performance of the Islamic banks in the GCC during the sample period.

Table 13: Descriptive Statistics

Variables	# of Obs.	Mean	Standard Deviation (SD)	Min	Max
CAR	168	0.2029	0.1084	0.0173	0.9707
ROE	168	0.0819	0.0684	-0.2038	0.2121
OEOI	168	0.5948	0.6822	0.0319	5.8999

FDR	168	0.9573	0.3941	0.0159	4.5584
SIZE	168	7.1829	0.6682	6.0008	9.3557
NPF	168	0.0479	0.0772	0.0000	0.8300
GDP	168	0.0265	0.0191	-0.0287	0.0542
INF	168	0.0223	0.0104	-0.0024	0.0407

Source: Author Computation

As visible in the table above, each variable has a 168 total observations sufficient to run our analysis. CAR of the banks 0.2029 and 0.1084 mean and SD respectively with a mininimum 0.0173 and maximum 0.9707. Generally, a 20.29% CAR mean indicates that on the average the banks relatively kept operated above the 8 percent minimum requirement. However, a 10.84 % SD signifies that these banks differ. The minimum and maximum values also reveals the difference considering the significant difference of CAR between the least and the most capitalized banks.

The mean and SD of ROE are 8.19% and 6.84% respectively, which means slightly lower profit generated from shareholder capital and slight variance among the banks. A negative 20.38% minimum and 21.2% maximum ROE respectively means show a huge gap between the least profitable and most profitable. The mean 59.48% of OEOI shows that on the banks on average maintained slightly poor expenditure management. Yet, variance across the banks were high considering the 68.22% SD which is substantial. Moreover, a 3.18% minimum and 589.9% maximum emphasized such variance implying that the most efficient bank spent only three cents on each dollar of operating income while the least efficient incurred more than five dollars to generate a one dollar profit.

A mean 95.73% FDR and a 39.41% SD demonstrates a large and differing liquidity positions of these banks respectively. Likewise, banks with 1.5% minimum and 455.8% maximum values illustrate how the former under-invested their deposits whereas the later used investments beyond their deposits. The average size of the examined banks denoted by SIZE was 7.1829 (a magnitude corresponding to around $95 Millions) indicating the sizable volume of these banks. Nonetheless, the 0.668 SD, and a range between 6.000757 and 9.355704 (corresponding to nearly $2 Million and $3 Billion respectively) all signify

the varying sizes of the banks throughout the study period. The mean of NPF was 4.79% showing favorable maintenance of asset quality. Also the 7.72% SD shows low variance beyond the mean. A minimum 0 and maximum 0.83 points out that the banks managed very well to realize their investments.

With regards to economic growth of the region, a 2.65% GDP means healthier economy. This favorable growth seems to be quiet consistent looking at the variance of 1.91% which is smaller. However, its undeniable that the region suffered economic decline of negative 2.866% in the worst case even though its maximum growth rate of 5.42% is greater that the drop. INF, another macro-economic indicator, showed similar trend to GDP where the average is 2.23% and SD is 1.04%, which means quite low and similar inflationary situation in the bloc. Despite reaching a maximum 4.07%, a deflation reaching minimum -0.024 during the sample period as well.

3.12. Correlation Analysis

This analysis measures the directional relationship between the main and explanatory variables, the prime objective of which is to measure how strong and in what direction the relation is. The Spearman's rank correlation analysis is utilized since our data does not fulfil the normality assumption. As per M Mukaka, Spearman's rank correlation is required for data that is not normally distributed with possible outlier values (2012, p. 71). Spearman's rank correlation has a range between positive one (+1) and negative one (-1) called the correlation coefficient where a coefficient of positive one is an indication of perfect proportional association between two variables while a negative one shows a perfect inverse correlation. A zero correlation coefficient means there is no correlation between the variable at all. Table 19 below is the Spearman's Rank correlation analysis:

Table 14: Spearman's Rank Correlation

Variables	CAR	ROE	OEOI	FDR	SIZE	NPF	GDP	INF
CAR	1							
ROE	-0.2174*	1						
OEOI	-0.0297	-0.4345*	1					
FDR	0.1537*	-0.2768*	-0.0362	1				
SIZE	-0.0524	0.3283*	0.0934	0.0198	1			

NPF	-0.3376*	-0.1	0.0121	-0.2755*	-0.3943*	1		
GDP	-0.0908	-0.0895	0.0693	-0.1162	-0.1213	0.1363	1	
INF	-0.1187	0.1498	-0.0696	-0.2021*	-0.1802*	0.0419	0.1454	1

Note: (*) denotes significance at 0.05 level.

Source: Author Computation

As shown in the table above, except FDR with positive 0.1537, the variables show a negative association with CAR. This implies that banks with higher CAR experience decreasing profitability (-0.2174) operating efficiency (-0.0297), and asset quality (-0.3376). Also, banks are found to reduce their regulatory capital as they grow bigger at -0.0524. On the other hand, during economic volatility (GDP and INF at -0.0908 and -0.1187) banks increase their CAR to observe financial precautions. In terms of significance, ROE, FDR, and NPF showcase strong correlation with CAR, whereas the association of CAR with OEOI, SIZE, GDP, and INF all insignificant. It is worth noting that the three significant variables have the highest correlation coefficients close to absolute value of one. One interesting indication from the table is that economic growth (GDP) have no considerable relation with any of the variables.

3.13. Selection of Most-Suited Regression Model

Before conducting any regression analysis, a researcher must check which analytical model appropriate for a panel data set. Basically there are three analytical models: Pooled regression model (PRM), fixed effects model (FEM), and random effects model (REM). The PRM is a regression model that pools or stacks all the observations from the units of a study and ignores time and space differences across the units. This model simply assumes that all the units have similar features and each individual unit's features does not change over time. Hence, pooled model have constant intercept and slope coefficients. Unlike PRM, FEM is based on the assumption that the units differ from one another but each individual unit remains unchanged over different times. Under FEM, slope coefficients across units are fixed but the intercept changes across the units, even though intercept within each unit is constant, i.e. time-invariant. On the other hand, REM assumes variance across units and also within each unit as time changes. This model takes

into account both characteristic and time differences. Both the slope coefficients and intercepts across the units vary or are random. Under the REM, the observed predictors are assumed to be uncorrelated with the unobserved time-invariant effects in the model while in under the FEM the opposite is pressumed (Bell, Fairbrother, & Jones, 2019, p. 1061).

3.13.1. Pooled or Fixed Effects Model

A common practice in selecting regression models is to compare PRM with FEM since these models have some similarities; both models ignore time effect within units or have constant slope coefficients. The idea is to find the more suitable model and test it with the REM. Basically, the R-sq and F-tests of both PRM and FEM are compared. If the R-sq of FEM is greater than that of PRM and F-test of FEM is significant then we can say FEM is more suitable. From table 15, we can see that the R-sq of FEM is 0.8508 and R-sq of PRM is 0.7902. Also the F-test of FEM is significant at 0.0000 (<0.01) level. Even if these values show that PRM is more suitable than the FEM, researchers should use logic and consider the type of effect they expect from their data. Since the units (i.e. Banks) of this study are based in different countries and went through different times, neglecting these effects and viewing them like a single unit is simply absurd. This same logic invalidates the idea of comparing the PRM with REM as it does not make sense According to Gujarati (2004, p. 641), the pooling model distorts the real relationship between the dependent and independent variables as it does not account for the nature of each unit.

Table 15: Pooled Model and Fixed Effects Model

	POOLED MODEL (PRM)			**FIXED EFFECTS MODEL (FEM)**		
Independent Variables	**Coefficients (Beta)**	**Significance (P-values)**	**T-values**	**Coefficients (Beta)**	**Significance (P-values)**	**T-values**
ROE	0.147559	0.033*	2.15	-0.05134	0.516	-0.65
OEOI	0.111963	0.000***	12.72	0.105323	0.000***	14.02
FDR	0.093523	0.000***	7.27	0.094985	0.000***	8.48
SIZE	-0.02449	0.000***	-3.56	-0.06345	0.005**	-2.88
NPF	-0.12433	0.021*	-2.33	-0.04736	0.276	-1.09
GDP	-0.11232	0.601	-0.52	-0.18816	0.327	-0.98

INF	-0.62201	0.134	-1.51	-0.33437	0.272	-1.1
Constant	0.233417	0.000***	4.39	0.524016	0.002**	3.24
Observations			168			168
Bank #			-			28
R-sq			0.7902			0.8508
F-test (Prob > F)			0.0000			0.0000

Note: * p<0.05, ** p<0.01, *** p<0.001

Source: Author Computation

Results from the table show that for the pooled model ROE, OEOI, SIZE, and NPF are significant but for the FEM only OEOI, FDR, and SIZE are significant. However interpreting these outcomes is pointless now as we need to compare FEM with REM and take the most appropriate one.

3.13.2. Fixed or Random Effects Model

When checking whether the FEM or the REM is highly suitable for any panel data, the hausman test is applied. Hausman test measures whether or not the error terms are correlated with the predictors. The null hypothesis indicates that REM is suitable where alternative hypothesis indicates the suitability of FEM.

Table 16: Hausman Test

Test: Ho:	difference in coefficients not systematic
chi2(7) =	10.50
Prob>chi2 =	0.1620

Source: Author Computation

The test indicates, with a p-value of 0.1620, that REM is most suited model for our regression. The fact that the banks are established under different banking jurisdictions, which might have some influence on our dependent variable, makes the application of

REM highly reasonable. The selection of REM is justifiable as the REM takes into account the differences across and within units as well as over time.

3.13.3. Analysis of the Random Effects Regression Model

A multiple number of explanatory variables or predictors are run against an outcome variable to test the influence of the former on the latter. Collectively, regression analysis is defined as methods used to model and analyze numerical data consisting several independent variables and one dependent variable, and to test hypothesis and causal relationships (Nyoka, 2017). As shown in section 3.10, our data is tested for statistical invalidities and all the necessary corrective steps are taken to establish the validity of our data. After selecting REM as a model for our study, the regression analysis is performed and presented in the table below.

Table 17: Regression Analysis

Independent Variables (Predictors)	Estimate Coefficients (Beta)	Significance (P-values)	T-values
Profitability (ROE)	0.0056186	0.936	-0.08
Operating efficiency (OEOI)	0.1101013	0.000***	15.80
Liquidity (FDR)	0.0951569	0.000***	8.77
Bank Size (SIZE)	-0.0307016^	0.003**	-2.99
Asset Quality (NPF)	-0.0660401	0.121	-1.55
Economic Growth (GDP)	-0.099294	0.581	-0.55
Inflation rate (INF)	-0.4059449	0.181	-1.34
Constant	0.2813042	0.000	3.65
Observations			168
Bank Numbers			28
R-sq			0.8472
Prob. (Wald Chi2)			0.0000

Note: * p<0.05, ** p<0.01, *** p<0.001

^ The coefficient of SIZE is adjusted and explained in Bank Size sub-section below.

Source: Author Computation

The model is good-fitted confirmed by the R-squared (R-sq) and Prob.(wald Chi2) of 0.8472 and 0.0000 respectively. Typically a model is with the high R-sq is considered optimal (E. A. Mohammed, Naugler, & Far, 2015, p. 591). Sınce, the significance of the model (Prob.(wald Chi2)) is below 0.05, the null hypothesis of no impact of the explanatory variables on the dependent variable is rejected. As evident from the table, from the seven explanatory variables only three are significant confirmed by the below 5% p-value and above the benchmark absolute value of 1.96 t-value. Building on the arguments of Figueiredo Filho et al. (2013, p. 34) and Kim (2015, p. 12), a p-value below 0.05 reflects a very strong evidence against the null hypothesis. The regression analysis shows that OEOI and FDR positively and significantly impact CAR whereas SIZE inversely and strongly impacts CAR. But, the rest have statistically insignificant impact on banks' CARs.

3.14. Interpretation of the Results

In the preceding section, the outcome of the study was presented in a nutshell. Thus, to have a clear understanding of how each independent variable impacts the outcome variable and its importance, each variable is discussed in detail in this section. In addition to that, the findings of prior studies relative to the revelations of this study are reviewed where possible reasons and explanation of the results are covered.

