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**ДЕТЕРМИНАНТИ НА ПРОФИТАБИЛНОСТ НА
КОМЕРЦИЈАЛНИТЕ БАНКИ ВО ДИНАМИЧНО ОКРУЖУВАЊЕ:
СЛУЧАЈ НА РЕПУБЛИКА СЕВЕРНА МАКЕДОНИЈА**

(PROFITABILITY DETERMINANTS OF COMMERCIAL BANKS IN DYNAMIC
ENVIRONMENT: EVIDENCES FROM THE REPUBLIC OF NORTH MACEDONIA)

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PROFITABILITY DETERMINANTS OF COMMERCIAL BANKS IN DYNAMIC ENVIRONMENT: EVIDENCES FROM THE REPUBLIC OF NORTH MACEDONIA

-ABSTRACT-

Banking sector plays an important role in economy and has significant impact on country's economic growth. In the dynamic environment of the banking system, the specific factors and macroeconomic factors are constantly changing. Hence, identifying those factors have always been a concern not only for bankers, but for all involved parties, as banking industry represents a main participant of financial system with severe contribution and effects on the economy as a whole.

The purpose of this study is to examine the quantitative impact of selected specific and macroeconomic factors on the profitability of commercial banks in the Republic of North Macedonia for a period of 16 years (2005-2020), based on the quarterly data. Study identifies and demonstrates the relationship and significance between each of the variables and the bank profitability, represented by ROA and ROE. The study represents the effort to fill the gap in the current literature for this region for empirical research, and it provides an empirical scientific evidence for the bank management in the future shaping the bank strategies, focusing on the variables that are most prominent and influential in the banking profitability. Such evidence will be visible having in mind that the internal factors are under the direct influence of the bank managers, which can shape the strategies for securing higher profitability as well as stable and healthy banking sector.

Key words: Bank Profitability, the profitability determinants, commercial banks, ROA, ROE, VECM

JEL Classification: G2, G21,

I declare that the doctoral dissertation is an original dissertation that I have made myself.

Handwritten signature of the doctoral student

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List of abbreviations

ROA – Return on Assets

ROE – Return on Equity

GDP – Gross Domestic Product

LTM - Lemon Market Theory

SCP- Structure-Conduct-Performance

RMP- Relative Market Power

QL- Quiet Life

ESX -Efficient-Structure theory

PM -profit margin

AU- Asset Utilization

NIM-Net Interest Margin

CAR- Capital Adequacy Ratio

DEA-Data Envelopment Analysis

ATM- Automated Teller Machines

EPS- Electronic Payment System

POS- Point of sale

IMF- International Monetary Fund

VECM- Vector Error Correction Model

VAR -Vector Autoregressive Model

ARB -Bank Rehabilitation and Restructuring Act

NBRNM -National Bank of the Republic of North Macedon

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INTRODUCTION

Financial sector has experienced major transformations, during the last two decades due to huge technological change and globalization. However, even nowadays the new trends, globalization, financial innovation and growth of financial institutions on the market, the role of commercial banks is still important. They play critical roles in smoothing the way of development in an economy.

It is a widely known the fact that banks are the main participant contributing to the development of the economic growth of the country as they remain at the centre of the economy due to their role as part of financial system. They exist to reduce informational asymmetries and transaction costs that hinder channelling an economy savings towards the most productive investment opportunities. The banking industry can be considered as a derivative for the future progress and development of local and international economies.

Banks gather, distribute and invest most of the savings of economic agents. Therefore, their performance has significant consequences on capital distribution, firm expansion, industrial growth and economic development. For that reason, the profitability of banks is not important only at the level of individual banks, but it is also important at a macroeconomic level.

Consequently, based on importance of commercial bank as part of financial instructions it is really important performance of banks and factors that influence the performance of commercial banks. Economies that have a profitable banking sector are more capable to withstand negative shocks and contribute to the stability of the financial system. Therefore, it is important to understand the factors that really affect the profitability of the banking sector.

In developed countries, the financial markets and the banking system work together with financial companies, savings houses, exchange offices, the deposit insurance fund, insurance companies, pension funds, investment funds, brokerage firms, and a stock exchange to achieve this key goal. As a contrast, in developing countries financial markets are usually underdeveloped and small, so in this case, banks fill the gap between borrowers and depositors and ensure safe and profitable channelling of funds. Considering that savings and investments are the most important determinants of economic growth, the health of a country's overall economy depends significantly on the proper functioning of the financial system. This is especially true for countries such as the

Republic of North Macedonia, where the banking sector is the backbone of the economy. Financial sector in the Republic of North Macedonia's is defined by the dominant role of commercial banks.

Profitability of commercial banks is considered key ingredient to ensure permanent development of the banking industry. The term profitability refers to a bank's ability to maintain its profitability year after year. Therefore, the question that comes to mind about profitability is: What are the factors that influence a bank to maintain profit year after year? According to previous studies, factors that significantly affect the profitability position of banks include internal banking factors and external macroeconomic factors.

Consequently, the importance of commercial bank is fundamental in developing countries because of the lack of stock exchange, all economic activity is based on classic bank products/services. Furthermore, banking industry in developing countries experienced numerous mutations in order to create some profitable banks that will help the development and economic growth of countries. In those countries the profitability of the banking industry will definitely contribute to the economic development of the country by providing additional employment and tax revenues for the government treasury. Moreover, it will contribute to the income of investors by having a higher dividend and thus improve the standard of life.

Furthermore, profitability reflects of how banks are run, based on the environment they operate. More precisely, it reflects the quality of the bank's management and shareholder behaviour, bank's competitive strategies, efficiency and risk management ability. There are many aspects that banking industry can be analysed, but this research is precisely focused on the profitability and factors that affect profitability of the banking industry.

Therefore, it is fundamental for commercial banks to identify the key factors that affect profitability and how they have changed over time. Identifying those factors will help interested groups such as managers, board members, regulators, supervisors, owners, investors, researchers, financial analysts and supervisory authorities to build strong banks and also it is important for policy makers in order to plan effective and efficient regulatory rules for the banking industry and take appropriate measures.

A considerable number of studies have been conducted in the field of profitability of commercial banks and its determinants, given the importance of this field at the international level. Specifically, the effect and relationship of internal and external factor of the bank profitability has been analysed in the existing literature, both from a theoretical point of view and through empirical

analyses. They conclude that there is a significant relationship between industry and its internal and external factor and profitability of commercial banking, however most of the research concerns developed countries, related to Western European banks and US, but not including developing country such as the Republic of North Macedonia. Starting from the gap study of this topic, this study contributes to the literature by becoming empirical evidence for the Republic of North Macedonia and an analysis of those factors in particular way for this country.

To sum up, based on literature review of research there are no universally accepted findings on the factor that effect the profitability of the banking sector. Have in mind that countries distinct from each other by their economic systems, financial systems, political systems and operating environments. Therefore, the performance determinants of banks have attracted the interest of academic research, as well as the management of the bank, financial markets and banking supervisors. Thus, the study will be an attempt to empirically examine the main determinants of profitability of the Republic of North Macedonia banks taking into consideration banks and macroeconomic factors during the period 2005-2020.

Hence, the choice of this topic is for the vital power that presents commercial banks in the entirety of the economic activity of a developing country such as the Republic of North Macedonia, where the bank is a main institution on the financial system of the country. The main reasons for choosing the topic are:

The first reason for choosing this topic is a limited number of research studies on factors that affect the profitability of commercial banks in the Republic of North Macedonia. In general, healthy and sustainable profitability is vital in maintaining the stability of the banking system and contributes to the stability of the financial system which is mostly based on banks, such as in the Republic of North Macedonia.

The second reason for research on this topic is to provide empirically reasoned evidence of variables that affect the profitability of commercial banks in the Republic of North Macedonia and fill in the gap in the current literature for this region. Moreover, to get the deeper answers of relationship and significance of those factors over this period of research.

The third reason for research on this topic is to provide an empirical scientific evidence for the bank management in the future shaping the bank strategies, focusing on the variables that are most prominent and influential in the banking profitability based on the empirical model. Such

evidence will be visible having in mind that the internal factors are under the direct influence of the bank managers which can shape the variables toward higher profitability.

Therefore, the main purpose of this study is to take a closer look at the potential impacts of internal and external factors proclaimed by different research, based on the quantitative model, to assess whether those factors are significant or not. Hence, in our model, we used data for banking system in the Republic of North Macedonia, provided by the Nacional Bank of the Republic of North Macedonia, including data for the period of 2005-2020.

In order to withdraw an answer for the objectives, there are raised hypothesis based on theories related to bank profitability that have been developed over the years by banking sector researchers and other empirical studies related to bank profitability:

The hypotheses of this research tend to examine the impact of particular banking factors and macroeconomic factors on banks' profitability. In general, based on the research problems and objectives of the study, one main hypothesis and ten sub-hypotheses were developed for each model (ROA / ROE). Below are the two main hypotheses of the study, for the first model (ROA) and for the second model (ROE).

