People's Democratic Republic of Algeria

Ministry of Higher Education and Scientific Research

Faculty of Economic, Commercial and Management Sciences.

Thesis submitted to complete the requirements for an academic master's degree

Department of Financial and Accounting Sciences

Section: Finance and Accounting

Specialization: Finance and Banks

The Title

The impact of capital adequacy on bank's performance (evidence from selected Middle East and north African commercial banks)

Presented by

Ms. Maaradji Chaima

Ms. Messous Wissam

Thesis supervisor

Dr.Benzai yassine

Discussed and publicly approved on 13 July 2021

In front of the committee composed of Messrs:

Dr.	Rafafa Ibrahim	President
Dr.	Benzai Yassine	Supervisor
Dr.	Boutaiba faycel	Discusser

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Dedication

This dissertation is dedicated to our parents who instilled in us the virtues of perseverance and commitment and refentfessfy encouraged us to strive for excellence.

Acknowledgment

First and foremost, we must thank God for giving us the strength to go on, secondly we would like to thank our thesis supervisor, Dr. Benzai Yassine, for his daily support and encouragement of the idea of thesis in English, which he consider to be a challenge to us, he consistently allowed this thesis to be our own work but he steered us in the right direction whenever he thought we needed it. We would like to thank all the professors who have supervised our teaching throughout our university career, finally we must express our very profound gratitude to our parents for providing us with unfailing support and continuous encouragement through the process of researching and writing this thesis, this accomplishment would not have been possible without them. Thank you.

List of Acronyms

MENA	**Middle East And North Africa**
CAR	**Capital Adequacy Ratio**
MCR	**Minimum Capital Requirement**
TCR	**Total capital ratio**
SA	**Standardized approach**
RWA	**risk-weights assets**
IRB	**The internal ratings-based approach**
AIRB	**The advanced internal ratings-based approach**
BIA	**The basic indicator approach**
AMA	**The advanced measurement approach**
IMA	**Internal Models Approach**
ROA	**Return On Assets**
ROE	**Return On Equity**
MVA	**Market Value Added**
EVA	**Economic Value Added**
NIM	**Net Interest Margin**

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SUMMARY

SUMMARY

INTRODUCTION

The banking sector in the world witnessed many developments and updates during the last decade of the twentieth century, because of its great importance in the economies of countries, and these developments were represented in the tremendous technological progress in the banking industry and the development of new financial tools and the opening of financial markets to the world In many countries, very quickly and in an unprecedented manner. However, these positive developments did not limit the economic crises witnessed by the banking sector in many countries, which negatively affected their economies.

What is interesting in this matter is that most of the countries that suffered from economic and financial crises were the common factor. Among them are problems related to banks, and this is due to poor management and due to the increase in banking risks, especially credit risks. The nature of the various banking activities and the return that commercial banks seek to achieve made the latter face many obstacles and risks, which directly affect their profitability in the market.

The main pillar that has become governing the activities of banks is the management of risks and the search for the best alternatives to reduce them. In this context, the attention of the Basel Committee on Supervision was focused. The latter issued many guiding documents for the management and management of banking risks. After the Basel Agreement 1 of 1988, which approved the minimum capital adequacy to face credit risks and in the face of the development of risks and their increasing complexity, the Basel Agreement was updated by adding amendments, as the agreement appeared Basel 2, which worked to achieve proportionality between the bank's capital and its risky assets, in addition to strengthening the role of supervisory authorities and raising the level of transparency and disclosure.

It was expected that the banking system would witness a qualitative leap with the implementation of Basel 2 at the beginning of 2007, but the world is in this The period witnessed a severe financial crisis, which led to a deep and comprehensive review of the provisions and proposals of the Basel II agreement, to generate the Basel III agreement in September 2010, which consists of a set of new regulatory standards, on top of which is the capital adequacy standard.

As for the Middle East and North Africa (MENA) region is of great interest as it represents the bridge connecting Europe with Asia and its banking sector is relatively young . Since 2000, the size of the economy in many countries of MENA region has increased significantly and their financial sector has expanded. Although restructuring initiatives in the MENA region are not taking place as fast as in Eastern Europe and part of Asia, several MENA countries are witnessing new eras in privatization, bank regulation and market-oriented financial institutions. This led to efficient and profitable efforts in some countries .(Vassakis, Lemonakis, Stylianos, & Voulgaris, 2015)

1. The Problematic of The Research

The capital adequacy criterion is one of the most important decision of the Basel commite in its contribution to controlling and managing banking risks at the level of banks whether local or international .Based on the foregoing, the most important problem of this research relates to the following main question:

- ✓ Does the capital adequacy standard contribute to the performance of commercial banks in the Middle East and North Africa region?

- ➢ **<u>To provide answers to this problematic, we will use the following sub-questions</u>:**

1- What do we mean by the Basel Accords on Banking Regulation and Supervision and how the Capital Adequacy criterion from Basel I to Basel II and Basel III ?

2- What do we mean by the banking performance?

3-Does the capital adequacy criterion affect the banking performance in the context of the MENA Banking system?

4- How do the bank specific variables and banking system-macroeconomic specific variables interact with the Capital Adequacy when affecting the banking performance in the MENA region ?

2. The Hypotheses

In this study, we develop the following hypotheses**:**

H1: The capital adequacy ratio is a very essential criterion for the performance of banks through managing the different banking risks.

H2: The Capital Adequacy has a significant positive effect on the different banking performance indicators .

H3 : The Capital Adequacy affects the banking performance through the interaction of different bank specific and banking system specific variables such as : the bank size, liquidity , financial deepness,...etc

3. The Research Importance

The importance of this study stems from the fundamental role and great importance of commercial banks in the economies of countries, especially the countries of North Africa and the Middle East, as they are modern countries in the field of banking industry, as these banks mobilize savings, employ them in various aspects of investment and given the lack of studies related to this subject, this may gain The research is of great importance, as the issue of managing the bank according to the capital adequacy standard is one of the internal policies of the bank that is not usually disclosed.

Since controlling the bank's management is a conclusive evidence of successful management, the need for new tools and mechanisms has emerged to improve this management, especially with regard to risks and the attempt to reduce and control it, which led to the emergence of the capital adequacy standard in the banking sector.

4. The Aims of Research

The objectives of the research can be summarized in the following points:

- Providing a broad view of banking management.
- Determining the concept of capital adequacy in banks and the method of estimating it.
- Studying the various contents of the Basel Accords with regard to capital adequacy and linking them to the performance of the bank.
- Studying the contribution and impact of the capital adequacy standard on MENA region.

5. The Reasons for choosing the topic

Among the reasons behind choosing this topic are the following

- The nature of the specialization and its direct relationship to everything related to the bank.
- The importance of banking management in advancing the banking sector and economic development
- Considering the adequacy of capital in banks is a renewable issue, as the Basel Committee approved many amendments and decisions
- The lack of studies related to banks, which neglected the aspect related to capital adequacy

6. Structure of the Search

In order to answer the research problem, the work was divided into three chapters:

Where we will discuss in the first Chapter Banking regulation and supervision under Basel guidance Through four sections The first section deals An overview of the Basel Committee as for The second section present Basel I ,the third section It presents Basel II And concerning the last section is devoted to Basel III.

As for the second chapter, it has been structured to present The banking performance in terms of profitability It also contains three sections represented in The production of the banking firm In the first section, while studied The performance measurement in banks in the second section, concerning the third section it has revealing the impact of profitability in the bank performance.

the third chapter It includes the impact of capital adequacy on the performance of Middle East and North African banks: empirical study, This chapter deals with the practical side of the study, the first section it show an overview of the banking system in some countries of MENA region, As for the second section it represent the Literature review , the third section contain the Research Methodology, Data and Variables Let's move on to the last section of this chapter, which will be show An empirical study on the impact of capital adequacy on the performance of banks in the Middle East and North Africa.

CHAPTER I

BANKING REGULATION AND SUPERVISION UNDER BASEL GUIDANCE

Introduction of the Chapter One

The issue of capital adequacy for commercial banks is one of the most important topics that bank experts have been concerned with, especially in recent times. This is a result of the great economic transformations the world has gone through, which were linked to the results of economic globalization, as the latter produced freedom in the movement of capital and this across various international borders. , which led to the destabilization of financial and banking stability and made the economy into chaos and created a set of crises that had significant negative effects on the banking system and banking performance, especially with the increase in competition and the escalation of banking risks. It has become necessary to think of mechanisms that contribute to the development of banks' performance through the establishment of a supervisory system in accordance with unified international standards to limit the deterioration of the banking system and performance.

The capital adequacy criterion is considered one of the tools used by countries that were suffering from crises in order to strengthen banking performance and mitigate the amount of risks.

Capital adequacy has become a focus of attention by international bodies, including the International Basel Committee, due to its great importance and its effective role in facing risks and improving Banking business. In this chapter, we will address the bank capital adequacy criterion and highlight the various amendments it has undergone, according to what was stated in the First, Second and Third Basel Agreement and its impact on the development of the bank, by dividing the chapter into sections that will be addressed as follows:

- **Section One An overview of The Basel Committee**
- **Section Two Basel I**
- **Section Three Basel II**
- **Section Four Basel III**

1. Section One: An overview of the Basel Committee

Abstract

The history of many bank failures has devastated the entire economy as well as the global financial situation. Regulators try as much as possible to reduce exposure to risks through various procedures, regulations, including the Banking Supervision Organization, which defined several successive amendments from Basel 1 to Basel 3, which attached great importance to the element of capital adequacy it was considered one of the most important policies aimed at reducing risks and bank collapse. The principle of capital adequacy is based on the idea that the minimum capital must be sufficient to absorb any potential losses. While the capital acts as a buffer for the bank, the higher the buffer, the lower the risk of default during tough times.

1.1 A Brief History of Banking Regulation and Basel Accords

The roots of the Basel Committee on Banking Supervision can be followed back to the turmoil of major of financial markets, which brought about in this the collapse of the Breton Woods framework of overseen trade rates in 1973. After the collapse of the latter many banks incurred significant foreign exchange losses.

On June 26, 1974 a West German assembly took put at which the Federal Banking Supervision Office revoked Bankhaus Herstatt's banking licencean account permit after finding that the bank's outside trade chance equalled three times its capital. Banks exterior Germany brought about overwhelming misfortunes in their dubious exchanging with Herstatt, including an worldwide measurement to the turmoil.

In October of the same year, the Franklin National Bank in New York City closed after incurring significant foreign exchange losses .In response to these various fluctuations in global financial markets in general, bank governors in the G10 countries established a committee on banking regulations and supervision of practices of the end of 1974 After that, the name of the Basel Committee on banking Supervision was designed as a forum for regular cooperation between its member countries on banking supervisory matters. The objective of the committee was and remains to enhance financial stability by improving supervisory knowledge and quality of banking supervision worldwide. (BankingSupervision, 2014, p. 01)

This committee seeks to achieve its objectives by setting the guidelines for the supervision of banks. By sharing different supervisory issues, strategies, and procedures to advance engagement and enhance understanding across all borders. Through the process of exchanging information, the banking sector has witnessed great developments, and this has helped to bring about a qualitative leap in defining the current and expected risks at the level of the global financial system, as well as the possibility of dealing with the challenges posed by financial conglomerates.

The Committee also works with many bodies to set various standards Since the initial assembly, which was held in February 1975, numerous assemblies have been followed routinely three or four times a year. Having started its life as a G10 body, the commission extended its membership in 2009 and thereafter in 2014 and is currently made up of 28 jurisdictions. The Committee currently also submits intermittent reports to supervisory professionals as well as the Group of Central Bank Governors and Chiefs of Supervision (GHOS) (BankingSupervision, 2014, p. 01).The committee

represents the Central Banks and supervisory authorities of the Group of Ten (G10)industrialised countries plus

Luxembourg. The committee aims to improve the co-operation on international regulatory issues by establishing principles and recommendations for effective regulatory and supervision of the international banking sector. (Qaisi, 2016, p. 36) The current chair of the committee is Stefan Ingves, Governor of Sveriges Riksbank, Swede Central Bank. Committee decisions are not subject to legal force. (BankingSupervision, 2014, p. 01)

The committee formulates the oversight of Standards, guidelines and good practices. The committee encourages full, timely and consistent implementation of its standards by members, and in 2012, began monitoring implementation to improve resilience of the global banking system, enhance public confidence in prudential ratios and encourage raising the regulatory level for internationally active banks. (BankingSupervision, 2014, p. 01)

Before getting into the details of the Basel 1 Accord, let's take a look at the (limited) history of banking regulation and bank failures, which are inextricably intertwined, with a focus on the last few decades.

A study of bank failures is also very informative in allowing a critical assessment of suggested legislative changes' capacity to avoid systemic crises. If a bank experiences liquidity issues, the appropriate authorities can usually supply the necessary interim money to fix the problem. Insolvency of a bank, on the other hand, might have far-reaching consequences. If governments are forced to act, it may be with taxpayer funds, which may be unpopular with their citizens. Being bankrupt means being unable to absorb losses, and capital is the primary means of absorbing losses.

As a result, when regulators have attempted to adopt various regulations, one of the key quantitative requirements imposed has frequently been solvency ratios (which have multiple definitions). Following moments of crisis, the history of banking regulation has been a series of waves of deregulation and tighter restrictions. Many people nowadays believe that banks in industrialized countries are immune to bankruptcy and that their savings are fully guaranteed, but this has not been the case over the past two or three decades (Balthazar, 2006, p. 05)

Below we will go through the most important historical stations that the banks went through:

1.2 A chronology of banking regulation: 1979–1999

1979 In the United States, the OCC began stress and emphasizing the amounts of credit being extended to developing nations by the big American commercial banks. He imposed restrictions: the presentation of one borrower may not be higher than 10 percent of his capital and reserves.

1980 This was considered the beginning of the American savings and loan crises which lasted for a long period of ten years. The S&L institutions experienced a breakneck speed in their development after 1929. Their principal business was to provide long-term, fixed-rate mortgage loans financed through short-term deposits. Mortgages had low credit risk, and as a result of us federal law that limited the rate of interest paid on deposits Interest rate margins were comfortable, but the situation quickly changed after the turbulent economic environment in the seventies.

In 1980, the effective interest rate obtained on a mortgage portfolio was around 9 percent while inflation was at 12 percent and government bonds at 11 percent. Money market funds grew from $9 billion in 1978 to 188 1 billion US dollars in 1981, which meant that S&L faced increasing funding problems and to solve this latter problem, regulators removed the maximum interest rate paid on deposits. But to make up for more expensive financing, S&L had to invest in riskier assets: land, development, construction, junk bonds.

1981 Seeing the banking sector deteriorating, US regulators for the first time introduced a capital ratio at the federal level. Federal banking agencies required a certain level of leverage ratio on primary capital (basically equity and loan loss reserves: total assets).

1982 Mexico announced that it could not repay $80 billion in debt. By 1983, a total of 27 countries had undergone debt restructuring 239 billion US dollars. Although OCC had tried to impose restrictions regarding concentration, a single borrower is defined as An entity that has its own funds to repay credit. But as a public entity There are many borrowers in developing countries, mergers Many banks have exposure to the public sector that far exceeds 10 Percentage limit (some banks have risk exposure equal to more than twice that Capital and reserves).

U.S. regulators decided not to pressure banks direct write-off of all non-performing loans, which will lead to countless Bankruptcy, but the write-off is done gradually. It took ten years for large banks to completely clear up their balance sheets of those bad assets.

1983 U.S. International Lending and Regulatory Act (ILSA) Uniform Capital The requirements of various bank types account for 5.5% of total assets And unified the definition of capital. It highlights the growing Banking regulation requires international convergence. the same One year, the Rumassa crisis hit Spain.

The Spanish banking system has It was highly regulated in the 1960s. Interest rates are regulated; The market is closed to foreign banks. In 1962, the new bank license Approved: Since the industry is stable and profitable, there are many Candidates. But most entrepreneurs who get a license do not Bank experience, they often use the bank as a way of

financing their industrial group, which resulted in a very inefficient financial sector. Supervision of suspicious assets and reserves is also weak, which gave a false picture to the health of the sector.

When the time for deregulation comes, the consequences It was disastrous again. From 1978 to 1983, more than 50 commercial Banks (half of commercial banks at the time) received crisis. Small banks go bankrupt first, then big banks, and then in 1983, the Rumasa Group was severely affected.

Rumasa is a holding company Controls twenty banks and several other financial institutions, this crisis look likely to have a systemic impact. The crisis is Eventually resolved by creating mechanism to take over the troubled Banks, use existing capital to absorb losses (punish shareholders), Then get new funding from the government when needed. There were also several nationalizations. The root of the crisis lies in the economy Weakness to the poor management and supervision.

1984 The Continental Illinois failure – the biggest banking failure in American history. With its 40 billion USD of assets, Continental Illinois was the seventh largest US commercial bank.

It had been rather a conservative bank, but in the 1970s the management decided to implement an aggressive growth strategy in order to become Number One in the country for commercial lending. It reached its goal in 1981: specific sectors had been targeted, such as energy, where the group had significant expertise. Thanks to the oil crises, the energy sector had enjoyed strong growth, but at the beginning of the 1980s, energy prices went down, and banks involved in the sector began to experience losses an important a part of Continental's portfolio was made from loans to developing countries, which didn't improve things.

Continental began to be cited regularly within the press. The bank had few deposits due to regulation that prevented it from having branches outside its state, which limited its geographic expansion. It had to believe less stable sources of funding and used certificates of deposits (CDs) on the international markets.

Within the first quarter of 1984, Continental announced that its non-performing loans amounted to 2.3 billion USD. When stock and rating analysts began to downgrade the bank, there was a run because the federal law didn't protect international investors' deposits.

The bank lost 10 billion USD in CDs in two months. This posed a crucial systemic threat as 2,299 other banks had deposits at Continental (of which 179 may need followed it into chapter 11 if it had been declared insolvent following a FDIC study). it had been decided to rescue the bank: 2 billion USD was injected by the regulators, liquidity problems were managed by the FED, a 5.3 billion USD credit was granted by a gaggle of twenty-four major US banks, and top management was laid off and replaced by people chosen by the govt. the entire estimated cost of the Continental case was 1.1 billion USD, not a lot considering the bank's size, because of the effectiveness of the way the regulators had handled the case.

1985 Following the 1983 financial crisis in Spain, a replacement regulation was issued: expertise, independence, and integrity criteria were adopted for the issuance of new banking licenses; the principles for provisioning and doubtful assets were examined and thus the old regulatory percentage of equity: A ratio of equity: debt was abandoned in favour of a ratio of

equity: assets weighted in six classes by function of their risk level, three years before Basel1.

In Europe, the European Commission published a White Paper on the formation of a Single Market. In the banking industry, there are a number of factors to consider. Was a demand for a one-of-a-kind banking license and regulation made by the home nation, and it's well-known around the world.

1986 The S&L's financial soundness was rapidly degraded by riskier investments and funding concerns that began to plague the sector in 1980. The final blow came in 1986, when the tax treatment of mortgages was changed.

S&L's government insurer went bankrupt, resulting in the insolvency of 441 S&Ls. Having a total asset value of 113 billion dollars; 553 others had capital levels of less than 2% of 453 billion dollars in assets they accounted for 47 percent of the total of the S&L sector .To deal

With the crisis, authorities told depositors that their funds would be insured by the federal government (to avoid Bank runs), and they purchased insolvent S&Ls in order to sell them.

Return to other banking conglomerates only half of the S&Ls existed in the 1990s.There were still remnants of the 1980s. The Bank of England supervised banks in the United Kingdom, whereas the securities market was largely self-regulatory. The Financial Services Act (FSA) of 1986 altered the situation by establishing independent regulating bodies. As a result, UK regulation differed from the continental model to get closer to the post-Glass–Steagall framework in the United States

1987 The stock exchange has crashed. The Dow Jones index dropped 22.6 percent in a single day (Black Monday), the largest one-day drop since the 1929 disaster.12.8 percent had been the figure. (However, this was not as terrible as it had been in 1929.)
The Dow Jones had already recovered five months later).

In the city of Paris, The CAC40 fell 9.5 percent, while the Nikkei fell 14.9 percent in Tokyo.

Japan had fared reasonably well during the crisis of the 1970s. In 1988, the country's GDP increased by 6% while inflation was only 0.7 percent. Its social concept was quite precise (lifetime job guarantees in exchange for income and working time flexibility). The Japanese management style was held up as an example, and Japanese businesses, notably banks, expanded their international footprint quickly.

The stock and real estate markets in Japan were expanding, and there were tremendous American pressures on Japan to open its markets or even guarantee some market share for American firms on the domestic market (in the electronic components industry, for example).

1988 The Directive on the Liberalization of Capital Flows is a major directive aimed at creating a unique European market for the financial services industry. A specific endeavour eventually put an end to calls for the development of uniform international law.

The G10 countries (Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, and the United Kingdom) At a meeting at the Bank for International

Settlements (BIS) in Basel, Switzerland, representatives from central banks and regulatory authorities formed a committee.

Their purpose was to clarify the roles of various regulators in the case of multinational banking groups, to ensure that such groups did not evade supervision by forming holding companies, and to ensure that such groups did not avoid supervision by forming holding companies. as well as to promote a level playing field. They published a reference paper in 1988 that became the basis of national regulation in more than 100 nations a few years later: the 1988 Basel Capital Accord.

1989 The second Banking Directive contained principles established in the European Commission White Paper of 1985. It reinforced the European concept of universal banking (no distinction between securities firms and commercial banks), ignoring the necessity for national agreement on opening branches in other countries. It separated the regulatory function between the home country (solvency issues) as well as the host country (liquidity, Advertising, monetary policy). The home-country concept permitted the UK to keep its dual system in place.

1991 The first hints of inflation in Japan occurred in 1989. In response, the Bank of Japan (BoJ) raised interest rates five times in 1990. The stock market began to react, and by the end of 1990, it had lost half of its value, and the real estate market had begun to show signs of weaknesses as well. For the next ten years, the market would be on a declining trend. The first bank failures happened in 1991, but they were only small banks, and people were still hopeful about the economy's future. The regulators took a "wait-and-see" approach.

The liberalization of the 1980s in Norway prompted banks to pursue an aggressive development strategy: between 1984 and 1986, the volume of credit supplied increased at a rate of 12% per year (inflation-adjusted). The economy was impacted hard in 1986 by a downturn in oil prices (because oil was one of the country's key exports). Bankruptcies rose fast, with loan losses rising from 0.47 percent in 1986 to 1.6 percent in 1989. The deposits insurance mechanism was utilized to inject capital into the initial banks that were in trouble. However, the three largest Norwegian banks disclosed significant loan losses and higher funding costs in 1991.

The insurance fund was insufficient to save even one of those institutions, so the government had to step in to prevent the entire financial system from collapsing. It pumped money into a number of banks, eventually controlling 85 percent of all banking assets. At the end of 1993, the overall net cost of the crisis (funds invested less the value of the shares) was projected to be 0.8 percent of GDP.

Sweden followed a similar trend of deregulation, rapid increase in lending activities (particularly mortgage loans), and a real estate asset price bubble. The first hints of weakness occurred in 1989, when the stock exchange's real estate index plunged 50% in the next two years.

NBFIs that had given a considerable number of mortgages were the first to suffer. They were mostly funded through short-term commercial paper due to legal limits, and as the market panicked, they quickly ran out of liquidity.

The issue was subsequently spread to banks, who had significant exposures to finance corporations without realizing it on their balance sheets (because they were competing, little information was disclosed by finance companies).

In 1991, loan losses hit 3.5 percent, then 7.5 percent in the last quarter of 1992. (twice the operating profits of the sector). In 1991, real estate values in Stockholm plummeted by 35%, followed by a 15% drop the following year.

By the end of 1991, two of Sweden's six largest banks need government assistance to avoid a financial crisis. The real estate market meltdown in Switzerland from 1991 to 1996 also contributed to the country's predicament. The losses were projected by the Swiss Federal Banking Commission (SFBC) to be 42 billion CHF, or 8.5 percent of the credits given. Half of the 200 regional banks were vanished by the conclusion of the crisis.

1992 The Basel Banking Accord was transferred into the legislation of the majority of the participating countries, despite the fact that it was not mandatory (it is not legally binding) and Japan requested a longer transition period.

1994 The situation in Japan's financial sector did not improve as planned. For the first time, significant banks have gone bankrupt - two urban cooperative banks with deposits totalling 210 billion JPY. To avoid a bank run, the state guaranteed deposits, and a new bank was established to take over and manage the doubtful assets.

1995 in 1995 Banks and other financial institutions in Japan formed the Jusen firms to issue mortgages. However, beginning in the 1980s, they began lending to real estate developers without having the requisite abilities to assess the projects' risks.

In 1995, the combined losses of these enterprises were 6.4 trillion JPY, and the government had to compensate them. To meddle with funds provided by taxpayers in the same year, Barings, London's oldest merchant bank, went bankrupt. In compared to the other failures, this one has a unique feature: it can be traced down to only one man (and to a lack of rigorous controls). The issue was not one of financial risk, but rather one of market and operational risk (matters not covered by the 1988 Basel Accord).

Nick Lesson was the head trader in Singapore, in charge of both trading and trade papers, which he could simply fabricate. He performed some nasty operations on the Nikkei index. He boosted his positions to compensate for his losses**.** roles and camouflaged them to look to be client-related rather than proprietary operations The positions were identified in 1995, albeit the true amount of losses was difficult to determine due to accounting manipulation.

The Bank of England was enlisted to assist in the bank's rescue .After lengthy discussion in the sector, it was determined that, despite its size, Barings did not pose a systemic risk. It was agreed not to use taxpayer funds to cover the losses, which were eventually estimated to be worth 1.4 billion dollars, or three times the bank's capital.

1997 Sanyo Securities, a medium-sized securities firm in Japan, has filed for reorganization under the Insolvency Law. Although it was not thought to be a systemic risk, its failure had a psychological impact on the interbank market. The interbank market swiftly dried up, and

Yamaichi Securities, one of Japan's four largest securities firms, filed for bankruptcy three weeks later. got bankrupt. The government provided the required cash and guaranteed the liabilities because there was a clear risk of a systemic crisis. Yamaichi's bankruptcy was officially announced in 1999.

1998 The Long-Term Credit Bank (LTCB) was Japan's greatest bank failure in history, with assets of 26 trillion JPY and a significant derivatives portfolio. The "Financial Reconstruction Law," a significant change to the legislation, followed**.**

1999 The European Single Currency is established. Money and capital markets moved into the euro after exchange rates were irreversibly fixed.

This brief and rather selective summary of the history of banking regulation and bank failures gives us some context before delving deeper into contemporary regulation. as well as the

Recommended update We can see that an international regulation, at the very least, responds to a growing need for a more secure financial system as well as some criteria to produce a level playing field for international competition.

For more than a century, capital ratios have been used to define minimum regulatory requirements. However, it was only after the multiple financial crises of the 1980s that it became a worldwide standard. Until then, the banking industry favoured a more subjective approach in which regulators could choose whatever capital requirements were appropriate for a certain banks**.** (Balthazar, 2006, pp. 09-15)

The Global bank capital rules are a relatively new idea that has progressed through three stages (see Figure [1.1]). Large banks decreased their capital levels during the financial crises of the 1970s and 1980s.

The Basel Supervisors Committee planned to set capital requirements in 1988 through the Basel Accord in order to safeguard depositors from excess bank and systemic risk.

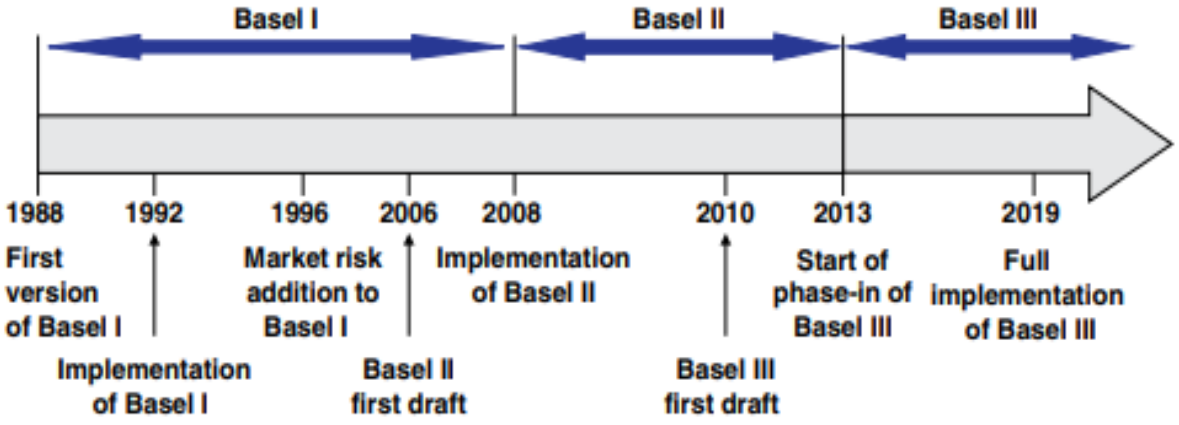
The Basel I Accord established universal capital definitions as well as minimum capital adequacy requirements based on the riskiness of assets (a minimum of 4 percent for Tier 1 capital, which was mainly equity less goodwill, and 8 percent for the sum of Tier 1 capital and Tier 2 capital). (Ramirez, 2016, p. 02)

Basel It was straightforward risk assessments were almost solely focused on credit risk, which was thought to be the most significant risk faced by banks. Basel I capital standards went into effect in December 1992, following years of study and consultation since 1988.

In 1996, Basel I was revised to include capital requirements for dealing with market risk in banks' trading books. Basel I was not sensitive enough in monitoring risk exposures, therefore banking authorities worked on a version of the Basel Agreement in 2004. International Convergence of Capital Measurement and Capital Standards, released by the Basel Committee on Banking Supervision in July 2006, Basel II is the successor to Basel I.

The Basel Committee on Banking Supervision (BCBS) was forced to propose an update to Basel II, known as Basel III, due to the extraordinary severity of the financial crisis of 2007–2008 and the principal the additions made by this committee to enhanced minimum capital ratios changed the definition of capital and the computation of risk weighted assets, and added additional metrics relating to leverage, liquidity, and funding to the prudential regulatory regime that applies to banks. (Ramirez, 2016, p. 02)

Figure [1.1]: Bank regulatory capital accords



Source: (Ramirez, 2016, p. 02)

1.3 The Basel Accord (Risk- Based Capital Standards)

The importance of capital in maintaining a safe and strong financial system cannot be emphasized. Banks can assure that they will be able to satisfy their obligations to their creditors if they keep an adequate amount of capital. (Samina, venus, & rossazana, 2019, p. 13)

An adequate level of capital will also instil confidence and inspiration in depositors and other creditors, encouraging them to believe that the banks would return their debts, even if some of the banks' assets cause them to default. Finally, the Basel Accord has emerged as a supporting factor in ensuring secure financial system and structure stability through the application of a set of norms that is acceptable in all global financial hubs and allows for some scientific risk aversion treatment.