Profitability (ROE)

In general sense, the anticipation is a positive profitability influence on capital level whereby an increase of the former prompts the rise of the latter to avoid risk exposures from the additional investments. As bank profitability surges, banks become more inclined to take in riskier investments taking advantage of the additional earnings. Yet, to improve the stability and solvency of the bank, management prefer holding some of the earning (Shaddady & Moore, 2015, p. 14). Despite the positive coefficient of ROE of 0.0056186, implying that CAR increases by 0.562% with a 1% increase of ROE, the influence of ROE on CAR is clearly insignificant at a t-value -0.08 and above the threshold 0.936 p-value. Such positive and insignificant relation between the two factors have also been established by Hewaidy & Alyousef (2018, p. 17). Asarkaya & Ozcan (2007, p. 107) found similar results only when ROE and risk variables are treated as endogenous and with 2 years lagging. However, there are researchers who observed

negative and strong effect of ROE on CAR of different banks (Bokhari et al., 2013, p. 7; El-Ansary & Hafez, 2015, p. 815). The proportional increase of CAR with ROE shows shareholders prudency and preferrence for stable banking performance rather than greed for higher yeilding investments. Technically Islamic banks are required to provide a fifty percent (50%) capital coverage for the investments of unrestricted profit-and-loss sharing account holders, thus as profitability rises capital ratio is raised as well (Muljawan et al., 2004, p. 15), henceforth in consistence with the buffer theory. According to the finding, the null hypothesis (H_o) that profitability have no influence on GCC Islamic banks' CARs is accepted.

Operating Efficiency (OEOI)

Operating efficiency is vital for bank stability because increased operating efficiency leads to more stability. When interpreting this ratio, cautiousness must be practiced. A rising OEOI indicates that more costs are incurred by banks to generate income from normal activities. Thus a lower OEOI ratio is preferred. OEOI has a positive coefficient of 0.1101013 and a strongly significant influence on CAR reflected by a of 0.000 and 15.80 p-value and t-value respectively. This shows that Islamic banks in the Gulf region increase their CAR by 11% for every 1% drop of operation efficiency or a single percentage increase of operating cost inefficiency. The significance of OEOI in this study is found to be in conflict with previous researcher (Abusharba et al., 2013, p. 164; Asma & Khadidja, 2015, p. 58), that found weak influence. Some traditional-banks-focused studies (Ahmad, Ariff, & Skully, 2008, p. 269; Aspal & Nazneen, 2014, p. 39) found strong OEOI effectin CARs of the banks. Higher operating expenditures usually means decline in profitability and refrainment from risky assets which in turn reduces regulatory capital because of decreased risk exposures. Yet this may not always hold true as increasing operating costs during a business cycle might be the result of aggressive banking activities and surging revenue volume, thus warranting rise in CAR to withstand the additional risks taken (Almazari, 2013, p. 291). Islamic banks in the GCC witnessed tangible growth over the past years driven by intensive demand from their Muslim majority customers who prioritise their religious values over financial gains, hence pushing Islamic banks in the region to expand their offers and meet the needs of their customers. According to World Bank's 2018 report, GCC Islamic banks showed faster

growth than conventional ones reaping the benefits of strong demand for *Sharia*-based financial products that are equilly provided in the market (2018, p. 4). This is driven by banks in start-up stages and their greed to gain their share of market. With regards to the obtained results of OEOI, the null hypothesis (H_o) stating no impact of operating efficiency on the GCC Islamic banks' CARs is rejected.

Liquidity (FDR)

FDR indicates the percentage of total deposit invested toward islamic financing vehicles. A higher FDR implies lesser deposit funds, hence prompting increased the capital ratio of a bank to protect depositors' funds. The regression analysis shows a positively significant impact of FDR on CAR with 0.0951569 beta and 0.000 p-value implying that a 1% rise in the financing activities of these banks leads to a 9.52% boost in their CAR. Other researches (Abusharba et al., 2013, p. 167; Sutrisno, 2018, p. 86; Yolanda, 2017, p. 172) concentrating on Islamic banks also found the same outcome. On the contrary, An inverse effect of FDR on Indonesian Islamic banks' CARs was found by Ibrahim et al. (2019, p. 8). However, general assumption holds that banks that aggressively provide financing or loans should maintain additional capital in comparison to less financing banks (Mursal et al., 2019, p. 3). The growth of customer deposits and relative financing carried out by the banks explains the accumulation of regulatory capital or increased CAR of the banks as reported by IFSB (2018a, p. 14) plus the low-cost funding prospects enjoyed by these banks which helped their profitability remain strong (The World Bank, 2018, p. 4). Another possible explanation could be the lack of sufficient and efficient liquidity risk easing instruments at the disposal of the banks. Throughout the global Islamic banking system and particularly in the GCC Islamc banking sector, liquidity requirements ranked as the most challenging area to be filled by these banks (CIBAFI, 2019, p. 87). Such reality is attributed to the slower implementation of LCR and NSFR measure of the Basel III in the region. Despite maturing for the past 40 years, Islamic banking industry face constant challenges and only managed to develop few liquidity instruments that can lessen the concerns of the industry and stakeholders as well. As mentioned by Sutrisno (2018, p. 86), the surge of FDR translates into increased corporate profits which in turn boosts their capital. This argument goes in line with the buffer theory to earmark part of earnings for capitalization purposes. The proportional trend of liquidity

and capital adquacy shows the applicability of agency theory in Islamic banking system as depositors demand protection for their funds since they bear the losses (Fayed & Ezzat, 2017, p. 10). Given the substantial result, this study rejects the null hypothesis (H_o) that FDR does not influence CAR of the sample banks.

Bank Size (SIZE)

Larger banks conceptually enjoy market accessability to acquire funds when it is needed, thus they hold relatively lower capital . The regression model demonstrates that SIZE negatively and significantly impacts CAR with a beta of -0.0307106 and a power of 0.003 (p-value<0.01). However, log transformation alters how a logged variable is influenced and interpreted (Pek, Wong, & Wong, 2017, p. 4). Generally, the outcome of a log transformed variable is divided by a value of hundred . Nonetheless, the SIZE coefficient becomes 0.000307106 (0.0307106/100) which when converted into percentage equals 0.0307%. Benoit (2011, p. 6) argued that directly interpreting the relation between a log-independent variable and dependent variable does not make any sense and suggested that dividing a 100 by the coefficient of the logged variables as the appropriate solution. The findings indicate that for each 1% growth of bank size the sampled banks reduce their CAR by 0.03% holding other variables constant. Our observation is in consistence with almost all similar studies (J. A. Mohammed, 2018, p. 119; Mursal et al., 2019, p. 6). The inverse association between bank size and their CAR supports the supposition that risk level of banks directly relates to their CAR and bigger banks engage in riskier undertakings (Wong et al., 2007, p. 16). Yet, due to asset diversifications of larger banking organizations, their risk exposure might diminish hence lowering their CAR (Asma & Khadidja, 2015, p. 58). Following the CIBAFI (2019, p. 17) classification, we can characterize most GCC Islamic banks as larger banks. Rising risk levels taken by larger banks should normally call for increased monitoring costs increasing agency costs. But the observed inverse linkage between the two variables seems to disregard the agency theory (Shaddady & Moore, 2015, p. 14). All in all, bank size is a significantly relevant factor in explaining risk-taking incentives of banks as mention by Srairi (2013, p. 125). Hewaidy & Alyousef (2018, p. 14) stated that the trade-off theory can explain the tendency for larger banks to reduce their CAR as they can easily acquire funds bearing less transaction costs from capital markets. According to the regression table, the the null

hypothesis (H$_o$) that the impact of SIZE on GCC Islamic banks' CARs is insignificant is rejected.

Asset Quality (NPF)

NPF reflects the quality of financing assets on the balance sheet of banks. A higher ratio of NPF incidates that larger portion of the financed assets are doubtful or impaired due to expected or realized customer defaults reducing the proft generating capacity of financing granted. Under such circumstances, banks are anticipated to have effective loan loss provissions to mitigate the risk of losses resulting due to unrecoverable financing (Ozili, 2019, p. 66). As stated by Indriastuti & M. Ifada (2019, p. 152), banks might not accomplish their objective of maximizing profit margins and face possible liquidations if NPF ratio is not lowered to a certain level. Thus a higher ratio of NPF is anticipated to have unfavorable influence of the soundness of banks. The analysis table above shows a negative but insignificant relation between NPF and CAR with a -0.0660401 beta and 0.121 p-value (p-value>0.05). This means the a 1% NPF rise marks the corresponding decline in CAR of the studied banks at 6.6%, holding other factors constant. Our results shows consistency with the study of Valipour Pasha (2015, p. 77) who found similar results claiming that better capitalized banks manage to lower their NPF ratios. But it is contrary to that of other researchers (Ahmad et al., 2008, p. 267; Yüksel & Özsarı, 2017, p. 6) who claim the an upsurge in NPF calls for the raising of capital ratios. The insignificance of NPF in this study is noticed to be reasonable since the average NPF among the banks is 4.7% which is acceptable in the banking sector as mentioned by Indriastuti & M. Ifada (2019, p. 152). The result opposes the trade-off theory where stressed banks tend to keep substaintial capital volume to offset anticipated losses from risky financing (Osborne et al., 2012, p. 3). The experienced negative and weak effect of NPF can be explained by the strong capital buffers and low NPF ratios in the region, plus Khandelwal, Miyajima, & Santos (2017, p. 34) stated that loan loss provisions enjoyed by the region's banks can entirely cover the non-performing financing on the average. With respect to the findings, this study accepts the null hypothesis (H$_o$) is accepted.

Economic Growth (GDP)

A commonly used macroeconomic determinant of capital adequacy is economic growth measured with gross domestic products (GDP). Researchers in the banking field hold two conflicting views concerning how economic expansion influences bank capitalization. One segment of the researchers argue that during economic growth banks lower their CAR expecting a decline in customer defaults and improved income generation in the economy, while another segment claim that economic growth leads to aggressive lending by the banking institutions which leads to increased capital adequacy ratios (Shaddady & Moore, 2015, p. 15). Therefore, the effect of GDP on CAR remains indefinite. The model shows insignificant and inverse GDP impact on CAR with a -0.099294 beta and a power of 0.581 (p-value>0.05) implying that a single percentage growth of the GCC economy translates to decreased CAR at around 10%. However, the effect is insignificant enough to disqualify GDP as a major determinant. The inverse relation can be related to the fact that during economic expansion companies prefer using generated cash flow rather as a means of internal cash financing over debt financing, hence supporting the theory of pecking order (Ye Ekström & Kanaporyte, 2015, p. 29) Our result contradicts the findings of Abdul Karim et al. (2014, p. 73), who found that GDP growth triggers the uprising of CAR of the overall Islamic banking institutions. However, well-capitalized banks are found to be not influenced by the changes in the economy. According to Asarkaya & Ozcan (2007, p. 105), profits made by banks during economic boom contributes to the expansion of capital ratios as part of the earnings go to their capital base. The study, therefore, accepts the null hypothesis(H_o).

Inflation (INF)

The impact of inflation on bank capital ratio is unclear since some researchers are in the opinion that inflation escalates market uncertainity forcing banks to increase their capital (Yüksel & Özsarı, 2017, p. 7), others believe that inflationary situations lifts ivestors' desire to earn more money encouragiing banks to hold less capital and meet investor demands (Shaddady & Moore, 2015, p. 15). Banks that can swiftly adjust to inflationary situations and in well-developed financial markets engage in more investments and earn higher profits in contrast to developing markets and unprepared banks. A negative and insignificant INF impact on CAR with beta of -0.4059449 and power of 0.181 (p-value>0.05) resulted the model. Even though its ineffective, this indicates that a 1%

inflationary rate rise in the GCC corresponds to around 40.5% drop in the CAR of the bloc's Islamic banks. Our result confirms the findings of Bitar, Hassan, & Hippler (2018) that inflation and economic growth lack notable effect on GCC Islamic banks' capitals. However, our findings contradicts the observations of Abdul Karim et al. (2014, p. 69), which concluded that inflation impacts member state banks except Oman. The difference between both studies could be due to the area covered, where the former study focused on the GCC only and the latter expanded its scope to include other Muslim major countries. The insignificance of inflation (INF) in our study can be explained by the overall improving and stable inflation rate enjoyed by the region between 2013 and 2017 where inflation dropped smoothly as stipulated in the GCC-STAT's Report (2018, p. 16). As per the outcomes, the study accepts the null hypothesis (H_o).