H1: There is a significant relationship between bank size and profitability of commercial banks

H2: There is a significant relationship between credit risk and profitability of commercial banks

H3: There is a significant relationship between loans and profitability of commercial banks

H4: There is a significant relationship between liquidity and profitability of commercial banks

H5: There is a significant relationship between revenue diversification and profitability of commercial banks

H7: There is a significant relationship between operational efficiency and profitability of commercial banks

H6: There is a significant relationship between reservation for loan loss and profitability of commercial banks

H8: There is a significant relationship between growth of GDP and profitability of commercial banks

H9: There is a significant relationship between inflation and profitability of commercial banks

H10: There is a significant relationship between interest rate and profitability of commercial banks

This thesis research is structured in five chapters which all address with priority profitability of commercial banks related to the impact of banks specific and macroeconomic

factors - profitability as well as other financial indicators within the Republic of North Macedonia banking system. Consequently, based on the objective of the research, the other part of this research is organized as follows.

The chapter one presents a theoretical part of banking industry as part of financial market. It illustrates the role of banking industry through figures and how financial system collects and communicates information for participants of financial system. In addition, chapter provides answers how banking industry is important as part of financial system that helps economy function normally and efficiently and exactly how banks ensure the activity of country's economy through financial system. Then, banks theories are observed, including financial intermediation and credit creation theory. Additionally, the intermediation function is explained as a basic function, which is present in almost the entire banking business and permeates all the work, instruments, techniques and practices of banks the accumulation of funds represents the trust of costumers. As well, it is giving details about credit creation activity, enables the bank to manufacture money and separates a bank from other financial institutions. Finally, the chapter indicates the literature review about banks profitability theories such as market power, efficient structure and expense preference theory. Market power theory gives insight view about concentration and connection to profitability. As well, efficient structure theory explains the effect of better management of banks revenue. The chapter discusses expense preference theory on how firm management should primarily be driven by the goal of maximizing their utility.

Chapter two on the topic profitability determinants of commercial banks in dynamic environment provides a broad overview regarding the literature review by evaluating and studying the conclusions reached by various authors around the world regarding this phenomenon. The chapter parts divides a review into two groups that include: analyses in cross-country evidence and individual countries, since bank's profitability is a complex process, which involves the interaction among internal operations, external activities and the surroundings. The literature review of those two groups presents a detailed overview of banks specific factors, macroeconomic factors and market factors that affect profitability. Furthermore, the chapter indicates that profitability determinants, are usually being expressed as a function of internal and external determinants. In addition, , it investigates how internal determinants as factors originated from financial statements of commercial banks and have impact on banks profitability. Furthermore, the chapter, investigates macroeconomic (external) factors that are not related to the management of the bank, and thus

those factors are broad sectors or wide-ranging factors of the country that are beyond the control of the banks, but that reflect the economic and legal environment which affect the functioning and performance of financial institutions. Moreover, previous studies in this field define the knowledge gap of this topic and also describes the approaches of measurement of banks' profitability. This chapter is very important for our research because it will give series of very important conclusions that have resulted from browsing this literature review regarding and this phenomenon that has been taken into study.

The discussion in chapter three provides the theoretical framework of the concept of innovation and financial technology as a factor on profitability of commercial banks. The discussion has been put on types of innovation on banking industry, and how those types of new technological and innovation will improve efficiency, increase productivity and overall performance. Then, innovations in banking sector such as: electronic banking, debit and credit card, ATM are observed. Furthermore, the chapter analyses trend of those innovations in the banking industry of the Republic of North Macedonia. The chapter end with a detailed discussion, and comments on the innovations on the banking industry in the Republic of North Macedonia.

Chapter four describes research design and methodology used for analysing the banking industry in the Republic of North Macedonia for covering period quarterly data from 2005 to 2020. It starts by identifying availability the sources and explains the methodology used for the research. Furthermore, the chapter indicates that for the measures of commercial banks profitability will use the time series vector autoregressive model (VAR) and vector error correction model (VECM) and descriptive statistics in static framework. Then the most important test is described for time series data such as: stationary, co-integration, normality, autocorrelation and heteroscedasticity test. The chapter also defines and highlights the ways of measuring profitability, as well as the internal and external variables selected for the study. Furthermore, the chapter indicates the two most commonly used measures of bank profitability dependents variables: Return on Assets (ROA), Return on Equity (ROE). The next part describes the independent variables that are used to analyse bank profitability in the North Republic of Macedonia. They contain internal factors (bank-specific) and external factors (macroeconomic) that determine bank profitability. Applying the Vector Autoregressive Model (VAR) and Vector Error Correction Model (VECM) will give deep insight about banks profitability in the Republic of North Macedonia.

Chapter five in the first part analyses the profitability of banking sector in the Republic of North Macedonia based on the statistical data. Such approach enables to draw the conclusions for the past and current trends of development of the variables that are highly important for the bank profitability. Then based on the Vector Autoregressive Model (VAR) and Vector Error Correction Model (VECM) and also through descriptive statistic including two indicators (ROA and ROE) the effects and relationships between internal and external factors and bank profitability are being analysed. The chapter confirms the finding and take the estimation of the relationship between internal and external factors and bank profitability. Moreover, the chapter indicates specific finding for each of the hypothesis that has been raised. By applying vector autoregressive model (VAR) and vector error correction model (VECM), it is confirmed the statistically significant impact of internal and external factor on bank profitability. Furthermore, the chapter summarise the main findings of the thesis and conclusions of the analysis. It also highlights the recommendations for the future research and limitations of this research.

1. THEORETICAL BACKGROUND ON BANK'S PROFITABILITY

1.1. The role of the commercial banks

The function of the economy, in its extents, is impossible without the functioning of financial system. The financial system is complex, consisting on different types of private sector financial intermediation, including banks, insurance companies, mutual funds, financial companies and investment banks, which fulfil several very important functions and are largely regulated by the government. Three main financial services that are provided by financial system are:¹

1. Risk diversification
2. Liquidity
3. Information

First, the risk represents the degree of uncertainty for the return of funds so the financial system enables risk allocation, offering savers and borrower's ways to reduce uncertainty. To prevent risk, financial institutions should place products / services on a large customer base. Risk diversification should be done according to geographical locations, nature of business and type of individual.

Second, most of the people care about how easily they can turn assets into money. Liquidity is the measure of how easily an asset can be turned into money. The financial system enables us to do this conversion.

Finally, the financial system collects and communicates information about borrowers, so that individual savers do not need to look for prospective borrowers. In this way, the financial system allocates funds efficiently, as it reduces the cost of meeting and borrower information.

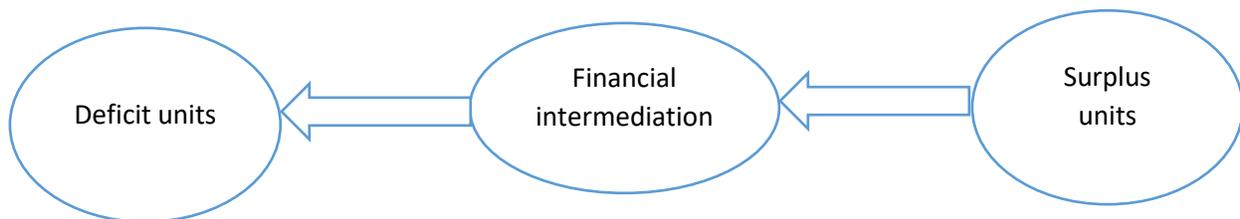
Every day people lend money to a large number of borrowers, including the government, companies, shops, etc., without even knowing it. They relate to these borrowers, not directly through the financial markets, but indirectly through financial institutions that are intermediaries.

¹ Mishkin, F. (2012). The Economy of Money, Banking and Financial Markets, 10th edition. Pearson Education, Inc., USA.

Financial intermediaries are institutions, such as commercial banks, credit unions, savings and credit associations, savings banks, mutual funds, financial companies, insurance companies and pension funds, that lend money to savers and lend to borrowers.

The prime task of the financial intermediation is to enable the system to channel funds from borrower savers in a secure and developing economy. Henceforward, financial intermediation is a process which includes surplus units depositing funds with financial institutions who in turn lend to deficit units. This is showed in Figure 1.

Figure 1.1. Financial intermediation



Source: Kent Matthews & Joan Thompson, 2005, The economics of banking, John Wiley & Sons Ltd, p: 34.

Savers and borrowers have different requirements through the financial intermediaries which is why it is impossible to create connection and to vanish the gap between borrowers and lenders. If this process is done in an efficient way, then the funds will be used to improve this process and make a better customer service quality. Overall, the main goal of the establishment and existence of the financial intermediation is profit, except when we are dealing with financial institutions that aim to fulfil the mission of regulating the financial market, such as the central bank or any institution with the same field of action.