As a provision of the Basel Accord, all banks were subjected to a number of capital requirements. These strict standards are beneficial to the economy since they protect banks' performance from losses resulting from credit, operational, and market risk exposures, as well as ensuring the availability of capital throughout the business cycle. Banks are also protected against systemic risks by the capital restrictions imposed on them.

The Basel Accord, which established minimum capital requirements in 1988, was endorsed by the G1O group. The Accord has since expanded to numerous countries and is in use in over a hundred countries throughout the world.

The BCBS has issued three capital agreements, known as Basel I, Basel II, and Basel III, since 1988. Basel I was implemented by member countries in 1992, while Basel II is currently being implemented in some countries, and Basel III went into force gradually in most member nations on January 1, 2014 (Samina, venus, & rossazana, 2019, p. 14)

2. Section two: Basel I

Abstract

The Basel Committee on Banking Supervisory established a set of banking supervision regulations known as the Basel Accords (BCBS). They were created and developed over a period of several years, from 1980 to 2011, and went through several changes beginning with Basel 1 until Basel 3. In this section, we will provide a comprehensive overview of Basel 1. About its definition, the goal for which it was established, and it's most important decisions.

2.1 Definition of Basel one

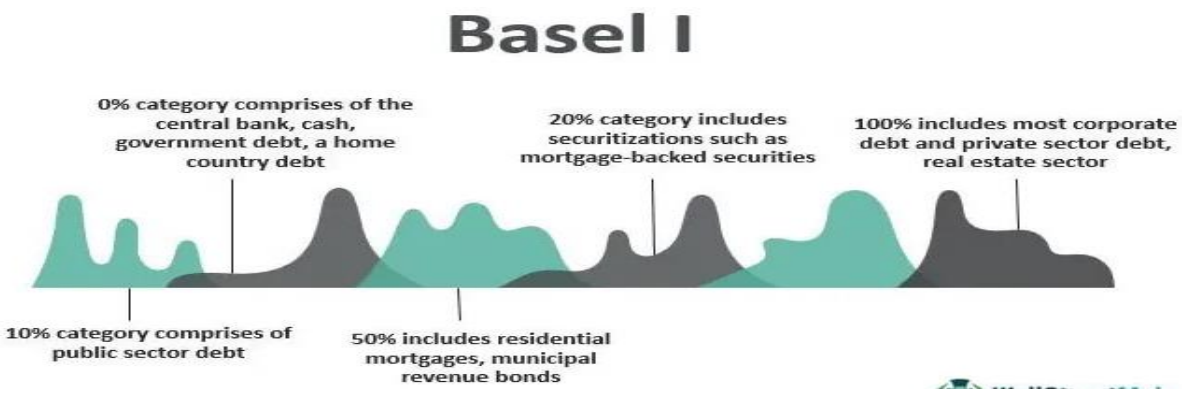
In July 1988, the first Basel Accord, known as Basel I, was established among the G-10 member countries. It was created to create an equal playing field for all internationally active banks across countries, i.e., to avoid global competitiveness conflicts. (Siddika & Haron, 2020) .

The group published the "Basel Capital Accord," a capital measurement scheme. The idea behind this calculation was to weigh on-balance sheet and off-balance sheet assets based on the risk they posed. The agreement mandated that banks keep at least 8% of risk-weighted assets (RWA) in capital, with 50% of that being Tier 1 or core capital. Initially, the Basel Accord I concentrated on the bank's credit risk as assessed by the Cookie ratio. (Samina, venus, & rossazana, 2019, p. 14)

This accord initiated by the BCBS in 1988 to provide two very essential objectives from the start. The first objective was to strengthen the international banking system's secure and sound stability, and the second was to level the playing field among international banks by reducing the existing methods and ways of competitive disparity.

In order to attain these objectives, a set of two levels was chosen to describe capital in banks. In everlasting words, Tier 1 capital is applicable to common stocks and other preferred stocks, as well as retained earnings. International banks were required to have Tier 1 risk-weighted capital of at least 4% of their total capital. As a result, capital in Tier 1 and Tier 2 are defined as follows: "fixed maturity preferred stock, subordinated debt, and loan loss reserves, with an 8 percent capital-to-risk-weighted-assets (RWA) ratio "As a result, banks' assets are divided into distinct groups, or "buckets," within the range of 0%, 20%, 50%, and 1 00%, pertaining to risks as established by the Basel I Accord. These are then multiplied by the risk weight associated with each category. Describes the various asset categories as well as the risk weights attributed to each (Samina, venus, & rossazana, 2019, p. 14)

Figure [1.2]: Risk weighted Basel 1



Source: (Paranjal & Dheeraj) **available on** https://www.wallstreetmojo.com/basel-i/

2.2 Objectives of The New Framework

It is obvious that the Accord must modify to keep up with market trends. As a result, the Committee is developing a new and comprehensive capital adequacy framework that focuses on the following supervisory goals:

- ✓ the Accord should continue to promote financial system safety and soundness;
- ✓ the Accord should improve competitive equality;
- ✓ the Accord should represent a more comprehensive approach to risk management

The Accord should concentrate on internationally engaged banks, notwithstanding the fact that its core principles are universal. (Framework, 2000, p. 9)

- ✓ Maintain a certain level of capital in the system.
- ✓ Concentrate on globally internationally banks active**.** (Ramirez, 2016, p. 02)

2.3 The Core Principles of Basel I

The Core Principles are a set of baseline principles for competent supervisory processes that, if effectively applied, will strengthen local and international financial stability. The Basel Core Criteria specify 25 principles that must be followed in order for a supervisory system to be effective. The Principles are divided into seven groups:

(1): objectives, independence, powers, transparency, and cooperation.

(2)- (5): cover licensing and structure.

(6)- (18): cover prudential regulation and requirements.

(19)- (21): cover methods of ongoing banking supervision.

(22): deals with accounting and disclosure.

(23): deals with corrective and remedial powers of supervisors.

(24) and **(25):** cover consolidated and cross-border supervision**:** (Lessambo, 2013, pp. 95-96)

We will define this in detail through the following table:

--

Table [1.1]: The Basel Core Principles

Principle 1 Objectives, Independence, powers, transparency And cooperation	• Clear responsibilities and objectives • Operational independence • Transparent processes • Sharing of information between supervisors
Principle 2 Permissive activities	• Must be clearly defined
Principle 3 Licensing criteria	• An assessment of the ownership structure and Governance
Principle 4 Transfer of significant Ownership	• Review of any proposal pursuant to ownership significant transfer change
Principle 5 Major acquisitions	• Includes cross-border transactions
Principle 6 Capital adequacy	• Compliance with prudent and adequate Capital minimum and reserves
Principle 7 Risk management Process	• Identification • Evaluation • Monitoring • Control of risk profile
Principle 8 Credit risk	• Assessment of credit risk under the criteria Defined under Principle 7
Principle 9 Problems, assets, provisions and reserves	• Asset management •Evaluation of provisions and reserves
Principle 10 Large exposure limits	• Identification and management of portfolios' Concentrations
Principle 11 Exposures to related Parties	• Assessment of exposures to related parties
Principle 12 Country and transfer Risk	• Identification, measurement, monitoring and Controlling of country risk exposures
Principle 13 Market risks	• Identification, measurement, monitoring and Controlling of market risk exposure

Principle 14 Liquidity risk	• Liquidity management strategy • Daily management of liquidity
Principle 15 Operational risk	• Identification, measurement, monitoring and Controlling of operational risk exposures
Principle 16 Interest rate risk in the Banking book	• Identification, measurement, monitoring and Controlling of interest risk In the book
Principle 17 Internal control And audit	• Clear and transparent delegation of authority • Separation of functions • Internal independent audit and compliance Process
Principle 18 Abuse of financial Services	• Promotion of high ethical standards in finance • Detection of fraudulent and criminal activities
Principle 19 Supervisory approach	• Sound understanding of the banking Activities by supervisors
Principle 20 Supervisory techniques	• On- and off-site supervision and Regular contacts with management team
Principle 21 Supervisory reporting	• Collection, review and analysis of Prudential reports and statistics • Verification of the reports and statistics
Principle 22 Accounting and disclosure	• Compliance with internationally-accepted Accounting principles
Principle 23 Corrective and remedial Powers of supervisors	• Timely corrective actions to fix an issue Or a departure from any principle
Principle 24 Consolidated supervision	• Supervision on a consolidated basis
Principle 25 Home-host relationships	• Cooperation and information exchange Between the home supervisors and host-Related part

Source: (Supervision, 2012, pp. 21-58)

2.4 Scope of Application

The Accord should cover all of the banking group's risks. At the same time, it should consider the individual banks' safety and soundness within the group. To this aim, it is proposed that the Accord be expanded to encompass holding firms that are the parents of banking groups on a fully consolidated basis. Banking groups are those that primarily participate in banking activities and, as a result, are referred to as "banking groups**.**" (Framework, 2000, p. 11)

A banking organization may be registered as a bank in various countries. In addition, the Committee is clarifying the Accord's application to all internationally active banks at every tier within a banking group on a fully consolidated basis. Supervisors should also make sure that each bank in a group is sufficiently capitalized on its own.

Banks are progressively diversifying their business into other areas of finance, particularly the securities and insurance businesses. As a result, the Committee is clarifying capital treatment for banks' investments in certain sectors. The Committee is also clarifying the capital treatment for significant minority-owned firms and soliciting input from the industry on the proper capital treatment for majority-owned commercial entity investments.

The Committee recognizes the need to continue working with insurance and securities regulators to unify capital adequacy rules for diverse financial companies and encourages the use of techniques developed by the Joint Forum on Financial Conglomerates, for example. (Framework, 2000, pp. 11-12)

2.5 The Definition of Capital Adequacy Ratio – CAR

What Is Capital Adequacy Ratio – CAR?

The capital adequacy ratio (CAR) is a calculation that compares a bank's available capital to its risk-weighted credit exposures. The capital adequacy ratio, commonly known as the capital-to-risk weighted assets ratio (CRAR), is used to protect depositors and promote global financial system stability and efficiency. Tier-1 capital, which can absorb losses without requiring a bank to discontinue operations, and tier-2 capital, which can absorb losses in the event of a winding-up and so provides a lower level of protection to depositors, are the two categories of capital that are measured. (ET The economicTime, 2021) Or in other meaning the capital adequacy ratio is the central feature of the Basel Capital Accord. It is an analytical construct in which regulatory capital is the numerator and risk-weighted assets is the denominator.

A minimum ratio of regulatory capital to risk-weighted assets is set to achieve the objective of securing over time soundly-based and consistent capital ratios for all international banks.

2.5.1 Why is it Capital Adequacy Important?

Minimum capital adequacy ratios (CARs) are important because they ensure that banks have adequate to sustain a reasonable level of losses before going bankrupt and losing depositor funds. Capital adequacy ratios reduce the danger of banks going bankrupt, ensuring the efficiency and stability of a country's financial system. A bank with a high capital adequacy ratio is generally thought to be safe and capable of meeting its financial obligations.

Depositor money are given a greater priority than the bank's capital during the winding-up process, thus depositors can only lose their savings if the bank's loss exceeds the amount of capital it has. As a result, the higher the bank's capital adequacy ratio, the better the depositors' assets are protected. (Hayes, 2020)

Regulators strive to guarantee that financial institutions, banks, and investment firms have sufficient capital to maintain their operations. This safeguard not only protects depositors within the industry, but also the entire economy, as institution failures, such as bank collapses, can have far-reaching consequences. (ET The economicTime, 2021)

Table [1.2]: capital adequacy

Tier 1	– Paid-up capital – Disclosed reserves (retained profits, legal reserves …)
Tier 2	– Undisclosed reserves – Asset revaluation reserves – General provisions – Hybrid instruments (must be unsecured, fully paid-up) – Subordinated debt (max. 50% Tier 1, min. 5 years – discount factor for shorter maturities)
Deductions	– Goodwill (from Tier 1) – Investments in unconsolidated subsidiaries (from Tier 1 and Tier 2)

Source: (Balthazar, 2006, p. 18)

2.5.2 Calculation of capital adequacy

We divide a bank's capital by its risk-weighted assets to get the capital adequacy ratio. There are two Layers Of capital used to determine the capital adequacy ratio according to the following Process: (Hayes, 2020)

$$\mathbf{CAR} = \frac{\mathbf{Tier\ 1\ Capital\ + Tier\ 2\ Capital}}{\mathbf{Risk\ Weighted\ Assets}}$$

2.5.2.1 Risk-weight of assets

Risk-weighted assets are divided into four different categories, each receiving A specific rate:

- Government obligations are weighted at 0%;
- Short-term inter-bank assets are weighted at 20%;
- Residential mortgages are weighted at 50%;
- Other assets are weighted at 100%. (Lessambo, 2013, p. 96)

Table [1.3]: Risk weighted assets

%	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, 2006, p. 18)

For the purposes of assessing capital adequacy, capital will be split into two tiers- Tier 1 core capital and Tier 2 supplementary capital. While Tier 1 capital provides the most permanent and readily available support to a bank against unexpected losses, Tier 2 capital Contains elements that are less permanent in nature or are less readily available. The broad details of the capital framework which is to be implemented are indicated in detail ,in the following paragraphs: (Notes, 1993, p. 01)

2.5.2.2 Tier 1 - Core Capital

Tier 1 capital will be made up of paid-up capital or assigned capital, as applicable, share premium, statutory reserve, surplus from the sale of fixed assets, general reserve, other disclosed reserves created by appropriations from post-tax retained earnings, and undistributed balance in profit and loss account attributable to prior years.

Tier 1 capital will be reduced by accumulated losses, current year interim losses, goodwill, and other intangible assets. If the bank's external auditors have validated the current years interim retained profits, they may be included in Tier 1 capital. The current year's interim profits will not be included in the capital base till such verification is completed. The verification by external auditors should entail at least the following: (Notes, 1993, p. 02)

(a) Ascertaining that the statistics underpinning the interim profits have been derived correctly from the underlying accounting records.

(b) Examining the accounting policies used to calculate interim profits to ensure that they are consistent with those used by the bank to prepare its annual financial statements.

(c) Performing analytical procedures on the results to date, including comparisons of actual performance to date with budget and prior period results.

(d) Discussing the bank's overall performance and financial status with management.

(e) gaining sufficient assurance that the implications of existing and future litigation, all known claims and commitments, changes in business activity, and provisioning for bad and doubtful debts have been correctly considered in determining interim profits.

(f) Investigating trouble areas that the auditors are already aware in the course of auditing the bank's financial statements. (Notes, 1993, p. 03)

The bank must receive an opinion from the external auditors on whether the interim results are honestly stated. Annexure II, the mandatory report, shall be added to the Quarterly Capital Adequacy Return.

2.5.2.3 Tier 2 - Supplementary Capital

Tier 2 supplementary capital will consist of**:**

(a) **Undisclosed reserves** these may have the same intrinsic quality as publicized retained earnings, but due to their lack of transparency, the Basle framework classifies hidden freely available reserves as supplemental capital.

As a result, unreported reserves representing accumulations of post-tax earnings that are not encumbered by any known liability and are not usually utilized for absorbing normal loan losses are not habitually used for absorbing normal loan or operating losses may be included in the supplementary capital.

(b) **Fixed assets revaluation reserves** these reserves are primarily the result of a bank's own premises being devalued to reflect their current value, or something close to it, rather than their past cost. The extent to which revaluation reserves can be used as a cushion for unanticipated losses is largely determined by the level of confidence that can be placed in market value estimations for the relevant assets.

As a result, the assets must be priced sensibly. Independent professional values should revalue the premises on a methodology that is acceptable to both the external auditors and the Bank of Mauritius. Reserves for revaluation of fixed assets should be stated openly in the balance sheet or as notes to the audited accounts. (Notes, 1993, p. 04)

Only 75 per cent of the amount of reserves arising from the revaluation of tangible fixed assets will be eligible for inclusion in Tier 2 capital.

(c) **General provisions/general loan loss reserves**

Against the likelihood of losses, general provisions or general loan loss reserves are established.

These provisions or reserves are eligible for inclusion in Tier 2 capital if they do not reflect a known decrease in the valuation of certain assets.

Where, on the other hand, provisions or reserves have been established to cover identified losses or deterioration in the value of any asset or group of assets, they are not freely available to cover unidentified losses that may arise elsewhere in the portfolio and lack an essential characteristic of capital.

As a result, such provisions or reserves should be excluded from the capital base. Before considering general provisions and/or general loan loss reserves to be part of Tier 2 capital, ensure that sufficient provisions or reserves have been created to cover all known losses and expected potential losses.

Tier 2 capital will be reduced by 1.25 percent of total weighted risk assets if general provisions and/or general loan loss reserves are retained against unidentified and unanticipated losses. (Notes, 1993, p. 05)

(d) Subordinated debt Subordinated debt as approved by the Bank of Mauritius may be included in Tier 2 supplementary capital. Broadly, to be eligible for inclusion, it should satisfy the following conditions:

(i) the subordinated debt must be unsecured

(ii) it must have an original maturity of over five years

(iii) it may be redeemed before maturity only at the option of the bank Concerned and with the prior written approval of the Bank of Mauritius

(iv) Despite any other provision of law, in the event of the bank's insolvency, the subordinated debt shall not be reimbursed until all depositors' and other creditors' claims have been fully met.

Such further conditions, if any, as may be prescribed by the Bank of Mauritius. During the last five years to maturity, a cumulative discount (or amortisation) factor of 20 per cent per year should be applied to reflect the diminishing value of the subordinated debt as a continuing source of strength.

The amount of subordinated debt included in Tier 2 capital will be limited to maximum of 50 per cent of Tier 1 core capital**.** (Notes, 1993, p. 06)

Calculating the Capital Adequacy Ratio (CAR) – Worked Example

Let us look at an example of Bank A. Below is the information of the Bank A's Tier 1 and 2 Capital, and the risks associated with their assets.

Table [1.4]: the Bank as Tier 1 and 2 Capital

(in thousands)	Bank A
Tier 1 capital	**$ 3,000.00**
Tier 2 capital	**$ 1,000,00**

Source: (Capital Adequacy Ratio (CAR))

Table [1.5]: The risks associated with their assets

(in thousands)	Amount	Risk weighting
Debenture	$ 9,000.00	90%
Mortgage	$ 45,000.00	75%
Loan to Government	$ 4,000.00	0%

Source: (Capital Adequacy Ratio (CAR))

Bank A has three types of assets: Debenture, Mortgage, and Loan to the Government. To calculate the risk-weighted assets, the first step is to multiply the amount of each asset by the corresponding risk weighting:

- **Debenture :** $9,000 * 90% = **$8,100**
- **Mortgage:** $45,000 * 75% = **$33,750**
- **Loan to Government:** $4,000 * 0% = **$0**

As the loan to the government carries no risk, it contributes $0 to the risk-weighted assets.

The second step is to add the risk-weighted assets to arrive at the total:

- **Risk-Weighted Assets:** $8,100 + $33,750 + $0 = **$41,850**

The calculation can be easily done on Excel using the SUMPRODUCT

Table [1.6]: calculation with SUMPRODUCT

	A	B	C
1	**(in thousands)**	**Amount**	**Risk weighting**
2	**Debenture**	**$ 9,000.00**	**90%**
3	**Mortgage**	**$ 45,000.00**	**75%**
4	**Loan to Government**	**$ 4,000.00**	**0%**
5	**Risk weighted assets = SUMPRODUCT (B2:B4 ,C2:C4)**		

Source: (Capital Adequacy Ratio (CAR))

The Capital Adequacy Ratio of Bank A is as follows

Where:

- **CAR :** $4,000 / $41,850 = **10%**

As Bank A has a CAR of 10%, it has enough capital to cushion potential losses and protect depositors' money. (Capital Adequacy Ratio (CAR)) **Available on** **https://corporatefinanceinstitute.com/resources/knowledge/finance/capital-adequacy-ratio-car/**

Example of risk-weighted capital requirements

Table [1.7]: risk-weighted capital requirements

Assets	Amount $	Risk weight %	Weighted assets $
Cash	10,000,000	0	0
T-bills	190,000,000	0	0
Municipal bonds	50,000,000	20	10,000,000
Mortgages	300,000,000	50	150,000,000
Home equity loans	40,000,000	100	40,000,000
Total	590,000,000		200,000,000

Source: (Lessambo, 2013, p. 98)

- Vehicles. Securitization has been utilized by banks to manipulate Basel primary capital ratios. In order to turn these things into risk requiring capital support, Basel proposes four possible conversion factors. These are the conversion factors:

1- 100% conversion factors for: direct credit substitutes, risk participation in bankers acceptances and direct credit substitutes, and securities loans for which the bank is at risk.

2 - 50% conversion factor for: transaction-related contingencies, unused portions
Of commitments with original maturity, and revolving underwriting facilities and note issuance facilities.

3- 20% conversion factor for: short-term, self-liquidating trade-related contingencies,
Including commercial letters of credit.

4 - 0% conversion factor for: unused portions of commitments with original
Maturity of one year or less or which can be cancelled at any time (Lessambo, 2013, pp. 98-99)

2.6 Critics of Basel I

In this element we will try to provide a brief overview of the positive effects and weaknesses of the capitalist Basel Agreement of 1988

2.6.1 Positive Impacts

Despite much criticism, the Basel 1 Accord was a big success in a lot of respects. The initiative's first and undeniable accomplishment was the establishment of a global standard for banking rules. Designed originally for G10 countries' internationally engaged banks, it is now the inspiration for Banking laws in over 100 countries and is frequently imposed on national institutions as well. (Balthazar, 2006, p. 32)

Detractors would argue that it does not automatically create a fair playing field for banks, as one of the Accord's goals was, because banks with various risk profiles may end up with the same capital need. At the very least, multinational banks now face an unified set of requirements, avoiding the need to discuss the appropriate capital level for performing the same activity in many countries with each national regulator.

Furthermore, regulatory capital requirements are the same for banks from different nations competing on the same markets. In comparison to the condition before 1988, this is certainly an improvement. Although the adoption of distinct risk-weights for different asset classes does not fully reflect the underlying risks of banks' credit portfolios, it is a significant improvement over earlier regulatory ratios such as equity: assets or equity: deposits ratios that were employed in some countries.

Has the Basel 1 Accord succeeded in making the banking sector a safer place?

Although much research has been done on the subject, the answer remains a mystery. At the start of the 1990s, most banks' capital ratios did indeed rise (the capital ratios of the large G10 banks went from an average of 9.3 percent in 1988 to 11.2 percent in 1996and bank failures diminished (for instance, yearly failures of FDIC-insured banks in the US went from 280 in 1988 to fewer than 10 a year between 1995 and 2000) But it's unclear how much of this improvement is due to Basel 1 and how much is due to other causes (such as improved economic conditions).

Even without empirical proof, one might reasonably believe that the capital ratio has compelled banks with a capital ratio below 8% to get new capital (or to decrease their risk exposures) and that the G10 initiative has helped to a better awareness of the risks connected with banking activities and a stronger attention on them. (Balthazar, 2006, p. 33)

2.6.2 Regulatory Weaknesses and Capital Arbitrage

Aside from the benefits mentioned above, we must acknowledge that the Basel 1988 Accord has a number of flaws that are only growing as time passes, resulting in a steady flow of financial industry innovations. Since the 1990s, credit risk management research has resulted in significant advancements in the way banks manage their risk.

Quantification approaches have enabled sophisticated banks to make more accurate and dependable predictions of their internal economic capital needs over time. Economic capital (EC), as opposed to

regulatory capital mandated by regulators, is the capital required to fund a bank's risk-taking operations as determined by the bank. It is based on the bank's proprietary risk factors and models. As a result, when a bank calculates its economic capital to be higher than the regulatory capital level, there is no issue. (Balthazar, 2006, p. 33)

However, if regulatory capital is higher than economic capital, the bank must maintain a capital level that is higher than what it considers to be acceptable shareholder value. The sophisticated banks' response is known as "capital arbitrage." This entails striking a balance between regulatory and economic capital, which can be accomplished by launching new operations that consume more economic capital than regulatory capital.

As long as these new operations are correctly priced, they will increase the returns to the shareholders. Capital arbitrage is not a terrible thing in and of itself, because it allows banks to address regulatory limits that are even recognized by regulators. The 1988 Basel Capital Accord, on the other hand, becomes less efficient as this practice expands and is aided by financial innovations. Various capital arbitrage procedures are used by banks.

The simpler method entails investing in riskier assets within a risk-weighted range. If a bank wishes to buy bonds on the capital markets, for example, it can acquire speculative-grade bonds that pay high interest rates while requiring the same regulatory capital as investment-grade bonds (that they could sell to finance the operation).

The deal's economic capital consumption should exceed the deal's regulatory capital consumption, allowing the bank to employ the excess economic capital it must hold due to regulatory limits. Securitization and credit derivatives are two of the most complex strategies that are now in use. Banks demonstrate a creative spirit by inventing new financial products that allow them to borrow money.

The banks demonstrate their innovative spirit by inventing new financial vehicles that allow them to reduce their capital needs while without actually lowering their risk. Regulators then update the 1988 rules to cover these new instruments, although with some lag time. (Balthazar, 2006, p. 34)

3. Section three: Basel II

Abstract

With the developments of the banking industry and the intensification of competition between banks and the exposure of the banking sector to many crises during the period of Basel I, it produced a set of defects and negatives, which necessitated the Basel Committee on Banking Supervision to conclude a new agreement for the capital adequacy standard called Basel II, which is based on three basic pillars and this is what we'll talk about in depth in this section.

3.1 Moving From Basel I to Basel II

The Basel Committee began discussing the modernization of Basel I in the late 1990s. A change was necessary to include more complex risk measurement methodologies from the 1988 "one-size-fits-all" approach.

The 1988 standard method was increasingly seen as a burden by major banks, which were increasingly using their own more comprehensive risk assessment mechanisms out. Moreover, a new framework was needed to account for changes in financial markets, such as the widely used technique of "credit risk transfer".

Transferring (or mitigating) credit risk is the practice of selling credit derivatives or securitizing credit to pass on credit risk to other banks or individuals. Finally, in reaction to the Enron scandal and the innovation of financial derivatives after the implementation of Basel I, as well as to the Asian financial crisis in the late 1990s, it was necessary to introduce a new regulatory framework. And off-balance sheet items, strengthening more risk-sensitive capital requirements through self-assessment of banks, and providing greater transparency has led to a rewriting of the capital agreement.

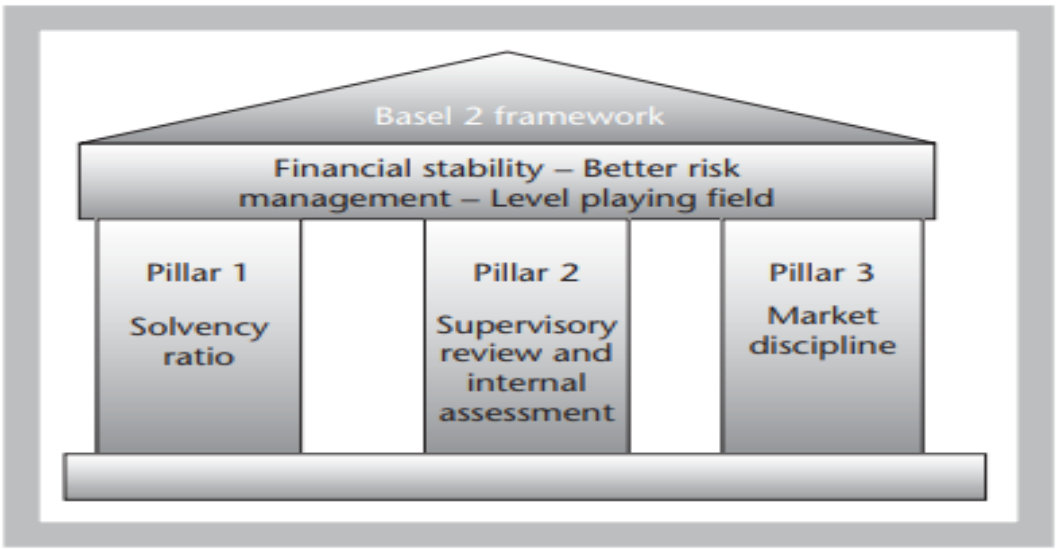
Basel member states reached agreement on Basel II by May 2004 The purpose of Basel II was to address areas of risk that were not covered by Basel I, to measure capital requirements above the minimum, and the Basel II agreement issued in 2004 was developed on three pillars.

3.2 Definition of Basel II

Basel II is the second set of international banking regulations defined by the Basel Committee on Bank Supervision (BCBS). It is an extension of the regulations for minimum capital requirements as defined under Basel I. The Basel II framework operates under three pillars (see Figure opposite).

- **Pillar I** Capital adequacy requirements.
- **Pillar II** Supervisory review.
- **Pillar III** Market discipline. (BankingSupervision, 2014, p. 03)

Figure [1.3]: The Three pillars



Source: (Balthazar, 2006, p. 45)

3.3 How to calculate CAR?

Minimum capital requirement (MCR) is calculated for credit risk, market risk, and operational risk as BCBS advises that the minimum capital requirement under Basel II must be 8%, which will be calculated as follows:

$$\mathbf{CAR} = \frac{\mathbf{Tier1 + Tier2 - Deductions + Tier3}}{\mathbf{Cr\ risk\ RWA + Oper\ risk\ RWA + Mkt\ risk\ RWA}} \geq \mathbf{8\%}$$

Where CAR is the capital adequacy ratio, Tier 1 is the Tier 1 capital, Tier 2 is the Tier 2 capital, Tier 3 is the Tier 3 capital, Cr risk RWA is the risk-weighted asset for credit risk, Oper risk RWA is the risk-weighted asset for operational risk, and Mkt risk RWA is the risk-weighted asset for market risk. The following sections present a brief discussion on calculation of capital requirements for these risk areas, i.e., credit risk, operational risk, and market risk. (Siddika & Haron, 2020)

3.4 Pillar I

Minimum Capital Requirement (MCR)

The 8% requirement under Basel II is computed as the total of the bank's credit, market, and operational risks. Despite the fact that Basel II establishes the capital requirement, banks are urged to have more capital than is required. Recognizing the unique characteristics of each financial jurisdiction, the Basel Committee identified three key areas on which regulators should concentrate their efforts: interest rate, concentration risk, and residual risk. Operational risk, market risk, and credit risk have all become key concerns as a result of Basel II, but members' regulatory authorities have been given some leeway in addressing these risks. (Lessambo, 2013, p. 99)

This is an update to the solvency ratio from 1988. RWA is still considered the most important control ratio since capital is the principal buffer against losses when profits fall below zero.

Although the 8% criterion remains the benchmark, the way assets are weighted has been greatly improved. .

The Basel 2 values are directly and openly generated from a standard simplified credit risk model, whereas the 1988 values were imprecise approximations. Internal economic capital calculations should now be more closely matched with capital requirements (the adequate capital level estimated by the bank itself, through its internal models). There are three techniques to calculating risk-weighted assets (RWA) for credit risk, each with increasing complexity.