With respect to the results drawn and discussions submitted, a summary table of the hypothesis testing, direction and significance of each variable is presented below:

Table 18: Summary of Hypothesis Testing

Variables	Directional Sign	Significance Level	Hypothesis
ROE	Positive	Insignificant	Accepted (H_o)
OEOI	*Positive*	**Significant**	**Rejected (H_o)**
FDR	*Positive*	**Significant**	**Recejted (H_o)**
SIZE	*Negative*	**Significant**	**Rejected (H_o)**
NPF	Negative	Insignificant	Accepted (H_o)
GDP	Negative	Insignificant	Accepted (H_o)
INF	Negative	Insignificant	Accepted (H_o)

Source: Developed by Author

CONCLUSION

The main objective behind conducting this research was to analyze determining factors of GCC Islamic banks' CAR. The whole pure Islamic banks in the region during 2013-2018 are examined to cover all Sharia-law implementing banks where the most recent bank completed its banking cycle in 2013. To achieve the intended objective, a quantitative research method and secondary data are utilized. A descriptive statisitics, correlation and regression analysis on a panel data comprising 168 observations are carried out and varying results are found.

Results

The descriptive statistics indicated that there are substantial variances in the banks, thus showing the varying business behaviors followed the banks. Variances in terms of economic factors are quite small in the region despite the observed economic decline and positive inflationary conditions. The correlation analysis showed varying co-association levels between among the variables. The regression model showed that OEOI, FDR and SIZE strongly effect the CAR of the banks studied and can be used as predictors. However, the remaining variables - ROE, NPF, GDP and INF – lacked any significance. Thus, it can be reasoned that these banks do not consider such variables as important factors for their required capitalization policy.

The average solvency level (CAR) was 20.29% signifying strong capital footing. But the standard deviation of 10.84% showes variations among the banks in terms of solvency and stability. The correlation analysis concludes that CAR has a strong inverse correlation with NPF and ROE, but strong and positive correlation with FDR. However, the remaining have no significant correlation with CAR. The regression analysis concluded that only OEOI, FDR and SIZE have significant influence on CAR.

The banks demonstrated a mean profitability (ROE) of 8.2% with a 6.8% standard deviation. The correlation analysis showed a strong and negative correlation of ROE with CAR, but the regression analysis failed to support the correlation analysis and an insignificantly positive effect of ROE on banks' CARs is reached. The average operating efficiency (OEOI) of the banks which measures the operating costs banks incurr to generate operating income stood at 59.5% with a standarn deviation of 68.2% showing

significant varying expenditure management approaches of the banks. The correlation analysis showed insignificant negative association of OEOI with CAR whereas the regression analysis indicated significantly direct OEOI impact on CAR. The mean liquidity ratio (FDR) of the banks was 95.7% with differing liquidity positions of the banks demonstrated by the standard deviation of 39.4%. The correlation analysis indicated a positive and strong correlation between FDR and CAR. This is further approved by the regression analysis by with similar result.

The banks' average SIZE stood at absolute value of 7.183 and 66.8% SD suggesting that the banks differ in terms of size. The correlation analysis suggested that SIZE insignificantly and negative correlates with CAR. However the regression analysis proved that SIZE negatively and significantly influences CAR of the banks. The GCC Islamic banks maintained a mean asset quality (NPF) ratio of 4.78% with a 7.72% SD, indicating a satisfactory management of bank assets. Correlation outcome indicates strongly inverse co-association between NPF and CAR. Yet, the regression analysis found inversely insignificant NPF impact on CAR. The banks enjoyed 2.65% average GDP but such growth fluctuated slightly over the years indicated by a 1.91% standard deviation. According to the correlation analysis GDP has a negative but insignificant correlation with CAR, a result confirmed by the regression analysis as well. The banks also enjoyed a 2.22% mean INF with a trivial variation indicated by a 1.91% standard deviation witnessed by the studied banks in the region. The correlation analysis of the study showed that INF relates to CAR in a negative but insignificant form, a result approved by the regression analysis which found that INF insignificantly and negatively influences the CAR of the banks.

Conclusions

Having delivered the interpretation of the findings in chapter three (3) of this study, we establish the following conclusions regarding the outcome that is obtained.

Setting the most ideal and efficient rate of solvency level proxied by CAR is essential for banks and for a financial system alike in order to avoid bank-level idiosyncratic and overall systematic financial risks as well, especially when the bank is systematically important. Hence, to establish the most effective CAR, banks need to determine which

factors influence their capital ratios and to what extent and even to which direction is its effect. After performing the planned analysis, it is realized that some variables influence CAR while others do not. As provided in the regression table, operating efficiency higly and directly impacts bank capitalization since banks raise their CARs when corresponding operating expenses mounts. One reason for such behavior could be to curb financial risks faced by the banks who engage in aggressive risky investments that can increase their likelihood of instability. Liqiudity metric revealed that when the banks exhaustively utilize deposits for financing purposes proxied by increased FDR, they tend to increase their CAR so as to set aside sufficient funds to deliver their financial obligation in case of probable customer defaults resulting from failed financing activities. The regression analysis also demonstrated that the banks lower their CAR as their SIZE increases since bigger enjoy ease access of funds leading to reduced risks and lowered capital ratios unlike smaller ones.

Apart from the mentioned variables, profitability, asset quality, economic growth, and inflation lacked statistical power to influence the capital ratios (CAR) of the studied banks. This implies that Islamic banks in the GCC can allocate less consideration towards such factors when setting their capital adeqaucy ratios.

Recommendations

First, the study exposed that the operating efficiency (OEOI), which is substandard due to increased expenses incurred by the GCC Islamic banks, resulted in a parallel increase in CAR indicating the critical perilous position that inefficient management of expenditures can put a bank. Increasing bank costs reduces bank profitability or might even lead to losses if non-operating profits of the banks are not sufficient to offset bank operating overheads. Expansion of Islamic banks is the GCC bloc is huge and pushed mainly by the strive for growth by banks in the start-up stages who aggressively provide financial products in-line with Islamic principles to the ever-demanding clients. To avoid any possible risks that might arise from such intensive bank behaviors, banks raise their regulatory capital base as a preventive approach. Apparently this method is not the most effective one as it can push banks to refrain from high-yielding risky investments. Even though managing costs is private bank matter, the effect of higher costs is felt by bank customers to whom it is transferred in a way of bank service charges or in any other form

possible. Regulators monitor banks' cost management strategies as consistent cost inefficiency can derail the performance of banks. Hence, managers of the banks should exert utmost effort to curb their costs to lowest level in order to maximize their profitabiliy which can consequently lower their exposure to solvency risks and create value for their owners and customers.

Second, this study discovered that capital base of the banks is raised when financing (FDR) momentum increases. Generally, a very low financing ratio reflects a risk-averse banking behavior leading to weakened profitability and unhappy depositors, where as extreme usage of customer funds to financing streams shows insufficient liquidity to avoid unforeseen losses and aggressive risk-taking behavior. Hence, banks should maintain optimum level of financing. Specifically, banks should implement a robust financing policy that can effectively reduce shortage of liquid assets or raise liquidity risks and improve their ability to settle their debts on time or on demand. The fact that Islamic security market is under-developed is a major obstacle for acquiring liquidity instruments complaint with Sharia laws. Additionaly, implementing LCR and NSFR of Basel III proved nearly impossible for Islamic banks to acquire very liquid instruments because of lacking secondary markets and interbank and money markets. Hence, to solve liquidity deficits, state banks in the GCC States should undertake intensive attempts to formulate effectual liquid instruments that adheres to Islamic business laws.

Third, it is exposed that the larger the GCC Islamic banks' SIZE grows the lesser the regulatory capital base (CAR) required. Bigger banks reap the benefits of reputational edge against smaller ones, ease access to funds or even bail-outs from central banks in case of financial downturns given their importance for the financial system. Regulators require small-and-medium-sized banks to maintain strong solvency approaches to avoid regulatory interference or possible shutdown since they engage in highly risky endeavors to grow bigger. However, maintaining abundant capital may diminish their chance of generating efficient returns increasing oppportunity costs. On the other hand, bigger banks' reliance on government backing during immense financial losses can affect their ethical obligation toward their customers as their financial trusties. Risk-averse customers entrust their money with the bigger banks because of they beleive they are too big to fail. Bigger banks are percieved to endure smaller or medium scale shocks unlike smaller

banks. Even in the case of sizable magnitude of financial shocks, bigger banks receive support from state banks which bolsters their reliability. Generally, Islamic banks are encouraged to develop suitable strategies that can help them grow in order to emmerge competetive in the market, hence the growing merger and acquisition activities witnessed in the GCC. To encourage small-scale banks to pursue growth, relevant regulators need to introduce favorable policies for them while pursuing strong capital regulations. Such policies should also consider maintaining a balance between performance, effeciency and stability at the same time.

Despite their lack of influence on the capitalization level of the studied banks, ROE, NPF, GDP and INF should be observed carefully as all the variables of this study including the insignificant ones explain 84.72% of the variations of the outcome variable. Additionally, prior studies of similar are and target proved that economic situations of the GCC pose powerful influence on their capital ratios. The study focused on only Sharia-compliant commercial banks and excluded other financial institutions like wholesale and retail investment Islamic banks, , Islamic insurance (Takaful), Islamic windows and etc. Therefore, the researcher suggests that similar studied to be conducted in the future to consider all the Islamic banking industry of the region or extend the study time range or even employ other variables viewed as influencial.

BIBLIOGRAPHY

AAOIFI. (2010). Statement of Financial Accounting No.1 Conceptual Framework for Financial Reporting by Islamic Financial Institutions. In *Exposure Drafts*. Retrieved from https://aaoifi.com/announcement/aaoifi-officially-publishes-the-exposure-draft-of-the-revised-aaoifi-conceptual-framework-for-financial-reporting-by-islamic-financial-institutions/?lang=en

Abdul Karim, M., Hassan, M. K., Hassan, T., & Mohamad, S. (2014). Capital adequacy and lending and deposit behaviors of conventional and Islamic banks. *Pacific Basin Finance Journal*, *28*, 58–75.

Abedifar, P., Molyneux, P., Tarazi, A., Abedifar, P., Molyneux, P., Tarazi, A., & Banking, I. (2013). Risk in Islamic Banking. *Review of Finance*, *17*(6), 2035–2096.

Abosede, A. J. (2012). Pecking Order Theory of Capital Structure: Another Way to Look At It. *Journal of Business Management and Applied Economics*, *4*(5), 1–11.

Abusharba, M. T., Triyuwono, I., Ismail, M., & Rahman, A. F. (2013). Determinants of capital adequacy ratio (CAR) in Indonesian Islamic commercial banks. *Global Review of Accounting and Finance*, *4*(1), 139–170.

Acharya, V. V. (2013). Understanding Financial Crises: Theory and Evidence from the Crisis of 2007-2008. In *NYU Stern School of Business Working Paper*. Retrieved from http://pages.stern.nyu.edu/~sternfin/vacharya/public_html/pdfs/NBER Reporter - Summary of Crisis Research - V V Acharya - 3 Mar 2013.pdf%5Cnpapers2://publication/uuid/C5394FE0-0330-410B-B215-138CA3118D6D

Agbi, E. S., & Ekundayo, O. O. (2016). Banks' Profitability, Ultimate Lending Behavior, Dividend Payout Ratios, and Share Price Movement: Does Basel II Matter? *International Journal of Economics, Commerce and Management*, *4*(9), 740–768.

Aggarwal, R. K., & Yousef, T. (2000). Islamic Banks and Investment Financing. *Journal of Money, Credit and Banking*, *32*(1), 93–120.

Agunbiade, D. A., & Adeboye, N. O. (2012). Estimation of Heteroscedasticity Effects in a Classical Linear Regression Model of a Cross-Sectional Data. *Progress in Applied Mathematics*, *4*(2), 18–28.

Ahmad, R., Ariff, M., & Skully, M. J. (2008). The Determinants of Bank Capital Ratios in a Developing Economy. *Asia-Pacific Financial Markets*, *15*(3–4), 255–272.

Akbas, H. E. (2012). Determinants of Bank Profitability: An Investigation on Turkish Banking Sector. *Öneri Dergisi*, *10*(37), 103–110.

Akhtar, I. (2016). Research Design. *Research in Social Science: Interdisciplinary Perspectives*, 68–84.

Alajmi, M., & Alqasem, K. (2016). Determinants of Capital Adequacy Ratio in Kuwaiti

Banks. *Journal of Governance and Regulation*, *4*(4), 315–322.