Nowadays, new businesses and ways to earn money are being discovered by different people worldwide. The increase of economic activity sparked the introduction a banking system that is highly developed, so it is impossible to think of normal life without the bank. The introduction of commercial banks has developed the economy of country and has helped save money and create the wealth for many people.

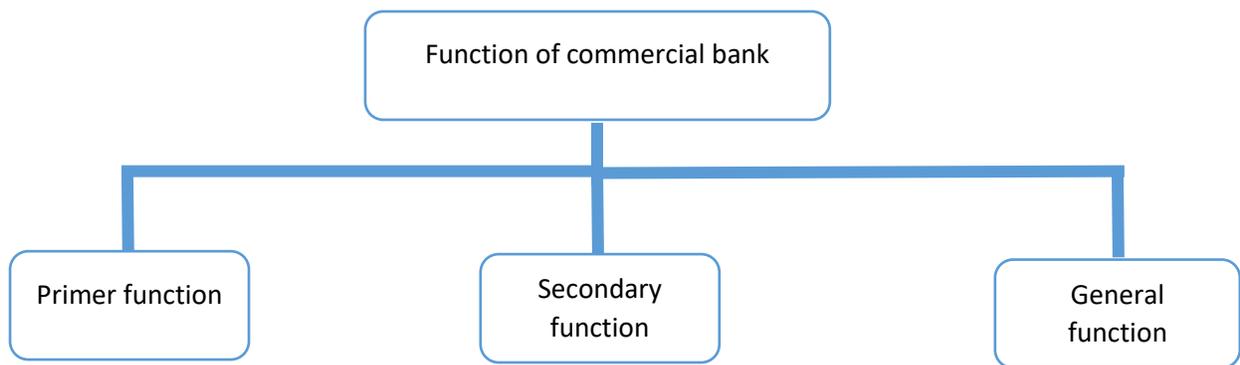
Banking activity plays an essential role in the process of channelling borrower funds, which have the opportunity to make productive investments. This financial activity is important to ensure that the financial system and the economy function normally and efficiently. Commercial banks through the role of intermediation between savers and investors have influenced the volume,

as well as the accumulation of savings, ensuring the market diversification of instruments that will meet the exact liquidity needs of savers and at the same time provide financial resources available to investors for a relatively long period according to their needs. The role which the bank plays in society are many, but not all of them are aimed at improving the economic value of a country. It is understood that the commercial operating activities are regulated by-laws, policies, and procedures which form part of the perceived banking market in the market structure.

Commercial banks offer many product and services to its customers in today's era such as: the deposit of money as well as the safekeeping of valuables or important documents, removing from the latter the concern for the safekeeping of his property, various savings rates with attractive interest rates in order to encourage people to save more, loans for the purchase or construction of houses, and financial advice.

Banks also finance the government in development programs, thus affecting the economic stability of a country. They are a key element in the implementation of monetary and fiscal policy by the Central Bank, because the increase in interest rates by the Central Bank must be accompanied by an increase in interest rates by commercial banks, certainly in line with the Central Bank. In addition to receiving deposits and lending money, the bank edits its work. All the main function of the commercial bank can be divided into three forms which areas are presented in the figure below:²

Figure1.2.The main functions of commercial banks



Source: Shelagh Heffernan (2005), Modern Banking, John Wiley & Sons Ltd, p: 5-40.

² Source: Shelagh Heffernan (2005), Modern Banking, John Wiley & Sons Ltd, p:5-40.

1. **Primer function** - Receiving deposits is the primary function of commercial banks which encouraging the public to save. It gives interest on the money and is liable to return them when demanded by the customers. Banks usually receive deposits for the consumers in three types of deposits:
 - i) Current deposit -the main feature of these deposits is that they can be deposit and withdrawn at any time by their owner. In general, banks do not pay interest on current accounts, therefore these accounts do not bring costs to the bank. These deposits are held by both individuals and businesses. The bank charges the holders of these accounts with monthly maintenance fees, which represent one of the forms of bank revenues
 - ii) Fixed deposit - also known as time deposits. The fixed deposit is the deposit which the bank takes for a certain period. These deposits cannot be withdrawn before the maturity of the term period, or without prior notice from the client to terminate the business agreement. Banks offer a higher interest rate for this type of deposit.
 - iii) Saving deposit - It is mainly known as an account where clients or businesses can deposit their surplus assets from which they realize interest income. These accounts cause banks expenses as interest and must be paid for them. The characteristic of these accounts is that the client can deposit or withdraw money at any time, but in some cases the bank may set a daily or monthly withdrawal limit.
2. **Secondary function**- This is also one of the most important functions of commercial banks. All commercial banks provide loans to their customers especially to entrepreneurs and the main purpose is to make a profit.

Commercial banks provide those main categories of loans:

- i) Cash credit and overdraft - represent the loans that can be used without a certain amount of time. Through these two types of loans, the bank customer has a credit limit which can be used as needed. The interest payable by the borrower is calculated on the amount of credit limit actually drawn. With the repayment of the loan, the available limit increases again, enabling the customer to use it further. The bank charges the customer only for the used part of the credit limit.
- ii) Short- and long-term loans- They represent those loans which can be used only within its time limit. Short-term loans (less than 1 year) are given as personal loans against some security. Long term loans are generally considered to be a loan with

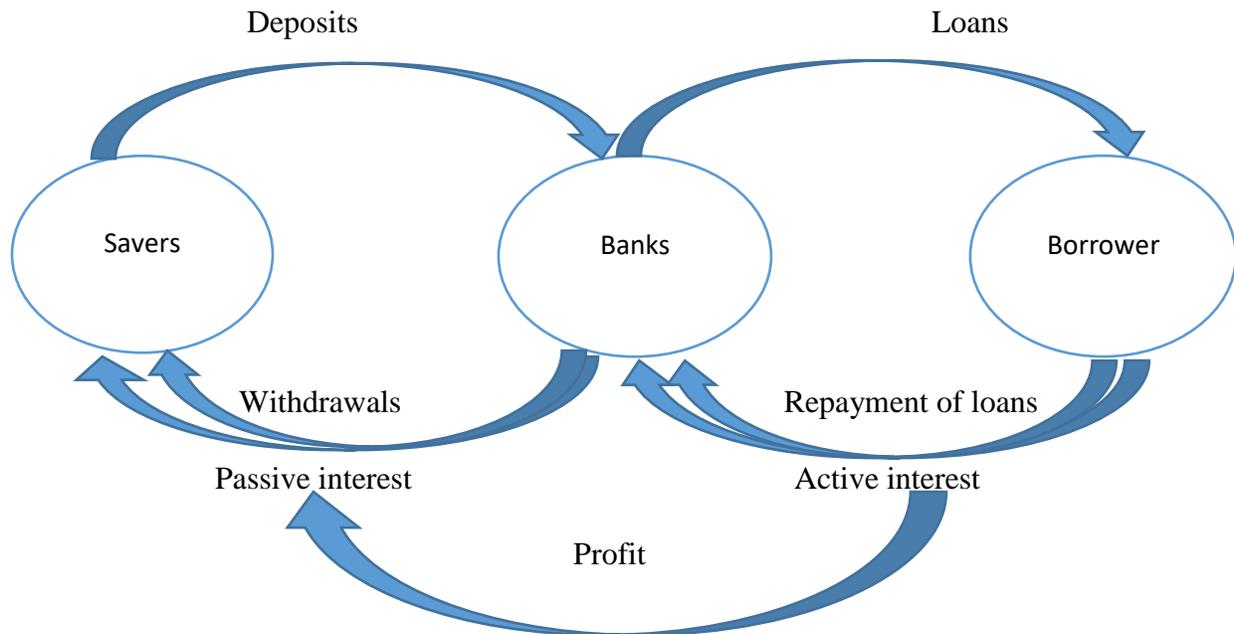
a repayment term longer than five years. Compared to other types of loans, long-term loans could be a good option if you need to borrow a large amount of money and want to keep your monthly payments low. So, these loans can be taken again, after their payment. With the payment of instalments of these loans, the credit balance is reduced. However, in these loan categories, there is no credit limit which can be used continuously. Instead, if the client needs extra funds, they should apply for a new loan. The main types of land loans are: mortgage loan, vehicle loan, student loans, personal loans, home loan, business loan, education loan, etc.

- iii) Secured loans - are those loans which use assets as based of security. If the borrower fails to repay the loan, the bank can take ownership of the assets left in the form of collateral. Secured loans may allow borrowers to enjoy lower interest rates, as they present a lower risk to lenders. Assets left as collateral must be valued by the bank or by independent appraisers.
- iv) Unsecured loans- is a loan that doesn't require any type of collateral. These loans can be more difficult to secure by the client and are more expensive in terms of interest rate. For granting these loans, the bank approves unsecured loans based on a borrower's creditworthiness of the client as well as in his income.