The more advanced are designed to use less capital while imposing higher quality standards and quantitative requirements on internal systems and processes. Banks will be encouraged to improve their internal risk management practices as a result of this. A significant expansion of the types of collateral that are recognized to offset risks, in addition to more explicit capital needs based on risk categories, is another motivation to develop a more systematic collateral management process. (Balthazar, 2006, p. 44)

This is also a substantial improvement over the present Accord, which has a very limited scope of qualifying collateral. Another significant change in pillar 1 is the addition of a new criteria for operational risk. There is a clear capital requirement in the new Accord for risks relating to potential losses originating from process failures, internal frauds, and information technology (IT) issues.

There are three approaches to choose from, each growing in complexity. At least 8% of the risk-weighted requirements pertaining to three major types of hazards must be covered by qualified capital which are: (Balthazar, 2006, p. 44)

3.4.1 Credit Risk

Principle 8 of the Core Principles deals with credit risk(this is shown in the following table) . It requires banks to implement a credit risk management plan that takes into account the institution's risk profile.

Remember that banks are in the business of collecting deposits from clients and issuing loans to other customers on the one hand. The essence of the banking business is credit risk assessment.

As a result, banks should develop a sensible policy and a method for identifying, measuring, monitoring, and controlling their credit risk. Basel II proposes three methods for calculating regulatory capital for credit risk:

1. the standardized approach
2. the internal ratings-based approach
3. the advanced internal ratings-based approach (Lessambo, 2013, pp. 101-102)

Table [1.8]: Beta factors under the standardized approach

Business unit	Fixed percentage (beta factors) %
Corporate finance	18
Payment and settlement	18
Trading and sales	18
Agency services	15
Commercial banking	15
Asset management	12
Retail banking	12
Retail brokerage	12
Total	100

Source: (Lessambo, 2013, p. 101)

3.4.1.1 Standardized Approach (SA)

Risk-weights

For banks with a smaller volume of operations and a simpler control structure, the standardized method is ideal. It entails the appraisal of a bank's debtor's creditworthiness using credit ratings from external credit assessment firms. . (Basel II)

The Standardized Approach (SA) is the most similar to current practice. The primary novelty is that the risk-weights are no longer solely based on the counterparties' categories (banks, corporations, etc.), but also take into account their assessed risk level via external ratings. If they meet the standard criteria of objectivity, independence, resources, transparency, and credibility, a number of External Credit Assessment Institutions (ECAI) — firms that give public risk assessments of borrowers through ratings – will be recognized. The authorities will then overlay those external ratings onto Standard & Poor's' international rating system (S&P). S&P ratings have finally been released and converted into risk-weights. (Balthazar, 2006, p. 50)

Table [1.9]: RWA in the Standardized Approach

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, 2006, p. 50)

3.4.1.2 The Internal Ratings-Based Approach (IRB)

Internal-ratings-based strategy (IRB) Basel II permits banks to estimate their minimum credit risk capital by referring to their internally created credit rating rather than depending on independent credit rating organizations (e.g., S&P, Moody's).

Banks demonstrate that their internal rating systems were put in place after thorough financial research and that the assigned rating is appropriate for a specific borrower by doing so. The problem with this technique is that banks create their credit risk models based on their own data. Given the suspicion surrounding banking activities, the Basel II Committee granted such an authorization under specific conditions: (Lessambo, 2013, p. 102)

Internal credit risk factors must be constructed using standard risk factors such as the likelihood of default (PD), loss given default (LGD), exposure at default (EAD), and expected loss (EL).

Banks should design a rating system with at least eight likelihood of default ratings, according to the Basel II Committee. Once a rating system is in place, banks should closely monitor it based on the borrower's information to ensure that their minimum capital credit risk is accurate. (Lessambo, 2013, p. 102)

3.4.1.3 The Advanced Internal Ratings-Based Approach (AIRB)

Banks are required under AIRB to analyze credit risk based on seven years of historical data. In addition, unlike the IRB, which only requires banks to estimate the PD, the AIRB method requires banks to estimate all credit risk components (PD, LGD, EAD, and EL). (Lessambo, 2013, p. 102)

3.4.2 Operational Risk

Operational risk is defined by Basel II as loss caused by insufficient or failing internal processes, human and system failures, and external occurrences. The Basel II Committee mandates that banks implement a system to identify, analyze, measure, monitor, and regulate their activities based on their size and complexity. Banks are allowed to use one of three approaches in calculating their operational risk capital:

1. the basic indicator approach (BIA)
2. the standardized approach (SA)
3. The advanced measurement approach (AMA). (Lessambo, 2013, pp. 99-101)

3.4.2.1 The Basic Indicator Approach (BIA)

The basic indicator approach, banks compute their operational capital from a fixed percentage of the average of the annual gross income of the last three years.

The Basel II Committee requires that the operational capital be 15% of the predetermined annual gross income average. The basic indicator approach is not used very much, and is less accurate as more banks are involved in various lines of banking activities, each coming with its own level of operational risk (Lessambo, 2013, p. 101)

The calculation of capital charge in basic indicator approach is as follows: (Siddika & Haron, 2020)

$$\mathbf{KBIA} = \left[\sum(\mathbf{GI1} \ldots . \mathbf{n} \times \mathbf{a})\right] / \mathbf{n}$$

Here K_{BIA} is the capital charge in basic indicator approach; GI is the gross income, which was positive, over the previous 3 years; n is the number of previous 3 years for which gross income is positive; and α is 15% required capital level against the operational risk.

3.4.2.2 The Standardized Approach (SA)

Under the basic indicator approach, the standardized technique is thought to avoid the over-generalized assessment of operating capital. It separates a bank's activities into eight business lines, and then assigns beta factors to each business line based on the three-year average positive gross income. BCBS expressed the equation as follows: (Siddika & Haron, 2020)

$$\mathbf{KSA} = \left\{\sum \mathbf{years\ 1-3max}\left[\sum(\mathbf{GI1-8x\beta 1-8}), \mathbf{0}\right]\right\} / \mathbf{3}$$

Where K_{SA} is the capital charge under the standardized approach; $GI_{1–8}$ is the annual gross income in a given year, for each of the eight business sectors; and $\beta_{1–8}$ is a fixed percentage, set by the BCBS, the level of required capital to the level of the gross income for each of the eight business sectors.

This is close to the BIA, except that banks' activities are divided into eight business lines and each one has its own capital requirement as a function of its specific gross income. Again, the average gross income over the last three years must be calculated. But this time the negative gross income of one business line can offset the capital requirements of another (as long as the sum of capital requirements over the year is positive). The formula is:

$$\mathbf{Capital} = \sum_{\mathbf{J=1}}^{\mathbf{3}} \frac{\mathbf{max}\sum_{\mathbf{i=1}}^{\mathbf{8}}[(\mathbf{GIi,j} \times \boldsymbol{\beta}\mathbf{i}); \mathbf{0}]}{\mathbf{3}}$$

With GIi,j the gross income of business line i in year j and βi the capital requirement for business line i (Balthazar, 2006, p. 74)

3.4.2.3The Advanced Measurement Approach (AMA)

The method of advanced measurement (AMA) The usage of AMA is subject to severe regulatory constraints due of its level of sophistication. To begin with, the Basel II Committee did not give a Model, instead leaving the decision to each banking institution's authority. Banks can utilize the AMA if they can show and convince their regulators that they have a model in place that captures practically every high-loss scenario that could happen. (Lessambo, 2013, p. 101)

3.4.3 Market Risk

RWAs indicate the risk of fluctuating fair values of financial instruments held in the trading book as a result of market movements – such as foreign exchange, commodity prices, interest rates,

credit spreads, and stock prices – in both the balance sheet and off-balance sheet items. (Ramirez, 2016, p. 08)

Because banks have some latitude in developing their models, the following minimum principles should apply for calculating their capital charge:

- ✓ Value-at-risk must be computed on a daily basis, at 99% confidence level.
- ✓ The minimum holding period will be ten trading days.
- ✓ The choice of historical observation period for calculating VaR will be constrained to a minimum length of one year.
- ✓ Banks must update their data sets often and reassess them whenever the market prices are subject to material changes.
- ✓

Banks must meet their capital requirement on a daily basis. (Lessambo, 2013, p. 103)

3.4.3.1 The Standardised Approach (SA)

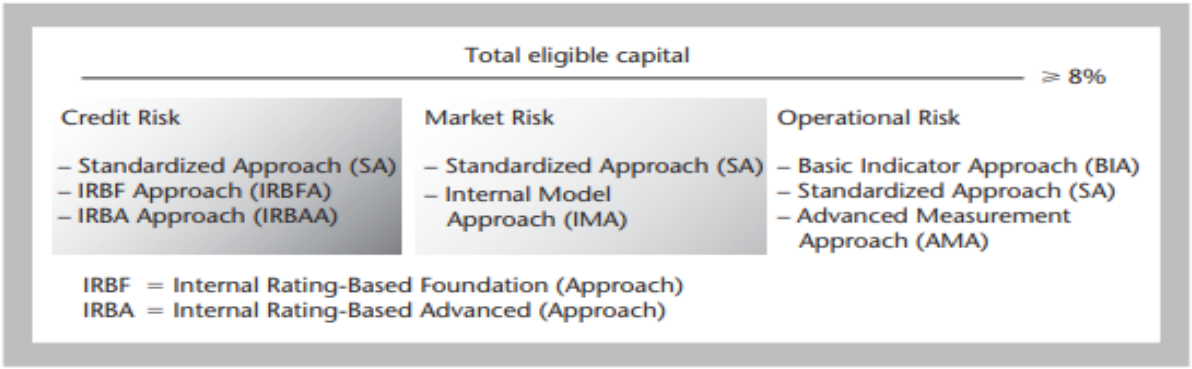
The Amendment's standardised approach provides a suitable foundation for the disclosure of market concerns. Market risks will be disclosed by banks that use the standardised technique to calculate capital requirements.

3.4.3.2 Internal Models Approach (IMA)

After receiving supervisory clearance, the amendment added the option for banks to utilize their internal models to estimate capital requirements for market risk instead of the standardised approach. (supervision, 2001, pp. 15-16)

We will try to summarize the three elements included in Pillar in the following figure:

Figure [1.4]: Solvency ratio



Source: (Balthazar, 2006, p. 45)

3.5 Pillar II: Supervisory Review

Internal controls and supervisory review make up the second axis of the regulatory framework It necessitates that banks have internal procedures and models in place to assess their capital requirements in tandem with the regulatory framework, taking into account the banks' unique risk p rofileIn the banking system, banks must additionally incorporate the types of risks not covered (or not entirely covered) by the Accord, such as reputation and strategy risk, concentration credit risk, and interest rate risk (IRBBB).

Under pillar 2, regulators are also expected to ensure that pillar 1 standards are efficiently met, as well as assess the suitability of the banks' internal models. If authorities believe capital is insufficient, they can take a variety of steps to correct the issue.

The most obvious are measures such as requiring the bank to strengthen its capital base or limiting the amount of new credit that may be provided, but others include improving the effectiveness of internal controls and rules. Because pillar 2 must capture additional risk sources, the new Accord specifically specifies that banks must operate with a capital level greater than 8%. (Balthazar, 2006, p. 46)

3.5.1 The Four principles of the core of Pillar 2

1. Banks should have a procedure in place to review their overall capital adequacy in relation to their risk profile, as well as a plan in place to keep their capital levels.
2. Banks' internal capital adequacy evaluations and plans, as well as their ability to monitor and maintain compliance with regulatory capital ratios, should be reviewed and evaluated by supervisors.
3. Supervisors should expect banks to operate at levels higher than the minimal regulation capital ratios, and they should be able to compel them to do so.

Supervisors should intervene early to prevent capital from falling below the minimal levels required to support a bank's risk characteristics, and if capital is not maintained or restored, supervisors should demand immediate remedial action. (Lessambo, 2013, p. 104)

3.6 Pillar III : Market discipline

Market discipline has the ability to support capital regulation and other supervisory initiatives to improve bank and financial system safety and soundness, according to Pillar 3. Market discipline provides banks with significant incentives to operate in a safe, sound, and efficient manner. It can also provide an incentive for a bank to maintain a high capital base as a buffer against future losses resulting from its risk exposures.

The Committee thinks that supervisors have a vested interest in facilitating effective market discipline as a means of bolstering the banking system's safety and soundness. (supervision, 2001, p. 01)

The regulations are related to disclosures and deal with market discipline. Banks are required to create detailed reports on their internal risk management systems as well as the implementation of the Basel 2 Accord.

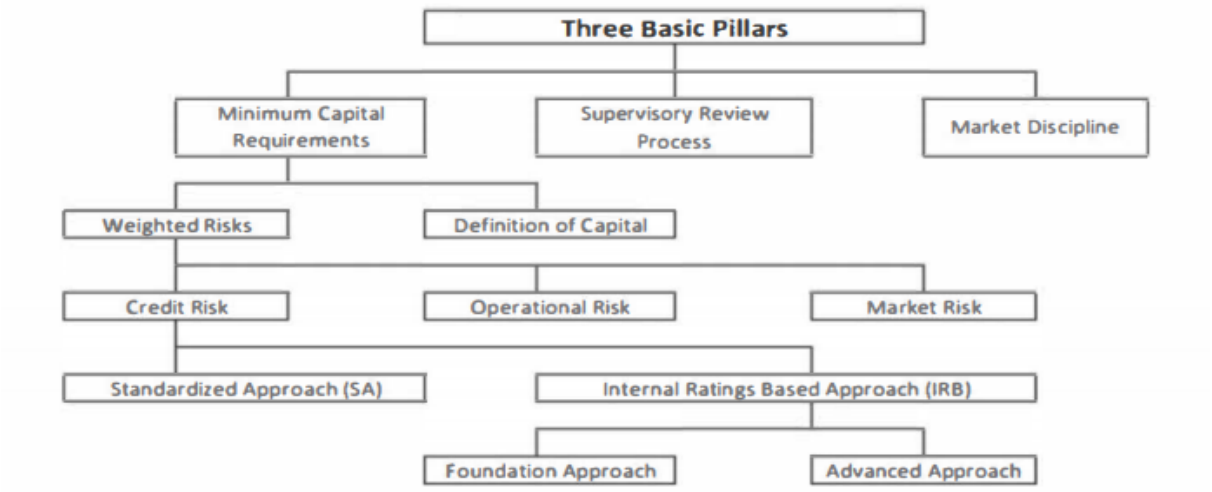
At least twice a year, those reports must be made public. This creates certain privacy concerns in the industry, given the lengthy number of elements to be made public: internal loss experience, by risk grade; collateral management procedures; exposures, by maturity, by industry, and so on. as well as by geographic region; Basel 2 possibilities..

The idea is to put further pressure on banks to improve their risk management methods by allowing the market to do so. Bank credit and equity analysts, bond investors, and other market participants will undoubtedly find the revealed information quite helpful in assessing a bank's health (Balthazar, 2006, pp. 46-47)

3.7 Structure of the Basel II Accord (Three Basic Pillars)

The Basel II framework is made up of three elements, referred to as the Accord's three pillars see Figure [1.5]:

Figure [1.5]: Structure of the Basel II Accord



Source: (Samina, venus, & rossazana, 2019, p. 18)

3.8 GOALS OF THE ACCORD

It is instructive to look at the three stated Committee objectives:

- ✓ To improve the quality
- ✓ Stability of the international financial system.
- ✓ Promote the adoption of more stringent risk management standards by creating and maintaining a level playing field for internationally operating banks.

The first two objectives are those set forth in the 1988 Accord. The last is brand new, and according to the Committee, it is the most crucial. This marks the start of a shift away from ratio-based regulation, which is only a component of the new framework, and toward regulation that is increasingly based on internal data, practices, and models**.** (Balthazar, 2006, pp. 39-40)

The Internal models became permissible as the basis for capital needs under market-risk regulation that is why, behind the scenes, talk of a "Basel 3 Accord" that would fully recognize internal credit risk models is already circulating. To set up Basel 2, several interactions between regulators and the sector had to be established through joint conferences and dialogues.

This resulted in priceless communication arrangements that are intended to be maintained long after Basel 2's implementation date in order to continue working on the 2010s' regulatory framework. (Balthazar, 2006, p. 40)

4. Section four: Basel III

Abstract

After the global financial crisis, he revealed the extent of the fragility of the banking system which prompted the need for a deep review of financial systems and amendments to Basel II, which led to the emergence of a new agreement called Basel III. In this section, we will present the most important reforms and amendments that Basel 3 brought

4.1 An Overview of Basel III

In September 2010, the BCBS promulgated a further amendment, known as the Basel III Accord, in response to many flaws in the Basel II Accord, which were brought to light during the global financial crisis.

The Basel III Accord is an addition to the Basel II Accord, not a replacement. The Basel III Accord's major purpose was to strengthen banks' ability to absorb asset losses while minimizing the impact on other sectors of the economy.

The Basel III Accord focuses on both the quantity and quality of capital held by banks when it come s to capital standards. (Samina, venus, & rossazana, 2019, p. 19)

One of the most important aspects of the Basel III Accord was the discussion of a"new definition " of regulatory capital, which would make it more restricted while also emphasizing quality.
Furthermore, the Basel III Accord has preserved the distinction between tier 1 and tier 2, while also limiting the composition criteria to higher-quality capital that is better equipped to withstand losses.

Tier 1 capital must primarily comprise of "core capital," which includes equity capital and retained earnings, according to the Basel III Accord. Furthermore, most assets formerly included in capital calculations of banks under Basel II, such as several types of subordinated debt, will now be omitted from the new Basel III Accord.

As a result, under the Basel III Accord, capital instruments that no longer qualify as "capital" will be taken out of banks' capital calculations beginning in the year 2013 The Basel III Accord has been changed to improve the quantity of capital that banks are required to hold, in addition to improving the quality of capital. Banks are anticipated to maintain a total capital ratio of 10.5 percent by the time participating nations completely implement Basel III in 2019, up from the 8 percent minimum under Basel II**.** (Samina, venus, & rossazana, 2019, p. 20)

According to the Basel III Accord, banks must maintain a total capital ratio of at least 8% of risk weighted assets. After calculating their 8% capital requirements, banks must still maintain and keep additional capital as a conservation buffer, equal to at least 2.5 percent of risk weighted assets, increasing the entire total capital requirement to 10.5 percent of risk-weighted assets.

The major goal of preserving the capital conservation buffer, which was designated in the Basel III Accord, is to ensure that banks retain greater levels of sufficient capital to absorb asset losses, particularly during times of financial and economic crisis.

By creating a counter-cyclical capital buffer, the Basel III Accord addresses several obstacles and problems relating to pro-cyclical capital (an increase in economic upturns and vice versa) and counter-cyclical capital restrictions (too low in economic upturns and vice versa). In order to combat pro-cyclical behaviour, the Basel III Accord requires banks to maintain a counter-cyclical buffer of 0 percent to 2.5 percent of risk-weighted assets. (Samina, venus, & rossazana, 2019, p. 21)

Its actual size will be set by national regulatory agencies, and will be mostly dictated by the amount of credit available in the economy, with greater capital resulting in a larger buffer. The counter-cyclical buffer guarantees that banks have adequate capital during periods of excessive credit growth, which typically occurs when asset risk is low.

As a result, when larger capital levels are properly maintained during strong economic times, banks are less likely to take drastic measures to conserve capital during poor times. Furthermore, the leverage ratio is applied under the Basel III Accord in such a way that banks are required to keep a minimum capital amount equal to 3% of their exposures.

As a result, the leverage ratio ensures that banks must maintain the smallest amount of capital at all times under the Basel III Accord. As a result, banks with limited competence engage in tactics aimed to scratch away at the requirements of minimum capital. As a result, the leverage ratio serves as the foundation for capital, with an amount set aside to defend against any unanticipated disasters. (Samina, venus, & rossazana, 2019, p. 21)

The proposed standards were issued by the Committee in mid-December 2010 (and have been subsequently revised). The December 2010 versions were set out in Basel III It also extended the framework with several innovations, namely: (BankingSupervision, 2014, p. 04)

- ✓ an additional layer of common equity – the capital conservation
- ✓ a countercyclical capital buffer, which places restrictions on participation by banks in system wide credit booms with the aim of reducing their losses in credit busts
- ✓ a leverage ratio – a minimum amount of loss-absorbing capital relative to all of a bank's assets and off-balance sheet exposures
- ✓ liquidity requirements - a minimum liquidity ratio, the liquidity coverage ratio (LCR), intended

to provide enough cash to cover funding needs over a 30-day period of stress; and a longer-term ratio, the net stable funding ratio (NSFR), intended to address maturity mismatches over the entire balance sheet

Additional proposals for systemically important banks, including requirements for supplementary capital, augmented contingent capital and strengthened arrangements for cross-border supervision and resolution. (BankingSupervision, 2014, p. 04)

4.2 The Most Important Ratios Included in Basel III

(Ramirez, 2016, p. 06)

$$\textbf{LCR} = \frac{\textbf{high quality liquid assets}}{\textbf{Total net liquidity outflows over 30 day times period}} \geq \textbf{100}$$

$$\textbf{NSFR} = \frac{\textbf{available stable funding}}{\textbf{Required stable funding}} \geq \textbf{100}$$

4.3 A Quantitative Comparison of Capital Requirements

Table [1.10]: Basel III versus Basel II

	Basel III	Basel II
Core Tier 1 Common equity, retained earnings	4.5%	2.0%
Additional Tier 1 Preferred shares, subordinated instruments**	1.5%	2.0%
Tier 2 Subordinated debt***	2.0%	4.0%
Tier 3 Reserve for market risk	Abolished	Fuzzy definition
Total	**8.0%**	**8.0%**

Source: (Chorafas, 2012, p. 62)

4.4 Pillar III Disclosures

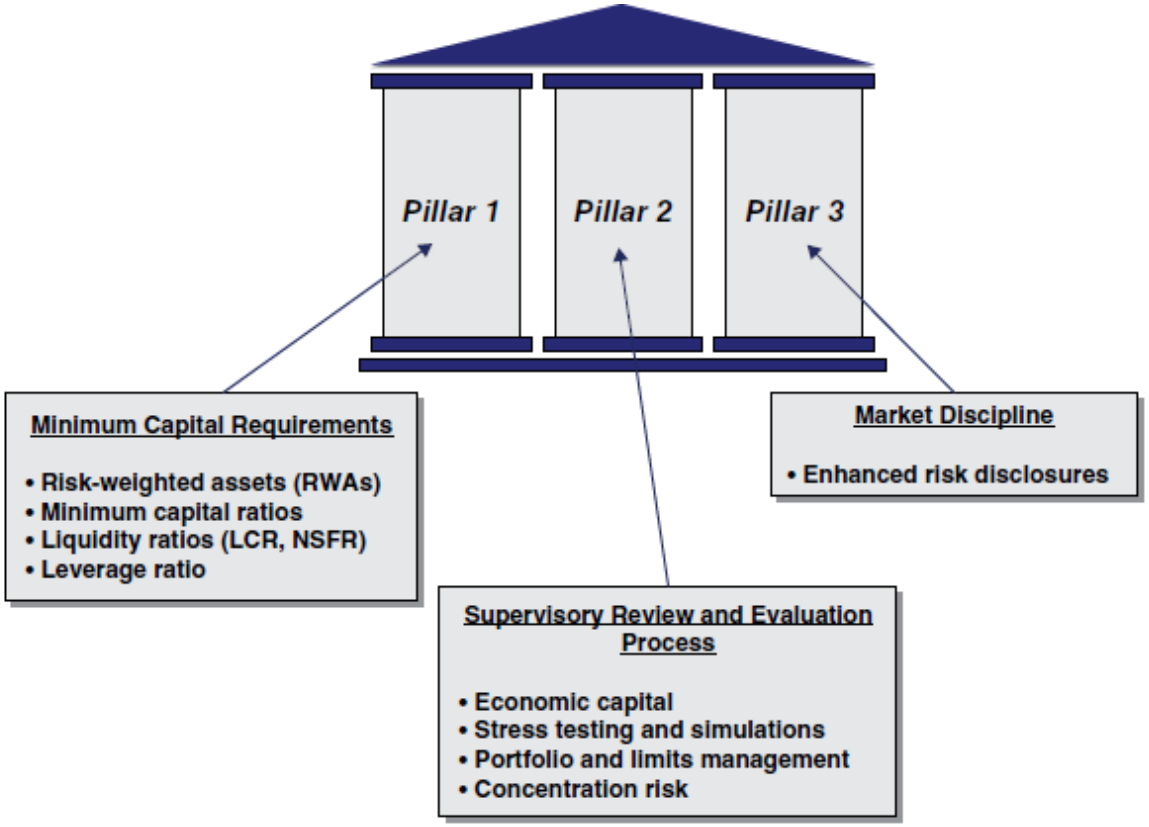
With pillar 3, the third actor in the banking regulation framework enters the scene. Pillar 1 was focused on the banks' own risk-control systems, pillar 2 described how the regulators were supposed to control the banks' risk frameworks, and finally pillar 3 relies on market participants to actively monitor the banks in which they have an interest. Broadly, pillar 3 is a set of requirements regarding appropriate disclosures that will allow market participants to assess key information on the scope of application, capital, risk exposures, and risk assessment processes, and so the capital adequacy of the institution. Investors such as equity or debt holders will then be able to react more efficiently when banks' financial health deteriorates, forcing banks' management to react to improve the situation.

Table [1.11] : Pillar III disclosures

Topic	Qualitative disclosures	Quantitative disclosures
Scope of application	– Name of top entity – Scope of consolidation – Restrictions on capital transfer	– Surplus capital of insurance subsidiaries – Capital deficiencies in subsidiaries – Amount of interest in insurance subsidiaries not deducted from capital
Capital	– Description of various capital instruments	– Amount of Tier 1, Tier 2, and Tier 3 – Deductions from capital
Capital adequacy	– Summary of bank's approach to assessing the adequacy of its capital	– Capital requirements for credit, market, and operational risks – Total and Tier 1 ratio
Credit risk – general disclosures	– Discussion of bank's credit risk management policy – Definitions of past due and impaired	– Total gross credit risk exposures – Distribution of exposures by: country, type, maturity, industry and Basel 2 method (Standardized, IRB ...) – Amount of impaired loans
Credit risk – SA	– Name of ECAI, type of exposures they cover – Alignment of scale of each agency used with risk buckets	– Amount of a bank's outstandings in each risk bucket
Credit risk – IRBA	– Supervisor's acceptance of approach – Description of rating systems: structure, recognition of CRM, control mechanisms ...	– EAD, LGD, and RWA by PDs – Losses of preceding period – Bank estimated versus realized losses over a long period
CRM	– Policies and processes for collateral valuation and management – Main types of collateral and guarantors – Risk concentration within CRM	– Exposures covered by: financial collateral, other collateral, guarantors
Securitization	– Bank's objectives in relation to securitization activity – Regulatory capital approaches – Bank's accounting policies for securitization activities	– Total outstanding exposures securitized by the bank – Losses recognized by the bank during current period – Aggregate amount of securitization exposures retained or purchased
Market risk (internal models)	– General qualitative disclosure: strategies and processes, scope and nature of risk measurement system ...	– High, mean, and low VAR values over the reporting period and period end – Comparison of VAR estimates with actual gains/losses
Operational risk	– Approach(es) for operational risk capital assessment for which the bank qualifies – Description of the AMA, if used by the bank	
Equities	– Policies covering the valuation and accounting of equity holdings in banking book – Differentiation between strategic and other holdings	– Book and fair value of investments – Publicly traded/private investments – Cumulative realized gains (losses) arising from sales and liquidations
Interest rate risk in banking book (IRRBB)	– Assumptions regarding loan pre-payments and behavior of non-maturity deposits, and frequency of IRRBB measurement	– Increase (decline) in earnings or economic value for upward and downward rate shocks broken down by currency (as relevant)

Source: (Balthazar, 2006, pp. 95-98)

Figure [1.6]: the III pillars around Basel III



Source: (Ramirez, 2016, p. 05)

4.5 The Impact of Basel III on The Bank's Profitability and Risk Exposures

The combined consequences of the new liquidity requirement and the new minimum capital adequacy criteria are readily obvious when comparing the first and last stages, B1 and B4. Although it is more or less obvious that all regulatory requirements will have a major influence on the bank's overall profitability in terms of ROE, it is less clear that the new regulatory requirements on core equity will boost the bank's ROA.

Liquidity and equity requirements have varying effects on the bank's returns and risk exposures. Liquidity risk regulation appears to result in a reduction in both liquidity and interest rate risk exposure. If the bank covers the liquidity need with low-risk short-term assets, such rule may also lead to a lower credit risk exposure. Although a smaller equity ratio reduces capital risk, the bank may compensate by raising interest rate risk. (Falzon, 2013, p. 31)

4.6 The Criticism of Basel III

The most common criticism levelled towards the Basel III Accord is the amount of minimum resources (capital) that banks must hold. It may have a negative impact on the lending process if it is deemed to be excessively high. The Basel III Accord's high capital requirements may eventually

restrict banks' lending capacity. For example, a bank with 100 US dollars in capital (the Basel II Accord's minimum capital requirement) could make a loan of up to 1250 US dollars. in the risk-weighted loan capacity To be more specific, when the Basel III Accord is completely implemented, 100 US$ will represent 13% of total assets (Samina, venus, & rossazana, 2019, p. 21)

4.7 Evolvements of The Basel Accord Minimum Capital Requirements

Table [1.12]: Evolvements of the Basel Accord

	Basel I	Basel II	Basel III						
			2013	2014	2015	2016	2017	2018	2019
Minimum common equity ratio			3.5%	4%	4.5%	4.5%	4.5%	4.5%	4.5%
Capital conservation buffer						0.625%	1.25%	1.875%	2.5%
Minimum common equity plus capital conservation buffer			3.5%	4%	4.5%	5.125%	5.75%	6.375%	7%
Phase-in of deductions from CET1				20%	40%	60%	80%	100%	100%
Minimum Tier 1 Capital	4%	4%	4.5%	5.5%	6%	6%	6%	6%	6%
Minimum Total Capital	8%	8%	8%	8%	8%	8%	8%	8%	8%
Minimum Total Capital plus conservation buffer	8%	8%	8%	8%	8%	8.625%	9.25%	9.875%	10.5%
Liquidity coverage ratio					60%	70%	80%	90%	100%

Source: (Samina, venus, & rossazana, 2019, p. 22)

This table summarizes the evolution of the Basel Accords. It shows that the minimum capital requirement will gradually increase from an actual 8% to a potential 10.5%. At the end of the phase-in period, in 2019, the highest quality components of capital shall represent at least 6% of risk-weighted assets (RWA); more in detail, at least 4.5% of RWA should be held as common equity.