Almazari, A. A. (2013). Capital Adequacy, Cost Income Ratio and the Performance of Saudi Banks (2007-2011). *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *3*(4), 284–293.

Almenberg, J., Andersson, M., Buncic, D., Cella, C., Giordani, P., Grodecka, A., & Roszbach, K. (2017). Appropriate Capital Ratios in Major Swedish Banks – New Perspectives. In *Sveriges Riskbank Staff Memo*. Retrieved from https://www.riksbank.se/en-gb/press-and-published/publications/staff-memos/?&year=2017

Alper, D., & Anbar, A. (2011). Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey. *Business and Economics Research Journal*, *2*(2), 139–152.

Alsharif, M., Md Nassir, A., Kamarudin, F., & Zariyawati, M. A. (2016). Basel III : Main Issues for GCC Banks. *International Journal of Economics, Commerce and Management*, *IV*(11), 541–563. Retrieved from http://ijecm.co.uk/

Altman, E. I., & Saunders, A. (2001). An Analysis and Critique of the BIS Proposal on Capital Adequacy and Ratings. *The Journal of Banking and Finance*, *25*, 167–186.

Amorello, L. (2016). Beyond the Horizon of Banking Regulation: What to Expect from Basel IV? *Harvard International Law Journal*, *58*, 18.

Antoniou, A., Guney, Y., & Paudyal, K. (2009). The Determinants of Capital Structure: Capital Market-Oriented versus Bank-Oriented Institutions. *Journal of Financial and Quantitative Analysis*, *43*(01), 59.

Ariss, R. T., & Yolla, S. (2007). Challenges in Implementing Capital Adequacy Guidelines to Islamic Banks. *Journal of Banking Regulations*, *9*(1), 46–60.

Asarkaya, Y., & Ozcan, S. (2007). Determinants of Capital Structure in Financial Institutions: The Case of Turkey. *Journal of Banking and Financial Markets*, *1*(1), 91–109.

Asma, T., & Khadidja, K. (2015). Determinants of Capital Adequacy Ratio in Malaysia Islamic Banks (A panel Data Analysis). *International Research Journal of Finance and Economics*, *1*(129), 55–63.

Aspal, P. K., & Nazneen, A. (2014). An Empirical Analysis of Capital Adequacy in the Indian Private Sector Banks. *American Journal of Research Communication*, *2*(11), 28–42.

Astalin, P. K. (2013). Qualitative Research Designs: A Conceptual Framework. *International Journal of Social Science & Interdisciplinary Research*, *2*(1), 118–124.

Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-Specific, Industry-

Specific and Macroeconomic Determinants of Bank Profitability. *Journal of International Financial Markets, Institutions and Money*, *18*(2), 121–136.

Ayub, H., & Javeed, A. (2016). Impact and Implications of Capital Adequacy Ratio on the Financing Behaviour: Evidence from Islamic Banks in Pakistan. *Journal of Islamic Business and Management*, *6*(1), 19–40.

Azadinamin, A. (2013). The Bankruptcy of Lehman Brothers: Causes of Failure & Recommendations Going Forward (Swiss Management Center (SMC)).

Bakar, D. A. (2008, September). Basel II Enhances Islamic Banks. *Islamic Finance Asia*, (August), 25–27. Retrieved from https://www.islamicfinancenews.com/?s=Basel+II+Enhances+Islamic+Banks#

Baltaci, N., & Ayaydin, H. (2014). Firm, Country and Macroeconomic Determinants of Capital Structure: Evidence from Turkish Banking Sector. *Emerging Markets Journal*, *3*(3), 45–58.

Balthazar, L. (2006). *From Basel 1 to Basel 3: The Integration of State-of-the-Art Risk Modeling in Banking Regulation* (1st ed.).

Barth, J. R., Dopico, L. G., Nolle, D. E., & Wilcox, J. A. (2002). Bank Safety and Soundness and the Structure of Bank Supervision: A Cross-Country Analysis. *International Review of Finance*, *3*(4), 163–188.

Basher, S. A., Kessler, L. M., & Munkin, M. K. (2017). Bank Capital and Portfolio Risk among Islamic Banks. *Review of Financial Economics*, *34*, 1–25.

Bashir, A. H. (2003). Determinants of Profitability in Islamic Banks: Some Evidence from the Middle East. *Islamic Economic Studies*, *11*(1), 31–57.

Bateni, L., Vakilifard, H., & Asghari, F. (2014). The Influential Factors on Capital Adequacy Ratio in Iranian Banks. *International Journal of Economics and Finance*, *6*(11), 108–116.

BCBS. (1995). An Internal Model-Based Approach to Market Risk Capital Requirements. In *BCBS Guidelines*. Retrieved from https://www.bis.org/publ/bcbs17.htm

BCBS. (2004). Basel II - International Convergence of Capital Measurement and Capital Standards: A Revised Framework. In *BCBS Guidelines*. Retrieved from https://www.bis.org/publ/bcbs107.htm

BCBS. (2005). Amendment to the Capital Accord to Incorporate Market Risks. In *BCBS Guidelines*. Retrieved from https://www.bis.org/publ/bcbs119.htm

BCBS. (2009). Revisions to the Basel II Market Risk Framework. In *BCBS Guidelines*. Retrieved from https://www.bis.org/publ/bcbs158.htm

BCBS. (2010). Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems. In *BCBS Guidelines*. Retrieved from

http://www.bis.org/publ/bcbs189.htm

BCBS. (2011). Part 2 : The First Pillar – Minimum Capital Requirements. In *BCBS Guidelines*. Retrieved from http://www.bis.org/publ/bcbs128b.pdf

BCBS. (2014). Basel III: The Net Stable Funding Ratio. In *BCBS Guidelines*. Retrieved from https://www.bis.org/bcbs/publ/d295.htm

BCBS. (2015). The Interplay of Accounting and Regulation and its Impact on Bank Behaviour: Literature Review. In *BCBS Working Paper* (No. 28). Retrieved from https://www.bis.org/bcbs/publ/wp28.htm

BCBS. (2016). Basel Committee Membership. Retrieved April 11, 2019, from https://www.bis.org/bcbs/membership.htm

BCBS. (2017a). Basel III: Finalising Post-Crisis Reforms. In *BCBS Guidelines*.

BCBS. (2017b). High-level Summary of Basel III Reforms. In *BCBS Guidelines*.

BCBS. (2018). Finalising Basel III in Brief. In *BCBS Guidelines*. Retrieved from https://www.bis.org/search/index.htm?globalset_q=Finalising+Basel+III+in+Brief

Bell, A., Fairbrother, M., & Jones, K. (2019). Fixed and Random Effects Models: Making an Informed Choice. *Quality and Quantity*, *53*(2), 1051–1074.

Ben Zeineb, G., & Mensi, S. (2018). Effects of Corporate Governance Control Measures on Islamic Banks' Financial Soundness : Evidence from the International Financial Crisis. *Journal of Islamic Economics Banking and Finance*, *12*(3), 140–163.

Benoit, K. (2011). Linear Regression Models with Logarithmic Transformations. *Course Notes*, pp. 1–8. Retrieved from https://www.semanticscholar.org/paper/Linear-Regression-Models-with-Logarithmic-Benoit/169cc9bbbd77cb7cec23481f6ecb2ce071e4e94e

Berg, B. L. (2001). *Qualitative Research Methods for the Social Sciences* (4th ed., Vol. 4). California: A Pearson Education Company.

Berger, A. N., DeYoung, R., Flannery, M. J., Lee, D., & Öztekin, Ö. (2008). How Do Large Banking Organizations Manage Their Capital Ratios? *Journal of Financial Services Research*, *34*(2–3), 123–149.

BIS. (2014). 84th Annual Report: 1 April 2013–31 March 2014. In *Annual Report*. Retrieved from https://www.bis.org/publ/arpdf/ar2014e.htm

Bitar, M. (2006). *Banking Regulation, Stability and Efficiency of Islamic Banks: What Works Best? A Comparison with Conventional Banks (Phd Dissertation)*. Université de Grenoble.

Bitar, M. (2012). Basel III Requirements and the Stability of Islamic and Conventional Banks. *30th International Symposiums on Money, Banking and Finance*, 1–46.

Villeurbanne, France: Center for Direct Scientific Communication (CCSD).

Bitar, M., Kabir Hassan, M., & Hippler, W. J. (2018). The Determinants of Islamic Bank Capital Decisions. *Emerging Markets Review*, *35*(December), 48–68.

Blasig, S. B. (2016). *Does the Banking System Affect Banks' Performance? Islamic vs. Conventional Banking*. University of Twente.

Blundell-wignall, A., Atkinson, P., & Lee, S. H. (2009). The Current Financial Crisis: Causes and Policy Issues. *Financial Market Trends*, 1–21.

Bokhari, I. H., Ali, S. M., & Sultan, K. (2013). Determinants of Capital Adequacy Ratio in Banking Sector: An Empirical Analysis from Pakistan. *Academy of Contemporary Research Journal*, *2*(1), 1–9.

Boumediene, A. (2011). Basel III: Relevance for Islamic Banks. *SSRN Electronic Journal*, (May).

Buehler, K., Samandari, H., & Christopher, M. (2009). Capital Ratios and Financial Distress: Lessons from the Crisis. In *McKinsey Working Paper on Risk*. Retrieved from https://www.mckinsey.com/business-functions/risk/our-insights/capital-ratios-and-financial-distress-lessons-from-the-crisis

Calem, P., & Rob, R. (1999). The Impact of Capital-Based Regulation on Bank Risk-Taking: A Dynamic Model. *Journal of Financial Intermadiation*, *1*, 1–47.

Caruana, J. (2014). How Much Capital Is Enough? *Speech at the Conference "Challenges for the Future of Banking: Regulation, Supervision and the Structure of Banking" IESE Business School Conference, London*, *26*, 1–17. London: Bank for International Settlements.

Caruana, J., & Narain, A. (2008). Banking on More Capital. *Finance and Development*, *45*(2), 24–28.

CBB. (2019). Banking. Retrieved July 13, 2019, from Central Bank of Bahrain website: https://www.cbb.gov.bh/fact-sheet/

CBK. (2019). Kuwaiti Banks. Retrieved July 13, 2019, from Central Bank of Kuwait website: http://www.cbk.gov.kw/en/supervision/financial-units/kuwaiti-banks.jsp

CBO. (2019). Oman's Financial System. Retrieved July 13, 2019, from Central Bank of Oman website: https://cbo.gov.om/Pages/OmanFinancialSystem.aspx

CBUAE. (2019). Commercial Banks. Retrieved July 13, 2019, from Central Bank of the UAE website: https://www.centralbank.ae/en/about-us

Cecchetti, S. (2014). What's the Impact of Higher Capital Rquirements? Retrieved May 25, 2019, from World Economic Forum website: https://www.weforum.org/agenda/2014/12/whats-the-impact-of-higher-capital-requirements/

Chang, W. W. (2011). Financial Crisis of 2007-2010. *Keio Economic Studies*, *47*, 25–56.

Chapra, M. U., & Khan, T. (2000). Regulation and Supervision of Islamic Banks. In *Islamic Research and Training Institute Occasional Paper* (No. 3). Retrieved from https://irti.org/product/regulations-and-supervision-of-islamic-banks/

Chen, L.-J., Jung, C., & Chen, S.-Y. (2011). How the Pecking-Order Theory Explain Capital Structure. *Journal of International Management Studies*, *6*(3), 92–100.

Chesebro, J. W., & Borisoff, D. J. (2007). What Makes Qualitative Research Qualitative? *Qualitative Research Reports in Communication*, *8*(1), 3–14.

Chronopoulos, D. K., Sobiech, A. L., & Wilson, J. O. S. (2017). Future Issues in Bank Taxation. *Centre for Responsible Banking and Finance*, 1–28. Retrieved from https://fca.org.uk/publication/research/future-issues-bank-taxation.pdf

CIBAFI. (2019). Sustainability, Growth Drivers, and the Regulatory Challenge. In *Global Islamic Bankers' Survey*. Retrieved from https://www.cibafi.org/SurveyPage?ContentId=CI1809

Cline, W. R. (2016). Benefits and Costs of Higher Capital Requirements for Banks. In *Working Paper* (No. 16–6).

Cline, W. R. (2017). Preface. In *The Right Balance for Banks: Theory and Evidence on Optimal Capital Requirements* (pp. ix–xi). Washington DC: Peterson Institute for International Economics.