3. Credit creation- This is a unique function performed by the commercial banks. Like other companies, banks aim at earning profits. For this purpose, they accept cash when demanding deposits and advance loans for the credit they give to customers. When a bank asks for a loan in advance, it does not pay the amount in cash. But it opens a current account in clients behold and allows him to withdraw the required sum by cheques. In this way, the bank creates credit or deposits. In this way banks make credit by lending more than their lending deposits.

Also, banking is business, commercial banks meet the needs of the market, by providing services and making a profit, charging customers for those services. Banks make a profit, through raising funds from savers and allowing those funds to borrowers, added in this case the value also by ensuring risk sharing. This process is presented in the figure 3.

Figure 1.3. Bank as a Financial Intermediaries



Source: Rose P. and Hudgins S. (2005). Bank Management and Financial Services, 6th Edition, New York: McGraw-Hill.

As it is showed in the figure 1.3. Banks act as financial intermediaries because they stand between the savers and borrowers. Savers place deposits in banks, and then receive interest payment (passive interest) and withdraw money. On the other hand, borrowers receive loans from banks and replay the loans with interest (active interest). Similar as any other business, banks aim to maximize profits. The difference between the return that a bank earns from lending and the cost of securing assets is the bank's profit. Furthermore, the bank realizes the profit from the difference through the interest earned from loans (active interest) and the expenses from deposits and borrowings (passive interest). This is one of the main functions of commercial banks, which consist to receive funds (deposits) with lower interest rates and give them in the form of loans with higher interest rates. The interest gained from granting loans represents the main income of each commercial banks.³

³ Rose P. and Hudgins S. (2005). Bank Management and Financial Services, 6th Edition, New York: McGraw-Hill.

In addition to interest income, banks also offer a number of other services to their clients, from which it generates fee and commission income (noninterest income). These other services represent another important source of the bank income which has an upward trend recently.

In terms of the importance of financial institutions, banks have the greatest weight, since they define the basic activity of economic entities and promote financial development. Hence commercial banks have always played an important role in the country's economy and play a decisive role in the development of industry and commerce. They act not only as caretakers of the country's wealth, but also as a domestic resource, which are needed for the country's economic development.

It is important to highlight that commercial banks play a vital role in the economic resource allocation of the countries; they channel funds from depositors to investors continuously. They can do so, if they generate the necessary income to cover their operational cost they incur in the due course. In other words, for sustainable intermediation function, banks need to be profitable. Beyond the intermediation function, the financial performance of the banks has critical implications for economic growth of the countries. Good financial performance rewards the shareholders for their investment. This, in turn, encourages additional investment and brings about economic growth. On the other hand, poor banking performances can lead to banking failure and crisis, which have negative repercussions on the economic growth.⁴

Furthermore, the core role of a financial system all-over the world is to lubricate the gears facilitating the economic operations. The banking system plays a major role in transferring funds from the saving units to the investing units. If a financial system is efficient, it should show improvements in profitability, increasing the volume of funds flowing from saver to borrowers, and better-quality services for consumers.⁵

Nowadays, banking sector is becoming more and more complex, due to the development of the securities financial market, major transformations, huge technological change and globalization. Even nowadays the new trends, globalization, financial innovation and growth on market –based the role of commercial banks is still important. Hence based on importance,

⁴Ongore, V.O., & Kusa, G.B., (2013), Determinants of financial performance of commercial banks in Kenya. *International Journal of Economics and Financial, Issues*, Vol.3 (1), p: 237-252.

⁵Levine, R., Loayza, N, Beck, Th., (2000). Financial Intermediation and growth: Causality and causes, *Journal of Monetary Economics*, 4(46), p: 31-77.

profitability of commercial bank as part of financial instructions it is really important not only because of the information it provides about the health of the economy each year, but also because earnings remain a key determinant of growth and employment in the medium term.

Mainly, the role of commercial bank is fundamental in developing countries because financing markets are usually underdeveloped and small also there is a lack of stock exchange, so in this case, the banks fill the gap between borrowers and depositors and provide safe changing and adjustment of funds, in the other word all economic activity it is based on classic banks product/service. Therefore, in developing countries it is highly desirable to have good, sustainable and quick economic progress, which can be intensified by increasing the benefits of all financial institutions. It is vital that every country to have well-structured and profitable banking sector in order for it to be competitive and successful. For the existence of competitive and successful financial sector, the particular importance is the degree of profitability realized by banks. The stability of the financial system depends on the profitability of the banking sector.

Profitability in banking industry is a replication of how banks are run and the macroeconomic environment they are operating. More specifically, it reflects the quality of the bank management and shareholder behaviour, banks' competitive strategies, efficiency and risk management skills.

Banking profitability evaluation is a process that requires special attention of various factors, in macroeconomic and microeconomic levels. These factors can be classified into specific (internal) and macroeconomic factors. Internal banking factors can be defined as factors that are individual bank characteristics that affect the performance of the bank. These factors are essentially influenced by internal management and board decisions. Even though good management decision and board would lead to better bank performance, it is difficult, if not impossible, to assess the quality of management and board directly. In fact, it is implicitly assumed that such a quality will be reflected in operational performance. To examine a banking performance in terms of internal factors we can found in the financial statements, such as the balance sheet and income statement. External factors are broad sectors or wide-ranging factors of the country that are beyond the control of the company and affect the profitability of the banks. They represent occasions outside the bank environment. However, the management of the bank can anticipate

changes in the macroeconomic environment and try to position the bank to take advantage of the anticipated developments.⁶

Banks gather, distribute and invest most of the savings of economic agents. Therefore, their profitability has significant consequences on capital distribution, firm expansion, industrial growth and economic development. Consequently, the efficiency and profitability of banks is of interest not only at the level of individual banks, but it is also important on a broader macroeconomic level. Thus, identifying those factors will help interested groups such as managers, board members, regulators, supervisors, owners, investors, researchers, financial analysts and supervisory authorities to build strong banks and also it is significant for policy makers in order to plan effective and efficient regulatory rules for the banking industry and take appropriate measures.

For the reason's mentation above, identifying the determinants of commercial bank profitability have involved the interest of academic research as well as the interest of bank the management, financial markets, and bank supervisors. From the aspect of technological change, globalization and financial crisis this topic has become even more important, given its importance on the banking industry in financial system of the countries around the globe.

1.2. Bank theories

Banks play a central role in the financial system of the country especially in developing country were the financial system it is based on the banking industry. So, the importance of commercial banks in the development of economic growth is enormous.

Furthermore, commercial bank plays an important role in the payment system of the economy and affect the efficiency of the financial system, as well as contribute to the development of a healthy economy. Commercial banks play a huge role in economic growth through the product /services provided to the customers and the economic resource allocation of countries. Hence, banks are crucially sectors that determine the country's economy growth and development. Only safe and sound banks can provide sufficient loans for expanding firms.

⁶ Poposka, K., & Trpkovski, M., (2016). Bank Profitability prior and after the Crisis: Evidence from the selected Transitional Economies, *Economic Development. Journal of the Institute of Economics*, No. 1-2, p: 309-336.

The efforts of these banks are made more accessible by having a legal framework, which makes trading and business activities available for everyone. Additionally, the liberalization of the economy allows other competitors to join the market. Increased competition means more creativity, innovation and quality services to counter the competitor. Some of the ways which these banks use to gain competitive advantage are excellent customer services, which lead to the customer satisfaction. Customer satisfaction is linked to customer loyalty, who return to banks to receive similar benefits.

According to Werner research analyses about banking theories there are three banking theories: credit creation theory, fractional reserve theory and financial intermediaries. Those theories are used to explain the decisions and banking activities carried out to create wealth.

The oldest of the ideas is credit creation theory, which states that each bank has the ability to create wealth out of nothing using accounting operation activities or by lending the finances they have from saving customers. The fractional reserve theory states that the banking system can create money as a whole with an individual bank getting cash by receiving deposits and lending money. The financial intermediary's theory considers banks and financial intermediary, both individually and collectively, making them indistinguishable from other non-financial institutions in their behaviours of accepting depositing and lending of cash.⁷

So, based on the literature review the main function of the banks are divided into three theories of banking:

1. Financial intermediation theory of banking
2. Credit creation theory of banking

1.2.1. Financial intermediation theory of banking

Financial function of intermediation presents intermediation of banks between other sectors (economic units, country, clients) and resources transfer from those which have sufficient financial resources to those that have deficit of financial resources meaning that they act like a bridge form saver to borrowers. So, the first core activity of bank is intermediaries between depositors and borrowers. The literature in bank intermediation suggests that by screening bank, technological advancement of services, regulations, market structure, and legal framework can

⁷Werner, R.A. (2014). Can banks individually create money out of nothing? — The theories and the empirical evidence. *International Review of Financial Analysis*, 36, p: 1–19.

improve the poor communication between borrowers and lenders. From the information obtained, the bank can make monitor contractual performance, assess risks, write contracts, and resolve non-performance problems when required to. The ability of banks to receive information from both the lenders and borrower's transaction is the bank's ability to produce. These abilities are integral to banks' output and performance for efficient management of the banks' operational activities. The intermediation process has been explained in several theories that try to make sense of banking activities.