A capital conservation buffer is being gradually introduced starting in 2016. Other provisions relate to the deductions from Core Equity Tier 1 (CETl) that were introduced in 2013 and will be gradually increased until 2018. Non-core Tier 1 or Tier 2 capital has to be eliminated from the regulatory capital base as they are being cancelled at the beginning of 2013 over a 1 0-year period. Moreover, disclosures for Basel III started from January 1 , 2015 and the liquidity minimum requirement has been introduced from the same date (Samina, venus, & rossazana, 2019, p. 22)

Conclusion of The chapter One

The agreements issued by the Basel Committee on Banking Supervision all share one point, which is the capital adequacy standard, which is the main pillar of these agreements. Global markets in the field of financial transactions have witnessed developments through competition, which made banks vulnerable to many banking risks. Thinking began to search for solutions and mechanisms to confront these risks. The first mechanism was the establishment of the Basel Committee on Banking Supervision, which issued a set of first recommendations regarding capital adequacy, and this dated July 1988, and here it was called by the First Basel Agreement as it specified 8% for the capital adequacy standard this ratio began to work as of the end of 1992.

The first Basel Agreement had a set of positives, but it was not without negatives and shortcomings, as it produced several weaknesses and defects, which require the Committee to reconsider and amend this agreement, especially after the emergence of new risks It requires more sophisticated and accurate techniques to measure and manage it for the safety of banks and the stability of the banking sector.

In 2004, the Basel Committee issued the second Basel Convention in a new framework, where it introduced operational risks, credit risks and market risks, and its application began at the beginning of 2007, and due to the financial turmoil that occurred, the supervisory authorities of the Basel Committee announced new reforms for the banking sector on 2010, which were By issuing new rules that formed Basel III, which recognize the obligation to immunization banks themselves against crises, without the intervention of the government and the central bank, and all this comes only through the capital adequacy standard, as the new Basel system aims to increase and strengthen capital.

CHAPTER II

THE BANKING PERFORMANCE IN TERMS OF PROFITABILITY

Introduction of The Chapter Two

Performance is an important concept for the banking system, as it reflects the level of success achieved by the bank or what it seeks to achieve, as improving performance is no longer an optional matter for the bank, but rather it has become a prerequisite for continuity.

Banks are considered financial intermediation institutions where they play the role of mediator between savers and investors in terms of depositing and investing money, and therefore banks are considered an important and very sensitive sector, as they reflect the image of the countries' economy. The main objective of the bank is to increase revenues and achieve profit, as in recent years, evaluating profit efficiency and revenue efficiency has become a preferred model for experts to evaluate The general performance of banks, in this chapter, we will address the production of banks and performance measurement and profitability on bank performance, by dividing the chapter into three sections as follows:

- **Section One The production of the banking firm.**
- **Section Two The performance measurement in banks.**
- **Section Three The impact of profitability in the bank performance.**

1. Section One: The Production of The Banking Firm

Abstract

In the first section, we will review the current theory about the production of the banking company, by providing an explanation of the bank's performance, presenting its stages and the risks facing commercial banks.

1.1 Explanations for Bank Performance

A bank's shareholders are entitled to its profits; hence it is in their best interests to maximize those earnings. They can do it by increasing income while lowering costs. In addition, depending on the bank's market power in the input and output markets, they may be able to raise or lower output or input prices. Aside from speculative considerations, shareholders are unconcerned about profit distribution, earning a return on their investment in the bank through an increase in the bank's share price or dividends.

Profit maximization is identical to cost minimization in a completely competitive situation, according to economic theory. In practice, however, profit maximization and/or cost minimization are not always followed. **(Bos, 2008, p. 6)**

Exogenous influences such as regulation or (economic) shocks, on the other hand, can result in unsatisfactory performance. Such factors can drive a wedge between cost minimization and profit maximization to the degree that they do not have a similar impact on both.

Exogenous influences such as regulation or (economic) shocks, on the other hand, can result in unsatisfactory performance. Such factors can drive a wedge between cost minimization and profit maximization to the degree that they do not have a similar impact on both.

There are two types of other plausible explanations for deviations from profit maximization. All deviations that can be traced to incentive issues fall under the first group. Wrong incentives lead banks to deviate from a cost-cutting and/or profit-maximizing strategy. All aberrations that can be attributable to inefficiency go under the second group. In this case, inefficiency is defined as the inefficient use of inputs given outputs or the inefficient use of outputs given inputs. (Bos, 2008, p. 6)

1.1.1 Incentive Problems

Profits are maximized at a level of output when average costs are no longer minimized as a result of imperfect competition. A second, related reason why shareholders might refrain from maximizing predicted earnings and lowering costs is that their risk tolerance is different. If shareholders are both risk averse and under-diversified, they will want to ensure that their bank performs counter-cyclically, even if this means making decisions that aren't necessarily the best for the bank. Apart from the dubious premise that shareholders are fully aware of the relationship between the economic cycle and the bank's performance, the requirement that shareholders be under-diversified is impossible to maintain in practice. (Bos, 2008, p. 7)

The separation of ownership and control, which is more easily translated into banking practice, is at the heart of incentive difficulties that are - ceteris paribus – irrespective of market structure. The principal–agent theory implies that in the absence of complete knowledge, shareholders' incapacity to appropriately oversee bank management and the resultant managerial discretion may result in non-optimal behavior, i.e. revenues are not maximized and/or expenses are not reduced. As long as

shareholders cannot insure themselves against this possible suboptimal behavior, bank management may show expense-preference behavior or – if it is highly risk averse – any other strategy that reduces profits. This means that the asymmetric knowledge between principal and agent, which Diamond (1984) used to explain why banks exist by reducing audit costs for non-financial lenders, now helps explain why banks may suffer from moral hazard and other incentive difficulties.

Principal–agent problems are particularly important in banking, according to Dewatripoint and Tirole (1994), because debt is widely distributed among a bank's deposit holders. The huge leverage of banks should have a detrimental impact on management incentives to spend excessively on perks and decrease managerial slack. Individual depositors, on the other hand, are too small, and free riding obstructs coalition monitoring. This issue is particularly acute during difficult times, when the concave return structure of risk-averse deposit holders should put enough pressure on a bank's management to prevent excessive risk-taking and drive high efficiency. (Bos, 2008, p. 7)

Managerial slack can be reduced while maintaining managerial discretion through monetary and non-monetary incentives, as well as yardstick competition. External control mechanisms, supervisory institutions, collateralized loans, and takeover attempts, for example, have an impact on discretion. Price and non-price competition, the substitutability of a bank's products, and the contestability of its markets may all help to assure a bank's optimal performance by exerting competitive pressure on its management, assuming that management compensation is performance-based. Signaling devices, like as ratings, can play a similar purpose. Finally, while we focus on incentive issues between bank management and loan holders, shareholders face similar issues, albeit to a smaller amount.

It's debatable whether motivation issues are significant in European banking.

To begin with, few researches have sought to objectively examine the influence of principal–agent conflicts on European bank performance. The above-described instances, in which hidden action by or concealed knowledge of bank management results in inferior performance, are rarely translated into practical tests.

Second, moral hazard issues in the principal–agent relationship are only significant if the principal (i.e. the shareholder) is unable to insure himself against the agent's excessive risk-taking.

Third, while incentive concerns cause a bank's performance to be suboptimal, the extent to which this has an impact on European banking dynamics is unknown. There's little reason to believe that the incentive issues that can impair a bank's profitability or increase its average costs change considerably from one bank to the next, or even from one country to the next. Even if institutional oversight differs, the divide between ownership and control is very similar for commercial banks throughout Europe.

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To summarize, even if incentive concerns can assist explain bank performance, empirically assessing whether they can explain differences in bank performance has proven difficult and inconclusive thus far. (Bos, 2008, p. 8)

1.1.2 Inefficiency Problems

Explaining bank performance through inefficiency could be a more rewarding strategy. If a bank makes greater use of its inputs and converts them into outputs as cheaply as feasible, it can produce at a lower cost and profit than other banks.
To thrive in the long run, a bank must generate effectively.

The necessity of efficiency in European banking is stressed by Molyneux et al (1997) Higher efficiency can be expected 'If efficiency profit gains are channeled into improved capital adequacy positions, it will lead to improved financial products and services, a higher volume of funds intermediated, greater and more appropriate innovations, a generally more responsive financial system, and improved risk-taking capabilities' according to the authors In a nutshell, bank efficiency is critical for understanding and evaluating bank performance. Berger and Humphrey (1992) and Avkiran (1999) provide important instances, arguing that the only way massive bank mergers may benefit consumers is through higher efficiency, which results in cheaper costs and better service.
Rose (1995), Altunbas et al. (1997), and Akhavein et al. (1997) have all looked at whether merged banks are more efficient than non-merged banks of similar size. Baker and Bresnahan (1985) investigate whether stepped-up product differentiation can help boost efficiency following a merger. Haynes and Thompson (1999) focus on British building societies and ask the same question. The findings of this research highlight the need of evaluating whether inefficiency can explain bank performance. There is only some evidence of efficiency gains from mergers in the last scenario. In the other research, there is either no evidence (e.g., Rose, 1987) or evidence that mergers reduce efficiency (e.g. Altunbas et al., 1997). (Bos, 2008, p. 8)

Economic Research Ltd. (1997) decided to conduct its own comprehensive study of market power and efficiency in European banking in response to the growing interest in efficiency as an explanatory element in bank performance as well as its potential significance in policymaking. According to the authors, the single market integration program (S.M.P.) has 'enabled the (greater) realization of [efficiency advantages] in European banking markets.' The impact of the S.M.P. on bank efficiency differed between countries, according to the findings.

Importantly, this influence is unrelated to the explanatory capacity of the models applied to different countries, despite the authors' assertions to the contrary. However, the findings are solid and reliable enough for the European Commission to conclude that 'there does seem to have been a trend for European banks, on average, to move closer to the EU cost efficiency frontier.'
To summarize, efficiency is critical in describing the forces that drive European bank performance. It can also help in measuring and evaluating the factors that influence bank performance. It is also an important policy tool for responding to the dynamics of the single market for financial services. (Bos, 2008, p. 9)

1.2 From Economic Rationality to Production Functions

Our paradigm begins with identifying and describing why banks strive for efficiency. To accomplish so, we must first define bank production and demonstrate why and how it is improved.

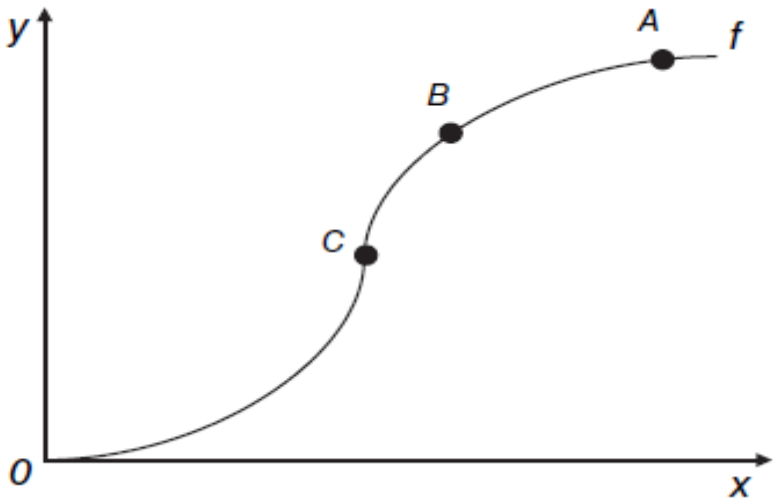
Banks are shown as rational economic agents. This is an idea that has to be explained. To begin, we assume that banks operate in a reasonable manner. That is, a bank functions in such a way that it achieves its own objectives in the best possible and optimal manner. Of course, this implies that banks are expected to understand the mechanics of their own production and to be able and willing

to employ it to achieve their objectives. Second, banks are agents that engage with other agents like consumers and governments. As a result, banks must consider external influences when pursuing their objectives. Finally, banks are economic agents in the sense that these objectives are established in economic terms from the start. This suggests we don't care about non-monetary goals. Banks are also expected to increase revenues and/or reduce costs. . (Bos, 2008, p. 9)

A bank, more specifically, strives to be productive and efficient. We offer a simple production function to explain both concepts: **y = f (x)**

All outputs and inputs are homogeneous when output y is produced using input x.

Figure [2.1]: Productivity.



Source: (Bos, 2008, p. 10).

The production function is also two-fold continuously differentiable. There are no financial constraints as well.

The production function, f, is graphically depicted in Figure [2.1]. It aids in the demonstration of productivity.

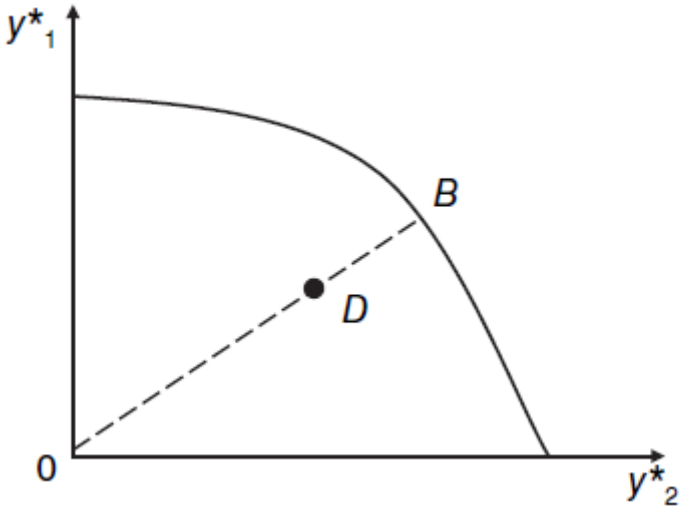
A bank provides a single output with a single input in this example, but the analysis that follows can easily be extended to a multi-output, multi-input scenario. Long-run production functions, on the other hand, are always taken into account. We begin with what is commonly referred to as productivity and then go on to efficiency.

The number of outputs produced with a single unit of input is defined as y/x in this case. $\partial y/\partial x > 0$ for the production function in the graph, and $\partial^2 y/\partial^2 x < 0$ from C onwards. The pace at which output changes as all inputs are changed at the same time is known as economies of scale. As a result, from 0 to C, we see growing returns to scale, constant returns to scale at C, and declining returns to scale from C onwards. We discover the feasible production set on and below f, which is the set of all potential input-output combinations. Bank B has the highest (potential) productivity on the graph, followed by banks A and C. Total factor productivity is the sum of all output-specific productivity in a multiple-input, multiple-output system (first and second-order partial derivatives).

Economies of scope result from supplying many goods and services through the same organization rather than through specialized providers, resulting in cost savings. These potential cost savings

should be distinguished from economies of scale, which refer to decreasing costs per unit of a specific commodity or service as total output increases**.** (Bos, 2008, p. 10)

Figure [2.2]: Efficiency.



Source: (Bos, 2008, p. 11).

Economies of scope quantify the net cost savings from producing two outputs together rather than individually in a two-output, single-input situation.

Efficiency, on the other hand, refers to the production set that is viable, as shown in Figure [2.2]for a two-output scenario. In general, efficiency is defined similarly to productivity, except that instead of y, the actual output, we now use y*, the maximum output for a given level of input. As a result, efficiency refers to the difference between actual and ideal input/output combinations.

This means that measurements are taken relative to the frontier, which specifies the maximum output for each input level in Figure [2.2]. (Or the minimum input level, for input minimization). Efficiency is defined as (y/x)/(y*/x) = y/y*, where y is the vector of outputs y_1 and y_2. As a result of its location on the frontier, bank B is efficient. (Bos, 2008, p. 11)

X-efficiency is the name given to the type of efficiency mentioned here. It calculates a bank's efficiency based on its location inside the feasible production set and in relation to the production frontier. The role of prices, on the other hand, is not taken into account. We can do this by dividing X-efficiency into technical and al locative efficiency. Al locative efficiency is defined by Coelli et al. (1998) as a firm's ability to utilize inputs and/or outputs in optimal proportions, given their relative prices and production processes. The word "al locative efficiency" is sometimes known as "price efficiency."

Of course, price information is required for al locative efficiency. Because bank output prices are difficult (if not impossible) to get, we shall concentrate entirely on technical efficiency when analyzing X-efficiency in the following sections.

To summarize, economies of scale and scope are closely related to (particularly) X-efficiency as productivity indicators. Both assess how well a bank's inputs are combined to achieve its outputs. X-efficiency, on the other hand, is measured relative to a standard, whereas economies of scale and scope are absolute – though comparable – measurements. To put it another way, the optimal output y* is a productive frontier efficient and feasible point that may or may not be seen in practice. The fact that economies of scale and technological efficiency are both radial measurements is a key similarity. The ratio of the linear distance between 0 and D and 0 and B, respectively, is used to quantify technical efficiency in Figure [2.2].

Finally, all of the efficiency metrics that have been calculated thus far may alter over time. A symmetrical shift (i.e., a radial measure) of the productive frontier as a result of technological advancements making their way into the production process is a specific situation. Technical change is the term for this transformation.

To summarize, we defined a basic production function and incorporated a variety of efficiency measurements. It's crucial to notice the specific issues that arise from the ambiguity of a bank's underlying production technologies in the banking business. One of the main reasons for modeling efficiency evaluations on the basis of cost and/or profit functions is to avoid ambiguity. (Bos, 2008, p. 12)

1.3 From Production Functions to Cost and Profit Functions

1.3.1 Bank Behavior

According to standard microeconomic theory, a bank will be a price taker in a perfect competition scenario, maximizing revenues while minimizing costs.
It raises output until marginal costs equal marginal income and average costs are kept to a minimum.

Banks may not be price takers and may not operate in a totally competitive market for a variety of reasons. As an example, a single bank should theoretically serve the market in the context of increasing returns to scale. Second, through switching costs, search costs, and product differentiation, price discrimination can lead to monopsony powers. Third, cross-subsidization could result in spillover effects from one concentrated banking market to the next.

A fourth example is the existence of regulatory hurdles, such as the prohibition on interstate branching in the United States after the passage of the Glass–Steagall Act, or interest rate regulation (in the form of maximum rates) in France and Spain in the early 1990s. (Bos, 2008, p. 12)

As a result, we require an analytical framework capable of incorporating and measuring behavioral assumptions about banks. Consider how a bank operating in a fully competitive market and a bank with a natural monopoly both optimize outputs while presumably employing the same manufacturing technology. As a result, they perform the same production purpose. As a result, we make a clear distinction between cost minimization and profit maximization. For any single bank in a completely competitive market, the two approaches should provide equal outcomes. In the case of imperfect competition, however, the presence of market dominance (for whatever reason) may result in a bank that optimizes profit at the expense of limiting expenses, or vice versa. Incorporating bank behavior in response to its competitive environment through the use of both cost and profit optimization is thus a suitable – if indirect – technique to do so. (Bos, 2008, p. 13)

1.3.2 Duality

To begin, we can formulate input demand and output supply equations using the production function. We can identify the output level that minimizes expenses and/or maximizes revenues in a single-input, single-output model by looking at all of the inputs. Profits (π) are maximized by taking: Max π: y−x, ignoring the difference between given and ideal inputs and prices for the time being. By setting $\partial\pi/\partial x = 0$, we may determine the input demand equations. (Bos, 2008, p. 13)
We determine the primal by plugging the resultant equations back into the profit maximization (or cost-minimization) model. We would have to estimate the production function as well as the input demand and output supply equations within a system of simultaneous equations in order to empirically follow suit. If one or more inputs are not exogenous, such estimates may suffer from simultaneous equations bias. Furthermore, the efficiency measures that result would not account for the potential impact of market power on price-setting. In addition, this approach necessitates knowledge of input and output volumes.

This is not always an easy task for financial institutions. A loan can be described in terms of outstanding value or indebted interest rate, for example.

The derivation of the dual becomes significantly easier with the help of the envelope theorem. The negative of input demand and output supply equations can be determined by calculating the first order partial derivatives from a profit function in a profit maximization model, according to Hotelling's Lemma. Likewise, for a cost minimization model, Shephard's Lemma states that the first partial derivative of the cost function with respect to each of the input prices defines the conditional input demand functions (i.e. conditional upon the output level, y) A second-order partial derivative is invariant to the order of differentiation in both models, according to Young's Theorem, and cross partial derivatives are symmetrical. There is no longer any simultaneous equations bias, and we can clearly assess the role of market dynamics in bank efficiency using the resulting cost minimization and profit maximization models. (Bos, 2008, p. 13)

1.3.3 Bank Production

The specification of bank production's inputs and outputs is a topic of continuing discussion. The production approach, on the one hand, separates labor and physical capital as inputs from the quantity of processed documents or transactions as output. It is widely accepted in the literature that it is best suited for bank branches with limited lending policy authority.

The intermediation approach, on the other hand, begins with the conventional core role of financial institutions, taking deposits as inputs and defining loans and investments as outputs.

The appropriate concept of output in banking has been a hot matter of debate, with the intermediation method and the production approach being the two prominent approaches.

The former assumes that a bank receives deposits and other cash and converts them into loans and securities (investments) utilizing labor, capital, and materials as inputs. Interest payments are considered costs, and the corresponding dual cost function includes the interest rate paid on deposits as an input element, rather just deposits. The output components are loans and investments. The latter method presupposes that a bank offers loan and deposit-related services. Interest payments are not considered banking costs in this perspective. Loans and deposits make up the output components. Because operating costs appear to account for the majority of a bank's cost inefficiencies, this research, like most others, adopts a production-based approach. Both strategies

have their drawbacks. The yield to maturity + notional amounts may be a preferable way to specify output under the production approach. (Bos, 2008, p. 14)

Alternatively, some scholars have proposed that deposits should be considered outputs rather than inputs in the intermediation method. However, it appears that the primary incentive for this is because banks generate revenue on deposits. This would imply including the interest margin, which isn't a valid output definition. Finally, we believe that the inclusion of loans as outputs is sufficient justification for including deposits as inputs (hence the term intermediation approaches).

Both approaches also overlook risk management, data processing, and the resolution of agency issues originating from the distinctions between loans and deposits, as well as the separation of management and ownership. A revised formulation of the constraint under which banks solve their minimization and maximization issues, respectively, could be a potential remedy to these flaws. The integration of the degree of equity in bank output is an example of risk management being incorporated. When it comes to funding loans, equity can be used instead of deposits. This would undoubtedly have an influence on both costs and profits. Furthermore, according to Mester (1996), the inclusion of equity in the analysis may account for differences in bank managers' risk attitudes, because higher amounts of equity, all other things being equal, lessen the chance of default. Finally, Berger and Mester (1997) cite the greater reliance on debt financing by large banks as a rationale to include equity. (Bos, 2008, p. 15)

1.4 Risks in The Commercial Banks

A risk can be described as an uncertain but possible event that could result in financial losses. Uncertainty regarding the divergence from the expected outcome is at the root of the risk. Risk is defined as phenomena that occurs when a decision maker is able to recognize potential trends/events, as well as their probability, but is unable to predict which of these occurrences will occur.

Negative deviations from expected or desired outcomes are related with the potential of a loss in the financial industry in general, but especially in the banking system, whereas positive deviations are regarded opportunities. Any procedure, transaction, or decision involving a degree of uncertainty regarding the outcome is subject to the risk associated with banking activity. All banking operations contribute to a bank's overall risk since they all have a degree of uncertainty connected with them.

Banking risk is related with financial risks in the literature because banks are the first and most affected by worsening economic and financial conditions in the nations where they operate due to the nature of the services they perform.

As previously said, banking risks may be divided into two categories: permanent risks (risks that are caused by a source or factor that does not change over time) and unique risks (risks that are caused by a source or factor that does not vary over time) (occurring as the result of a specific, discontinuous source). Banking risk is a phenomenon that occurs throughout the course of banking operations and has a negative impact on these activities by deteriorating asset quality, reducing earnings, or even registering losses, all of which have an impact on the bank's functionality. Banking risk can develop due to internal or external factors, and in view of the potential for unplanned expenses, risk management operations are of special relevance to banks. (Apătăchioae, 2015, p. 37)

Customers repay loans or interest late or do not pay back the loans or interest, depositors demand earlier withdrawal of deposits, market interest rates change significantly; human error, fraud,

regulatory changes, system collapse, poor organization, and so on are all risks that banks face in their daily operations.

Derminte (2009) found at least 15 risk factors in the banking industry, which he categorizes into six categories:

- ✓ **Credit risk:** is a customer's inability to return the loan's principal and/or interest on time.
- ✓ **market risk:** Unfavourable changes in interest rates, currency rates, and market prices of primary and derivative financial instruments held by the bank in its transactional portfolio have resulted in losses.
- ✓ **Liquidity risk:** Inability of the bank to obtain the required short-term cash.
- ✓ **Legal risk:** Unexpected regulatory changes have resulted in losses**.**
- ✓ **Operational risk:** the likelihood of a loss due to insufficient internal procedures, workers, systems, or external events.
- ✓ **Strategic risk:** refers to the possibility that a new rival, company, or product will change the competitive landscape in the banking industry. (Apătăchioae, 2015, p. 38)

2. Section two: The Performance Measurement in Banks

In this section, we will touch on performance measurement in banks, where to measure performance, tools must be used, and there are two methods for that: the classical method and the modern method. The most commonly used tools in the classical method are the return on equity, return on assets, net interest margin, and the method Modern is the economic value added. This section will be divided into two. First, we provide a definition of performance measurement, and secondly, we present the measurement tools.

2.1 Performance Measurement Definitions

Despite the fact that the word "performance measurement" has been in use since the late 1970s, it has yet to be given a universal definition. Performance measurement, according to the Government Accountability Office, is an assessment of an organization's performance that includes measures of:

- Productivity, which measures an organization's outputs and inputs.

- Effectiveness, which determines the relationship between an organization's outputs and the goals it is supposed to achieve.

- Quality, which evaluates a product or the method through which it is created.

- Timeliness, which considers the amount of time it takes to produce a suitable result.

“The process of assessing the efficiency and effectiveness of past actions,” according to Neely et al., is the most commonly referenced definition of performance measurement. Despite the fact that this definition emphasizes both effectiveness and efficiency, it is unlikely to cause managers to pause and question their performance measuring techniques. It, in particular, concentrates solely on the past and provides no guidance as to what they should quantify or why. (Faten Ben Bouhen, 2016, p. 117)

This is why Moullin proposes a different definition: "performance measurement measuring how well organizations are managed and the value they deliver to consumers and other stakeholders." People interested in performance measurement will benefit much from his definition. It will challenge them to think about how their company assesses the value it provides to consumers and whether it covers all of the important components of how it is managed. In the area of performance measurement, there has been some lively debate. When Bocci disputed Neel et al definition’s he stated that performance measuring entails not only quantifying but also comparing to a benchmark. According to him, performance measurement is a type of primary process that can be part of larger and various processes: we measure performance to review and manage the organization's performance on the inside or from the outside. As a result, the goals of performance measurement may differ significantly.

Furthermore, Bocci remarked on Moullin's definition, stating that the terms "performance measurement" and "performance evaluation" should be distinguished. Consider performance measuring in this way, especially in the public sector, is one of the primary challenges that individuals must overcome if the company wishes to go from measurement set to judge to measurement consciously adopted to support decision making.

"Someone somewhere is going to ask how well an organization is doing or what is responsible for the drop in sales," Moullin responded, adding that evaluating was a better term because it included interpretation and analysis: "someone somewhere is going to ask how well an organization is doing or what is responsible for the drop in sales." We can't keep hiding behind the stats indefinitely."

Pratt concurred, noting that evaluating is preferable than quantifying because it includes both qualitative and quantitative measures. In essence, Neely agreed with Moullin and Pratt that delivering value to stakeholders is critical to an organization's success, though he later in the article claims that the concept of stakeholder adds no clarity to the definition because the question of which stakeholders matter is so context dependent.

"When you can measure what you're talking about and communicate it in numbers, you know something about it," Kelvin says. As Anon put it, "you can't manage what you can't measure." (Faten Ben Bouhen, 2016, pp. 117-118)

2.2 Performance Measurement Tools

The performance metric we use may differ depending on the industry we're researching. Venkatram and Ramanujam categorize the various techniques of measuring business performance, which they regard as a part of the larger area of organizational effectiveness. The financial and operational performance of a business would be combined in this approach. Financial performance employs financial metrics to indicate the firm's economic successes, presuming that financial goals are preferable in this way. Growth sales, profitability (return on assets (ROA) and return on equity (ROE)), profits per share (EPS), and market metrics (market-to-book value, stock returns, and Tobin's Q^1) are among these indicators. Operational performance, on the other hand, broadens the definition of business performance by incorporating key operational success factors that can lead to financial performance, such as market share, product quality, marketing effectiveness, company reputation, new product introduction, and manufacturing value-added. (Faten Ben Bouhen, 2016, p. 119)

Biazzo and Garengo recently compared performance measurement models using the eight dimensions of performance measurement strategies (alignment, development, focus on stakeholders, balance, process orientation, depth, breadth, dynamic adaptability, causal relationships, and clarity and simplicity) as well as the three typologies defined by De Toni and Tonchia (vertical, balanced and horizontal):

– **Vertical architectures** are models that are strictly hierarchical (or strictly vertical) and are characterized by cost and non-cost performances on different levels of aggregation, until they eventually become economic-financial ones; the first hierarchical model was that of Gold, which linked productivity with ROI. (Faten Ben Bouhen, 2016, p. 119)

– **Balanced architectures** are models that are balanced scorecards or dashboards, in which several separate performances are considered independently; these performances correspond to different perspectives of analyses (financial, internal business processes, customers, learning/growth), which remain largely separate and whose links are only defined in a general way.

– **Horizontal architectures (by process)** are models that concentrate on the value chain and take into account the internal customer-supplier connection.

They conclude that the use of De Toni and Tonchia's models demonstrates a clear distinction between the vertical structure of most generic models (performance measurement matrix,

performance pyramid system, results and determinants framework, and balanced scorecard) and the horizontal structure of the two specific models for SMEs (organizational performance measurement by Chennell and balanced scorecard by De Toni and Tonchia). On the one hand, there is a focus on the differences between large enterprise and small and medium enterprise models, while on the other; there is evidence of a time-related evolution of the models under consideration. (Faten Ben Bouhen, 2016, p. 120)

2.2.1 Classical Methods

The traditional approaches are based on earnings (profit). These conventional methodologies have been used by managers to assess financial performance. The following are a few of the most commonly used conventional performance measurements: (Faten Ben Bouhen, 2016, p. 120)

2.2.1.1 Ratio Analysis

The calculation and comparison of financial ratios generated from information in a company's financial statements is known as financial ratio analysis. These ratios can be used to make judgments about a company's financial situation, operations, and investment attractiveness based on their current levels and past trends. Financial ratio analysis divides ratios into categories that reveal information about a company's finances and activities.

The various types of ratios are listed below: (Faten Ben Bouhen, 2016, pp. 120-122)

1) **Leverage ratios** are a measure of how much debt a company uses in its capital structure. The firm's leverage, or the extent to which it relies on debt as a source of funding, is a crucial piece of information that we can learn from its balance sheet, according to Berk and Demarzo. The debt-to-equity ratio is a typical metric for determining a firm's leverage. Divide the total amount of short- and long-term debt (including current maturities) by the total stockholders' equity to get this ratio.

- **Debt –Equity Ratio**

$$\text{Debt-Equity Ratio} = \frac{\textbf{Total Debt}}{\textbf{Total Equity}}$$

- **Debt -to-capital ratio**

$$\text{Debt-to-Capital Ratio} = \frac{\textbf{Total Debt}}{\textbf{Total Equity} + \textbf{Total Debt}}$$

2) **Liquidity ratios** These metrics show a company's financial health or solvency in the short term. We distinguish between three main ratios.