Conlon, T., Cotter, J., Molyneux, P., Conlon, T., Cotter, J., & Molyneux, P. (2018). Beyond Common Equity: The Influence of Secondary Capital on Bank Insolvency Risk. In *Michael J. Brennan Irish Finance Working Paper Series*. (No. 18–4).

Cooper, R., & Ross, T. W. (2018). Bank Runs: Deposit Insurance and Capital Requirements. *Iternational Economics Review*, *43*(1), 55–72.

Cornford, A. (2010). Capital Requirements for Banks in Non-Standard Contexts. *Finance & Bien Commun*, *21*(1), 68–80.

Daniëls, T., & Kamalodin, S. (2016). The Return on Equity of Large Dutch Banks. In *DNB Occasional Studies* (Vol. 15). Retrieved from https://www.dnb.nl/en/news/dnb-publications/dnb-occasional-studies/dnb347498.jsp

Delis, M. D., Tran, K. C., & Tsionas, E. G. (2012). Quantifying and Explaining Parameter Heterogeneity in the Capital Regulation-Bank Risk Nexus. *Journal of Financial Stability*, *8*(2), 57–68.

Deutsche Bank. (2019). Reputational Risk Management. Retrieved April 7, 2019, from Deutsche Bank website: https://www.db.com/cr/en/concrete-management-of-reputational-risks.htm

Dhumale, R. (2000). Capital Adequacy Standards: Are They Sufficient? In *ESRC Centre*

for Business Research Working Paper (Vol. 165). Retrieved from https://www.cbr.cam.ac.uk/publications/working-papers/2000/

Diaw, A., & Mohamed, O. E. T. B. (2011). The Implementation of Basel II by Islamic Banks: The Case of Bank Islam Malaysia Berhad. *International Journal of Excellence in Islamic Banking and Finance*, *1*(2), 1–15.

Dowd, K. et al. (2011). Capital Inadequacies: The Dismal Failure of the Basel Regime of Bank Capital Regulation. *Cato Institute Policy Analysis*, *681*(7), 1–40. Retrieved from http://www.cato.org/pubs/pas/pa681.pdf

Driessnack, M., Sousa, V. D., & Mendes, I. A. C. (2007). An Overview of Research Designs Relevant to Nursing: Part 1: Quantitative Research Designs. *Revista Latino-Americana de Enfermagem*, *15*(3), 502–507.

Eickmeier, S., Kolb, B., & Prieto, E. (2015). Macroeconomic Effects of Bank Capital Regulation. In *Deutsche Bundesbank Discussion Paper*. Retrieved from https://www.bundesbank.de/en/publications/research/discussion-papers/macroeconomic-effects-of-bank-capital-regulation-768908

El-Ansary, O. A., & Hafez, Ha. M. (2015). Determinants of Capital Adequacy Ratio: An Empirical Study on Egyptian Banks. *Corporate Ownership & Control*, *13*(1), 806–816.

Elliott, D. J. (2010). A Primer on Bank Capital. In *Brookings Institution*. Retrieved from http://www.brookings.edu/~/media/research/files/papers/2010/1/29 capital elliott/0129_capital_primer_elliott.pdf%5Cnhttp://www.brookings.edu/research/papers/2010/01/29-capital-elliott%5Cnfiles/782/Elliot_2010.pdf

Emmons, W. R., Lskavyan, V., & Yeager, T. J. (2005, April). Basel II Will Trickle Down to Community Bankers, Consumers. *Regional Economist*, (April), 12–13. Retrieved from https://www.stlouisfed.org/publications/regional-economist/april-2005/basel-ii-will-trickle-down-to-community-bankers-consumers

Errico, L., & Farahbaksh, M. (1998). Islamic Banking: Issues in Prudential Regulations and Supervision. In *IMF Working Papers* (No. 98/30).

Estrella, A., Park, S., & Peristiani, S. (2000). Capital Ratios as Predictors of Bank Failure. *Economic Policy Review*, (July), 33–52.

Ezike, J. E., & Oke, M. O. (2013). Capital Adequacy Standards, Basle Accord and Bank Performance: The Nigerian Experience (A Case Study of Selected Banks in Nigeria). *Asian Economic and Financial Review*, *3*(2), 146–159. Retrieved from http://search.proquest.com/openview/1585280b9ccf7456810b13ef53549707/1?pq-origsite=gscholar

Farag, H., Mallin, C., & Ow-Yong, K. (2018). Corporate Governance in Islamic Banks: New Insights for Dual Board Structure and Agency Relationships. *Journal of International Financial Markets, Institutions and Money*, *54*, 59–77.

Fayed, M., & Ezzat, A. (2017). Do Principal-Agent Conflicts Impact Performance And Risk-Taking Behavior of Islamic Banks? *Topics in Middle Eastern & African Economies, Proceedings of Middle East Economic Association*, *19*(2), 32–67. Retrieved from http://meea.sites.luc.edu/volume19/meea19.html

Fic, T., & Karim, D. (2011). Bank Capital Composition, Regulation and Risk Taking. *Money, Macro and Finance Conference*, (July), 1–22. Birmingham: National Institute of Economic and Social Research.

Figueiredo Filho, D. B., Paranhos, R., Rocha, E. C. da, Batista, M., Silva Jr., J. A. da, Santos, M. L. W. D., & Marino, J. G. (2013). When Is Statistical Significance Not Significant? *Brazilian Political Science Review*, *7*(1), 31–55.

Firestone, S., Lorenc, A., & Ranish, B. (2017). An Empirical Economic Assessment of the Costs and Benefits of Bank Capital in the US. In *Finance and Economics Discussion Series* (No. 034).

Frank, M. Z., & Goyal, V. K. (2003). Testing the Pecking Order Theory of Capital Structure. *Journal of Financial Economics*, *67*(2), 217–248.

GCC-STAT. (2018). Economic Performance and Outlook for the Gulf Corporation Council (GCC) 2018. In *GCC-STAT Report*. Retrieved from https://gccstat.org/en/statistic/publications/gcc-outlook

Georgescu, O. M., & Laux, C. (2015). Financial Reporting, Financial Regulation, and Financial Stability: Evidence from German Bank Failures in 2007-2008. *SSRN Electronic Journal*, (June), 1–37.

Getter, D. E. (2014). U.S. Implementation of the Basel Capital Regulatory Framework Specialist in Financial Economics. In *Congressional Research Service (CRS) Report*. Retrieved from https://www.everycrsreport.com/reports/R42744.html

Ghandour, G. F. (2017). The Importance of a Capital Adequacy for Islamic Banks. *International Journal of Research - Granthaalayah*, *5*(4), 292–300.

Ghasemi, A., & Zahediasl, S. (2012). Normality Tests for Statistical Analysis: A Guide for Non-Statisticians. *International Journal of Endocrinology and Metabolism*, *10*(2), 486–489.

Ghosh, S. (2014). Risk, Capital and Financial Crisis: Evidence for GCC Banks. *Borsa Istanbul Review*, *14*(3), 145–157.

Golafshani, N. (2003). Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report*, *8*(4), 597–607. Retrieved from http://www.news-medical.net/health/Thalassemia-Prevalence.aspx

Goodhart, C. (2011). *The Basel Committee on Banking Supervision: A History of the Early Years 1974-1997* (1st ed.).

Goodwin, N. R. (2003). Five kinds of Capital: Useful Concepts for Sustainable

Development. In *Global Development And Environment Institute- G-DAE Working Paper* (No. 03–07). Retrieved from https://ageconsearch.umn.edu/record/15595/

Gujarati, D. (2004). *Basic Econometrics* (4th ed.). New York: McGraw-Hill.

Gursida, H. (2018). The Influence of Inflation Rate, Interest Rate, and Money Supply on Share Price LQ45. *Sinergi : Jurnal Ilmiah Ilmu Manajemen*, *8*(1), 21–28.

Haan, J. De, & Poghosyan, T. (2011). Bank Size, Market Concentration, and Bank Earnings Volatility in the US. In *DNB Working Paper* (No. 282). Retrieved from https://www.dnb.nl/en/news/dnb-publications/dnb-working-papers-series/dnb-working-papers/working-papaers-2011/dnb252985.jsp

Habeck, Cristian, G., & Brickman, Adam, M. (2014). A Common Statistical Misunderstanding in Psychology: Do We Need Normally Distributed Independent or Dependent Variables for Linear Regression to Work. *Taub Institute for Research in Alzheimer's Disease and Aging Brain*, (April), 1–15.

Haberler, G. (1960). *Inflation: Its Causes and Cures* (1st ed., Vol. 6).

Hadjixenophontos, A., & Christodoulou-volos, C. (2018). Financial Crisis and Capital Adequacy Ratio : A Case Study for Cypriot Commercial Banks. *Journal of Applied Finance & Banking*, *8*(3), 87–109. Retrieved from www.scienpress.com/Upload/JAFB%2FVol 8_3_6.pdf

Hamza, H. (2016). Does Investment Deposit Return in Islamic Banks Reflect PLS Principle? *Borsa Istanbul Review*, *16*(1), 32–42.

Harun, M. S. Bin. (2016). *The Impact of Corporate Governance and Its Consequences on CSR Disclosure: Empirical Evidence from Islamic Banks in GCC Countries*. University of Plymouth.

Harzi, A. (2012). The Impact of Basel III on Islamic Banks: A Theoretical Study and Comparison with Conventional Banks. *Ethics and Financial Norms*, *77*(3), 1–20.

Hassan, M. K., & Chowdhury, M. A. M. (2004). Islamic Banking Regulations in Light of Basel II. *The American Journal of Islamic Social Sciences*, *27*(1), 74–101.

Heider, F., & Gropp, R. (2009). The Determinants of Bank Capital Structure. In *ECB Working Papers* (No. 1096). Retrieved from https://www.ecb.europa.eu/pub/research/working-papers/html/index.en.html

Hewaidy, A. M., & Alyousef, H. Y. (2018). Bank-Specific and Macroeconomic Determinants of Capital Adequacy Ratio: Evidence from Kuwaiti Banks. *European Journal of Economics, Finance and Administrative Sciences*, (99), 5–20.

Ho, A. (2012). Weaknesses in Regulatory Capital Models and Their Implications. *Enterprise Risk Management Symposium*, 1–9. Retrieved from https://www.ermsymposium.org/erm-2012/research-paper-sessions/

Hodgson, G. M. (2014). What is Capital? Economists and Sociologists Have Changed its Meaning: Should it Be Changed Back? *Cambridge Journal of Economics*, *38*(5), 1063–1086.

House, C. C. (2010). Statistical Aspects of a Census. In *Agricultural Survey Methods* (pp. 63–72).

Hussain, M., Shahmoradi, A., & Turk, R. (2015). An Overview of Islamic Finance. In *IMF Working Papers* (No. 15/120). Retrieved from https://www.imf.org/en/Publications/WP/Issues/2016/12/31/An-Overview-of-Islamic-Finance-42976

IFSB. (2003). About IFSB. Retrieved April 25, 2019, from IFSB website: https://www.ifsb.org/background.php

IFSB. (2005). Capital Adequacy Standard for Institutions (Other Than Insurance Institutions) Offering Only Islamic Financial Services (IFSB-02). In *IFSB Standards*. Retrieved from https://www.ifsb.org/published.php

IFSB. (2013). Revised Capital Adequacy Standard for Institutions Offering [Excluding Islamic Insurance (Takāful) Institutions and Islamic Collective Investment Schemes] (IFSB-15). In *IFSB Standards*. Kuala Lumpur: Islamic Financial Services Board.

IFSB. (2018a). Islamic Financial Services Industry. In *Stability Report*. Retrieved from https://www.ifsb.org/sec03.php

IFSB. (2018b). Revised Standard on Disclosures to Promote Transparency and Market Discipline for Institutions Offering Islamic Financial Services (IFSB-22). In *IFSB Standards*. Retrieved from Islamic Finance Services Board website: https://www.ifsb.org/published.php

Ikpefan, O. A. (2016). Capital Adequacy, Management and Performance in the Nigerian Commercial Bank (1986 - 2006). *African Journal of Business Management*, *7*(30), 2938–2950.

IMF. (2005). Implementation of Basel II -- Implications for the World Bank and the IMF. Retrieved March 22, 2019, from International Monetary Fund website: https://www.imf.org/external/np/pp/eng/2005/072205.htm

Indriastuti, M., & M. Ifada, L. (2019). The Effect of Non-Performing Financing on Sharia BPR Performance. *Proceedings of the 3rd Annual International Seminar and Conference on Global Issues (ISCoGI 2017)*, *140*, 152–154.