The financial intermediation function consists of four components:⁸

- i) The accumulation of available funds within a national economy, in fact is the gathering of the fund available to the various enterprises, institutions and small savings, which the population has at its disposal, but keeps those funds for a time, when the owners do have surplus and not need them in this way banks transfer them to those that have deficit or to ones that need more money. Banks with different methods, accumulate funds, make their concentration, division the liquidity reserve, and allow the remaining part for economy or other sectors that need cash, primarily in the form of credit. The function of financial intermediation also implies the connection of the country's financial flows with those of the outside world.
- ii) Transfer of deposit term structures, which enables the bank on the basis of deposits with shorter repayment terms, to provide loans with longer repayment terms.
- iii) Creating the most efficient and rational methods of collecting and allowing cash, both in terms of stimulating savings and ensuring the inflow of funds, or in terms of quality, i.e. the structure of the term and the degree of liquidity of assets, as well as in terms of economic allocation of placements.
- iv) Ensuring the optimal concentration of cash flow in order to overcome territorial, time and destination constraints.

Based on Kashyap et al. research analyses it is considered that traditional role of commercial banks is financial intermediaries. This role consists in creating wealth using funds

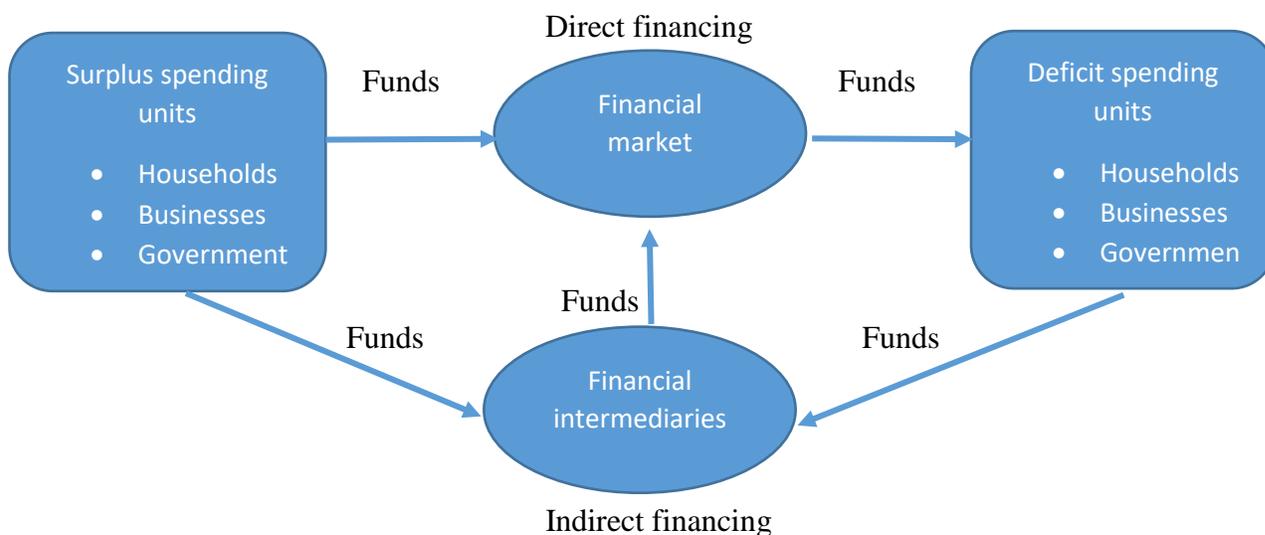
⁸Shekhar, K., and Lekshmy, S. (2007). Banking Theory and Practice, 20th edition, VIKAS publishing House, New Delhi.

from those that the surplus and the bank collected in the form of deposits and by gaining interest in the fund on the issuance of loans and equities.⁹

Through a financial intermediary, savers can pool their funds, enabling them to make large investments, which in turn benefit the entity in which they are investing. Regarding the intermediary financial theory, it is stated that banks receive deposits from the customers and lend them at high rates to create profit from their interests. Banks benefit from accept guarantees, which is unique to the banks compared to non-financial institutions that can offer lending services only. At the same time, financial intermediaries pool risk by distributing funds across a diverse range of investments and loans. The loans benefit families and countries by enabling them to spend more money than they currently have. The lending activities are concentrated on banks due to massive deposits from customers allowing for lending in huge capacities, which will enable the bank to create wealth from interests charged from the loans.

Financial intermediaries also offer the benefit of cost reduction on several fronts. For example, they have access to economies of scale to professionally assess the credit profile of potential borrowers and to maintain cost-effective records and profiles. Finally, they reduce the costs of many financial transactions that an individual investor would have to make if the financial intermediary did not exist.

Figure 1.4. Flows of funds Through Financial intermediates



⁹Kashyap, A., Rajan, R., & Stein, J. (2002). Banks as liquidity providers: An explanation for the coexistence of lending and deposit-taking. *Journal of Finance*, 57, p: 33–73.

Source: Mishkin, F. (2012). The economy of money, banking and financial markets, 10th edition. Pearson Education, Inc., USA.

Function of intermediation exist because of financial market are not perfect. The imperfection comes from: transaction costs, informational asymmetries basically results in the agency problems, adverse selection, moral hazard.

Transaction costs approach, individual borrowers and lenders will spend a lot of time and money and accomplish financial transactions, so financial intermediaries act as individual lenders or borrowers and can considerably reduce the transaction costs, so they benefit from economies of scale or scope in the transaction technology.

Consequently, credit markets are usually affected by imperfection because of the existence of asymmetric information. Lenders potency do not have the right information about the price of loans, this situation will reflect to borrowers' risk, that is it the chance to default. So, lenders could face extra cost for analyses application from risky application and also for monitoring borrowers' actions, and therefore they could involve additional fees, in this way they would transfer their transaction costs to borrowers.

Informational asymmetries can be operationally defined differences in information held by lenders and borrowers, where a lender has asymmetrical and less information regarding the actual creditworthiness of a borrower and this could occur to adverse selection and moral hazard.

Lemon Market Theory (LMT) introduced by Akerlof explain information asymmetry. This theory is based on the market of used cars to explain the problem of information asymmetry. In a car market with asymmetric information determinate on those in which sellers of goods know more than the potential buyers about the quality of goods that they are selling. In this case lemon are used to describe cars in bad condition and this leads to the problem of asymmetric information.

Adverse selection refers to a situation created by asymmetries information before the transaction occurs. It is created where lenders have more information than borrowers, or vice versa, about some aspects of product quality, although typically the more knowledgeable party is the seller, because adverse selection makes it more likely that loans might be made to bad credit risks, lenders may decide not to make any loans even though there are good credit risks in the marketplace.

Moral hazard remains another asymmetric problem that states to a situation created after entering into a contract, the incentives of the lender and borrowers change, such that the riskiness of the contract is altered or where risk can be passed onto another part.

The second activity of banks is to offer liquidity to their customers. Liquidity refers to the ability of a bank to fund increases in assets and meet obligations as they come due without irreparable losses. It is known that the bank is a financial institution in the economic system which works by using foreign funds (saving deposits, loans taken in the country and abroad, etc.) for these funds the bank assumes the obligation to return them without any extension. Therefore, the trust of depositors relies on the timely performance of obligations.

The recent financial crisis highlighted the importance of liquidity that banks have to cover unexpected cash outflows. In order to consistently apply the principle of liquidity, it is necessary for the bank to constantly review and analyse the structure as well as the performance of its liabilities on the side of the bank's balance sheet liability.

The third core activity of banks is to offer assurance to their customers. The assurance principal obliges the bank to take into consideration that the loans are allowed in safe places, respectively to examine the creditworthiness of the debtor by seeking assurances that the loan will be repaid properly. Therefore, the consistent application of the assurance principle should insure against potential risks all customer, depositors and creditors.

The principle of security is expressed during the selection of the debtor and the provision of the allowed credit. The bank must consider not only whether the loan will be repaid on time, but must establish all the facts of necessity on the reasonableness and economic viability of each loan application, creditworthiness and that such loans will give the desired effects.

The intermediation function is almost the basic function, because it is present in almost the entire banking business and permeates all the work, instruments, techniques and practices of banks. The accumulation of funds represents the trust of depositors. This is right but also the privilege of the bank, which at the same time obliges it and in essence orients the principle of security and liquidity on other qualitative bases, which are not characteristic of other economic entities. The functions of the bank, its work and duties, rank it within the organizations of special interest to society.

1.2.2. Credit creation theory of banking

An important function performed by commercial bank is the creation of credit. Credit creation separates a bank from other financial institutions. During the business of banks, continuous is developed the process of creating credit and deposits. This is done in an alternative way so that with the increase of deposits, the opportunity for credit growth is created, and again the increase of credit affects the growth of deposits.¹⁰

In this way, the process of increasing deposits creates potential additional credit for banks, i.e. uses it to provide loans, which again creates opportunities for increasing deposits which can be used again to increase credit.