– Current ratio $= \frac{\textbf{Current assets}}{\textbf{current liabilities}}$

– Quick ratio $= \frac{(\textbf{Cash} + \textbf{short-term investments} + \textbf{A/R})}{\textbf{current liabilities}}$

– Cash ratio $= \frac{\textbf{Cash}}{\textbf{current liabilities}}$

3) **Profitability ratios** According to Berk and Demarzo, the income statement contains a wealth of information about a firm's profitability and how it relates to the value of its stock. A firm's gross margin is the ratio of gross profit to revenues (sales):

- **Gross Margin** Gross Margin=$\frac{\textbf{Gross profit}}{\textbf{sales}}$

The ability of a firm to sell a product for more than its cost of production is measured by its gross margin. Because there are costs associated with running a business in addition to the direct costs of items sold

- **Operating margin** Operating margin=$\frac{\textbf{Operating profit}}{\textbf{sales}}$

The operational margin shows how much a company generates from each dollar of sales before interest and taxes. We can also calculate a firm's earnings before interest and taxes. We can analyze the relative efficiency of the firms' operations by comparing operating or EBIT margins among enterprises within an industry.

- **EBIT margin** EBIT margin=$\frac{\textbf{EBIT}}{\textbf{sales}}$

Differences in operating margins can emerge from business strategy, in addition to operational efficiency.

- **Net profit margin** Net profit margin=$\frac{\textbf{Net Profit}}{\textbf{sales}}$

The net profit margin illustrates how much of each dollar in revenue is available to equity investors after interest and taxes have been paid.

- **Net Interest margin** net interest margin =$\frac{\textbf{net interest income}}{\textbf{assets (or interest-bearing assets)}}$

Finally, the net interest margin is a proxy for the intermediation function of banks' ability to generate income. (European Central Bank, 2010, p. 9)

4) **Operational ratios** Turnover measurements are used in operational ratios to indicate how efficient a company's operations and asset utilization are. Despite the fact that financial ratio analysis is well-developed and the actual ratios are well-known, professional financial analysts frequently create their own measurements for certain industries and even individual organizations. The following are the most commonly used ratios. (Faten Ben Bouhen, 2016, p. 122)

- **Return on Equity (ROE)**

The most important profit metric is return on equity (ROE), which analyzes banking management in all dimensions and provides an image of how capitals brought by shareholders are used, as well as the impact of their retainer on the bank's activities. According to Berk and Demarzo, a high ROE may imply that the firm is capable of identifying highly profitable investment possibilities. This metric is calculated as follows: (Faten Ben Bouhen, 2016, p. 123)

Return on Equity=$\frac{\textbf{Net Income}}{\textbf{Book Value of Equity}}$ (AHSAN, 2012, p. 133)**.**

It is defined as the difference between net profit after all expenses and taxes and the book value of equity. This indication, which is considered one of the most typical barometers of various commercial enterprise performances, receives significant attention in the speciality literature. In the case of banks, a normal margin of this indicator is thought to be somewhere between the major thresholds of 10% and 30%.

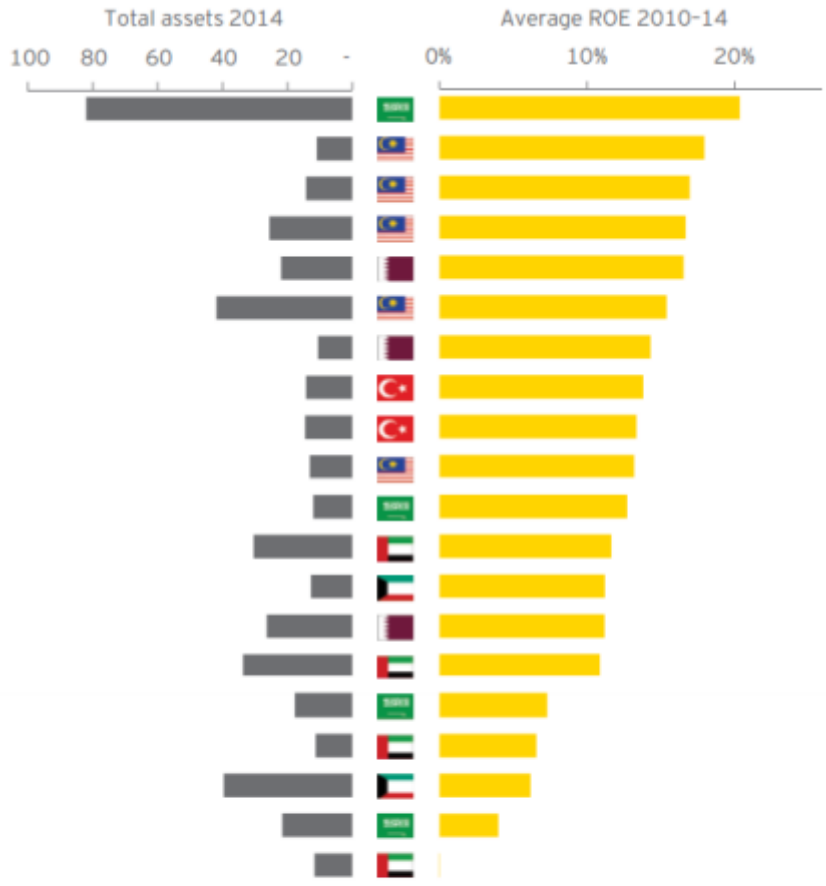
The next figure [9] shows the total profitability of the top 20 participation banks, which climbed by $1 billion in 2014 to surpass $7 billion, with an asset growth rate of 14 percent (2010–2014).This resulted in a strong increase in ROE, which has aided in the growth of shareholder equity (22 banks have crossed the equity landmark of 1 billion USD) (Faten Ben Bouhen, 2016, p. 123)

- **Return on Assets (ROA)**

This metric represents the profitability of a banking society's whole operation. This metric, also known as profit to assets or asset profitability, assesses the ability of management to utilise an institution's financial and real resources to generate profit. The return of assets indicator is thought to be the most accurate measure of banking activity since it immediately expresses the result of active operations optimization, according to the unique management of banking intermediaries, for a given volume of resources. This indicator's formula is as follows: (Faten Ben Bouhen, 2016, p. 123)

$$\textbf{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}}$$ (Jeffrey A. Mankin, 2011, p. 82)

Figure [2.3]: Profitability and shareholders' equity in focus: top 20 participation banks.



	Average ROE* (2014)	Average assets	Average growth 2010-14
Leading Participation banks by assets	12.6%	US$23b	14.0%
Comparable conventional average	14.5%	US$87b	11.0%

Source: (Faten Ben Bouhen, 2016, p. 123)

ROA is a measure of a company's profitability before leverage, and it is compared to other companies in the same industry. Because the carrying value of the assets determines the total assets of the company, prudence is advised for enterprises whose carrying value does not match the actual market worth. Because the bulk of their assets will have a carrying value that is near to their real market worth, ROA is a typical measure used to compare the performance of financial institutions (such as banks). The fluctuation limits of indicators are typically between 0.5 and 1.6 percent. The small value (<1%) is unique to large banks, but small and medium institutions have an additional unit dimension of indication. Return on assets (ROA) has the advantage of being less susceptible to debt than return on equity (ROE) as a performance indicator. It is, however, sensitive to working capital — an equal rise in the firm's receivables and payables, for example, will raise total assets and hence lower ROA. (Faten Ben Bouhen, 2016, p. 125)

The DuPont Identity (called after the corporation that originated its use) is used to gain additional insight into a firm's ROE. This tool calculates the return on investment (ROI) based on the profitability, asset efficiency, and leverage of the company. The ultimate purpose of the DuPont analysis, according to Harrison et al., is to explain the rate of return on common shareholders' equity (ROE) in detail by breaking it down into its component elements: Return on sales, asset turnover, and leverage are all factors to consider. The model's first two components combine to produce a rate of return on total assets (ROA). When the last component (leverage) is added to the equation, the rate of return on common stockholders' equity is calculated (ROE).
According to Berk and Demarzo, the DuPont identity is:

$$\textbf{ROE}=\left(\frac{\textbf{Net Income}}{\textbf{Sales}}\right)\times\left(\frac{\textbf{Sales}}{\textbf{Tatal Assets}}\right)\times\left(\frac{\textbf{Total Assets}}{\textbf{Book Value of Equity}}\right)$$

ROE=Net profit margin×Assets Turnover×Equity Multiplier.

ROE=ROA×Leverage.

ROE developing:

$$\textbf{ROE}=\frac{Ni}{E}=\left(\frac{Oi}{S}\right)\times\left(\frac{S}{A}\right)\times\left(\frac{Ni}{Oi}\right)\times\left(\frac{L}{E}\right)$$

[Operational margin] × [Asset turnover] × [cost of debt] × [arm of leverage] [Economic profitability] × [debt structure]

Where:
L = total liabilities.
A = total assets.
S = sales.
Ni = net income.
E = equities.
Oi = operational income.
Arouri et al. shown that comparing the financial statements of non-financial enterprises listed on a stock exchange for the same year published under IFRS and national accounting standards considerably alter these ratios. (Faten Ben Bouhen, 2016, p. 126)

– Return on Invested Capital

The return on investment, also known as the return on invested capital (ROIC), is a measure of a company's efficiency, or how much profit it can make with the resources provided by its investors. Investors are usually looking for organizations that have a high and growing return on investment.

$$\textbf{Return on Invested Capital}=\frac{\textbf{EBIT}(\textbf{1}-\textbf{Tax Rate})}{\textbf{Book Values of Equity}+\textbf{Net Debt}}$$

Decision makers frequently seek ways to increase ROIC by lowering expenses, increasing gains, or speeding up gains. It's also a metric for how well a corporation invests its profits to generate more profits. The ROIC compares the capital raised from equity and debt holders that has already been deployed to the after-tax profit earned by the business itself, excluding any interest expenses (or interest income).The most helpful measure of operating returns (ROE, ROA, and ROIC) in measuring the performance of the underlying firm is ROIC. (Faten Ben Bouhen, 2016, pp. 127-128)

5) **Solvency ratios** depict a business's ability to produce cash flow and meet its financial obligations. In the following, we divide ratios into two categories.

* **Working capital ratios** The combined information in the income statement and balance sheet can be used to determine how efficiently a firm uses its net working capital. Companies frequently measure the number of accounts receivable days, or the number of days' worth of sales accounts receivable represents, to assess how quickly they convert sales into cash:

- **Accounts Receivable Turnover**

$$\textbf{Accounts Receivable Days} = \frac{\textbf{Accounts Receivable}}{\textbf{Average Daily Sales}}$$

A rise in the average days it takes to collect payment from clients may be cause for concern, indicating that the firm is either doing a bad job of collecting from customers or is attempting to promote sales by extending extensive credit terms. It's natural to compare these expenses to the company's cost of sales, which should include the overall amount paid to suppliers as well as inventory sold. As a result, accounts payable days are defined as follows:

- **Accounts payable turnover**

$$\textbf{Accounts payable Days} = \frac{\textbf{Accounts Payable}}{\textbf{Average Daily Cost of Sales}}$$

Inventory days are calculated as $\left(\frac{\textbf{inventory}}{\textbf{average daily cost of sales}}\right)$.

Working capital can also be measured using turnover ratios. Turnover ratios are calculated by multiplying annual revenues or costs by the relevant working capital account.

- **Inventory turnover**

$$\textbf{Inventory Days} = \frac{\textbf{Inventory}}{\textbf{Average Daily Cost of Sales}}$$

Assume that the inventory turnover is 400/20 = 20, which means that the company sold around 20 times its present inventory stock over the year. Accounts receivable turnover is calculated as (annual sales/accounts receivable) while accounts payable turnover is calculated as (annual cost of sales/accounts payable). It's worth noting that increased turnover equates to shorter days and, as a result, a more effective use of working capital.

$$\textbf{Accounts Receivable Turnover} = \frac{\textbf{Annual Sales}}{\textbf{Accounts Receivable}}$$

$$\textbf{Accounts Payable Turnover} = \frac{\textbf{Annual Cost of Sales}}{\textbf{Accounts Payable}}$$

$$\textbf{Inventory Turnover} = \frac{\textbf{Annual Cost of Sales}}{\textbf{Inventory}}$$

While working capital ratios can be compared across time or between industries, there are significant variances between them. (Faten Ben Bouhen, 2016, pp. 129-130)

***Interest coverage ratios** Lenders frequently use an interest coverage ratio to analyze a firm capacity to satisfy its interest obligations by comparing its earnings to its interest expenses. The firm's EBIT as a multiple of interest expenses is a standard ratio to analyze. A high ratio shows that the farm is earning significantly more than is required to cover its interest obligations.

Creditors frequently aim for an EBIT/interest coverage ratio of more than 5 for high-quality debtors, according to Berk and Demarzo. Lenders may begin to doubt a company's ability to repay its obligations if EBIT/interest goes below 1.5.When calculating EBIT, depreciation and amortization charges are deducted, although they are not cash expenses for the company. As a result, financial analysts frequently calculate a company's profits before interest, taxes, depreciation, and amortization, or EBITDA, as a measure of the cash generated from operations and available to pay interest.

EBITDA/interest

EBITDA = EBIT + depreciation and amortization.

A company's declining interest coverage could be cause for concern.

6) **Valuation ratios** Analysts employ a variety of ratios to determine the firm's market worth. The price–earnings ratio, or EPS, is the most prevalent: (Faten Ben Bouhen, 2016, pp. 131-132)

-Earnings per share Earnings (profit) are the most important metric for shareholders. As a result, the EPS, which divides total annual earnings by the number of shares in issue, is a widely used performance indicator. The earnings per share (EPS) are the earnings on the initial investment.

Preferred dividends are not included in the EPS formula for categories other than continuing operations and net income. The calculation of EPS and net income for continuing operations is more complicated since any preferred dividends are deducted from net income before computing EPS.

$$\textbf{EPS} = \frac{\textbf{Market Capitalization}}{\textbf{Net Income}} = \frac{\textbf{Share Price}}{\textbf{Earnings Per Share}}$$

The EPS ratio is a basic metric for determining if a stock is overvalued or undervalued. It is based on the premise that a stock's value should be proportional to the amount of profit it can make for its owners. EPS ratios vary greatly by industry, although they are often higher in areas with strong predicted growth rates.

-Market value versus book value Because creditors know that the market value of the assets is significantly higher than the book value, successful businesses are typically able to borrow in excess of the book value of their assets. As a result, it's not unexpected that the book value of equity often differs significantly from the price at which investors are ready to pay for it. The number of outstanding shares multiplied by the market price per share equals the entire market value of a firm’s equity.

Market value of equity = Shares outstanding × market price per share.

The market capitalization (or "market cap") of a firm refers to the market value of its stock. The market value of a stock is determined by what investors expect the firm's assets to produce in the future, rather than the previous cost of those assets.

$$\text{Market-to-Book ratio} = \frac{\textbf{Market Value of Equity}}{\textbf{Book Valueof Equity}}$$

– Enterprise value:

The market capitalisation of a firm is the market worth of its equity, or the value left over after the firm has paid its debts. The enterprise value of a company (sometimes known as total enterprise value) determines the value of the firm's underlying business assets, which are unencumbered by debt and distinct from cash and marketable securities. It is calculated in the following way:

Enterprise value (EV) = Market value of equity + net debt (or debt – cash)

The cost of taking over the business might be interpreted as the enterprise value.

2.2.1.2 Income Statement (P&L)

The income statement, often known as a statement of financial performance, shows the firm's earnings and expenses over time. The income statement's last or "bottom" line reflects the firm's net income, which is a measure of its profitability throughout the period. The profit and loss, or "P&L," statement is also known as the income statement, and the net income is also known as the firm's earnings.

The profit a firm makes after subtracting costs and expenses from total revenue is known as net income. The primary inflows and outflows of assets that occur during a business's operating cycle are revenues and expenses.

As a result, revenues are the assets obtained in exchange for delivering goods or services to clients. Expenses, on the other hand, are the assets that a corporation foregoes or consumes in order to supply goods or services to a consumer. The net income can either be given as a dividend to common stockholders or kept by the firm as retained earnings. The term "net income" is used in accounting .Profit is the common term in various nations, such as the United Kingdom. Although the phrase income is sometimes used in place of net income, this is not advised due to the potential for misunderstanding. Tax expense, finance expense (interest expense), and minority interest are the most common items removed. Preferred stock dividends will also be deducted, despite the fact that they are not an expense. Subtracted costs for a merchandising firm could include the cost of items sold, sales discounts, and sales returns and allowances. Advertising, manufacturing, and design and development costs are all included in the costs of a product company. (Faten Ben Bouhen, 2016, p. 133)

*Net revenue – cost of goods sold = gross margin.
*Gross margin – operating expenses = earnings before interest and tax (EBIT).
*Earnings before interest and tax – interest expense + interest income income before taxes.
*Income before taxes – income taxes = income after taxes (and before extraordinary items).
*Income before extraordinary items + extraordinary items = net income.
*Net income – preferred dividends = net income available to common.

The income statement, also known as the statement of operations, summarizes the period's earnings and expenses. The bottom line represents the period's net profit or loss. The term "net" in accounting refers to an amount that has been subtracted. After removing expenses and losses from revenues and gains, net income is the profit left over. The single most essential item in the financial statements is net income. (Faten Ben Bouhen, 2016, pp. 133-134)

2.2.1.3 Market Value Added

The difference between a firm's present market value and the capital given by investors is known as market value added (MVA). If MVA is positive, the firm has increased its value. If it's negative, the company has depreciated in value. The amount of value generated must be more than what the firm's investors could have gotten by investing in the market portfolio, adjusted for the firm's leverage (beta coefficient).

The MVA is calculated as follows:

Market value added (MVA) = Market value − invested capital (Faten Ben Bouhen, 2016, p. 134)

2.2.1.4 Cash Flow Statements

Cash flow statements illustrate how much money comes in and goes out of a firm over the course of a quarter or year, i.e. how much actual cash a company has earned, and are essential for determining a company's growth.
It demonstrates how the corporation may fund its operations and future expansion.
Operating operations, investment activities, and financing activities are the three divisions of the cash flow statement. The first section, operating activity, begins with the income statement's net income. The amount is then adjusted by adding back all non-cash inputs relevant to the business's operations. The cash used for investment is listed in the next section, Investment Activity. The third component, under financing activity, depicts the cash flow between the company and its investors. (Faten Ben Bouhen, 2016, pp. 134-135)

2.2.1.5 Variance Analysis

The difference (or variance) between real costs and the standard costs allowed for the satisfactory output is frequently explained using variance analysis.
Management can use variance analysis to better understand current costs and subsequently limit future costs.
The gap between actual and budgeted sales can also be explained using variance analysis. (Faten Ben Bouhen, 2016, p. 137)

2.2.1.6 Standard Costing

Standard costing is a cost-control and business-operations management technique. Its goal is to decrease waste and improve performance efficiency by establishing standards or generating cost plans. The term "standard" refers to a yardstick or a benchmark. The standard cost is a predetermined price that establishes how much any product or service should cost under specific conditions. It is a method of cost accounting that is used to determine how much a product should cost under current conditions. Only when production begins can the true cost be determined. The predetermined cost is compared to the actual cost, and any discrepancy allows management to take appropriate corrective action.

Traditional models, as defined by Bourne et al as models based on accounting systems and financial data, did not take into consideration the contemporary managerial demands.

They have some severe flaws, which is why old approaches focused on earnings cannot be employed as a trustworthy measure of performance measurement in today's world. As a result, new approaches to performance measurement are required, including those that include stakeholder perspectives as well as shareholder wealth. (Faten Ben Bouhen, 2016, p. 137)

2.2.2 .Modern Methods

Performance measurement has long been recognized as having an impact on a company's conduct and, as a result, on the successful implementation of its plan. In order to link the strategy to the objectives of functions, groups of people, and individuals, as well as operational factors, performance measurement must be established and performed in line with a company's business plan.

One of the primary impediments to attaining the intended results from a performance measurement has been discovered to be a lack of alignment between performance measurement and business strategy in traditional models.

The lack of alignment between performance measurement and company strategy in traditional models has been discovered to be one of the key hurdles to achieving the desired results from a performance measurement.

Performance will be measured in a successful comprehensive quality company by the benefits perceived by customers as well as the results supplied to other stakeholders, such as shareholders. Examining an organization's performance is also a key stage in determining the strategic activities' direction. The wealth maximization notion, as well as other non-financial factors such as innovation, customer happiness, and employee motivation, is all taken into account in modern techniques. The Performance Prism, the Cambridge performance measurement process, the TPM process, the step TPM process, the total measurement development method (TMDM), activity-based costing and management, quality management, customer value analysis, the performance pyramid system, and the balanced scorecard are just a few examples of modern techniques.

The EVA, the most widely used tool for measuring bank performance, will be the subject of this section. (Faten Ben Bouhen, 2016, p. 138)

2.2.2.1 Economic Value Added

Economic value added is the most widely used indicator for calculating the entire return on an investment, which is based on the concept of a "opportunity cost" (EVA).
EVA = return on invested funds – (weighted average cost of capital * invested capital) – (weighted average cost of debt * net debt)

(EVA, developed by Stern and Stewart in 1991, considers the opportunity cost for stockholders to hold equity in a bank, determining if a company delivers an economic rate of return greater than the cost of invested capital in order to raise the company's market value.) (European Central Bank, 2010, p. 9)

2.2.2.2 Principles of EVA

EVA was created to assist managers in incorporating two key financial principles into their decision-making.
- Any company's principal financial goal should be to maximize the wealth of its shareholders.
-The extent to which investors expect future profits to deviate from the cost of capital determines a company's value. A prolonged growth in EVA will, by definition, result in an increase in a company's market value. For many different sorts of companies, this method has proven to be legitimate and beneficial.
This is because the EVA level isn't the most important factor.
The current performance of the company is already reflected in its stock values.
Ongoing growths in shareholder wealth are due to continuous improvements in EVA. (Faten Ben Bouhen, 2016, p. 140)

2.2.2.3 Objectives of EVA

Within a value-based management framework, EVA is one of several frameworks. EVA is calculated using standard accounting components such as interest bearing debt, equity capital, net operational profit, and so on. The EVA concept is that a shareholder must obtain a return that compensates him for the risks he has committed. The main goals of EVA are listed below:

- The EVA's main goal is to measure an organization's genuine performance while taking into account the perspectives of its stakeholders.
-EVA's major goal is to figure out which business divisions make the best use of their assets to maximize shareholder value. It can be used to evaluate a firm, a business unit, a single plant, office, or even an assembly line.
-After taxes and the cost of supporting capital have been factored in, EVA attempts to determine a company's genuine profit.
It aids in determining whether a company or project is generating more or less than the money invested.
- EVA's goal is to determine the organization's financial health and its ability to generate "value" for shareholders.
-EVA focuses on a company's financial assessment, which is critical for the company's long-term success and strategy.
-EVA is a financial term that refers to the profit or loss that remains after deducting the cost of all types of capital used in a business. EVA aids in determining the organization's "worth" over a certain time period. (Faten Ben Bouhen, 2016, p. 140)

-Another goal of EVA is to assist managers in establishing organizational goals based on financial analysis and with the primary goal of increasing shareholder wealth in mind.

-EVA calculates the genuine economic profit and assists managers in calculating bonuses, valuing corporations, and analyzing equities. Its goal is to serve as a motivator for managers and a presenter of the organization's genuine and fair picture to investors and shareholders.

Traditional performance measurements based on cost accounting data are ineffective in assisting firms on their quality journey because they do not link process performance to customer improvements. Performance will be measured in a successful comprehensive quality company by the benefits perceived by customers as well as the results supplied to other stakeholders, such as shareholders. (Faten Ben Bouhen, 2016, p. 141)

3. Section three: The impact of Profitability in The Bank Performance

Abstract:

Among the indicators that reflect the bank's performance is the profitability indicator, as it plays an important role in maintaining the stability of the banking sector. In this section, we will present the theory of bank profitability and the impact of measurement and determinants on the profitability of the bank.

3.1 The Theory of Bank Profitability

Banks, like all other businesses, are profitable if their revenue exceeds their expenses. Bank income comes from two main sources. The first source of bank income is operating income, which comprises net profits on trading and derivatives, net gains on other securities, net insurance income, and net fees and commissions, while the second source is interest income, which represents the interest earned on the bank's assets. The interest it pays on its liabilities and non interest expenses like personnel and operations expenses are the two main sources of expenses. A bank's main assets are its loans to individuals, corporations, and other organizations, as well as the securities it owns. A bank's principal liabilities include its deposits and the money it borrows from clients, other banks, and other short-term sources. (Tan, 2014, p. 68)

Return on assets (ROA), return on equity (ROE), net interest margin (NIM), and profit margin are all used as profitability indicators in the current empirical research on banking (PBT)

The ratio of net income to total assets is known as the return on assets (ROA).It represents a bank's ability to generate net profit through utilizing assets. A low ratio shows that a bank is inefficient at converting its invested funds into net income. The ability of a bank to generate income using shareholder capital, on the other hand, is measured by its return on equity (ROE). Divide a bank's net income by shareholder equity to get this figure. The higher the ratio, the better a bank's use of shareholder capital is. Although the term "return on investment" (ROI) is often used in the financial literature, it is not the best indication of profitability for the following reasons. For starters, banks with higher equity levels (lower leverage) typically have a better ROA but a lower ROE. Second, ROE ignores the increased risk that comes with more leverage, as well as the impact of regulation on leverage. The net interest margin (NIM) measures how successful a bank's investment decisions are in relation to its interest expenses. It's calculated by dividing the difference between interest income generated and interest paid out by the number of interest-earning assets. A negative number implies that a bank's investment options aren't optimal because interest expenses exceed interest income from loans.

Other profitability measures are employed by certain academics in addition to these frequently used profitability indicators. A few empirical studies have utilized profit margin to determine bank profitability. It is the ratio of a bank's earnings before taxes to its total assets. It is a measure of a bank's ability to create earnings from its assets before contractual obligations must be met. The higher the ratio, the more effective the bank is at generating profits from its assets. (Tan, 2014, pp. 69-70)

3.2 Measurement of Bank Profitability and Risk

Economies of scale, economies of scope, and market concentration are all mentioned frequently in the literature on banking profitability. Growth potential, capitalization, balance sheet structure,

ownership and management, regional disparities, and bank size are all taken into account when comparing bank profitability.

A bank with low capitalization may, on the surface, profit from leverage effects in terms of a better return on equity (ROE). Many empirical studies have used this topic to explain discrepancies in returns between privately owned and state controlled banks, such as Molyneux and Thornton (1992). Several researches, however, claim that the opposite link exists. According to Garca-Herrero et al. (2009), equity capital can be utilized to increase the percentage of hazardous assets in the face of profitable opportunities, to generate cheaper financing, and to indicate creditworthiness impacts. It also necessitates banks borrowing less in order to maintain a certain level of assets. (Molyneux, 2011, p. 84)

It is self-evident that the asset side balance sheet structure is critical for the bank's trade-off between profitability and risk-taking. Larger levels of loans to total assets, for example, should result in a higher profit due to the increased risk. A high ratio of noninterest-earning assets to total assets, in particular, has been demonstrated to have a detrimental influence on bank profitability.

Differences in profitability between banks can also be explained by their ownership and management approaches. The ownership dilemma arises in comparisons between private and state-owned banks since the latter are frequently considered being less efficient than the former. On the one hand, this is due to the fact that state-owned banks typically retain lower-quality assets. On the other hand, according to Molyneux and Thornton (1992), one explanation for private banks' greater returns is their lower capitalization, which is a result of the government's implicit underwriting of state-owned banks.

The environment in which the bank operates has little to do with the bank's policy position. Instead, it is demonstrated that regional factors are important to banks. When more diverse banks enter a market, for example, the profitability of banks operating in less competitive local markets improves. One explanation could be that the regionally diverse bank does not follow local market prices.
This effect, however, is not completely evident because it is dependent on the volume of operations and varies between rural and urban locations.

A bank's return on equity (ROE) is decomposed into an equity multiplier and a return on assets (ROA), which is further decomposed into asset utilization and profit (and net interest) margin in the Dupont model. Return on invested funds (ROIF) and return on financial leverage (ROFL) are the two components of ROE in this approach, which incorporates the trade-off between the bank's return and risk.

ROE= ROIF +ROFL.