Iqbal, Z., & van Greuning, H. (2008). *Risk Analysis for Islamic Banks* (1st ed.). Washington DC: The World Bank.

Ismail, A. G., & Shahimi, S. (2003). Do Risk-Based Capital Requirements Allocate Financing and Cause a "Bigger" Loan Loss Provision for Islamic Banks? *IQTISAD Journal of Islamic Economics*, *4*(1), 1–11.

Ismail, A. G., Tohirin, A., & Ahmad, M. A. J. (2013). Debate on Policy Issues in the Field of Zakat on Islamic Bank Business. In *IRTI Policy Paper* (Vol. 1435–03). Retrieved from https://irti.org/product/debate-on-policy-issues-in-the-field-of-zakat-on-islamic-bank-business/

Jackson, R. L., Drummond, D. K., & Camara, S. (2007). What Is Qualitative Research? *Qualitative Research Reports in Communication*, *8*(1), 21–28.

Jasevičienė, F., & Jurkšaitytė, D. (2014). The New Capital Adequacy Framework (Basel III) Options and Issues in Commercial Banks in Lithuania. *Ekonomica*, *93*(4), 119–134.

Javaid, S., & Alalawi, S. (2018). Performance and Profitability of Islamic Banks in Saudi Arabia: An Empirical Analysis. *Asian Economic and Financial Review*, *8*(1), 38–51.

Kakilli Acaravci, S., & Ertuğrul Çalım, A. (2013). Turkish Banking Sector's Profitability Factors. *International Journal of Economics and Financial Issues*, *3*(1), 27–41. Retrieved from www.econjournals.com

Kara, H. (2011). Islamic Banks Hold Basel III Advantage. Retrieved May 10, 2019, from The Banker website: https://www.thebanker.com/Markets/Islamic-Finance/Islamic-banks-hold-Basel-III-advantage?ct=true

Kasman, A., & Kontbay Busun, S. (2016). A Note on Bank Capital Buffer, Portfolio Risk and Business Cycle. *Ege Akademik Bakis (Ege Academic Review)*, *15*(1), 1–8.

Khan, M. A., Chaudhry, G. M., Asad, M., Khan, M. A., & Naqvi, S. M. H. (2013). Operational Efficiency of Islamic Banks: The Case of Malaysia and Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, *5*(3), 660–668.

Khandelwal, P., Miyajima, K., & Santos, A. (2017). The Impact of Oil Prices on the Banking System in the Gulf Cooperation Council. *Journal of Governance and Regulation*, *6*(2), 32–47.

Kim, J. H. (2015). How to Choose the Level of Significance: A Pedagogical Note. *Munich Personal RePEc Archive*, (66373), 1–13.

King, P., & Tarbert, H. (2011). Basel III : An Overview. In *Banking and Financial Services Policy Report* (Vol. 30). Retrieved from http://www.weil.com/~/media/files/pdfs/Basel_III_May_2011.pdf

Kish, L. (2006). Samples and Censuses. *International Statistical Review*, *47*(2), 99–109.

KLM Group. (2019). Islamic Banking – Key Differences of Components within a Financial Statements of an Islamic Bank , Kuala Lumpur. Retrieved December 23, 2019, from KL Management Services website: https://www.klmanagement.com.my/news/islamic-banking-key-differences-of-components-within-a-financial-statements-of-an-islamic-bank/

Koehn, M., & Santomero, A. M. (1980). Regulation of Bank Capital and Portfolio Risk. *The Journal of Finance*, *35*(5), 1235–1244.

König, P., & Pothier, D. (2016). Design and Pitfalls of Basel's New Liquidity Rules. *Wochenbericht*, *6*(21), 251–260.

KPMG. (2019). GCC Listed Banks' Results. In *Annual Report*. Retrieved from https://home.kpmg/xx/en/home/insights/2019/06/gcc-listed-banks-results-embracing-digital.html

Kragh-sørensen, K. (2012). Optimal Capital Adequacy Ratios for Norwegian Banks. In *Staff Memo*. Retrieved from https://www.norges-bank.no/en/news-events/news-publications/Papers/Staff-Memo/2012/Staff-Memo-292012/

Laeven, L., Ratnovski, L., & Tong, H. (2016). Bank Size, Capital Requirements, and Systemic Risk: Some International Evidence. *Journal of Banking & Finance*, *1*(69), 25–34.

Lederman, N. G., & Lederman, J. S. (2015). What Is A Theoretical Framework? A Practical Answer. *Journal of Science Teacher Education*, *26*(7), 593–597.

Leedy, P. D., & Ormrod, J. E. (2006). *Practical Research: Planning and Design* (9th ed., Vol. 9).

Lembcke, A. C. (2010). Introduction to Stata. *Course Notes*, pp. 1–62. Retrieved from http://personal.lse.ac.uk/lembcke/teaching.html

Li, Q. (2013). What Causes Bank Failures during the Recent Economic Recession? In *Honors Projects*. Retrieved from https://digitalcommons.iwu.edu/busadmin_honproj/28/

Liljeblom, E., Mollah, S., & Sikder, O. (2016). Capital Buffer and Risk-taking in Banks: Islamic vs. Conventional Banks. *Semantic Scholar*, 1–26. Retrieved from https://www.semanticscholar.org/paper/Capital-Buffer-and-Risk-taking-in-Banks-%3A-Islamic-.-Liljeblom-Mollah/8a14c889490bb73c09d108a7e57d617808b038f8

Lotto, J. (2018). The Empirical Analysis of the Impact of Bank Capital Regulations on Operating Efficiency. *International Journal of Financial Studies*, *6*(34), 1–11.

Lumley, T., Diehr, P., Emerson, S., & Chen, L. (2002). The Importance of the Normality Assumption in Large Public Health Data Sets. *Annual Review of Public Health*, *23*(1), 151–169.

M Mukaka, M. (2012). Statistics Corner: A Guide to Appropriate Use of Correlation Coefficient in Medical Research. *Malawi Medical Journal*, *24*(3), 69–71.

Martynova, N. (2015). Effect of Bank Capital Requirements on Economic Growth. In *DNB Working Paper* (Vol. 467).

Masood, O., & Ashraf, M. (2012). Bank-specific and Macroeconomic Profitability

Determinants of Islamic Banks. *Qualitative Research in Financial Markets*, *4*(2), 255–262.

Matthews, K. (1996). Capital Adequacy Ratios for Banks. *Reserve Bank Bulletin*, *59*(2), 135–141.

Mendoza, R., & Rivera, J. P. R. (2017). The Effect of Credit Risk and Capital Adequacy on the Profitability of Rural Banks in the Philippines. *Scientific Annals of Economics and Business*, *64*(1), 83–96.

Miles, D., Yang, J., & Marcheggiano, G. (2011). Optimal Bank Capital. Retrieved December 26, 2019, from Bank of England website: https://www.bankofengland.co.uk/external-mpc-discussion-paper/2011/optimal-bank-capital

Mili, M., Sahut, J.-M., Trimeche, H., & Teulon, F. (2014). Determinants of the Capital Adequacy Ratio of a Foreign Bank's Subsidiaries: The Role of the Interbank Market and Regulation of Multinational Banks. In *IPAG working papers* (No. 366).

Miller, M. H., & Modigliani, F. (1963). Corporate Income Taxes and the Cost of Capital: A Correction. *The American Economic Review*, *53*(3), 433–443.

Mohamed, H. H., Masih, M., & Bacha, O. I. (2015). Why Do Issuers Issue Sukuk or Conventional Bond? Evidence from Malaysian Listed Firms Using Partial Adjustment Models. *Pacific Basin Finance Journal*, *34*, 233–252.

Mohammed, E. A., Naugler, C., & Far, B. H. (2015). Emerging Business Intelligence Framework for a Clinical Laboratory Through Big Data Analytics. In Q. N. Tran & H. Arabnia (Eds.), *Emerging Trends in Computational Biology, Bioinformatics, and Systems Biology* (1st ed., pp. 577–602).

Mohammed, J. A. (2018). *Measuring the Determinants of Capital Adequacy and Its Impact on Efficiency in the Banking Industry: A Comparative Analysis of Islamic and Conventional Banks*. University of Bolton.

Muljawan, D., Dar, H. A., & Hall, M. J. B. (2004). A capital Adequacy Framework for Islamic Banks: The Need to Reconcile Depositors' Rsk Aversion with Managers' Risk Taking. *Applied Financial Economics*, *14*(6), 429–441.

Mursal, Darwanis, & Ibrahim, R. (2019). What Influences Capital Adequacy Ratio in Islamic Commercial Banks? Evidence from Indonesia. *Journal of Accounting Research, Organization and Economics*, *2*(1), 1–10.

Muskoya, B. K. (2017). *The Effect of Capital Adequacy on the Financial Performance of Commercial Banks in Kenya*. University of Nairobi.

Mutairi, A. AL, & Naser, K. (2016). Determinants of Capital Structure of Banking Sector in GCC: An Empirical Investigation. *Asian Economic and Financial Review*, *5*(7), 959–972.

Myers, S., & Majluf, N. (1984). Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. In *NBER Working Paper Series* (No. 1396). Retrieved from https://www.nber.org/papers/w1396

Nachane, D. . (2019). Capital Adequacy Ratio: An Agnostic Viewpoint. *Economic and Political Weekly*, *34*(3), 155–160.

Naser, K., Al-mutairi, A., Kandari, A. Al, & Nuseibeh, R. (2015). Cogency of Capital Structure Theories to an Islamic Country: Empirical Evidence from the Kuwaiti Banks. *International Journal of Economics and Financial Issues*, *5*(4), 979–988.

Nguyen, T. P. T., & Nghiem, S. H. (2015). The Interrelationships among Default Risk, Capital Ratio and Efficiency: Evidence from Indian Banks. *Managerial Finance*, *41*(5), 507–525.

Nugraha, E., & Setiawan, A. (2018). Non Performing Financing Factor in Syaria Commercial Banking in Indonesia. *International Journal of Commerce and Finance*, *4*(1), 27–39. Retrieved from http://ijcf.ticaret.edu.tr/index.php/ijcf/article/view/64

Nyoka, C. J. (2017). *Bank Capital and Profitability: An Empirical Study of South African Commercial Banks*. University of South Africa.

Ogunleye, G. A. (2002). Deposit insurance scheme in nigeria: problems and prospects by. *First Annual Conference of International Association of Deposit Insurers (IADI)*. Basel, Switzerland: International Association of Deposit Insurers (IADI).

Olalekan, A., & Adeyinka, S. (2013). Capital Adequacy and Banks' Profitability: An Empirical Evidence from Nigeria. *American International Journal of Contemporary Research*, *3*(10), 87–93.

Oppong, F. B., & Agbedra, S. Y. (2016). Assessing Univariate and Multivariate Normality, A Guide For Non - Statisticians. *Mathematical Theory and Modeling*, *6*(2), 26–33. Retrieved from www.iiste.org/Journals/index.php/MTM/article/download/28571/29333

Osborne, M., Fuertes, A., & Milne, A. (2012). Capital and Profitability in Banking: Evidence from US Banks. *3rd Emerging Scholars in Banking and Finance Conference, Cass Business School*, 1–54.

Ozili, P. K. (2019). Non-performing loans and financial development: new evidence. *The Journal of Risk Finance*, *20*(1), 59–81.

Ozkan, C., & Iqbal, Z. (2015). Implications of Basel III for Islamic Banking- Opportunities and Challenges. In *Policy Research Working Paper* (No. XYZ). Retrieved from https://www.tkbb.org.tr/academic-studies

Pancheva, A. (2013). Determinants of the Bank's Operating Efficiency. *IZVESTIA*, *1*, 74–85.

Paramasiva, C., & Subramanian, T. (2009). *Financial Management* (1st ed.). New Delhi: New Age International.

Paudel, G. P., & Khanal, S. (2015). Determinants of Capital Adequacy Ratio (CAR) in Nepalese Cooperative Societies. *SSRN Electronic Journal*, (August), 1–20.

Peek, J., & Rosengren, E. S. (1997). How Well Capitalized are Well-capitalized Banks? *New England Economic Review*, *19*, 41–50. Retrieved from http://ideas.repec.org/a/fip/fedbne/y1997isepp41-50.html

Pek, J., Wong, O., & Wong, C. M. (2017). Data Transformations for Inference with Linear Regression: Clarifications and Recommendations. *Practical Assessment, Research and Evaluation*, *22*(9), 1–11.