Therefore, the related process is credit creation by deposits and loans of the commercial bank which is known as the multiple- creation credit. The credit creation of commercial banks may be constrained by internal and external regulations. It is only this activity which has enabled the bank to manufacture money. Therefore, the banks are not only the purveyors of money, but also manufactures of money.

The following factors are the most important for the development of the multiplication process:¹¹

1. ration of required reserve, assets that the commercial banks hold with the Central Bank
2. ration of liquidity reserve, assets that the commercial bank holds with the Central Bank
3. the amount of funds that are returned from the bank loans to the commercial bank deposit system through the circulation of payments, respectively the amount of funds resulting from the process of microcredit multiplication in favour of central bank deposits or of another commercial bank or through the conversion of cash deposits into the hands of the population sector.

The power of commercial banks to expand the deposits through loans, advances and investment is known as credit creation.

¹⁰Werner, R. (2014). How do banks create money, and why can other firms not do the same? An explanation for the coexistence of lending and deposit taking. *International Review of Financial Analysis* (36), p: 71 – 77.

¹¹McLeay, M., Radia, A., & Thomas, R. (2014). Money creation in the modern economy. Retrieved form Bank of England.

The banking system as a whole can credit creation which is several times more than the original increase in the deposits of a bank. This process is called the multiply–expansion or multiply –credit creation. Similarly, if there is a withdrawal from any bank, it leads to the process of multiple-contraction of credit. Hence commercial banks through the process of credit creation provide finance to all sectors of the economy thus making them more developed than before. The credit creation by commercial banks is one of the most important sources to generate income.

1.3. Theories of Banking and profitability

Banks constitute one of the most important financial intermediaries. Banks brings funds in the economy by accepting deposits from different savers and lending to those which have a lack of it. Financial performance is regarded as an indisputable method to determine the profitability of the bank and efficiency in the management team. The bank can evaluate its profitability using a profitability index that is positive for the calculation of bank profit. The ability of banks to determine which factors affect their profitability is essential for the successful operations of banking activities and the growth of the economy. Profitability is crucial as it helps us understand the factors which could threaten the performance of the bank.

The efficiency of the banking sector also affects the growth of the economy. Traditionally, three ways are identified as methods of determining bank profitability, Return on Asset (ROA), Return on Equity (ROE), and Net Income Margin (NIM). All these methods are used to determine the bank’s profitability using different aspects of the financial statements of the banks.

In order to explain determinates of commercial banks profitability there are some theories that have been used in different researches and papers. Many of those researches have divide those theories on:

- I. Market-power theory
- II. Efficient-Structure theory
- III. Expense-Preference theory

1.3.1. Market-Power theory

Different hypotheses try to explain the concentration of the market and how it affects competition in the market, which in turn affects the market prices and bank profitability. Additionally, two opposing theories try to explain the concept of market concentration and how it affects bank profitability in the market.

Hence, the market power theories consist of the traditional industrial organization model. The theory is divided into two theories: Structure-Conduct-Performance (SCP) and the Relative Market Power (RMP).¹²

The first theory is sStructure-Conduct-Performance (SCP) in which the competition of market is based on the market concentration. Market concentration is defined by the number and size distribution of companies in the market. The (SCP) theory was first developed by Bain (1951), in the manufacturing industry. He has analysed data of manufacturing industry concentration in America since 1936 through 1940. The result of the researches consist on that industry performance depend on the market power, meaning that higher concentration in the market causes a lower degree of competition (higher interest rates, lower supply of funds) and thus, higher profitability. The (SCP) theory is based on following assumption: the degree of concentration in a market share applies a direct impact on the degree of competition among its companies.¹³

According to Goddard *et al.*, study, the markets with high concentration level induce a firm to behave (conduct) in a collusive way, as a result, performance of the firms gets better.¹⁴

In the banking industry (SCP) theory primary was used to measure performance and the concentration of deposits among banks in local market areas. They have been used different variables to measure the profitability of commercial banks such as: bank profit rates, interest rate charges on loans and the interest rates banks pay on deposits.

During the years, number of empirical studying have been done focusing and supporting the SCP theory and the contributions in the industry of the banking such as: Schweiger and McGee, 1961; Gilbert, 1984; Berger and Hannan, 1989; Molyneux and Thornton, 1992; Demirguc-

¹²Goldberg, L. and Rai, A. (1996). The Structure-Performance Relationship for European Banking. *Journal of Banking and Finance*, Vol. 20 (4), p: 745-771.

¹³Bain, J.S. (1951). Relation of Profit Rate to Industry Concentration: American Manufacturing, 1936-1940. *Quarterly Journal of Economics*, 65, 293-324.

¹⁴Goddard, J., Molyneux, P., and Wilson J. O.S..(2004). The Profitability of European Banks: A CrossSectional and Dynamic Panel Analysis. *Manchester School*. Vol.72.No3.p:363-381.

Kunt and Huizinga, 2000; Shaffer and Srinivasan, 2002; Flamini et al., 2009; Van Hoose ,2010; Rumler and Waschiczek 2016.

As mentioned before the initial use of SCP theory on the banking industry have been done by research of Schweiger and McGee, on local market area. They have analysed the effect of concentration on the gross interest rates charged on business loans and found that the greater the concentration ratio in a market and/or the smaller the number of banks, the higher the average rate charged on loans and this increased banks performance.¹⁵

Empirically analyses conducted by Gilbert provided a voluminous empirical literature on banking structure and performance evaluating the empirical relevance of the SCP hypothesis, the preponderance of which was generally supportive. Higher bank market concentration appeared to generate higher loan rates, lower deposit rates, and increased industry profits.¹⁶

In the same view Berger and Hannon research claim the support of the SCP theory. The research has been done in the U.S. for 430 banks during period 1983 and 1985. They have applied different measure of concentration and regression linear to measure the concentration.¹⁷

The research of Molyneux and Thornton examines the determinants of bank performances across eighteen European countries between 1986 and 1989 and the results show that concentration has a positive, statistically significant correlation with profitability which is consistent with the traditional structure conduct-performance theory.¹⁸

Similarly, Shaffer and Srinivasan empirical research on the U.S. banking industry based on the 2568 to 3879 banks out of a total of 9143 banks in the industry highlight strong support for the SCP theory.¹⁹

Moreover, a Van Hoose applies the SCP theory to the bank loan market in a dominant-bank framework. Results claim that the dominant bank maintains a higher loan interest rate but which declines to a lower level when the number of banks increases.²⁰

¹⁵Schweiger, I., & McGee, J.S. (1961). Chicago banking: The structure and performance at banks and related financial institutions in Chicago and other areas. *The Journal of Business* XXXIV (July): p: 201-366.

¹⁶Gilbert, R., (1984). Bank Market Structure and Competition: A Survey. *Journal of Money, Credit, and Banking* .Vol 16 (4) p: 617-44.

¹⁷ Berger, A.N., and Hannan, T.H., (1989). The price-concentration relationship in banking. *Review of Economics and Statistics*. Vol 71(2), p: 291-299.

¹⁸ Molyneux, P., and Thornton, J.(1992). Determinants of European Bank Profitability: A Note.*Journal of Banking and Finance* 16(6): 1173–78.

¹⁹Shaffer, Sherrill, and Soumya Srinivasan. 2002.Structure-Pricing Linkages among Single-Market Banks,Controlling for Credit Quality.*Applied Economics Letters* 9(10), p: 653–56.

²⁰ Van Hoose, D. (2010). *The Industrial Organization of Banking*, Springer Berlin Heidelberg, London, New York.

Empirical research based on the SCP hypothesis conclude that higher concentration reduces competition by fostering collusive behaviour among firms and whether higher concentrated market improves market performance as a whole. In a market with a high degree of concentration, firms have more market power which allows them to set prices above marginal costs and achieve higher profitability.²¹ On the other hand, empirical analyses done by Flamini et al. in the case of African banking systems fail to provide support for the SCP hypothesis.²²

The SCP theory dominated until the late 1970s and the main assumption of SCP theory is that the profitability of the commercial banks is determined by the concentration level of the market, meaning that the more concentrated the market is, it indicates to lower level of competition and therefore higher profitability for commercial banks. In other words, this hypothesis consists of the thesis that the bank profitability is affected by the market power.

The second theory of market - power theory is Relative Market Power (RMP). Developed by Shepherd, claims that banks with large market shares and diversified products might exercise market power to determine prices and get higher profits. In other words relative-market power theory opposes that only large banks with well – differentiated product can influence pricing and have higher profit. The main difference between those two hypotheses is that RMP theory does not consider market power to get higher profit, but it comes from the market shares and differentiation product.²³

Furthermore, Smirlock finds a positive relationship between market share and profitability and an insignificant relationship between concentration and profitability. He thus rejects the collusion hypothesis (SCP) and accepts the RMP hypothesis. He determines that banks in the US are more profitable through efficiency advantages.²⁴

²¹Rumler, and Waschiczek, W.(2016).Have Changes in the Financial Structure Affected Bank Profitability? Evidence for Austria.European Journal of Finance.22(10) p: 803–824.