ROFL is derived from the equation below:

ROFL = (ROIF$-k_d$)*D/E,

Where:

E = equity.
D = debt.
k_d = average cost of debt. (Molyneux, 2011, pp. 85-86)

3.3 Determinants influencing bank profitability

The determinants that influence bank profitability are divided into three categories: bank-specific determinants, industry-specific determinants, and the macroeconomic environment: (Tan, 2014, p. 73)

3.3.1 Bank-Specific Determinants

A number of bank-specific characteristics, such as bank size, liquidity, capitalization, risk, cost management, unconventional activity, and labor productivity, have an impact on bank profitability:

3.3.1.1 Bank Size The natural logarithm of total assets can be used to determine the size of a bank. The empirical literature presents many views regarding the impact of bank size on bank profitability. On the one hand, larger banks can save money due to economies of scale and scope. Bourke, 1989; Molyneux and Thornton, 1992; Akhavein et al., 1997; Bikker and Hu, 2002; and Goddard et al., 2004 are among the experts who accept this viewpoint.Large banks, on the other hand, are made up of extensive branches and representative offices in many cities and countries throughout the world, making them more difficult to administer. As a result of the increased costs, bank profitability suffers. According to Eichengreen and Gibson (2001), the influence of bank size on bank profitability is non-linear, with bank profitability increasing as size grows up to a certain point. Profitability will decline after this point. As a result, there is no presumption about the impact of bank size on bank profitability. (Tan, 2014, p. 74)

3.3.1.2 Liquidity Liquidity refers to a bank's ability to meet its debts when they fall due. This variable can be measured using the ratio of total loans to total assets. The higher the ratio, the more assets are used to provide loans, implying that the bank has less liquidity. Liquidity, according to Bourke (1989), can have a detrimental impact on bank profitability since the lower the liquidity, the larger the amount of loans, which boosts interest income and improves bank profitability even more. However, according to Graham and Bordelean (2010), the influence of bank liquidity on bank profitability is non-linear; in other words, any rise in bank liquidity boosts bank profitability, but if bank liquidity exceeds a certain level, bank profitability begins to decline. As a result, there is no presumption about the impact of liquidity on bank profitability. (Tan, 2014, pp. 74-75)

3.3.1.3 Capitalization The proportion of assets attributable to money donated by shareholders is known as capitalization. The ratio of shareholder equity to total assets can be used to calculate it. It is regarded as a critical factor in determining bank profitability. According to Berger (1995a), capitalization can have a detrimental influence on bank profitability because the higher the capitalization level, the lower the bank's relative risk position. Lesser risk equals lower profit, according to the risk–return trade-off. Some academics, on the other hand, believe that capitalization has a favorable effect on bank profitability. For example, Molyneux (1993) claims that banks with higher levels of capitalization can have lower funding costs since the larger the share of capital, the stronger the bank's creditworthiness. According to Berger (1995b), raising capitalization can increase expected earnings while lowering the expected cost of financial distress. Furthermore, higher levels of capital act as a buffer to absorb risk, allowing banks to make more loans and so boost bank profitability. As a result, there is no presumption about the impact of capitalization on bank profitability. (Tan, 2014, p. 75)

3.3.1.4 Bank Risk The ratio of loan loss provisions to total loans can be used to assess bank risk. The Z-score and stability inefficiency are two additional indicators that can be used in conjunction with this evaluation. 1The greater the loan loss provision to total loans ratio, the higher the bank risk; the lower the Z-score, the lower the bank risk; and the higher the stability inefficiency, the

higher the bank risk. The classic risk–reward theory states that increased risk is usually followed by higher returns. This theory, however, is only valid if a bank has a comprehensive risk assessment, monitoring, and management system in place. The inability to adequately manage risk will result in higher costs and lower bank profitability. (Tan, 2014, pp. 75-76)

3.3.1.5 Cost Management The ratio of overhead to total assets can be used to assess cost management. Operating expenses can have a negative impact on bank profitability, according to Jiang et al. (2003), because efficiency can be increased by cutting expenses, and cost reduction resulting from higher efficiency can boost bank profitability. Molyneux and Thornton (1992), Guru et al. (2002), and Ben Naceur all support a positive link between expenses and bank profitability (2003). They believe that salaries and wages provided to employees account for a considerable part of expenses. Banks offer experienced employees greater salaries and wages in order to motivate them to work harder and so enhance the productivity required to improve bank profitability. This viewpoint is supported by the efficiency wage theory. Furthermore, they believe that by rising loan interest rates and cutting deposit interest rates, banks can pass costs on to borrowers and depositors. As a result, there are no preconceived notions about cost management or bank profitability. (Tan, 2014, p. 76)

3.3.1.6 Non-Traditional Activity The ratio of non-interest income to total revenue can be used to determine non-traditional activities. Activity diversification might help you produce more revenue resources. A bank's reliance on interest income derived by traditional loan–deposit services, which can be badly affected by an economic downturn, decreases as the number of services it provides increases. As a result, bank profitability is predicted to benefit from this variable. However, Demirguc-Kunt and Huizinga (1999) claim that the volume of unconventional activity and bank profitability are negatively related. They justify their position by citing increased competition in non-traditional service areas such as insurance writing and investment banking, which reduces bank profitability. As a result, there is no presumption about the impact of non-traditional business on bank profitability. (Tan, 2014, p. 77)

3.3.1.7 Labor Productivity The ratio of gross income to the number of employees can be used to calculate labor productivity. Labor productivity, according to Athanasoglou et al. (2008), has a beneficial impact on bank profitability in Greece. The higher the degree of labor productivity, the more income per employee is created, which is meant to boost bank profitability. As a result, labor productivity is predicted to have a considerable and favorable impact on bank profitability. (Tan, 2014, p. 77)

3.3.2 Industry-Specific Determinants

Bank profitability is influenced by a variety of factors, including bank-specific drivers as well as trends in related industries. Three drivers have been studied in depth in the empirical literature: banking sector concentration, banking sector development, and stock market development: (Tan, 2014, pp. 77-79)

3.3.2.1 Banking Sector Concentration

The proportional quantity of assets owned by a few of the largest banks in relation to the assets of the entire banking sector is referred to as banking sector concentration. A concentration ratio of three or five banks is usually regarded a suitable proxy. It is calculated as the ratio of the assets of the top three/five banks to the assets of the entire banking industry. Bank profitability is influenced by a variety of factors, including bank-specific drivers as well as trends in related industries. Three drivers have been studied in depth in the empirical literature: banking sector concentration, banking sector development, and stock market development. (Tan, 2014, p. 78).

3.3.2.2 Banking Sector Development The development of the banking sector has a significant impact on bank profitability. The ratio of banking sector assets to GDP can be used to calculate it. Many studies have looked into whether the financial structure of a bank influences its performance In general, the higher the banking-assets-to-GDP ratio, and the greater the economic importance of financial development. This relative importance could imply increased demand for financial services, which could bring new rivals to the market. Bank profitability is predicted to suffer as a result of increased competition. Banks in nations with highly competitive banking sectors, where bank assets contribute significantly to GDP, have smaller margins and less profitability, according to Demirguc-Kunt and Huizinga (1999). As a result, this variable is expected to have a negative influence on bank profitability. (Tan, 2014, pp. 78-79)

3.3.2.3Stock Market Development Another aspect of the financial system that might affect bank profitability is stock market development. Bank profitability is better in countries with a well-developed stock market, according to Demirguc-Kunt and Huizinga (1999). They offer several reasons for the positive impact of stock market growth on bank profitability: (1) A well-developed stock market provides more opportunities for firms to obtain funds through equity financing, which reduces non-performing loans, increases borrowing capacity, and improves bank capitalization; (2) a well-developed stock market provides more information about publicly traded firms, which is very useful for banks to evaluate and monitor risk. A better assessment of bank risk lowers the number of non-performing loans and increases profitability. As a result, it is expected that stock market growth will have a considerable and favorable impact on bank profits. (Tan, 2014, p. 79)

3.3.3 Macroeconomic Determinants

3.3.1-Inflation The annual rate of inflation is a key factor of bank profitability.
Its impact on bank profitability is determined by whether or not inflation is expected. As long as inflation is properly anticipated and the interest rate is adjusted accordingly, the link between bank profitability and inflation is positive. As a result, revenues grow faster than costs, resulting in increased bank profitability.

3.3.3.2 GDP Growth Rate Bank profitability is thought to be influenced by economic growth. The indicator is the annual GDP growth rate. During recessions, demand for credit falls and the risk of default rises, resulting in a loss in bank profitability. Higher economic growth, on the other hand, according to Liu et al. (2013), improves the business climate while also lowering bank entry obstacles. Bank profitability is harmed as a result of the increased competition. As a result, there is no presumption about the impact of GDP growth on bank profitability. (Tan, 2014, pp. 79-80)

Conclusion of The Chapter Two

From the foregoing, we conclude that the Banks are at the center of the global financial system and the bank's performance represented in the capacity to generate sustainable profitability, efficiency and competition. The European Central Bank BCE defined three traditional measures of performance: Return on Assets ROA, Return on Equity ROE and Net Interest Margin NIM. In empirical studies, authors generally use ROA, ROE, and net interest margin NIM as measures of banking performance. These ratios are defined as follows: ROA = (Net income / Total assets) x 100, this ratio measures the profitability relative to bank's assets and therefore the overall bank performance. ; ROE = (Net Income / Equity) x 100, this ratio measures the profitability of the bank by revealing the profit generated using the capital invested by the shareholders; NIM (Net interest margins) = (Interest income - Total interest expense / Total productive assets) x 100 and measures the difference between the interest paid by the bank to the investors and the interest it receives from borrowers.

CHAPTER III

THE IMPACT OF CAPITAL ADEQUACY ON THE PERFORMANCE OF MIDDLE EAST AND NORTH AFRICAN BANKS: THE EMPERICAL STUDY

Introduction of The Chapter Three

Banking industry is one of most crucial sectors of an economy. Bank is such an institution that works with people's money and works for people's money to earn more money. As banks major business operations rely on the depositors' money which is counted as debt for them, banks have to mandatorily maintain certain rules and regulations to provide protection towards banks' consumers (depositors). One of the most important parts of these regulations is to hold an adequate amount of capital. Adequate capital not only ensure solvency but also operate as a shield against loss which in return ensure banks' sustainable economic operations with satisfactory return. In such a case argument can be predominated based on the research where researchers in many studies found that profitability and capital adequacy is negatively related (Navapan and Tripe, 2003). However, based on the perspective of banks' solvency it is more urged that adequate capital should be maintained in a standardized level where solvency and profitability will be optimal.

After our review of the issue of bank capital adequacy and highlighting the various amendments it has undergone in accordance with what was stated by the Basel Committee on Banking Supervision in the three agreements: Basel I, Basel II, and Basel III in order to enhance the stability of the banking system, protect banks from competition risks and manage banking risks .To learn more about this topic, in this chapter, we will present previous studies related to the subject of our research in order to be more familiar with the aspects of the impact of capital adequacy on the performance and profitability of banks, **t**hen we will present an empirical study on a sample of some banks from North African and Middle Eastern countries, The chapter is divided into the following sections:

- **Section One An overview of the banking system in some countries of MENA region**
- **Section Two Literature review**
- **Section Three Research Methodology, Data and Variables**
- **Section Four An empirical study on the impact of capital adequacy on the performance of banks in the Middle East and North Africa**

1. Section One An overview of the banking system in some countries of MENA region

1.1 Historical Overview of The MENA Banking System

The financial system is of paramount importance in the efforts of growth for all the economies no matter their development level, Based on this idea, developed countries and developing ones, have tried to exploit the opportunities offered by the financial systems in order to achieve growth. Governments of MENA countries launched, two decades ago (since the end of the eighties) vast programmes of restructuration and reforms in the aim to modernize their financial systems and enhance their performances. The foremost purpose of those policies, mainly driven by the World Bank and especially the International Monetary Fund, is to make financial systems more dynamic and active in achieving economic development tasks. (Beji & ousleti) Below we will try to provide an overview of the nature of the banking systems of some countries that were used in our study:

- **Algerian Banking System**

The Algerian banking system has passed through many stages. Thus, Algeria has inherited a well-developed banking system from the French colonial, but this system had hampered the achievement of the development programs planned by the Algerian state. After that, the banking system has been dominated by the state to ensure the required financing of the investment programs to develop an industrial sector that characterized by an intensive capital production technology.

The economic crisis of 1986 has pushed the Algerian government to adopt important economic reforms in which the banking system development was the pillar of these reforms. The transition from the centrally-planned economy to the market economy involves structural reforms focusing on the correction of the macro- economic imbalances, stimulate the foreign direct investment, and open the Algerian economy to the international competition.

Hence, the banking reforms of 1990 had a significant impact on the Algerian banking system where the Algerian authorities endeavoured to liberalize the banks' activities to improve the banks' performance. As consequences, the Algerian banking system changed radically, wherein, in 2016, it is composed of twenty commercial banks and eight financial companies and a group of liaison offices of foreign banks.. Furthermore, the reforms have encouraged opening the banking Sector to private investment to increase the competition level in the banking sector and improving the banks' performance. It is worth noting that banking competition is the cornerstone of the financial system and economic stability, authorities either in developed or developing countries give utmost importance to make the banking Market competitive. In other words, the authorities should remove the financial restrictions and initiate a real financial development to promote and sustain the economic growth.

The Algerian banking sector has passed through five phases; colonial phase, sovereignty phase, nationalization and socialization phase, restricting phase and Liberalization Phase. (HACINI & DAHOU, 2018)

Moroccan Banking System

In Morocco, as elsewhere, banking is the principal financial sector it has the potential to contribute the most or to most severely retard economic development. But the banking industry's potential performance is constrained by the monetary policies of the central bank.

The Moroccan central bank, Bank al'Magrib, has been very successful in providing a strong financial environment for the nation. Within this environment, indeed, perhaps because of it, the nation's banking sector is performing very well. One of the main recent achievements has been the near elimination of so-called "specialized banks," government institutions set up to provide directed credit to key sectors of the economy. These banks were a major drag on the private financial sector, boosting risk and raising costs, lowering returns to private banks and reducing the their supply of credit and raising the cost of credit for the private sector.

These institutions have largely been merged into private firms and their special status eliminated. Fiscal policy continues to remain a major barrier to private capital formation and bank lending. Unfortunately government policy continues to favor running large budget deficits, continuing the waste of scarce national resources. In addition, very high marginal tax rates kick in at very low levels of income, penalizing saving and investment and risk-taking activity. (Tatom & John, 2005)

Egyptian Banking System

The country's modern banking industry began in the mid-19th century, with the establishment of the Bank of Egypt in 1858 and the Anglo Egyptian Bank in 1864. At the time Egypt had one of the most open economies and cosmopolitan populations in the region, and as such it drew in a raft of other foreign institutions over the following decades. These included Credit Lyonnais in 1866, Ottoman Bank in 1867 and a number of other Greek, French and Italian institutions. National Bank of Egypt (NBE) and Agricultural Bank of Egypt were founded with British capital in 1898 and 1902, respectively. The first purely Egyptian bank was Banque Misr in 1920.

In the decades leading up to the Second World War the sector experienced rapid growth, but the abolition of the monarchy and the introduction of Nasserite socialism in the 1950s saw what had been a vibrant and largely privately held banking industry reduced to four state-owned commercial banks and a few specialised financial institutions. NBE, which had assumed the main functions of a central bank, was divided into a state-owned commercial bank that maintained its original name and the Central Bank of Egypt (CBE), which took over central bank duties.

Just two decades later the industry entered another phase of development, driven by the "open door" economic policy of former President Gamal Abdel Nasser's successor Anwar Sadat, which once again established an outward-looking economy. The banking law promulgated during this period, Law No. 120 of 1975, enabled private banks to return to the market and defined three modes of operation, with banks now designated as: commercial banks, which accepted deposits and offered other financial services to customers; business and investment banks, which facilitated medium- and long-term financing for new businesses and fixed-asset investments, as well as carrying out other commercial financial services; and specialised banks, which focused on particular economic sectors. In the 1990s a series of CBE decisions introduced a more favourable lending environment, resulting in an acceleration of private sector interest and a significant expansion of credit growth. However, this trend was accompanied by a deterioration in asset quality. Rising numbers of non-performing loans (NPLs) impelled the CBE to implement a programme of reform, which has

substantially reduced the number of banks operating in Egypt, with the 61 licensed banks in 2004 falling to 40 as of early 2018 (Campioni, Etreby, Arab, & Okasha, 2018)

Tunisian Banking System

The Central Bank of Tunisia (Banque Centrale de Tunisie-BCT), established in September 1958, is the sole bank of issue. The Tunisian Banking Co. (Société Tunisienne de Banque-STB) was established in 1957; it is the leading commercial and investment bank; the state holds 52% of the STB's capital.

The banking system is a mixture of state-owned and private institutions which offer a variety of financial instruments and services. There are 13 commercial banks; eight development banks; eight leasing companies; eight offshore banks; a savings bank; five portfolio management institutions; two merchant banks. Commercial banks include Citibank, Amen Bank, International Arab Bank of Tunisia (BIAT), National Agricultural Bank (BNA); and one merchant bank is International Maghreb.

Of the 12 commercial banks, one is fully state-owned and four others are part-owned by the state. These five banks control 70% of total bank assets.

A stock exchange began operations in Tunis in May 1970. While its activities have been expanding steadily, they remain limited to transactions in securities issued by the state and the stocks of a few private or government-owned firms, including 46 companies, 13 of them banks. Between 2000 and 2001, the Tunisian stock exchange reported a 30% loss. The exchange completed a shift to fully electronic trading, but remains under the government supervision. (Nations encyclopedia) Available in **:**
https://www.nationsencyclopedia.com/Africa/Tunisia-BANKING-AND-SECURITIES.html

United Arab Emirates Banking System

The Central Bank of the United Arab Emirates was established in 1980, with Dubai and Abu Dhabi each depositing half of their revenues in the institution. The bank also issues the UAE dirham, the emirates' national currency. There are commercial, investments, development, foreign, and domestic banks as well as a bankers' association. In 1991 the worldwide operations of Abu Dhabi's Bank of Credit and Commerce International (BCCI), partly owned by the ruling family, were closed down after corrupt practices were uncovered, and the emirate subsequently created the Abu Dhabi Free Zone Authority to develop a new financial centre. The emirates' first official stock exchange, the Dubai Financial Market was opened in 2000, followed by the Dubai International Financial Exchange in 2005.

The United Arab Emirates is a leading force in the development of modern Islamic finance, financial practices that comply with Islamic laws of transaction. Dubai Islamic Bank (DIB) was incorporated in 1975 as the world's first commercial Islamic bank. As more Islamic banks opened and the popularity of Islamic finance increased, the government began passing legislation regulating Islamic finance in 1985. In 2007 the DFM became the first stock exchange to comply with the standards of Islamic finance. Because the United Arab Emirates is an international financial and commercial hub, its Islamic financial institutions have become a particularly attractive market for Islamic organizations worldwide.

Meanwhile, the United Arab Emirates' geographic location, high traffic in international business, and liberal business and finance regulations have made financial institutions in the United Arab Emirates focus of attention**.** (Peterson, 2021)

- **JordanIan Banking System**

Jordan enjoys a very well-developed banking sector by regional standards with a wide array of business, investment, and retail services. Both local and international banks are operational and growing in Jordan.

There are 25 banks in Jordan: 16 Jordanian banks out of which 3 are Islamic Bank and 9 non-Jordanian Banks.

Whereas, the Amman Stock Exchange is modern and enjoys no taxes on capital gains, no taxes on cash dividends, free repatriation of investment and income, no ceiling on foreign equity ownership and privatization. With a comprehensive legal Infrastructure, internationally compliant financial environment, and a modern and well-established stock market, your investments are bankable, and your profits will grow.

Jordan enjoys a comprehensive Legal Framework (Central Bank of Jordan Law, Banking Law and Anti-Money Laundering and Combating Financing of Terrorism Law, the Money Exchange Business Law, The Public Debt Law, Foreign Currency Control Law, Electronic Transactions Law). (Strong Banking and Financial Institutions, 2018)

2. Section two: Literature Review

Through this section, we will present a number of studies:

The First Study: Nepalese Banks. (S, Pradhan, & shrestha, 2017)

- The study problem revolves around determining the impact of capital adequacy and bank operating efficiency on Nepalese commercial banks' financial performance.

- The purpose of this research is to examine into the impact of capital adequacy and operating efficiency on the performance of Nepalese commercial banks. It also examined the impact of capital adequacy on commercial banks' operating efficiency in Nepal.

- In this study, the two researchers relied on the analytical model to analyze the relationship between capital adequacy and operating efficiency measures using ROE and ROA. Regression models were applied to test the significance and importance of capital adequacy for commercial and development banks. Where he research design adopted in this study is a causal comparative type because it deals with the effect of capital adequacy and bank operation efficiency with the financial performance of Nepalese commercial banks.

- This study is based on secondary sources of data from 17 commercial banks in Nepal for the period 2006 to 2013, resulting in a total of 136 observations. Secondary data were obtained from the annual reports of the respective model banks, and the banking and financial statistics of Nepal Rastra Bank.

-The study reached a set of results, the most important of which are

- The results indicate that bank operating efficiency, loan ratio, total deposit to assets, and loan loss provision to total equity are all positively related to return on assets, implying that the higher the bank operating efficiency, loan ratio, total deposit to assets, and loan loss provision to total equity, the higher the return on assets will be.

- Return on assets is negatively related to loan loss provision to total loan, core capital ratio, risk weighted ratio, and total capital ratio, implying that the higher the loan loss provision to total loan, core capital ratio, risk weighted ratio, and total capital ratio, the lower the return on assets.

- The key factors of bank performance are bank operational efficiency, loan rate, total deposit to total assets, risk based capital ratio, and core capital ratios. .

- **The Second Study: Indian Banks.** (Pervez & Bansal, 2020)

- The problematic of the study is examines the relationships of Capital adequacy ratio and Bank risk with bank performance.

- The study was aimed to achieve these objectives: To examine the relationship of bank capital with the profitability of banks, To assess the relationship of bank capital with the productivity of banks, To investigate the relationship of credit risk with the profitability of banks, To find the relationship of credit risk with the productivity of banks.

- In this study, the researchers relied on the analytical method using a panel regression analysis, where used Equation of pit and ROA, ROE, NIM, OPR, BPE & PPE, whereas The methods used to estimate the equations of the plate data are the stochastic and stochastic effects model. To determine the choice of random effects or fixed effects, the Hausman test was generally run.

- The study is mainly based on secondary sources of data. The Reserve bank of India database was the main source of the data. Apart from the RBI database, various journals, books, websites, and studies were used as secondary sources of data. A sample of 65 banks has been considered for the present study, consisting of three ownership structures, with 21 public, 19 private and 25 foreign banks in the Indian banking sector. The period of the study is from 2005 to 2018.

-The study reached a set of results, the most important of which are

- Capital adequacy ratio has shown a negative relationship with return on equity and Business per employee indicating a negative impact of bank capital with bank performance.

- Net Non-performing assets have negatively impacted banks profitability and productivity.

- Rapid increase in the NPAs of Indian banks has impacted lending capacity as well as profitability of banks.

- Government is taking steps to mitigate the problems of increasing NPAs but there is a need of more effective methods to recover the NPAs of banks especially in case of the public sector banks.

- Economic financial crises of 2008 impacted US economy and economy of many other countries in the world including India because of the spillover effects, but Indian banking sector showed resilience towards the crises and was not much impacted by the crises.

- Profitability of banks was positively impacted by Basel II era but Basel III era had negatively impacted performance of banks indicating stricter requirement of Basel III norms.

- Profitability of Private and foreign banks was better than that of public sector banks.

- **The Third Study: Nigerian Banks.** (oyetayo, S.Osinubi, & Amaghionyeodiwe, 2019)

- The problematic in this research paper is The impact of capital adequacy on the bank's performance in Nigeria.

- The regulators of capital requirements in Nigeria aim to ensure that the risk exposures of banks and other financial institutions are reinforced by an adequate amount of capital which will at least guarantee effective bank performance.

- This study adopted the model used in the study of Umoru and Osemwegie (2016). Thus, they estimated a multi-regression model stated.

- The study utilized secondary data from selected banks. From the banking sector in Nigeria, ten (10) quoted banks on the Nigerian stock exchange and having elements of systematically important banks as given by the Central Bank of Nigeria, were selected. These banks were randomly selected from the pool of banks (cluster) that we have in Nigeria. Data on return on assets, capital adequacy, deposits, inflation, economic growth and liquidity of which were

sourced from the annual reports and statement of accounts of these banks while the macroeconomic data were sourced from the Central Bank of Nigeria Statistical Bulletin and National Bureau of statistics publication.

- The study reached a set of results, the most important of which are

- The study's findings revealed, among other things, that capital adequacy has a positive and significant impact on bank performance, whereas liquidity has a negative and significant impact on bank performance, implying that our findings are consistent with the trade-off principle that describes the relationship between liquidity and profitability.

- Deposits also have a negative relationship with bank performance, despite the fact that it is supposed to be positive.

- The study concluded that the Central Bank of Nigeria (CBN) should pay close attention to the costs that banks incur on deposits held with them, as this might have a substantial impact on the banks' capital and overall performance.

The Fourth Study: Middle East and North Africa. (Haque & Brown, 2016)

- The problematic of the study is examines If the banking regulation and activity restrictions are related to the efficiency of the bank , about whether the concentration of ownership, as well as government and foreign ownership, affects the efficiency of the bank and if the interaction amongst bank regulation and bank ownership impact bank efficiency.

- This study aims to examine the impact of bank regulation and ownership on the efficiency performance of banks in 12 countries in the Middle East and North Africa (MENA).

- In this study, researchers used data envelope analysis to estimate cost efficiency, and then applied one-step maximum likelihood estimates to examine the effect of ownership and banking regulation on banks' efficiency. They followed Zhu (2009) in using the following variable returns to scale DEA models for cost efficiency.

- In this study, they used an unbalanced data set covering 718 observations from 132 commercial banks in 12 countries in the Middle East and North Africa, including six Gulf Cooperation Council countries (such as Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) and six non-GCC countries. Gulf Cooperation Council countries (such as Algeria, Egypt, Jordan, Lebanon, Morocco and Syria). This study uses country-specific and bank-level data over an 11-year period (2002-2012). Proprietary and financial data were collected from the Bank scope database provided by Fitch/IBCA/Bureau Van Dijk, along with annual reports and the banks' websites.

-The study reached a set of results, the most important of which are

- The cost efficiency results supported the public view of bank regulation rather than the private view, implying that bank regulation supports in the efficient allocation of resources in the MENA region better than bank disclosure, where the market may discipline banks (i.e. the private view of bank regulation).

- The effects of bank regulation on cost efficiency were positive in both the post-crisis and complete sample periods, implying improvements in the post-crisis period, which also saw the adoption of the Basel framework.

- They discover that capital regulation had a favorable influence on cost efficiency in the post-global financial crisis period, but not in the pre-crisis period. Similarly, official supervisory power had a positive impact on cost efficiency, but not before the global financial crisis. Also with bank regulation that restricts activities of banks had the expected negative influence on cost efficiency, but not in the pre-global crisis period. In regards to ownership, they find some influence on bank efficiency.

- Ownership concentration is favorably associated to cost efficiency, but only in the pre-global crisis period for profit efficiency. Surprisingly, government ownership of banks had a positive impact on cost efficiency, but not on profit efficiency, in the post-crisis period. In the MENA region, foreign banks appeared to have no benefit, contradicting the global advantage hypothesis.

- The bank-level estimate of market power (a control variable) has a positive relationship with cost and profit efficiency, showing that imperfect competition in the concentrated MENA banking market does not appear to be a barrier to bank efficiency.

- The dependency between internal governance mechanisms (for example, concentration of ownership) and external governance mechanisms (supervisory authority) is demonstrated by the interaction results for concentration of ownership and supervisory authority.

- The relationship between bank ownership type and bank regulation yielded some interesting consequences, especially for government ow.

- The interaction of government ownership and supervisory power had a negative influence on cost efficiency in the pre-global crisis period but not significant post-crisis. This was not expected as individually these characteristics hade positive influence, but the findings show that things have improved in the post-crisis period.

- I n the complete sample and pre-global crisis periods, the interplay of foreign bank ownership and regulatory capital stringency had a negative effect on cost efficiency, but it did not appear to be substantial and thus to improve in the post-crisis period, implying some improvement in bank efficiency.

- Although the focus was slightly different, the results were not totally compatible with those of other banking research in the MENA region. For example, in the MENA region, government banks have had the best results.

- They results suggested that cost efficiency was explained with ownership and regulatory variables more so than profit efficiency.

The Fifth Study: Africa. (Triki, Kouki, Dahou, & Calice, 2016)

- The problematic of the study is around the relationship between bank efficiency, regulation and supervision practices in Africa.

- The objective of this paper is to study the relationship between bank efficiency and regulation in Africa.

- In this study, researchers used the Data Envelopment Analysis (DEA) technique to estimate cost efficiency scores for African banks.

- This study is based on 1306 observations relative to 269 banks operating in 42 African countries for the period 2005–2010. The data was obtained from country-level describing regulation and supervision and from Bank scope.

-The study reached a set of results, the most important of which are

- The presence of financial safety nets is linked to increased bank efficiency.

- In Africa, the impact of several bank regulations is significantly depending on the bank's size and risk profile. They discovered, for example, that tighter limitations on banking admission boost the efficiency of large banks while tighter restrictions on exit reduce the efficiency of small banks. Hence, while both restrictions on entry and exit are considered as barriers to competition, the distinction made in this paper shows that they have different effects on bank efficiency, at least in Africa. Similarly, they find that small banks are the main losers from increased transparency requirements, financial repression through price controls. On the other hand, more stringent capital requirements only enhance the efficiency of large banks and low risk banks.

- The findings have significant policy implications, since they highlight the importance of tailoring some parts of bank regulation to the size and risk level of the institutions under regulation.

- The findings back up the idea that regulation should not be based on a "one size fits all" approach, but rather should be tailored to the risks posed by the regulated institution and the resources at stake.

The Sixth Study: Saudi Banks. (Almazari, 2013)

- The problematic revolves around the relationship between two determinants (capital adequacy and cost-to-income ratio) and the profitability of commercial banks in the Kingdom of Saudi Arabia.

- The aim of this study is to search for the relationship between capital adequacy and the cost-to-income ratio and profitability.

- In this study, the researcher relied on a descriptive financial analysis model to describe, measure, compare and classify the financial positions of the selected banks, where he used financial ratios and statistical tools to examine and compare the effect of independent variables on the dependent variables, and also used analysis of variance (ANOVA), the Pearson correlation coefficient, and the program spss.

- The necessary information was collected from the financial data of nine Saudi banks, only 9 out of 11 banks listed in the Saudi stock market were considered as a sample of the study, which represents 82% of the study population during the period 2007-2011 In addition, the data were also collected. From books, papers, articles, and specialized international journals, the World Wide Web (Internet), and relevant previous studies.

-The study reached a set of results, the most important of which are

- Saudi banks are well positioned to address the competitive challenges posed by a more open and liberal global market, according to this analysis. The latest global financial crisis had a lesser impact on them.

- The return on assets ratio (ROA) is positively connected with the return on equity ratio (ROE), assets to liabilities ratio (AL), debt to equity ratio (DE), and bank size, according to the findings (BS).

- The return on assets ratio (ROA) was also discovered to be negatively correlated with the following ratios: total equity capital to total assets ratio (ECA), core capital to weighted-risk assets ratio (TRC), total equity capital to total asset ratio (TCA), cost income ratio (CIR), and core capital to total assets ratio (CCA).

- The majority of Saudi banks are concerned with keeping their capital levels above the statutory minimums.

- Deposits improve profitability, and banks that rely on deposits for funding can earn a higher return on assets.

- The higher the equity to assets ratio, the lower the need to external funding and therefore the higher the profitability of the banks.

- Well capitalized banks face lower costs of going bankrupt which reduces their costs of funding.

- The link between capital adequacy and profitability is negative.

- Capital adequacy improves bank profitability while also lowering the costs of financial difficulty, such as bankruptcy.

  - **The Seventh Study Egyptian Banks.** (naceur & kandil, 2008)

- The problematic revolves around knowing the correct standard to enforce regulations without compromising the banks' ability to serve the economy.

- The aim of this study has been to investigate the effects of capital regulations on the performance and stability of banks in Egypt.

- In this study, the tow researcher relied on two models. Empirical models, to explain the cost of intermediation and profitability in the banking system in Egypt , that includes a measure of capital regulations plus a number of other major determinants. The variables chosen to measure the performance of banks along with those chosen as proxies of the internal and external determinants, and Econometric modeling to describe how these biases affect cross-section and panel data estimators and then present the Generalized Method of Moments (GMM) estimator, which corrects for both of these biases and takes into account the dynamics of dividend policy.

- The information used to estimate the models is taken from the Bureau Van Dijk’s Bank Scope data base, using unconsolidated financial statements or consolidated ones if the former are not

available. The sample contains 28 banks observed over the period 1989-2004. The macro and finance data were collected from the World Bank World Development Indicators (WDI).

- The study reached a set of results, the most important of which are

- The Cost of Intermediation and Its Determinants:

  The evidence reveals that a number of variables pushed up the cost of intermediation in the post-capital regulation period, including a higher capital-to-assets ratio, improved management efficiency, and lower inflation. The rise in intermediation costs due to these factors was offset by a drop in output growth, which is likely to have tempered intermediation costs in the post-capital regulation period. Regardless of how spreads are defined, the results are consistent across the two metrics of net interest margins.