Perchstone, & Graeys. (2016). Nigeria: Low Capital Adequacy Ratio and the Overriding Impact on the Economy. Retrieved May 1, 2019, from Mondaq website: http://www.mondaq.com/Nigeria/x/511044/Financial+Services/Low+Capital+Adequacy+Ratio+And+The+Overriding+Impact+On+The+Economy

Peura, S., & Jokivuolle, E. (2004). Simulation Based Stress Tests of Banks' Regulatory Capital Adequacy. *Journal of Banking and Finance*, *28*(8), 1801–1824.

Pham, T. X. T., & Nguyen, N. A. (2017). The Determinants of Capital Adequacy Ratio: The Case of the Vietnamese Banking System in the Period 2011-2015. *VNU Journal of Science: Economics and Business*, *33*(2), 49–58.

Polat, A., & Al-khalaf, H. (2014). What Determines Capital Adequacy in the Banking System of Kingdom of Saudi Arabia? A Panel Data Analysis on Tadawul Banks. *Journal of Applied Finance & Banking*, Vol. 4, pp. 27–43.

Posner, E. A. (2015). How Do Bank Regulators Determine Capital Adequacy Requirements? *University of Chicago Law Review*, *82*(4), 1853–1895.

Prakash, A. (2008). Evolution of the Basel Framework on Bank Capital Regulation. In *Reserve Bank of India Occasional Papers* (Vol. 29). Retrieved from https://www.rbi.org.in/Scripts/Publications.aspx?publication=Occasional

Pratomo, W. A., & Ismail, A. G. (2006). Islamic Bank Performance and Capital Structure. *Munich Personal RePEc Archive*, (6012). Retrieved from https://mpra.ub.uni-muenchen.de/6012/

QCB. (2019). Registration. Retrieved July 13, 2019, from Qatar Central Bank website: http://www.qcb.gov.qa/english/supervisionapproach/licensingandregistration/pages/registration.aspx

Rabiul, I. (2017). Determinants of Factors that Affecting Inflation in Malaysia. *International Journal of Economics and Financial Issues*, *7*(2), 355–364. Retrieved from http:%0Awww.econjournals.com

Raharjo, P. G., Hakim, D. B., Manurung, A. H., & Maulana, T. N. A. (2014). Determinant

of capital ratio: A panel data analysis on state-owned banks in Indonesia. *Buletin Ekonomi Moneter Dan Perbankan*, *16*(4), 395–414.

Raniah, F. N., Khairunnisa, & Triyanto, D. N. (2016). The influence of capital adequacy ratio (car), non-performing financing (npf), and profit sharing ratio to profit sharing financing sharia bank. *The 7 Smart Collaboration for Business in Technology and Information Industries 2016*, 87–92.

Ratnovski, L. (2013). How much capital should banks have? Retrieved April 26, 2019, from VOX CEPR Policy Portal website: https://voxeu.org/article/how-much-capital-should-banks-have

Rosman, R., Wahab, N. A., & Zainol, Z. (2014). Efficiency of Islamic Banks during the Financial Crisis: An Analysis of Middle Eastern and Asian Countries. *Pacific-Basin Finance Journal*, *28*, 76–90.

Roulet, C., Distinguin, I., & Tarazi, A. (2012). Bank Capital Buffer and Liquidity: Evidence from US and European Publicly Traded Banks. *29th International Conference of the French Finance Association (AFFI)*, 1–61.

Saddiq, A. A. (2017). *Capital Adequacy of Banks in Ghana: Does Liquidity Transformation Matter*. University of Ghana.

Sakti, M. R. P., Tareq, M. A., Saiti, B., & Akhtar, T. (2017). Capital Structure of Islamic Banks: A Critical Review of Theoretical and EmpiricalRresearch. *Qualitative Research in Financial Markets*, *9*(3), 292–308.

Salgotra, P., & Wadhwa, R. (2012). Capital Adequacy-A Financial Soundness Indicator for Banks: A Comparative Analysis of Public Banks in India. *IOSR Journal of Business and Management*, *54*, 54–60. Retrieved from www.iosrjournals.org

SAMA. (2019). Saudi Banks. Retrieved July 13, 2019, from Saudi Arabian Monetary Authority website: http://www.sama.gov.sa/en-US/License/Pages/SaudiBanks.aspx

Samad, A. (2011). Is Capital Inadequacy a Factor for Bank Failure ? Evidence from US Banking. *Journal of Accounting and Finance*, *11*(4), 105–110.

Samuel, U. E., Udoh, B. E., Prince, A. I., Nneka, I. R., & John, I. U. (2018). Financial Fraud and the Effect of Insider Abuse in Nigerian Banking Sector. *Journal of Finance and Marketing*, *2*(3), 14–22. Retrieved from http://www.alliedacademies.org/articles/financial-fraud-and-the-effect-of-insider-abuse-in-nigerian-banking-sector-10721.html

Santoso, W. (1999). *Capital Adequacy Assessment in Indonesia: An Empirical Study*. Loughborough University.

Saragih, J. L. (2018). The Effects of Return On Assets (ROA), Return On Equity (ROE), and Debt To Equity Ratio (DER) on Stock Returns in Wholesale and Retail Trade Companies Listed in Indonesia Stock Exchange. *International Journal of Sciene and Research Methodology*, *8*(3), 348–367.

Sarker, A. A. (1999). Islamic Business Contracts, Agency Problem and the Theory of the Islamic Firm. *International Journal of Islamic Financial Services*, *1*(2), 12–28.

Sarker, A. A. (2005). CAMELS Rating System in the Context of Islamic Banking: A Proposed "S" for Shariah Framework. *Journal of Islamic Economics, Banking and Finance*, *1*(1), 1–26.

Schepens, G. (2016). Taxes and Bank Capital Structure. *Journal of Financial Economics*, *120*(3), 585–600.

Schmidt, A. F., & Finan, C. (2018). Linear Legression and the Normality Assumption. *Journal of Clinical Epidemiology*, *98*(June), 146–151.

Schwarz, C., Karakitsos, P., Merriman, N., & Studener, W. (2014). Why Accounting Matters? A Central Bank Perspective. In *ECB Occasional Papers* (No. 153). Retrieved from https://www.ecb.europa.eu/pub/research/occasional-papers/html/index.en.html

Shabani, M. (2015). The incidence of bank default and capital adequacy regulation in US and Japan (University of London). Retrieved from https://core.ac.uk/download/pdf/42549106.pdf

Shabsigh, G., Haron, A., Norat, M. A., Song, I. W., Khatat, Mariam El Hamiani Murphy, D., Arda, A., … Harutyunyan, A. (2017). Ensuring Financial Stability in Countries with Islamic Banking. In *IMF Policy Papers*. Retrieved from https://www.imf.org/en/Publications/Policy-Papers/Issues/2017/02/21/PP-Ensuring-Financial-Stability-in-Countries-with-Islamic-Banking

Shaddady, A., & Moore, T. (2015). Determinants of Capital Adequacy Ratio in Oil Exporting Countries: Evidence from GCC Commercial Banks. *Second Middle East Conference on Global Business, Economics, Finance and Banking (ME15Dubai Conference)*, 1–24. Retrieved from http://globalbizresearch.org/Dubai_Conference2015_May/

Shamsuddin, Z., & Ismail, A. G. (2013). Agency Theory in Explaining Islamic Financial Contracts. *Middle-East Journal of Scentific Research*, *15*(4), 530–545.

Sharbatly, A. (2016). *Risk Regulation in Islamic Banking: Does Saudi Arabia Need to Adopt the Risk Regulation Practices of Basel?* (University of Westminster.). Retrieved from https://westminsterresearch.westminster.ac.uk/item/9zyvq/risk-regulation-in-islamic-banking-does-saudi-arabia-need-to-adopt-the-risk-regulation-practices-of-basel

Shingjergji, A., & Hyseni, M. (2015). The Determinants of the Capital Adequacy Ratio in the Albanian Banking System During 2007 - 2014. *International Journal of Economics, Commerce and Management*, *3*(1), 1–10.

Short, H., & Keasey, K. (2002). Managerial Ownership and the Performance of Firms: Evidence from the UK. *Journal of Corporate Finance*, *5*(1), 79–101.

Sibindi, A. B. (2017). Determinants of Capital Structure: An Empirical Study of South African Financial Firms. University of South Africa.

Siklos, D. (2016). Capital Adequacy Regulations in Hungary: Did It Really Matter? In *ESM Working Papers* (No. 11).

Simion, K. (2016). Qualitative and Quantitative Approaches to Rule of Law Research. *The International Network to Promote the Rule of Law (INPROL)*, *7*(7), 1–65.

Simon, B. M. K., & Goes, J. (2013). Correlational Research. In J. L. Christopher, B. L. Cunningham, D. J. Weathington, & Pittenger (Eds.), *Understanding and Conducting Research in the Health Sciences* (1st ed., pp. 253–284).

Smolo, E., & Hassan, M. K. (2010). Capital Adequacy Requirements for Islamic Financial Institutions: Key Issues. In *Islamic Finance Instruments and Markets* (1st ed., pp. 61–65).

Spinassou, K., & Wardhana, L. I. (2018). Regulation of Islamic Banks: Basel III Capital Framework and Profit-Sharing Investment Accounts. *HAL Open Archives*, 1–17. Retrieved from https://hal.archives-ouvertes.fr/hal-01674376v3

Srairi, S. (2013). Ownership Structure and Risk-taking Behaviour in Conventional and Islamic Banks: Evidence for MENA Countries. *Borsa Istanbul Review*, *13*(4), 115–127.

Sufian, F. (2008). Determinants of Bank Profitability in a Developing Economy: Empirical Evidence from the China Banking Sector. *Asian Academy of Management Journal of Accounting and Finance*, *4*(2), 91–112.

Surow, F. A. (2014). *The Effects of Micro Economic Variables on the Financial Performance of Islamic Banks in kenya*. University of Nairobi.

Sutrisno, M. (2018). Factors Determinant of Bank Capital Suffer: Empirical Study on Islamic Rural Banking in Indonesia. *Advances in Social Science, Education and Humanities Research (ASSEHR)*, *186*(15), 84–87.

Tarbert, H. (2000). Are International Capital Adequacy Rules Adequate ? The Basle Accord and beyond. *University of Pennsylvania Law Review*, *148*(5), 1771–1849.

Thabet, O. Bin, & Hanefah, M. M. (2014). Capital Structure in Islamic Capital Markets: Evidences from Bursa Malaysia. *Proceedings of the Australian Academy of Business and Social Sciences Conference*, 12. Adelaide, Australia: Australian Academy of Business and Social Sciences Pty Ltd.

The World Bank. (2013). Why are Minimum Capital Requirements A Concern for Entrepreneurs? In *Doing Business 2014: Understanding Regulations for Small and Medium-Size Enterprises* (11th ed., pp. 41–45).

The World Bank. (2018). Islamic Finance Bulletin. In *World Bank Group Bulletin* (No. 42). Retrieved from https://www.tkbb.org.tr/research-and-reports

Thumbi, G. (2014). *Effects of Credit Risk and Working Capital on Capital Adequacy for Commercial Banks in Kenya*. University of Nairobi.

Valipour Pasha, M. (2015). Analysis of the Capital Adequacy Ratio and Nonperforming Loans Relationship in the Banking Network of Iran. *Journal of Money and Economy*, *9*(3), 59–83.

Van den Heuvel, S. J. (2002). Does Bank Capital Matter for the Transmission of Monetary Policy ? *Economic Policy Review*, *8*(1), 161–172.

van Greuning, H., & Brajovic Bratanovic, S. (2009). Analyzing Banking Risk: A Framework for Assessing Corporate Governance and Risk Management. In *The International Bank for Reconstruction and Development/ The World Bank* (3rd ed.).

Vazquez, F., & Federico, P. (2015). Bank Funding Structures and Risk: Evidence from the Global Financial crisis. *Journal of Banking & Finance*, *61*, 1–14.

Wang, G. C. S. (1996). How to Handle Multicollinearity in Regression Modeling. *Journal of Business Forecasting Methods & Systems*, *15*, 23–27.

Wasiuzzaman, S. (2018). Profitability of Islamic Banks in Malaysia: An Empirical Analysis. *Asian Economic and Financial Review*, *8*(1), 38–51.