²²Flamini, V., McDonald, C., and Schumacher, L.(2009).The determinants of commercial bank profitability in Sub-Saharan Africa. IMF Working Paper, p: 1–32.

²³Shepherd, W. (1982). Economies of Scale and Monopoly Profits, Industrial Organization, Antitrust, and Public Policy, Kluwer Nijhoff.

²⁴Smirlock, M. (1985). Evidence on the (Non) Relationship Between Concentration and Profitability, Journal of Money, Credit and Banking, No. 17, p:69-83.

Also, other researching analyses in the Mexican banking industry focused on 19 banks for the period of 1997 to 2003 have found evidence in supporting of the RMP hypothesis, thus rejecting the SCP and efficient structure models.²⁵

Some other studies consider a large number of countries. For example, Beck et al. analyse the relationship between market structure and bank performance for 364 banks operating in 8 Central and Eastern European Countries through the period of 1998 to 2001. They reject the SCP hypothesis and accept the RMP, although they also observe that costs, risks and reserve ratios are important determinants of bank performance.²⁶

As well, another important implication drawn from empirical results is that although the RMP hypothesis dominates in the advanced market banking system, the power of market share has an effect of stability, which policy makers should bear in mind when they regulate their anti-monopolistic provisions.²⁷

Another critique to the SCP theory is related to the fact that this approach regards higher profits as an indicator of the presence of market power. Hicks developed a theory opposite to the SCP, which is known in literature as the Quiet Life (QL). According to the QL, banks with superior market strength and thus a privileged position will get lower cost efficiency due to the quiet life of their managers.²⁸

According to Vesala, profits represent only a poor measure of market power as these two variables are not necessarily positively correlated. The author claims that firms may charge higher prices due to their market power, but may still realize low profits because of their cost inefficiencies. This view is in line with the quiet life hypothesis which claims that the managers of firms that have monopoly power are less induced to pursue policies aimed at the enhancement of efficiency since revenues can be increased by charging higher prices.²⁹ However, because of the

²⁵Guerrero, R., Sepulveda, E. and Villalpando, M. (2005). Profitability, Concentration and Efficiency in the Mexican Banking Industry. LACEA. Presented in conference.

²⁶ Beck, T., Demirguc-Kunt, A. and Levine, R. (2003). Bank Concentration and Crises. World Bank Working Paper.p:1-43.

²⁷ Mirzaei, A., Moore, T., and Liu, G., (2013). Does market structure matter on banks' profitability and stability? Emerging vs. advanced economies Journal of Banking & Finance, Vol. 37, (8), p: 2920-2937.

²⁸ Hicks, J. (1935). The Theory of Monopoly, *Econometrica*, Vol. 3: 1-20.

²⁹ Vesala, J. (1995). Testing for Competition in Banking: Behavioral Evidence from Finland, Bank of Finland, Bank of Finland Studies E:1.

inefficiencies associated with the market power, the increase in revenues does not necessarily lead to higher profitability.³⁰

However, despite the fact that firms with high monopoly power are considered to be less efficient than firms operating in competitive markets, still monopoly firms are generally expected to generate higher profits than the competitive firms. In this context, this might imply that higher profits might signal the presence of market power. Still, there is no clear indication of the market structure and financial stability of the banking system. Nevertheless, the relationship between the bank structure and the strength of finance is explained by the concept of market power theory.

1.3.2. Efficient-Structure theory

The third hypothesis, is commonly referred to in the literature as the Efficient-Structure theory (ESX) hypothesis. This hypothesis, states that better managerial efficiency in banks cause higher profits.

The banking sector is regarded as one of the financial institutions which hold a lot of money. To continue increasing their efficiency, the banks have been linked to acquiring other banks, which creates more concentration and competition of banks. The efficient-structure theory was shaped as an opposite theory of market-power theory, it was developed by Demsetz (1973) and Peltzman (1977). The efficient structure paradigm by Demsetz states that the winning banks will receive more income and shares to become the most competitive and concentrated in the market.

This Efficient Structure Hypothesis (ESX), as indicated by Demsetz, suggests that the firms with higher efficiency have higher ability to increase their market shares and firms' sizes, while this higher efficiency allowed the firms to concentrate and the resulting lower competition leads to higher profit.³¹

The (ES) hypothesis is considered as alternative to the structure conduct performance (SCP) hypothesis which suggests that concentration of market share promotes collusive behaviour among market players and allows them to earn abnormal profits through monopoly pricing.

³⁰Punt, L.W. & van Rooij M.C.J., (1999). The profit-structure relationship, efficiency and mergers in the European banking industry: an empirical assessment, WO Research Memoranda (discontinued) 604, Netherlands Central Bank, Research Department.

³¹Demsetz, H. (1973). Industry Structure, Market Rivalry, and Public Policy, *Journal of Law and Economics*. Vol. 16(1) p: 1-9.

Although, both SCP and ES predict a positive relationship between concentration and profitability, the underlying mechanism is different under these hypotheses.

Accordingly, both SCP and ES recommend contradictory policy measures. For instance, the SCP hypothesis favour antitrust/anti-concentration policies, whereas, the ES hypothesis suggests that such policies may bring inefficiency in the market.

The empirical studies on ES are not separable from those on SCP because most of the time they are tested simultaneously. Therefore, most of these studies correspond to both SCP and ES hypotheses. In this section, we review some relevant literature with focus on methodology applied to test ES hypothesis.

The (ES) theory consist on that the efficient is the key reason to get higher profit by companies, meaning that banks that are operating with low cost will get higher profit that result to be efficient. The efficient theory in banking sector have the meaning that banks which are more competitive will result to be efficient. Nowadays to be competitive banks should not only focus on operating with low cost but they have to have also good management, adequate product and service, to be on time with the innovation technology.

Two approaches that have dominated the banking efficient analyses are: the parametric (Stochastic Frontier Approach, Distribution Free Approach and Thick Frontier Approach) and non-parametric (Free Disposal Hull and Data Envelopment Analysis). Those two approaches differ in their assumptions, have pros and cons, and until now there is no evidence which of those approaches gives better results.

Research by Lloyd-Williams et al. further argue that the profit can be maximized by the banks with higher efficiency mainly through two ways: (1) maintaining the current market size and pricing policies -; (2) accommodating size expansion and price reduction strategies,³² while Berger suggest that the profit as well as the market share can be increased by a more efficient bank with superior management or production technology. The above two statements can also be explained from the perspectives of two different efficiencies, namely efficiency hypothesis into x-efficiency (XE) and scale efficiency (SE) hypotheses. According to the x-efficiency hypothesis, the costs incurred by banks with efficient management and/or technologies are lower resulting in higher profitability. The better banks' x-efficiency is, larger are market shares and higher is

³²Lloyd-Williams, D. M. & Molyneux, P., & Thornton, J. (1994). Market structure and performance in Spanish banking, *Journal of Banking & Finance Elsevier*, vol. 18(3), p: 433-443.

concentration. As per the efficiency hypothesis, the difference in performance between two firms is not due to differences in management quality, but differences at the level of scale efficiency. Banks' costs lower than their competitors result in higher profitability. These banks may acquire extended market shares which increases market concentration.³³

The efficiency-structure hypothesis is supported by studies of Brozen and Seelanatha, both of these two hypotheses hold the viewpoint that higher efficiency or larger market power increases concentration, which leads to a reduction in competition.³⁴

Besides the two types of efficiencies traditionally employed in the literature, Fiordelisi develops three measures of efficiency which are technical efficiency, allocative efficiency and scale efficiency. All these measures have been treated according to the DEA method over the Italian manufacturing industry during the period 1993-1997. The introduction of allocative efficiency constitutes the first innovation of the author. It is particularly interesting in the sense that it allows situating ourselves under a new version of relative market power hypothesis and extending the Efficient Structure hypothesis under the Allocative Efficient Structure (AE).³⁵

When assessing efficiency one can be interested in X-efficiency, i.e. whether banks use their available inputs efficiently, scale efficiency, i.e. whether banks produce the right amount of outputs, and scope efficiency, i.e. whether banks choose an efficient combination of outputs.

According to Gonzalez research analyses about the efficiency and market structure variables in a study for 69 countries using 2,592 observations over 1996 to 2002. His results are consistent with the ES hypothesis. He also acknowledges other relevant variables as determinants of profitability such as bank regulation, supervision, financial structure and financial development.³⁶

The main statement of the ES theory is that higher profits realized by companies operating in concentrated markets are a result of the superior efficiency of larger companies which comes from economies of scale. Also, by largest size companies' benefit lower cost per-unit of

³³Berger, A.N. (1995). The Profit-Structure Relationship in Banking—Tests of Market-Power and Efficient-Structure Hypotheses. *Journal of Money, Credit and Banking*. Vol. 27(2) p: 404-431.