- Bank Profitability Determinants:

In the post-regulatory period, a variety of variables aided bank profitability, including stronger capital requirements and lower implicit costs. The decline in economic activity, which is believed to have affected banks' profitability in the post-regulation period, is linked to counter-effects on bank profitability.

There is also some evidence, while it is not consistent among models that the drop in reserves may have resulted in much lower returns on equity in the post-regulation period. In reaction to a fall in reserves, banks are less inclined to make earnings. The impact of bank size on return is absent in all estimated equations. This finding backs with the findings of Athansouglou et al. (2005), indicating that small banks tend to want to grow faster, even if it means sacrificing profitability.

- **The Eighth Study: North African.** (Alssaleh, 2012)

- The problematic of this article is how to measure the technical efficiency of commercial banks in North Africa countries namely Libya, Tunisia and Algeria for the period of 2002-2009.

- The objectives of this study are to attempt to assess the banking efficiency in Libya, Tunisia and Algeria using a Data Envelopment analysis (DEA) during the period from 2002 to 2009.The most important for this study to assess the state of Libyan banks by comparing with the banks from other countries.

- Two econometric techniques have been applied in the literature to calculate efficiency and estimate and total factor productivity (Bauer & Hancock, 1993) namely:
  a) Parametric techniques
  b) Non-parametric. Linear mathematical programming techniques.

- The data used in this study are obtained from the" bank scope" for 18 commercial banks. The scope of the study will be 6 Libyan commercial banks, and 6 Tunisian banks and 6 Algerian banks. Exclude banks that do not follow the system of commercial banks .The data of banks were by local currency. So, they used the purchasing power parities (PPP) to convert the data to international dollar. It wills that the appropriate input-output approach is the intermediation approach. By using two bank outputs, loans and other earning assets also, include three input prices, one for labor, the other for physical capital and funds. The three price o inputs are compute by following the literature.

- The study reached a set of results, the most important of which are

- The findings revealed significant disparities in Libya's, Tunisia's, and Algeria's technical efficiency.
- Libyan banks have proven to be more efficient than those in other countries.

The Ninth Study: The Middle East And North Africa Region.
(farazi, feyan, & Rocha, 2017)

- The most important problems mentioned in this article are related to bank ownership and performance. And the interactions between the actions of banks and government policies and the assessment of the degree of political interference in these institutions.

- The main objective in this paper was to examine recent trends in bank ownership in the Middle East and North African region and the impact of bank ownership on bank performance.

- The methodology relies on a comprehensive empirical analysis at the, bank-level to assess the association between bank ownership and performance in nine non-GCC MENA countries

- Most of Our data are taken from Fitch's Bank scope database and include unconsolidated statements of commercial banks in MENA.

- The study reached a set of results, the most important of which are

- Despite the fact that local and foreign private banks have made inroads in the Middle East and North Africa region in recent years, government banks continue to play a vital role in many nations, but their performance has been noticeably lackluster. Greater holdings of government securities, higher costs due to more staff, and larger loan loss provisions reflecting low asset quality all contribute to this outcome.

- The findings reveal both operational flaws and policy mandates.

- The research also examines the performance of international and publicly traded banks in depth. Despite their smaller size and higher investment expenses, foreign banks are operating on par with domestic banks in the MENA region. Even with the greater costs associated with listing, listed banks are outperforming because of better interest margins.

- The findings do not rule out the importance of state banks in development, but they do suggest that their intervention comes at a price.

- As a result, there is room to reduce state bank share in some nations while also clarifying mandates, improving governance, and improving operational efficiency of most state banks in the MENA area.

- **The Tenth Study: Capital Adequacy of the Jordanian Banking Sector** (AL-FAWWAZ & ALRGAIBAT, 2015)

- The most important problems mentioned in this article are related to identify the capital adequacy of the Jordanian commercial banking.

- This research aims to identify: The relationship between capital adequacy and the Jordanian banking system liquidity, capital adequacy and the Jordanian banking system trust risk and capital adequacy and the Jordanian banking system capital risk.

- The study adopted the descriptive and the analytical approaches to measure, present, analyze, evaluate and interpret data in order to identify the capital adequacy of the Jordanian banking system.

- The study depended mainly on the data obtained from the Amman Stock Exchange, the Central Bank of Jordan and the Jordanian Ministry of Finance for the period 2000 - 2013.

- Through the analysis of the previous results, the researcher came up with the following results

- The capital adequacy (total assets) and liquidity have a statistically significant link (net cash flow from operations, net cash flow from investment operations, and net cash flow from financing operations).

- In Jordanian commercial banks listed on the Amman Stock Exchange, there is a statistically significant relationship between capital adequacy (total assets) and credit risk (net credit facilities) throughout the period (2000-2013).

- Return on total assets, the market value of shares, earnings per share, and return on equity are all statistically significant relationships between capital sufficiency and capital risk.

- Capital adequacy and investments in the securities portfolio in Jordanian commercial banks listed on the Amman Stock Exchange have a statistically significant association over the period (2000-2013).

Depending on the study findings, the researcher recommends the following:

- Commercial banks should improve their strategic planning and management capabilities in order to capitalize on any increase in capital and boost earnings.

- The development of market and operational risk assessment tools to be used in the computation of commercial banks' capital adequacy ratios.

- Conducting additional research and analysis on Jordanian commercial banks' capital sufficiency

- **The Eleventh Study: Capital Adequacy of the Banking Industry in Indonesia. (Sri Murtiyanti, 2015)**

- The problematic of the study is around the effect of credit risk and profitability on the adequacy of capital in Indonesia commercial banks.

- This study objective previous research coverage by distinguishing the impact of credit risk on capital adequacy and profitability in each group of banks in Indonesia.

- In this study, researchers used Error Correction Model (ECM) to model and analyze the data According to Engle and Granger. Data analysis began with a static test to avoid spurious regression. Tests were performed using the Augmented Dickey Fuller Test (ADF).

- The data used in this study is monthly time series data ranges from January 2010 to December 2014 which is obtained from Banking Statistics Indonesia, Bank Indonesia. The data used are various financial ratios describing the condition and performance of the Indonesian banking industry.

The study reached a set of results, the most important of which are

- Credit risk variables (KTA, LDR, NPL, and CKPN) and profitability variables (BOPO and ROA) have a considerable impact on capital adequacy.

- The features and complexity of the bank group are among the variables that have a significant impact on the CAR.

- Because credit risk can affect the bank's capital adequacy ratio (CAR), good risk management is required to identify measure, monitor, regulate, and mitigate those risks.

- Banks with a high risk profile need more capital to support them than banks with a low risk profile.

- According to the findings of this study, the time it takes to reach long-term equilibrium is less than a year.

- Banks must boost capital generation as a buffer in the form of Capital Conservation Buffer and Countercyclical Buffer, according to the legislation. In addition, a bank that faces a systemic risk must set aside more capital in the form of a Capital Surcharge.

- The banking industry had a capital ratio of ex ceding 8% during the study period, which is the regulatory capital. This demonstrates that, in addition to implementing PBI No. 15/12 / PBI / 2013 concerning the Minimum Capital Requirement for Commercial Banks, the bank has set aside funds to prepare for external repercussions.

3. Section three: Research Methodology, Data and Variables

3.1 The Regression Model

To investigate the impact of capital adequacy on MENA banks' performance, we adopt a basic cross-section regression model due to the lack of data on banks of our selected sample over different years as we could not apply a panel data regression model.
In our study we apply methods as follows: (james, 2001)**,** (menthos, 2011) **and** (pasiouras, 2007)

- First, we run a basic model where each variable that reflect the banking performance (Return on Assets ROA, Return on Equity ROE and Net Interest Margin NIM) is regressed only on the capital adequacy.

- Second , We run another regression model where some bank specific variables are included , and thus, to examine how the capital requirements affect the banking performance through the interaction of some bank specific variables such as : the bank's size , liquidity , Credit Risk ,...etc.

- Third, We include a set of banking system and macro economic variables to the second model to take account of differences in banking and economic characteristics of countries where our banks sample operate.
With this regard the adopted model is represented as follows:
.

$$PERFit = \alpha i + \sum_{i=0}^{r} \alpha i \; Xi + \varepsilon I \qquad [3.1]$$

The Model can be extended as follows:

- **ROA :**

$$ROAit = \alpha 0 + \alpha 1\ TCRit + \varepsilon it$$

$$ROAit = \alpha 0 + \alpha 1\ TCRit + \alpha 2SIZEit + \alpha 3LOit + \alpha 4LIit + \alpha 5DOit + \alpha 6NONit + \varepsilon it$$

$$ROAit = \alpha 0 + \alpha 1\ TCRit + \alpha 2SIZEit + \alpha 3LOit + \alpha 4LIit + \alpha 5DOit + \alpha 6NONt + \alpha 7GRt + \alpha 8MONit + \alpha 9CREDit + \varepsilon it$$

- **ROE**

$$ROEit = \alpha 0 + \alpha 1\ TCRit + \varepsilon it$$

$$ROEit = \alpha 0 + \alpha 1\ TCRit + \alpha 2SIZEit + \alpha 3LOit + \alpha 4LIit + \alpha 5DOit + \alpha 6NONit + \varepsilon it$$

$$ROEit = \alpha 0 + \alpha 1\ TCRit + \alpha 2SIZEit + \alpha 3LOit + \alpha 4LIit + \alpha 5DOit + \alpha 6NONit + \alpha 7GRit + \alpha 8MONit + \alpha 9CREDit + \varepsilon it$$

- **NIM :**

$$NIMit = \alpha 0 + \alpha 1\ TCRit + \varepsilon it$$

$$NIMit = \alpha 0 + \alpha 1\ TCRit + \alpha 2SIZEit + \alpha 3LOit + \alpha 4LIit + \alpha 5DOit + \alpha 6NONt + \varepsilon it$$

$$NIMit = \alpha 0 + \alpha 1\ TCRit + \alpha 2SIZEit + \alpha 3LOit + \alpha 4LIit + \alpha 5DOit + \alpha 6NONt + \alpha 7GRt + \alpha 8MONit + \alpha 9CREDit + \varepsilon it$$

3.1.1 In equation [3.1] the dependant variable PERF comprises three indicators of performance: ROA, ROE and NIM.

3.1.1.1 Return on Assets ROA This metric represents the profitability of a banking sector whole operations it, also known as profit to assets or asset profitability, assesses the ability of management to utilise an institution's financial and real resources to generate profit.

The return of assets indicator is thought to be the most accurate measure of banking activity since it immediately expresses the result of active operations optimization, according to the unique management of banking intermediaries, for a given volume of resources. This indicator's formula is as follows: (Yassine, 2016, p. 133)

Return on assets=Net Income / Total Assets [3.2]

3.1.1.2 Return On Equity ROE: The most important profit metric is return on equity (ROE), which analyzes banking management in all dimensions and provides an image of how capitals brought by shareholders are used, as well as the impact of their retainer on the bank's activities. According to Berk and Demarzo, a high ROE may imply that the firm is capable of identifying highly profitable investment possibilities. This metric is calculated as follows: (Yassine, 2016)

Return on equity=Net Income / Book Value of Equity [3.3]

3.1.1.3 Net Interest Margin NIM Net interest margin (NIM) is a measure of the net return on the bank's earning assets, which include investment securities, loans, and leases. It is the ratio of interest income minus interest expense divided by earning assets.

Net interest margin = net interest income / assets (or interest-bearing assets) [3.4]
Net interest income = Interest income − Interest expense

3.1.2 Independent Variables: We use several proxies as follows:

3.1.2.1 Capital Adequacy TCR The capital adequacy ratio (CAR) is a measurement of a bank's available capital expressed as a percentage of a bank's risk-weighted credit exposures. The capital adequacy ratio, also known as capital-to-risk weighted assets ratio (CRAR), is used to protect depositors and promote the stability and efficiency of financial systems around the world. Two types of capital are measured: tier-1 capital, which can absorb losses without a bank being required to cease trading, and tier-2 capital, which can absorb losses in the event of a winding-up and so provides a lesser degree of protection to depositors, This metric is calculated as follows:

$$\mathbf{CAR} = \frac{\mathbf{Tier\ 1\ Capital + Tier\ 2\ Capital}}{\mathbf{Risk\ Weighted\ Assets}} \quad [3.5]$$

3.1.2.2 Bank size (SIZE) this variable is set to be equal to the logarithm of total bank assets in millions of US Dollars. The Size might be an important determinant of bank performance if there are increasing returns to scale in banking. However size could have a negative impact when banks become extremely large owing to bureaucratic and other reasons. Thus, we expect a non-linear relationship between size and bank performance.

3.1.2.3 Bank Liquidity (LI) is defined as the ratio of liquid assets to deposits and short-term funding. This ratio represents the risk of insufficient liquidity to meet large, unforeseen withdrawals or new loan requests. Lack of liquidity can also force banks to borrow funds at excessive cost. Regarding the sign of the coefficients of this variable, we have no a priori expectations.

3.1.2.4 Net Loans (LO) defined as the ratio of net loans to total assets. Banks with larger loan portfolios to total assets might have expanded rapidly; might not be well diversified and therefore be more exposed to credit risk compared to counterparts. Given that MENA's banks risk management expertise is limited, this may bring about higher costs (or lost revenues) in term of nonperforming loans. This would have a negative effect on performance (i.e. bad management). Nevertheless, these banks may appear more profitable, if the higher credit risk is reflected in higher interest margins.

3.1.2.5 Net Deposits (DO) defined as the ratio of deposits to total assets ; the proxy appreciates the link between efficiency and the bank commercial policy, we expect a positive impact on performance .

3.1.2.6 Non Performing Assets (NON) It refers to those loans and advances that are in default or in arrears i.e. principal and interest payments are late or missed. As per the RBI, an asset becomes non-performing when it stops to generate income for the bank.

3.1.3 Industry and Macroeconomic Specific Variables

We examine how the level of financial development affects the banking performance . we specify the following variables to proxy the country's financial structure:

3.1.3.1 Gross Domestic Product GDP Growth GR GDP is the final value of the goods and services produced within the geographic boundaries of a country during a specified period of time, normally a year. GDP growth rate is an important indicator of the economic performance of a country.

3.1.3.2 Private Credit (CRED) defined as claims on the private sector by banks and other financial institutions divided by GDP. It is a standard indicator in the literature and empirical evidence has indicated that countries with higher rates grow faster. We expect a positive relationship with bank efficiency and profitability.

3.1.3.3 Money to GDP (MON) this ratio includes all of the money (time deposits + demand deposits + fiat currencies) divided by GDP, this indicator measures the level of financial deepness in an economy. A positive relationship with the bank performance is expected.

3.2 Data

The dataset comprises financial statements of 81 commercial banks operating in Six MENA countries (Algeria, Egypt, Jordan, Morocco, Tunisia and United Arab Emirates UAE) during the 2017 period. After reporting data from errors and other inconsistencies, we obtain a balance cross

sectional data of 81 bank-level observations. To avoid heterogeneity across banks' operations, we prefer work exclusively on commercial banks either they are conventional or Islamic banks . The bank's data are obtained mainly from *Bank scope Fitch international database* published by Moody's *Analytics (2017*). The database has comprehensive coverage of banks in a large number of countries and accounts for over 90% of all banking assets in each country, and the missing information were completed by banks' individual annual report via their official websites. The Table [3.1] and [3.2] report descriptive statistics Correlation matrix of independent and dependant variables adopted in this study respectively.

Table [3.1]: Descriptive statistics of independent and dependent variables

	N.Obs	Mean	Max	Min	Std. D	Kurtosis	Jarque - Bera	Prob	Sum	Sum Sq.Dev
TCR	81	16.56	44.47	4.08	6.07	8.60	156.09	0.00	1341.76	2952.96
SIZE	81	17.12	21.86	12.72	2.24	2.31	1.61	0.44	1387.36	404.68
ROE	81	12.53	86.11	-76.53	18.83	13.88	424.57	0.00	1015.46	28390.66
ROA	81	1.27	5.06	-8.86	1.67	19.84	1079.41	0.00	103.12	223.63
NON	81	8.08	38.26	0.14	6.88	7.46	119.11	0.00	654.85	3788.80
NIM	81	4.04	10.16	-13.91	2.97	17.87	817.47	0.00	382.01	709.47
MON	81	91.72	119.38	73.79	14.32	2.37	5.41	0.06	7429.47	16407.24
LO	81	0.49	0.91	0.04	0.19	2.50	4.58	0.10	40.19	3.19
LI	81	36.45	131.17	2.58	23.04	5.27	37.82	0.00	2952.87	42469.58
GR	81	2.87	4.24	1.30	1.19	1.24	10.50	0.005	233.22	113.39
DO	81	0.78	1	0.25	0.11	10.64	266.90	0.00	63.70	1
CRED	81	50.40	78.22	24.40	22.33	1.13	11.77	0.002	4082.99	39902.68

Source: Authors' Calculations using Eviews .12

Table [3.2]: Matrix of Correlation

Correlation t-Statistic probability	TCR	SIZE	ROE	ROA	NON	NIM	MON	LO	LI	GR	DO	CRED
TCR	1.00 ----- -----											
SIZE	-0.18 -1.69 0.09	1.00 ---- ----										
ROE	-0.044 -0.39 0.69	0.41 4.10 0.0001	1.00 ---- ----									
ROA	0.26 2.46 0.01	0.32 3.09 0.002	0.82 13.19 0.00	1.00								
NON	-0.15 -1.41 0.15	-0.05 -0.45 0.65	-0.27 -2.52 0.01	-0.16 -1.44 0.15	1.00 ---- ----							
NIM	0.11 1.04 0.30	0.29 2.77 0.006	0.42 4.20 0.0001	0.43 4.34 0.00	-0.22 -2.06 0.04	1.00 ---- ----						
MON	-0.02 -0.22 0.82	0.12 1.15 0.25	0.10 0.89 0.37	0.01 0.16 0.87	-0.39 -3.83 0.0003	0.11 1.0004 0.32	1.00 ---- ----					
LO	-0.02 -0.23 0.81	-0.02 -0.26 0.79	-0.25 -2.37 0.01	-0.24 -2.19 0.03	-0.04 -0.35 0.72	0.05 0.44 0.65	-0.17 -1.58 0.11	1.00 ---- ----				
LI	0.21 1.91 0.05	0.01 0.09 0.92	0.16 1.46 0.14	0.29 2.70 0.008	0.15 1.39 0.16	0.02 0.23 0.81	-0.06 -0.61 0.53	-0.75 -10.12 0.00	1.00 ---- ----			
GR	-0.04 -0.36 0.71	0.13 1.20 0.23	0.28 2.61 0.01	0.13 1.20 0.23	-0.42 -4.15 0.0001	-0.009 -0.08 0.93	0.75 10.25 0.00	-0.29 -2.76 0.007	0.07 0.68 0.49	1.00 ---- ----		
DO	-0.29 -2.73 0.007	0.05 0.51 0.60	0.29 2.71 0.008	0.01 0.13 0.89	-0.31 -2.92 0.004	0.13 1.22 0.22	0.20 1.84 0.06	-0.15 -1.43 0.15	-0.08 -0.77 0.43	0.22 2.01 0.04	1.00 ---- ----	
CRED	0.11 1.02 0.30	-0.57 -6.28 0.00	-0.34 -3.23 0.001	-0.34 -3.29 0.001	-0.07 -0.71 0.47	-0.48 -4.89 0.00	0.05 0.52 0.60	0.24 2.24 0.02	-0.35 -3.39 0.001	0.02 0.23 0.81	-0.006 -0.05 0.95	1.00 ---- ----

Source: Authors' Calculations using Eviews .12

4. Section Four An empirical study on the impact of Capital Adequacy on the performance of banks in the Middle East and North Africa

4.1 Discussion of Findings

Table **[3.3]** presents the main regression results of our model when the dependent variable is Return on Assets (**ROA**) . The column (1) reports the base model regression results. The column (2) reports the regression model when controlling for the bank specific variables. And the column (3) displays the regression model results when controlling for both bank specific variables and banking system – macroeconomic variables. The results suggest that capital adequacy has a non significant impact on bank profitability (Model 1). However, when controlling for bank specific variables, capital adequacy exerts a **statistically significant** negative impact on bank profitability (Model 2). The same statistically significant impact is obtained when taking on account the differences on banking system and macroeconomic characteristics across our sample (Model 3).

Table **[3.4]** presents the main regression results of our model when the dependent variable is Return on Equity (**ROE**) . The column (1) reports the base model regression results. The column (2) reports the regression model when controlling for the bank specific variables. And the column (3) displays the regression model results when controlling for both bank specific variables and banking system – macroeconomic variables. The findings indicate that capital adequacy is disconnected with Return on Equity as we obtain a non statistically significant coefficient in the three estimated models (Model 4, 5 and 6).

Table **[3.5]** presents the main regression results of our model when the dependent variable is Net Interest Margin (**NIM**). The column (1) reports the base model regression results. The column (2) reports the regression model when controlling for the bank specific variables. And the column (3) displays the regression model results when controlling for both bank specific variables and banking system – macroeconomic variables. The results show that capital adequacy has a statistically significant positive effect on bank's performance only when controlling for bank specific variables and banking system – macroeconomic indicators (Model 8 and 9).

Given the above results, the Hypothesis H1 is rejected because the capital adequacy affects the baking performance indicators with different signs (negatively with **ROA** and positively with **NIM**). Nevertheless, the Hypothesis H2 in not rejected as we have noticed the influence of the capital adequacy upon the banking performance only when we examine the interaction of the different bank specific and banking system specific variables .

Table [3.3]: Regression Analysis Results (ROA as Dependent variable)

ROA	Model1 : Base model ROA= C+TCR	Model 2 :bank specific variables ROA=C+TCR+SIZE+LO+LI+ DO+NON	Model 3 :Banking system and economic specific variables ROA=C+TCR+SIZE+LO+LI+ DO+NON+GR+MON+CREDIT
	Coefficient	**Coefficient**	**Coefficient**
C	0.646709 (0.540717)	-12.78825*** (2.221171)	-11.77508*** (2.905068)
TCR	0.037819 (0.030668)	0.126820*** (0.031059)	0.127342*** (0.031020)
SIZE		0.271405*** (0.071066)	0.311385*** (0.091554)
LO		0.392771 (1.263782)	0.315132 (1.337815)
LI		0.012646* (0.011851)	0.012413 (0.012536)
DO		8.418164*** (5.384044)	8.558989*** (1.562955)
NON		0.004322 (0.023720)	-0.010150 (0.027117)
GR			0.176816 (0.194590)
MON			-0.028945* (0.015362)
CRED			0.009770 (0.010796)
R-Squared	0.018885	0.404468	0.433073
Prob (f-statistic)	0.221175	0.000001	0.000003
Durbin –W.S	2.100307	2.218987	2.284010
Log-likelihood	-155.2928	-135.0738	-133.0802

* Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level (Standard Deviation STD in parentheses)

Source: Authors' Calculations using Eviews .12

Table [3.4]: Regression Analysis Results (ROE as Dependent variable)

ROE	Model 4 : Base model ROE= C+TCR	Model 5 :bank specific variables ROE=C+TCR+SIZE+LO+LI+ DO+NON	Model 6 :Banking system and economic specific variables ROE=C+TCR+SIZE+LO+LI+ DO+NON+GR+MON+CREDIT
	Coefficient	**Coefficient**	**Coefficient**
C	17.94633*** (6.116500)	-70.59901** (28.21121)	-47.76841 (35.48262)
TCR	-0.326576 (0.346915)	0.497491 (0.394481)	0.498466 (0.378880)
SIZE		2.638362*** (0.902614)	3.440158*** (1.118247
LO		-23.69681 (16.05136)	-27.05787 (16.34013)
LI		-0.033155 (0.150523)	-0.038174 (0.153114
DO		54.16644*** (19.85859)	57.43676*** (19.09000)
NON		0.008433 (0.301264)	-0.327134 (0.331211)
GR			2.795105 (2.376734)
MON			-0.570145*** (0.187626)
CRED			0.191609 (0.131868)
R-Squared	0.011093	0.243246	0.333783
Prob (f-statistic)	0.349383	0.001714	0.000407
Durbin –W.S	1.838578	1.886932	2.080849
Log-likelihood	-351.7866	-340.9503	-335.7897

* Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level (Standard Deviation STD in parentheses)

Source: Authors' Calculations using Eviews .12

Table [3.5]: Regression Analysis Results (NIM as Dependent variable)

NIM	Model 7 : Base model NIM= C+TCR	Model 8 :bank specific variables NIM=C+TCR+SIZE+LO+LI+ DO+NON	Model 9 :Banking system and economic specific variables NIM=C+TCR+SIZE+LO+LI+ DO+NON+GR+MON+CREDIT
	Coefficient	**Coefficient**	**Coefficient**
C	2.943450*** (0.963248)	-19.47636*** (4.114562)	-11.41701** (5.254448)
TCR	0.066771 (0.054633)	0.178629*** (0.057534)	0.180162*** (0.056106)
SIZE		0.346660** (0.131645)	0.073672 (0.165596)
LO		5.711106** (2.341066)	4.688688* (2.419731)
LI		0.039654* (0.021954)	0.019560 (0.022674)
DO		13.66580*** (2.896345)	13.74900*** (2.826946)
NON		-0.049326 (0.043939)	-0.047704 (0.049047)
GR			-0.336555 (0.351959)
MON			0.013168 (0.027785)
CRED			-0.049327** (0.019528)
R-Squared	0.018557	0.355833	0.415373
Prob (f-statistic)	0.225280	0.000009	0.000008
Durbin –W.S	1.739999	1.876533	2.034123
Log-likelihood	-202.0634	-185.0102	-181.0823

* Significant at 10 % level; ** Significant at 5 % level; *** Significant at 1 % level (Standard Deviation STD in parentheses)

Source: Authors' Calculations using Eviews .12

4.2 Interpretation of Results

4.2.1 Capital Adequacy and Bank's Performance

To the extent that performance analysis explore the process of an optimal combination of inputs (such as personnel or deposits) to produce outputs (loans and other earning assets), the capital requirement may affect this process through three channels (Yassine, 2016)

The first works through the impact on bank-decision making of both the quantity and the quality of lending activity. Second Banking efficiency can also be influenced through the impact of capital requirements on the decisions of banks as for the assets in which they invest. Finally, the third channel works through the impact of capital requirements on the liability side of banks' balance sheets.

As we have previously noticed, the capital requirement exerts a negative impact on MENA bank's performance if we consider that banking performance is captured by return on assets (**ROA)**. These results are in line with the private interest view. According to this view higher capital requirements may generate regulatory costs in the form of a higher barrier to entry and greater rent extraction by governments and lead to loss in banking efficiency. Yet, the supporters of the private interest view tend to oppose reliance on stringent regulations unless there is are no alternatives to adverse risk-taking incentives.

Turning to the impact of capital requirement on the Net Interest Margin (**NIM)**, we obtained a positive relationship, in line with the public interest view which suggests that Capital regulation is considered to affect bank performance insofar as it specifies the required amount of capital that is set aside to cover risks. And, thus, official capital adequacy regulations in the context of MENA banking systems play a crucial role in aligning the incentives of bank owners with depositors and other creditors which results in more careful lending and better bank performance. If bank owners are required to have more capital at risk. A decrease in potential loss of their capital would compensate the increase gains that they would enjoy from greater risk taking.

4.2.2 Impact of Bank specific variables

Bank Size: Looking at the bank specific variables, the bank size **(SIZE)** has a positive significant effect on the bank profitability (**ROA, ROE** and **NIM**) in all the estimated models. It demonstrates when the MENA banks become larger (especially public banks as they dominate the banking systems) they show ability to take advantage from the economies of scale generated by larger assets. So, the fixed costs per unit are gradually decreased as the banks are getting larger, leading to greater profitability.

Net Loans: We obtain a statistically significant negative relationship with Return on Equity **ROE**. Accordingly. In the context of MENA banking system, banks with larger loan portfolios to total assets might have expanded rapidly and might not be well diversified and therefore be more exposed to credit risk compared to counterparts. Given that MENA's banks risk management expertise is limited, this may bring about higher costs (or lost revenues) in term of nonperforming loans. This would have a negative effect on performance (i.e. bad management). Nevertheless, these banks may appear more profitable, if the higher credit risk is reflected in higher interest a margin which is confirmed in this study as we have obtained a statistically significant positive relationship with Net Interest Margin (**NIM**).

Liquidity: Our findings show that bank liquidity has statistically significant positive impact on both Return on Assets **ROA** and Net Interest Margin **NIM**. Which means that our MENA analyzed banks when having sufficient liquidity to meet large, unforeseen withdrawals or new loan requests, are not forced to borrow funds at excessive costs leading to greater profitability.

Net Deposits: According to the results, Banks deposits are positively correlated (statistically significant) with the bank's performance in all the estimated models. We can interpret this by the fact that more banks have larger deposits, more they enjoy the ability to provide loans and gain in terms of profitability, besides, the gains that can be generated by all sorts of commissions on operations related to deposits management.

4.2.3 Impact of Banking System and Macroeconomic Specific Variables

Private Credit to GDP: Moving to banking system specific variables, the results we obtained seem to be puzzling, we found positive significant impact of **private credit** to (**GDP)** on Return on Equity **ROE** confirmed by the literature. However, a significant negative impact on Net Interest Margin **NIM**, which is consistent with empirical evidence, conducted in MENA region. In fact, an excessive availability of funds under a lack of strong supervisory and governance structure contribute in a random investment, which in turn decreases banking Performance .

Gross Domestic Product Growth GR and Money to GDP Mon: In this study, we found that economic growth is disconnected with the bank performance. All the estimated models show a non statistically significant coefficient. With regard to the impact of the financial deepening indicator (Money to GDP), we obtained a conflicting results (a statistically significant negative sign) compared to the literature because the financial deepening is supposed to affect the bank's performance positively. Yet, we take these results with cautious as we worked on an unbalanced cross sectional data.

Conclusion of The Chapter Three

Through the foregoing of previous studies, it became clear that they included different time periods for several countries from the Middle East and North Africa, and most of the studies that were advanced relied on the descriptive and analytical approach to the data. We dropped the theoretical dimension and applied it to the banks of the Middle East and North Africa to know the impact of capital adequacy on these banks and we reached many results among them:

- The capital requirement exerts a positive impact on MENA bank's performance if we consider that banking performance is captured by return on assets (ROA).

- The bank size (SIZE) has a positive significant effect on the bank profitability (ROA, ROE and NIM) in all the estimated models. It demonstrates when the MENA banks become larger they show ability to take advantage from the economies of scale generated by larger assets.

- In terms of liquidity, we found that it has statistically significant positive impact on both Return on Assets ROA and Net Interest Margin NIM.

- The banking system and specific macroeconomic variables negatively affect the net interest margin.
- This study indicates that economic growth is not linked to the bank's performance, as all estimated models show a statistically significant coefficient.