Wiley, J., & Gardener, E. P. M. (2010). Managerially Specific (MS) Framework for Bank Capital Adequacy. *Managerial and Decision Economics*, *11*(1), 39–51.

Williams, C. (2007). Reseach Methods. *Journal of Business & Economic Research*, *5*(3), 65–71. Retrieved from https://clutejournals.com/index.php/JBER/article/view/2532/2578

Wong, J., Choi, K., & Fong, T. (2007). Determinants of the Capital Level of Banks in Hong Kong. In *Hong Kong Monetary Authority Working Papers* (No. 06/2007). Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1032032

Workneh, B. (2014). *Determinants of Capital Adequacy Ratio of Commercial Banks in Ethiopia* (Addis Ababa University). Retrieved from Masters

Yang, H. (2012). Visual aAsessment of Residual Plots in Multiple Linear Regression: A Model-based Simulation Perspective. *Multiple Linear Regression Viewpoints*, *38*(2), 24–37.

Ye Ekström, S., & Kanaporyte, I. (2015). *The Determinants of Capital Structure: A Comparison of Listed Large Capitalization Non-Financial Companies in the USA and Sweden* (Lund University). Retrieved from http://lup.lub.lu.se/student-papers/record/5473778%5Cnhttp://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=5473778&fileOId=5473783

Yego, K. J. (2016). *The Impact of Fraud in the Banking Industry: A Case of Standard Chartered Bank*. United States International University.

Yolanda. (2017). Capital Adequacy Ratio and its influencing Factors on the Islamic Banking in Indonesia. *Ikonomika: Journal of Islamic Economics and Business*, *2*(2), 162–176.

Yüksel, S., & Özsarı, M. (2017). Influencing Factors of Capital Adequacy Ratio of the Deposit Banks: A Panel Regression Analysis for Turkish Banking Sector. *TIMAM - Finance*, 1–9. Retrieved from https://paris2017.econworld.org/

Zins, A., & Weill, L. (2017). Islamic banking and risk: The impact of Basel II. *Economic Modelling*, *64*, 626–637.

Žmuk, B., Lutilsky, I. D., & Dragija, M. (2016). The Choice of A Sampling Procedure for a (Too) Small Target Population: The Case of Croatian Public Hospitals. *Zbornik Ekonomskog Fakulteta u Zagrebu, Godina*, *14*(2), 19–44.

Zubair, H. (2014a). Basel Accords and Islamic Banking: A Critical Evaluation. *Munich Personal RePEc Archive*, *56446*, 0–16. Retrieved from https://mpra.ub.uni-muenchen.de/56446/

Zubair, H. (2014b). Basel Accords and Islamic Fnance with Special Reference to Malaysia. *Munich Personal RePEc Archive*, (52941), 1–15. Retrieved from https://mpra.ub.uni-muenchen.de/52941/

APPENDICES

Appendix 1: The Selected Banks (Arranged In Order of Bank Name)

S.N	Code	Bank Name	Incorporated in
1	ABC IB	ABC Islamic Bank	Bahrain
2	ADIB	Abu Dhabi Islamic Bank PJSC	UAE
3	AUB	Ahli United Bank	Kuwait
4	AJMAN	Ajman Bank	UAE
5	AL BARAKA	Al Baraka Banking Group B.S.C	Bahrain
6	AHB	Al Hilal Bank	UAE
7	RAJHI	Al Rajhi Bank	Saudi Arabia
8	AL SALAM	Al Salam Bank	Bahrain
9	ALINMA	Alinma Bank	Saudi Arabia
10	ALIZZ	Alizz Islamic Bank	Oman
11	BISB	Bahrain Islamic Bank	Bahrain
12	BAB	Bank Al Bilad	Saudi Arabia
13	BAJ	Bank Al Jazira	Saudi Arabia
14	BKNZ	Bank Nizwa	Oman
15	BARWA	Barwa Bank	Qatar
16	BOUBYAN	Boubyan Bank	Kuwait
17	DIB	Dubai Islamic Bank	UAE
18	EIB	Emirates Islamic Bank	UAE
19	ITHMR	Ithmaar Bank	Bahrain
20	KHCB	Khaleeji Commercial Bank	Bahrain
21	KFH	Kuwait Finance House	Kuwait
22	KIB	Kuwait International Bank	Kuwait
23	MASRAF	Masraf Al Rayan	Qatar
24	NOOR	Noor Bank	UAE
25	QIIB	Qatar International Islamic Bank	Qatar
26	QIB	Qatar Islamic Bank	Qatar

27	SIB	Sharjah Islamic Bank	UAE
28	WARBA	Warba Bank	Kuwait

Source: GCC Central Banks (CBB, 2019; CBK, 2019; CBO, 2019; CBUAE, 2019; QCB, 2019; SAMA, 2019).
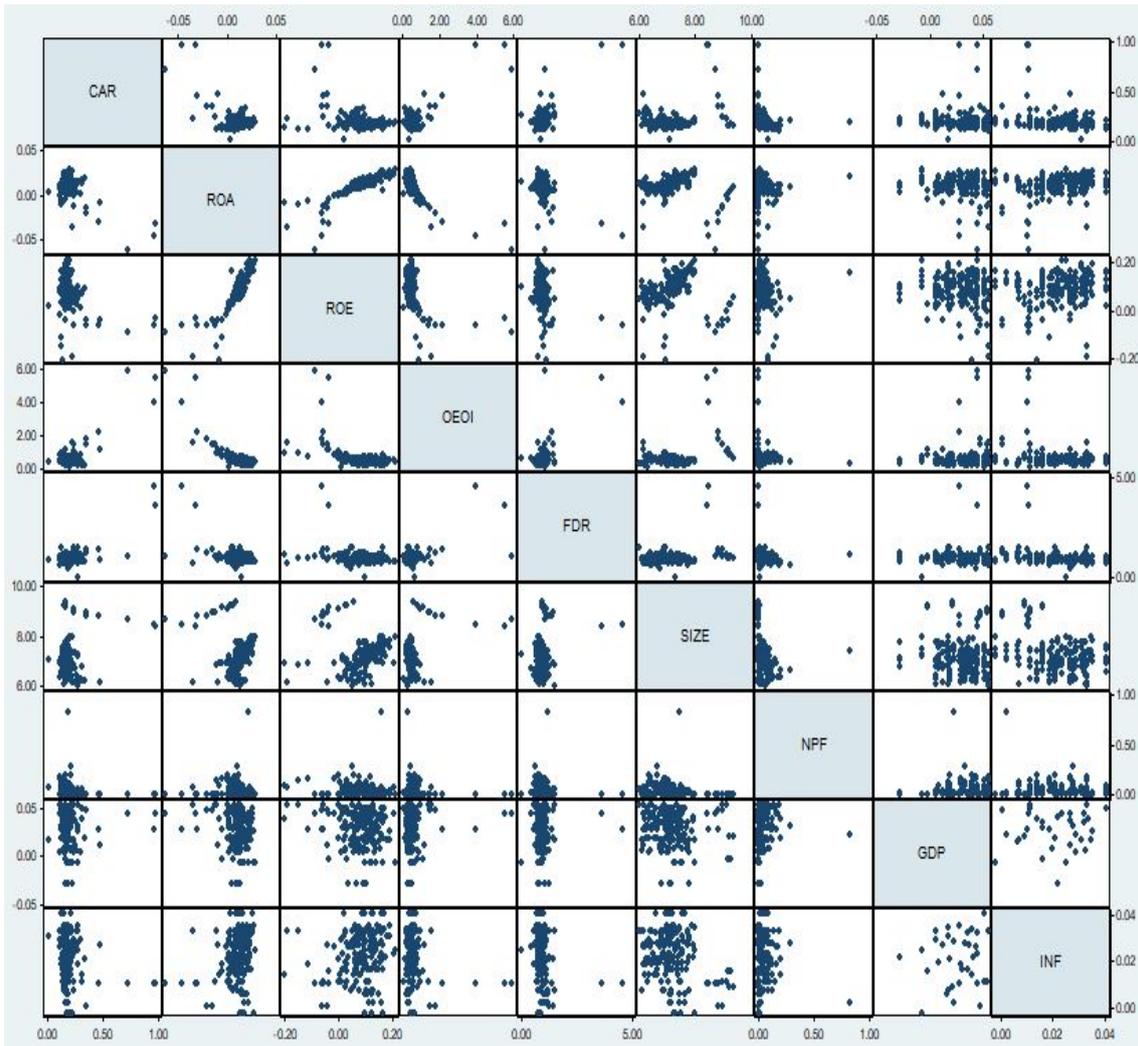
Appendix 2: Graphical Data Point Outlier Detection (Scatter Matrix Plot)

Source: Author Computation

Appendix 3: Classification of Regulatory Capital Components

Basel III Common disclosure template *(For transition period from 1 January 2015 to 31 December 2018)*	PIR as on 31 Dec 2017
Common Equity Tier 1 capital: instruments and Reserves	
Directly issued qualifying common share capital plus related stock surplus	1,874,607
Retained earnings	585,101
Accumulated other comprehensive income (and other reserves)	1,317,401
Common share capital issued by subsidiaries and held by third parties (amount allowed in group CET1)	324,161
Common Equity Tier 1 capital before regulatory adjustments	**4,101,270**
Common Equity Tier 1 capital: regulatory adjustments	
Goodwill (net of related tax liability)	431,297
Other intangibles other than mortgage-servicing rights (net of related tax liability)	43,430
Deferred tax assets that rely on future profitability excluding those arising from temporary differences (net of related tax liability)	1,615
Cash-flow hedge reserve	(26,659)
Significant investments in the common stock of banking, financial and insurance entities that are outside the scope of regulatory consolidation, net of eligible short positions (amount above 10% threshold)	-
Total regulatory adjustments to Common equity Tier 1	**449,683**
Common Equity Tier 1 capital (CET1)	**3,651,587**
Additional Tier 1 capital: instruments	
Directly issued qualifying Additional Tier 1 instruments plus related stock surplus	400,000
Additional Tier 1 instruments (and CET1 instruments not included above) issued by subsidiaries and held by third parties (amount allowed in group AT1)	163,813
Additional Tier 1 capital before regulatory adjustments	**563,813**
Total regulatory adjustments to Additional Tier 1 capital	**-**
Additional Tier 1 capital (AT1)	**563,813**
Tier 1 capital (T1 = CET1 + AT1)	**4,215,400**
Tier 2 capital: instruments and provisions	
Directly issued qualifying Tier 2 instruments plus related stock surplus	113,769
Tier 2 instruments (and CET1 and AT1 instruments not included above) issued by subsidiaries and held by third parties (amount allowed in group Tier 2)	51,655
Provisions & Reserves	348,577
Tier 2 capital before regulatory adjustments	**514,001**
Total regulatory adjustments to Tier 2 capital	**-**
Tier 2 capital (T2)	**514,001**
Total capital (TC = T1 + T2)	**4,729,401**

Source: Ahli United Bank. (2017). Pillar III Disclosures - Basel III. In *Regulatory Disclosures*, p.24.

Appendix 4: Classification of Credit Risks and Its Capital Requirement

	Gross exposure	Secured by eligible CRM	Risk weighted exposures after CRM	Capital requirement
			US$ '000	
Claims on sovereigns	5,553,979	-	303,151	37,894
Claims on public sector entities	1,228,596	-	842,490	105,311
Claims on banks	5,042,285	116,985	2,276,992	284,624
Claims on corporates	18,860,898	1,007,255	17,386,894	2,173,362
Regulatory retail exposures	1,982,139	9,199	1,479,705	184,963
Residential mortgage exposures	1,537,630	-	653,631	81,704
Equity	361,067	-	879,737	109,967
Investments in funds	39,816	-	58,860	7,358
Other exposures	1,190,807	-	1,614,233	201,779
TOTAL	35,797,217	1,133,439	25,495,693	3,186,962
TOTAL CREDIT RISK CAPITAL REQUIREMENT (STANDARDISED APPROACH)			25,495,693	3,186,962

Source: Ahli United Bank. (2017). Pillar III Disclosures - Basel III. In *Regulatory Disclosures*, p.9.

CURRICULUM VITAE

Abdilatif Mao ALI was born in Mogadishu, Somalia, in the year 1988 and graduated from Ma'mur Primary and Secondary School therein. He received Bachelor of Arts in Accounting and Finance from New Generation University College in Addis Ababa, Ethiopia. In Sakarya University's Faculty of Social Science, Abdilatif is currently pursuing Master of Islamic Economics and Finance.