GENERAL CONCLUSION

CONCLUSION

As a result of the great transformations the world has gone through in terms of economic globalization, the increasing role of financial markets, changing regulatory laws, and intensifying competition in the international financial arena, banks have diversified their business fields away from their original business in order to preserve their role in the economy. Banks worked to increase their market share, but maximizing their returns and profits caused them to overlook the magnitude of the risks they could be exposed to, resulting in the destabilization of financial and banking stability, as well as economic chaos and the emergence of a series of crises, as these crises had significant effects on the financial system. This is what caused the bank's poor performance, making capital adequacy a critical factor in the bank's success. As a result, an international commission for banking supervision was established to establish the laws that banks must implement and obey in order to avoid insolvency. one of the most important rules issued by the Basel Committee is the capital adequacy standard As it is considered the basis of the first Basel Agreement of 1988, this standard witnessed development and new methods in measuring the capital adequacy standard in banks in the second Basel Committee, Despite this, new amendments were made to the components of capital, and this is in the Basel III Agreement,

In order to know the impact of capital adequacy on the performance of banks in the Middle East and North Africa, we conducted a study the dataset financial statements of 81 banks operating in Six MENA countries (Algeria, Egypt, Jordan, Morocco, Tunisia and United Arab Emirates UAE) during the 2017 period, The bank's data are obtained mainly from Bank scope Fitch international database published by Moody's Analytics (2017) and the missing information were completed by banks' individual annual report via their official websites. And To investigate the impact of capital adequacy on MENA banks' performance, we adopt a basic cross-section regression model due to the lack of data on banks of our selected sample over different years as we could not apply a panel data regression model.

The Study results

The study enabled us to draw a number of results that can be mentioned as follows:

- Capital requirements may affect the optimum combination of inputs to produce outputs through three channels, as the first works by influencing the bank's decision-making in terms of the quantity and quality of lending activity. Second, banking efficiency can also be affected by the impact of capital requirements on Bank decisions regarding the assets in which to invest. Finally, the third channel operates through the influence of capital requirements on the liability side of banks' balance sheets.

- As we have previously noticed, the capital requirement exerts a negative impact on MENA bank's performance if we consider that banking performance is captured by return on assets (**ROA)**. These results are in line with the private interest view. According to this view higher capital requirements may generate regulatory costs in the form of a higher barrier to entry and greater rent extraction by governments and lead to loss in banking efficiency. Yet, the supporters of the private interest view tend to oppose reliance on stringent regulations unless there is are no alternatives to adverse risk-taking incentives.

- As for the impact of capital requirements on the net interest margin (NIM), we obtained a positive relationship in line with the public interest viewpoint.

- Regarding the impact of the variables related to the bank, we reached the following results

- The bank size (SIZE) has a positive significant effect on the bank profitability (ROA, ROE and NIM) in all the estimated models. It demonstrates when the MENA banks become larger they show ability to take advantage from the economies of scale generated by larger assets.
- In terms of net loans we obtained a statistically significant negative relationship with Return on Equity ROE and statistically significant positive relationship with Net Interest Margin (NIM).

- In terms of liquidity, we concluded that it has statistically significant positive impact on both Return on Assets ROA and Net Interest Margin NIM.

- Bank's deposits are positively correlated (statistically significant) with the bank's performance in all the estimated models.

- Concerning the Impact of Banking System and Macroeconomic Specific Variables

- The results obtained through the specific variables in the banking system reveal an important positive effect of private credit to (GDP) on the return on equity, which is confirmed by the literature.

- There is also a significant negative effect on the NIM, which is consistent with the empirical evidence conducted in the Middle East and North Africa.

- In addition, the excessive availability of funds in the absence of a supervisory structure would reduce banking performance.

- The results of the study indicate that economic growth is not linked to the bank's performance, as all estimated models show a coefficient that is not statistically significant.

- With regard to the effect of the financial deepening indicator (money to GDP), we obtained conflicting results (a negative sign with a statistical significance) compared to the literature because the financial deepening is supposed to affect the bank's performance positively. However, we take these results with caution as we work on unbalanced cross-sectional data.

Bibliography

Bibliography

1. (2021, february 03). Retrieved from ET The economicTime: https://economictimes.indiatimes.com/

2. AHSAN, A. F. (2012). CAN ROE BE USED TO PREDICT PORTFOLIO PERFORMANCE? *Economics, Management, and Financial Markets , 7* (2).

3. AL-FAWWAZ, T. M., & ALRGAIBAT, G. A. (2015). Capital Adequacy of the Jordanian Banking Sector for the Period 2000-2013. *International Journal of Academic Research in Accounting, Finance and Management Sciences , 05* (01), 179–189.

4. 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 , 03* (04), 284-293.

5. Alssaleh, E. M. (2012). Efficiency of Commercial Banks Selected North African Countries. *Prosiding perkem , 01* (07), 484-487.

6. Apătăchioae, A. (2015). The performance, banking risks and their regulation. *Elsevier , 20*.

7. Balthazar, L. (2006). *From Basel 1 to Basel 3:The Integration of State-of-the-Art Risk Modeling in Banking Regulation.* LONDRES. ROYAUME-UNI: PALGRAVE MACMILLAN.

8. BankingSupervision, B. C. (2014, october). Basel Committee on Banking Supervision. *A brief history of the basel commite* , 01. Bank for International Settlements.

9. *Basel II*. (n.d.). Retrieved from Corporate Finance Institute: https://corporatefinanceinstitute.com/resources/knowledge/finance/basel-ii/

10. Beji, S., & ousleti, A. (n.d.). The tunisian financial system in the post revolution period:what about islamic finance.

11. Bos, J. A. (2008). *Bank Performance A theoretical and empirical framework for the analysis of profitability, competition and efficiency.* the USA and Canada: Routledge International Studies in Money and Banking.

12. Campioni, D., Etreby, M. E., Arab, H. E., & Okasha, H. (2018). *Egypt sets new targets for banking sector after moving to free-floating currency.* egypt: OXFORD BUSINESS GROUP .

13. *Capital Adequacy Ratio (CAR)*. (n.d.). Retrieved from corporate finance institute: https://corporatefinanceinstitute.com/resources/knowledge/finance/capital-adequacy-ratio-car/

14. Chorafas, D. N. (2012). *Basel III, the Devil and.* (P. P. Molyneux, Ed.) PALGRAVE MACMILLAN.

15. European Central Bank. (2010). *BEYOND ROE – HOW TO MEASURE Bank performance.* Frankfurt am Main.

16. Falzon, J. (2013). *Bank Performance,Risk and Securitization.* PALGRAVE MACMILLAN.

17. farazi, S., feyan, E., & Rocha, R. (2017). Bank ownership and performance in the Middle east And north Africa region. *World bank DC* , 01-46.

18. Faten Ben Bouhen, C. A. (2016). *Banking Governance, Performance and Risk-Taking.* (C. Ammi, Ed.) United States, Britain: Library of Congress Control.

19. Framework, A. N. (2000, march 31). A NEW CAPITAL ADEQUACY FRAMEWORK. 9. the Basel Committee on Banking Supervision.

20. HACINI, I., & DAHOU, K. (2018). The Evolution of the Algerian Banking System. *Management Dynamics in the Knowledge Economy , 6* (1), 146.

21. Haque, F., & Brown, K. (2016). Bank ownership ,regulation and efficiency:perspectives from the Middle east and North Africa(MENA)Region. *Elsiever,International Review of economics and finance , 47*, 273-293.

22. Hayes, A. (2020, May 10). *Capital Adequacy Ratio – CAR*. Retrieved from Investopedia academy: https://www.investopedia.com/terms/c/capitaladequacyratio.asp

23. james, B. (2001). Banking system around the globe:Do regulation and ownerships affect performance and stability! 31-88. University of chicago.

24. Jeffrey A. Mankin, J. J. (2011). WHAT IS YOUR ROA? AN INVESTIGATION OF THE MANY FORMULAS FOR CALCULATING RETURN ON ASSETS. *Academy of Educational Leadership Journal , 15*.

25. Lessambo, F. (2013). *The International Banking system : Capital Adequacy, Core Businesses and Risk Management.* USA: PALGRAVE MACMILLAN.

26. menthos, D. (2011). Regulations and productivity Growth in banking:evidence from transition economies. *Money,credit and banking , 143*.

27. Molyneux, P. (2011). *bank performance risk and firm financing.* UK: PALGRAVE MACMILLAN.

28. naceur, s. b., & kandil, m. (2008). The impact of capital requirements on banks cost of intermidiation and performance :the case of egypt. *Economics and business,Elsevier , 61* (01), 70-89.

29. *Nations encyclopedia*. (n.d.). Retrieved from Tunisia - Banking and securities: https://www.nationsencyclopedia.com/Africa/Tunisia-BANKING-AND-SECURITIES.html

30. Notes, G. (1993). *Guidance Notes on Risk Weighted Capital Adequacy Ratio.* Maurice: BANK OF MAURITIUS.

31. oyetayo, O. j., S.Osinubi, T., & Amaghionyeodiwe, L. (2019, september). Capital adequacy and banks performance:a case study of selected banks in Nigeria. *International journal of economics commerce and management* , 63-78.

32. Paranjal, J., & Dheeraj, V. (n.d.). Retrieved from Wallstreetmojo: https://www.wallstreetmojo.com/basel-i/

33. pasiouras, F. (2007). International evidence on the impact of regulation and supervision on banks technical efficiency:An application of two stage data envelopment analysis . *School of management working paper* (1).

34. Pervez, D., & Bansal, D. (2020). Capital adequacy,Risk and bank performance:evidence from india. *11*, 199-212.

35. Peterson, J. (2021, july 04). *Finance of the United Arab Emirates*. Retrieved from Britannica: https://www.britannica.com/place/United-Arab-Emirates/Finance

36. Qaisi, F. A. (2016). The Role of Basel Accords in Preventing the Banking System Failure. *International Journal of Empirical Finance , 05* (01), 36.

37. Ramirez, J. (2016). *HANDBOOK ON BASEL 3 CAPITAL.*

38. S, R., Pradhan, & shrestha, A. k. (2017, september 27). The impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks. *SSRN elibrary* , 01-13.

39. Samina, R., venus, k.-s., & rossazana, A. (2019). *Basel Accords,Bank Capital and Portfolio Risk Behaviour.* Cambridge Scholars Publishing.

40. Siddika, A., & Haron, R. (2020, june O5). *We are IntechOpen,the world's leading publisher of Open Access books.* Retrieved march 18, 2020, from IntechOpen: https://www.intechopen.com/books/banking-and-finance/capital-adequacy-regulation

41. Sri Murtiyanti, N. A. (2015). Capital adequacy of the banking industry in Indonesia. *ECONOMIC JOURNAL OF EMERGING MARKETS , 7* (2), 69-77.

42. Strong Banking and Financial Institutions. (2018). Jordan Investment Commission.

43. supervision, B. C. (2001, may 31). Basel Committee on Banking Supervision. *Pillar 3 (Market Discipline)* . Bank for International Settlements.

44. Supervision, B. C. (2012). *Basel Committee on Banking Supervision.*

45. Tan, Y. (2014). *Performance, Risk and Competition in the Chinese Banking Industry.* UK and USA: Chandos-Publishing.

46. Tatom, & John. (2005, November 15). Banking and Economic Development in Morocco. *Munich Personal RePEc Archive* .

47. Triki, T., Kouki, I., Dahou, M. b., & Calice, P. (2016). Bank regulation and efficiency :what works for Africa? *elsiever,international Business and finance , 39*, 183-205.

48. Vassakis, K., Lemonakis, C., Stylianos, C., & Voulgaris, F. (2015). Efficiency, capital and risk in banking industry: the case of Middle East and North Africa (MENA) countries. *International Journal of Financial Engineering and Risk Management* , 111.

49. Yassine, B. (2016). These Pour l'obtention du grade de Docteur En Sciences Economiques. *Mesure de l'Efficience des Banques Commerciales Algériennes par les Méthodes Paramétriques et Non Paramétriques* . Ecole doctorale : Management International Des Entreprises.

LIST OF ANNEXES

1. Descriptive statistics of independent and dependent variables

Date: 06/24/21 Time: 16:26
Sample: 1 81

	TCR	SIZE	ROE	ROA	NON	NIM	MON
Mean	16.56504	17.12800	12.53658	1.273178	8.084600	4.049512	91.72187
Median	15.33000	17.56897	10.90360	1.359524	6.235000	3.809744	92.29564
Maximum	44.47509	21.86180	86.11290	5.068065	38.26588	10.16783	119.3832
Minimum	4.082592	12.72823	-76.53119	-8.861903	0.144404	-13.91249	73.79929
Std. Dev.	6.075530	2.249121	18.83834	1.671968	6.881861	2.977987	14.32098
Skewness	1.928721	-0.020574	-1.349674	-3.001443	1.957829	-2.281751	0.551595
Kurtosis	8.600955	2.310007	13.88642	19.84617	7.467836	17.87911	2.376926
Jarque-Bera	156.0956	1.612519	424.5774	1079.419	119.1170	817.4707	5.417714
Probability	0.000000	0.446525	0.000000	0.000000	0.000000	0.000000	0.066613
Sum	1341.768	1387.368	1015.463	103.1274	654.8526	328.0105	7429.472
Sum Sq. Dev.	2952.965	404.6835	28390.66	223.6381	3788.801	709.4725	16407.24
Observations	81	81	81	81	81	81	81

Date: 06/24/21 Time: 16:26
Sample: 1 81

	LO	LI	GR	DO	CRED
Mean	0.496202	36.45524	2.879259	0.786533	50.40731
Median	0.542468	30.63073	2.370000	0.817650	63.01950
Maximum	0.914143	131.1769	4.240000	1.000000	78.22298
Minimum	0.043233	2.581799	1.300000	0.258277	24.40293
Std. Dev.	0.199760	23.04061	1.190575	0.111912	22.33346
Skewness	-0.528500	1.226144	0.094486	-2.270420	-0.040157
Kurtosis	2.508988	5.278803	1.246296	10.64621	1.133516
Jarque-Bera	4.584403	37.82246	10.50026	266.9074	11.77947
Probability	0.101044	0.000000	0.005247	0.000000	0.002768
Sum	40.19240	2952.874	233.2200	63.70914	4082.992
Sum Sq. Dev.	3.192332	42469.58	113.3976	1.001940	39902.68
Observations	81	81	81	81	81

2. Matrix Correlation

Covariance Analysis: Spearman rank-order
Date: 06/24/21 Time: 16:53
Sample: 1 81
Included observations: 81

Correlation t-Statistic Probability	TCR	SIZE	ROE	ROA	NON	NIM	MON
TCR	1.000000 ----- -----						
SIZE	-0.186947 -1.691439 0.0947	1.000000 ----- -----					
ROE	-0.044783 -0.398442 0.6914	0.419083 4.102540 0.0001	1.000000 ----- -----				
ROA	0.267164 2.464171 0.0159	0.328388 3.090142 0.0028	0.829336 13.19248 0.0000	1.000000 ----- -----			
NON	-0.157709 -1.419515 0.1597	-0.050752 -0.451672 0.6527	-0.273351 -2.525798 0.0135	-0.160600 -1.446220 0.1521	1.000000 ----- -----		
NIM	0.116295 1.040711 0.3012	0.297777 2.772474 0.0069	0.427825 4.207055 0.0001	0.439558 4.349600 0.0000	-0.226243 -2.064423 0.0423	1.000000 ----- -----	
MON	-0.025310 -0.225036 0.8225	0.128599 1.152586 0.2526	0.100490 0.897715 0.3721	0.018161 0.161449 0.8722	-0.396177 -3.835113 0.0003	0.111850 1.000420 0.3202	1.000000 ----- -----
LO	-0.025949 -0.230713 0.8181	-0.029878 -0.265681 0.7912	-0.258333 -2.376795 0.0199	-0.240108 -2.198443 0.0308	-0.040317 -0.358634 0.7208	0.050068 0.445573 0.6571	-0.175831 -1.587551 0.1164
LI	0.210569 1.914504 0.0592	0.010547 0.093745 0.9255	0.162331 1.462220 0.1476	0.291238 2.705874 0.0083	0.154660 1.391391 0.1680	0.026152 0.232523 0.8167	-0.069187 -0.616425 0.5394
GR	-0.041274 -0.367164 0.7145	0.134638 1.207682 0.2308	0.282081 2.613316 0.0107	0.134395 1.205463 0.2316	-0.423573 -4.156044 0.0001	-0.009659 -0.085857 0.9318	0.755759 10.25783 0.0000
DO	-0.294015 -2.734111 0.0077	0.057927 0.515731 0.6075	0.291825 2.711836 0.0082	0.014905 0.132495 0.8949	-0.312268 -2.921594 0.0045	0.136868 1.228070 0.2231	0.203096 1.843579 0.0690
CRED	0.114753 1.026727 0.3077	-0.577222 -6.282811 0.0000	-0.342303 -3.238069 0.0018	-0.347543 -3.294392 0.0015	-0.079920 -0.712627 0.4782	-0.482727 -4.899200 0.0000	0.058589 0.521649 0.6034

LO	LI	GR	DO	CRED
1.000000				

-0.751581	1.000000			
-10.12702	-----			
0.0000	-----			
-0.297015	0.077076	1.000000		
-2.764691	0.687113	-----		
0.0071	0.4940	-----		
-0.159824	-0.087308	0.221188	1.000000	
-1.439044	-0.778985	2.015894	-----	
0.1541	0.4383	0.0472	-----	
0.244520	-0.356948	0.026948	-0.006189	1.000000
2.241384	-3.396360	0.239608	-0.055008	-----
0.0278	0.0011	0.8113	0.9563	-----

3. Regression Analysis Results (ROA as dependent variable)

The First Model : Base Model

Dependent Variable: ROA
Method: Least Squares
Date: 06/23/21 Time: 20:54
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.646709	0.540717	1.196021	0.2353
TCR	0.037819	0.030668	1.233153	0.2212

R-squared	0.018885	Mean dependent var	1.273178
Adjusted R-squared	0.006466	S.D. dependent var	1.671968
S.E. of regression	1.666553	Akaike info criterion	3.883774
Sum squared resid	219.4146	Schwarz criterion	3.942896
Log likelihood	-155.2928	Hannan-Quinn criter.	3.907494
F-statistic	1.520667	Durbin-Watson stat	2.100307
Prob(F-statistic)	0.221175		

The Second Model: Bank Specific Variables

Dependent Variable: ROA
Method: Least Squares
Date: 06/23/21 Time: 21:01
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.78825	2.221171	-5.757436	0.0000
TCR	0.126820	0.031059	4.083216	0.0001
SIZE	0.271405	0.071066	3.819057	0.0003
LO	0.392771	1.263782	0.310790	0.7568
LI	0.012646	0.011851	1.067069	0.2894
DO	8.418164	1.563539	5.384044	0.0000
NON	0.004322	0.023720	0.182218	0.8559

R-squared	0.404468	Mean dependent var	1.273178
Adjusted R-squared	0.356182	S.D. dependent var	1.671968
S.E. of regression	1.341558	Akaike info criterion	3.507996
Sum squared resid	133.1836	Schwarz criterion	3.714924
Log likelihood	-135.0738	Hannan-Quinn criter.	3.591018
F-statistic	8.376446	Durbin-Watson stat	2.218987
Prob(F-statistic)	0.000001		

The Third Model: Banking System and Economic Specific Variables

Dependent Variable: ROA
Method: Least Squares
Date: 06/23/21 Time: 22:59
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.77508	2.905068	-4.053288	0.0001
TCR	0.127342	0.031020	4.105146	0.0001
SIZE	0.311385	0.091554	3.401099	0.0011
LO	0.315132	1.337815	0.235557	0.8145
LI	0.012413	0.012536	0.990220	0.3254
DO	8.558989	1.562955	5.476157	0.0000
NON	-0.010150	0.027117	-0.374294	0.7093
GR	0.176816	0.194590	0.908656	0.3666
CRED	0.009770	0.010796	0.904925	0.3686
MON	-0.028945	0.015362	-1.884268	0.0636

R-squared	0.433073	Mean dependent var	1.273178
Adjusted R-squared	0.361210	S.D. dependent var	1.671968
S.E. of regression	1.336310	Akaike info criterion	3.532845
Sum squared resid	126.7863	Schwarz criterion	3.828456
Log likelihood	-133.0802	Hannan-Quinn criter.	3.651448
F-statistic	6.026298	Durbin-Watson stat	2.284010
Prob(F-statistic)	0.000003		

4. Regression Analysis Results (ROE as dependent variable)

The First model : Base model

Dependent Variable: ROE
Method: Least Squares
Date: 06/24/21 Time: 12:45
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.94633	6.116500	2.934085	0.0044
TCR	-0.326576	0.346915	-0.941374	0.3494

R-squared	0.011093	Mean dependent var	12.53658
Adjusted R-squared	-0.001425	S.D. dependent var	18.83834
S.E. of regression	18.85176	Akaike info criterion	8.735471
Sum squared resid	28075.72	Schwarz criterion	8.794593
Log likelihood	-351.7866	Hannan-Quinn criter.	8.759192
F-statistic	0.886184	Durbin-Watson stat	1.838578
Prob(F-statistic)	0.349383		

The Second Model: Bank Specific Variables

Dependent Variable: ROE
Method: Least Squares
Date: 06/23/21 Time: 23:35
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-70.59901	28.21121	-2.502516	0.0145
TCR	0.497491	0.394481	1.261126	0.2112
SIZE	2.638362	0.902614	2.923024	0.0046
LO	-23.69681	16.05136	-1.476312	0.1441
LI	-0.033155	0.150523	-0.220262	0.8263
DO	54.16644	19.85859	2.727608	0.0080
NON	0.008433	0.301264	0.027992	0.9777

R-squared	0.243246	Mean dependent var	12.53658
Adjusted R-squared	0.181888	S.D. dependent var	18.83834
S.E. of regression	17.03920	Akaike info criterion	8.591365
Sum squared resid	21484.74	Schwarz criterion	8.798293
Log likelihood	-340.9503	Hannan-Quinn criter.	8.674388
F-statistic	3.964349	Durbin-Watson stat	1.886932
Prob(F-statistic)	0.001714		

The third model: Banking System and Economic Specific Variables

Dependent Variable: ROE
Method: Least Squares
Date: 06/24/21 Time: 01:07
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-47.76841	35.48262	-1.346248	0.1825
TCR	0.498466	0.378880	1.315631	0.1925
SIZE	3.440158	1.118247	3.076384	0.0030
LO	-27.05787	16.34013	-1.655915	0.1022
LI	-0.038174	0.153114	-0.249318	0.8038
DO	57.43676	19.09000	3.008735	0.0036
NON	-0.327134	0.331211	-0.987693	0.3267
GR	2.795105	2.376734	1.176028	0.2435
MON	-0.570145	0.187626	-3.038728	0.0033
CRED	0.191609	0.131868	1.453037	0.1506

R-squared	0.333783	Mean dependent var	12.53658
Adjusted R-squared	0.249333	S.D. dependent var	18.83834
S.E. of regression	16.32174	Akaike info criterion	8.538017
Sum squared resid	18914.34	Schwarz criterion	8.833628
Log likelihood	-335.7897	Hannan-Quinn criter.	8.656620
F-statistic	3.952430	Durbin-Watson stat	2.080849
Prob(F-statistic)	0.000407		

5. Regression Analysis Results (NIM as dependent variable)

The First Model : Base model

Dependent Variable: NIM
Method: Least Squares
Date: 06/23/21 Time: 23:53
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.943450	0.963248	3.055757	0.0031
TCR	0.066771	0.054633	1.222163	0.2253

R-squared	0.018557	Mean dependent var	4.049512
Adjusted R-squared	0.006133	S.D. dependent var	2.977987
S.E. of regression	2.968841	Akaike info criterion	5.038602
Sum squared resid	696.3072	Schwarz criterion	5.097724
Log likelihood	-202.0634	Hannan-Quinn criter.	5.062322
F-statistic	1.493683	Durbin-Watson stat	1.739999
Prob(F-statistic)	0.225280		

The Second : Bank Specific Variables

Dependent Variable: NIM
Method: Least Squares
Date: 06/23/21 Time: 23:56
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-19.47636	4.114562	-4.733520	0.0000
TCR	0.178629	0.057534	3.104723	0.0027
SIZE	0.346660	0.131645	2.633296	0.0103
LO	5.711106	2.341066	2.439532	0.0171
LI	0.039654	0.021954	1.806278	0.0749
DO	13.66580	2.896345	4.718293	0.0000
NON	-0.049326	0.043939	-1.122593	0.2652

R-squared	0.355833	Mean dependent var	4.049512
Adjusted R-squared	0.303604	S.D. dependent var	2.977987
S.E. of regression	2.485141	Akaike info criterion	4.740991
Sum squared resid	457.0185	Schwarz criterion	4.947919
Log likelihood	-185.0102	Hannan-Quinn criter.	4.824013
F-statistic	6.812851	Durbin-Watson stat	1.876533
Prob(F-statistic)	0.000009		

The third Model : Banking System and Economic Specific Variables

Dependent Variable: NIM
Method: Least Squares
Date: 06/24/21 Time: 00:18
Sample: 1 81
Included observations: 81

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-11.41701	5.254448	-2.172827	0.0331
TCR	0.180162	0.056106	3.211069	0.0020
SIZE	0.073672	0.165596	0.444888	0.6578
LO	4.688688	2.419731	1.937690	0.0566
LI	0.019560	0.022674	0.862655	0.3912
DO	13.74900	2.826946	4.863552	0.0000
NON	-0.047704	0.049047	-0.972602	0.3341
GR	-0.336555	0.351959	-0.956232	0.3422
MON	0.013168	0.027785	0.473930	0.6370
CRED	-0.049327	0.019528	-2.526008	0.0138

R-squared	0.415373	Mean dependent var	4.049512
Adjusted R-squared	0.341266	S.D. dependent var	2.977987
S.E. of regression	2.417007	Akaike info criterion	4.718081
Sum squared resid	414.7765	Schwarz criterion	5.013692
Log likelihood	-181.0823	Hannan-Quinn criter.	4.836684
F-statistic	5.605004	Durbin-Watson stat	2.034123
Prob(F-statistic)	0.000008		

Abstract

This thesis aims at studying the impact of capital adequacy on the performance of commercial banks in the Middle East and North Africa MENA. The data set consists of the financial statements of 81 commercial banks operating in six countries in The MENA region (Algeria, Egypt, Jordan, Morocco, Tunisia and United Arab Emirates) during the 2017 period. We adopted a basic cross-section regression. We first run a base model where each variable reflects bank performance (ROA, ROE, and NIM) only on capital adequacy and then we run another regression model where some bank-specific variables are included to examine how the bank's requirements impact Capital on banking performance through the interaction of some bank specific variables. Finally, we included a set of banking system and economic variables to take into account the differences in the banking and economic characteristics of the analyzed. The outputs of this study suggest that capital requirements may negatively affect the performance of the MENA banks if we consider that banking performance is recorded through ROA. Accordingly, higher capital requirements may generate regulatory costs in the form of a higher barrier to entry and greater rent extraction by governments and lead to loss in banking efficiency. However, in terms of Net Interest Margin NIM , The findings suggest a positive relationship which indicate that Capital Adequacy plays a crucial role in aligning the incentives of bank owners with depositors and other creditors which results in more careful lending and better bank performance.

Key words: Basel, capital adequacy, bank performance, bank profitability, Middle East and North Africa**.**

Résumé

L'objectif de ce mémoire est d'examiner l'impact de l'adéquation des fonds propres sur la performance des banques commerciales qui opèrent dans la région du Moyen-Orient et Afrique du Nord MENA. Les données analysées sont constituées des états financiers de 81 banques commerciales qui activent dans six pays de la région MENA (Algérie, Égypte, Jordanie, Maroc, Tunisie et Émirats arabes unis) au cours de la période 2017. Nous avons adopté une régression de base en coupe transversale. Nous avons d'abord développé un modèle de base où chaque variable reflète la performance bancaire (ROA, ROE et NIM) uniquement sur l'adéquation des fonds propres, puis nous avons développé un autre modèle de régression où certaines variables spécifiques à la banque sont incluses pour examiner comment les exigences en capital de la banque impactent la performance bancaire à travers l'interaction de certaines variables spécifiques à la banque . Enfin, nous avons inclus un ensemble de variables spécifiques au système bancaire pour prendre en compte les différences dans les caractéristiques bancaires et économiques des pays sujets d'étude. Les résultats de cette étude suggèrent que les exigences en capital peuvent affecter négativement la performance des banques de la région MENA si on considère que la performance bancaire est reflétées par le ROA.. en termes de marge nette d'intérêt NIM, les résultats suggèrent une relation positive qui indique que l'adéquation du capital joue un rôle crucial dans l'alignement des incitations des propriétaires de banques avec les déposants et autres créanciers, ce qui se traduit par des prêts plus prudents et de meilleures performances bancaires.

Les mots clés : Bâle, l'adéquation des fonds propres, la performance bancaire, la rentabilité bancaire, Moyen-Orient et Afrique du Nord.

الملخص

تهدف هذه الأطروحة إلى دراسة تأثير كفاية رأس المال على أداء البنوك التجارية في منطقة الشرق الأوسط وشمال إفريقيا. تتكون مجموعة البيانات من البيانات المالية لـ 81 بنكًا تجاريًا تعمل في ستة بلدان في منطقة الشرق الأوسط وشمال إفريقيا (الجزائر ، مصر ، الأردن ، المغرب ، تونس والإمارات العربية المتحدة) خلال فترة 2017. اعتمدنا انحدار المقطع العرضي الأساسي. نقوم أولاً بتشغيل نموذج أساسي حيث يعكس كل متغير أداء البنك ROA) و ROE و NIM) فقط على كفاية رأس المال ثم نقوم بتشغيل نموذج انحدار آخر حيث يتم تضمين بعض المتغيرات الخاصة بالبنك لفحص كيفية تأثير متطلبات رأس المال البنك على الأداء المصرفي من خلال تفاعل بعض المتغيرات الخاصة بالبنك. وأخيرا قمنا بتضمين مجموعة من متغيرات النظام المصرفي والاقتصادي لمراعاة الفروق في الخصائص المصرفية والاقتصادية لتحليلها. تشير مخرجات هذه الدراسة إلى أن متطلبات رأس المال قد تؤثر سلبًا على أداء بنوك منطقة الشرق الأوسط وشمال إفريقيا إذا اعتبرنا أن الأداء المصرفي يتم تسجيله من خلال العائد على الأصول. وبناءً على ذلك ، قد تؤدي متطلبات رأس المال المرتفعة إلى تكاليف تنظيمية في شكل حاجز أعلى للدخول وزيادة استخراج الإيجارات من قبل الحكومات وتؤدي إلى خسارة في الكفاءة المصرفية. ومع ذلك ، فيما يتعلق بصافي هامش الفائدة NIM، تشير النتائج إلى وجود علاقة إيجابية تشير إلى أن كفاية رأس المال تلعب دورًا حاسمًا في مواءمة حوافز مالكي البنوك مع المودعين والدائنين الآخرين مما يؤدي إلى إقراض أكثر حرصًا وأداء مصرفيًا أفضل.

الكلمات المفتاحية: بازل ، كفاية رأس المال ، أداء البنك ، ربحية البنوك ، الشرق الأوسط وشمال إفريقيا.