³⁴ Seelanatha, L. (2010). Market structure, efficiency and performance of banking industry in Sri Lanka. *Banks Bank Syst*. Vol 5(1), p: 20–31.

³⁵ Fiordelisi, F. & Molyneux, Ph. (2004). Efficiency in the factoring industry. *Applied Economics* Vol .36(9), p: 947-957.

³⁶Gonzalez, F. (2005). Determinants of Bank Market Structure: Efficiency and Political Economy Variables. *Fundacion de las Cajas de Ahorros, Working Paper* Vol. 41(4), p: 735-754.

production, product diversification, which will give an opportunity to the largest banks to have access to markets that small companies cannot entry and improve performance and reduce risk.

1.3.3. Expense-Preference theory

According the neoclassical theory of profit maximization, a firm's goal is to maximize expected profits, whether by maximizing revenue or by minimizing the costs.

The Expense preference theory, was first introduced by Williamson and modified by Rees and it opposes the neoclassical theory that firm management primarily is driven by the goal of profit maximization, especially in an environment characterized by a separation of ownership and control of firms, a less competitive environment, and a highly regulated industry. Instead, he suggested that managers might pursue a strategy of maximizing their personal utility by supporting excessive allocation of resources in salaries, larger staff, extra bonuses and privileges.³⁷

According to the expense preference behaviour hypothesis, which has been tested empirically in banking with conclusive results, the management might not have a neutral attitude toward costs. Firm managers might aim to maximize their utility, and their underlying individual preferences might not be consistent with profit maximization. Under the expense preference theory, firm managers might opt to overspend, for example, in hiring staff, in office furnishing and equipment, or in other perquisites and might perceive certain expense items as a source of security, power, status, prestige, and professional achievement. According to Williamson, "the utility-maximizing theory is based on the proposition that opportunities for discretion and managerial tastes will have a decided impact on the expenditures of the firm."³⁸

This theory, like most postclassical theories of a firm, is premised on assumptions that permit firms to pursue non-profit-maximizing policies: separation of ownership from control and imperfections in either the goods or capital markets or both.

Edwards research found that wage and salary expenditures in banking increase with monopoly power indicates that an expense-preference model may be more useful framework for describing and predicting bank behaviour that is the traditional profit-maximization model. More

³⁷Rees, R. (1974). A Reconsideration of the Expense Preference Theory of the Firm. *Economica*, Vol 41(163), p: 295-307.

³⁸Williamson, O. (1963). Managerial Discretion and Business Behaviour. *A.E.R.* 53, p: 1032-57.

generally, result suggest that the managerial objective function of regulated firms is not one of the profits maximizations. His findings indicate that an expense-preference theoretical framework better explains the behaviour of regulated firms than does a profit-maximization framework.³⁹

Edwards' finding was confirmed by Hanna on the same view Hannan and Mavinga, who found that the number of employees in the banks operating in markets that exhibit monopoly power was higher than the number of employees in banks existing in competitive markets.⁴⁰

However, Smirlock and Marshall, argued against these findings and claimed that the validity of this theory was subject to a series of breakdowns in other markets. They offered an alternative paradigm hypothesis called the agency-theoretic hypothesis. This hypothesis posits that any ostensible deviations from profit maximization are because of the costs of an organizational structure that separates ownership from management and requires hierarchy. Profit maximization is carried out subject to the constraints of available organizational structures and the associated contracting and monitoring costs.⁴¹

As noted by Merton, the primary function of a financial system is to facilitate the allocation and deployment of economic resources, both spatially and across time, in an uncertain environment. This function encompasses a payment system with a medium of exchange; the transfer of resources from savers to borrowers; the gathering of savings for pure time transformation (i.e., consumption smoothing) and the reduction of risk through insurance and diversification.⁴²

The expense preference theory is focused on the wellbeing of staff and other functions of the bank, which are not profit-making. Managers using this kind of theory work with the concept that profit maximization comes last after the utility of people and other activities of the financial institution has been taken care of. The expense preference theory is commonly practiced in SACCOs that are interested in improving the social and economic welfare of the members. Thus, compared to commercial banks that are profit-oriented, the Stockholder Banks are interested in the

³⁹Edwards, F. R. (1977). Managerial objectives in regulated industries: expense preference behavior in banking. *Journal of Political Economy*, 85(1), p: 147-62.

⁴⁰Hannan, T. H. and Mavinga, F. (1980). Expense preference managerial control: The case of the banking firm. *The Bell Journal of Economics*, vol. 11(2), p: 671-682.

⁴¹Smirlock, M, and Marshall, W. (1983). Monopoly power and expense-preference behaviour: theory and evidence to the contrary. *The Bell Journal of Economics*, Vol.4 (1), p: 166-78.

⁴²Merton, R., (1992). Financial innovation and economic performance, *Journal of Applied Corporate Finance*, Vol. 4(4), p: 12-22.

general interest of the people. When the SBS show concern and care for the people, they attract more people to come and save with them in their financial institution.

The expense preference behaviour theory is assumed to create competition in the market, which reduces customers for commercial banks. However, research conducted has shown if the commercial bank can engage in expense preference behaviour in some of their operational activities, they can equally make profits. The banks can create profits by attracting customers who feel that the banks are focused on the overall wellbeing of the society while at the same time earning profit.

2. IDENTIFYING DETERMINANTS AND METHODS FOR MEASUREMENT OF COMMERCIAL BANKS PROFITABILITY

2.1. Literature Review on determinants for commercial bank profitability

Profitability is one of the main reasons for the existence of business companies, and business companies will continue exist only if they have profit year by year. Banks are also the companies which main aim has to secure profit just like others business companies. Thus, the profitability of a commercial bank indicates the success of bank management and other factor that are beyond control of the bank. Therefore, bank's profitability is really one of the most important indicators for management, investors, client, government, etc.

Based on the earlier research the analyses of those determinants are divided into two groups that include: analyses that have done in cross-country evidence and individual countries.

The first group of studies includes authors such as: Haslem (1969), Molyneux and Thornton (1992), Demirguc-Kunt and Huizinga (1999), Abreu and Mendes (2001), Hassan and Bashir (2003) Goddard and Molyneux and Wilson (2004), Staikouras and Wood (2004), Athanasoglou et al. (2005), Micco et al. (2007), Flamini et al. (2009), Ben Naceur and Omran (2011), Lee et al. (2014), Dietrich and Wanzenried (2014), Petria et al. (2015), Menicucci and Paolucci (2016), Deng (2016), Djalilov and Piesse(2016), Ozili (2016), Ahmad et al. (2016). The empirical analyses result of these vary form development of country, data, periods and other country specific.

Molyneux and Thornton, analysed the profitability of the banking sector 18 different European countries. According to the results of regression analysis, they reached a conclusion that the higher capital and interest rate will increase the profitability of the banks also the results support the expense preference expenditure theories.⁴³

In the same way, Demirguc-Kunt and Huizinga analysed the banking sector in 80 different countries in the years 1988-95 by using regression analysis. They defined a positive relationship between the inflation rate and profitability of the banks.⁴⁴

⁴³Molyneux, P., & Thornton, J., (1992). Determinants of European Bank Profitability: A Note. *Journal of Banking and Finance* 16 (6), p: 1173-1178.

⁴⁴Demirguc, A., & Huizinga, H., (1999). Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence. *World Bank Economic Review* 13 (2), p: 379-408.

The study of Goddard, Molyneux and Wilson, evaluated the profitability of the banks in 6 European Union member countries. By using GMM they determined that there is a positive relationship between bank size and the capital–assets ratio is positive with profitability.⁴⁵

Also, Athanasoglou et al., examine the effect of bank specific, industry-specific and macroeconomic determinants of the bank profitability focused on analyses of South Eastern European (SEE) of banks in period 1998-2002. According to the empirical results concentration has a positive effect on profitability of banks which gives the support of structure-conduct performance hypothesis.⁴⁶

Furthermore, Dietrich and Wanzenried focused on the determinants of the bank profitability in the 35 European low, middle, and high-income countries. By using the regression analyses how bank-specific, macroeconomic and industry-specific factors affect the profitability of commercial bank they concluded that the profitability determinants differ quite widely across the different levels of income in terms of significance, sign and size of the effect. In low-income country, market concentration privately owned banks are more profitable than state-owned banks, foreign-owned banks tend to be more profitable than domestic banks, macroeconomic factors such as GDP growth and inflation has a positive and significant effect on bank profitability. While in middle-income countries market concentration, the privately-owned banks are more profitable than state-owned banks, macroeconomic factors such as GDP growth and inflation, income diversification has a positive and significant effect on the bank profitability. High-income countries bank's capital level, income diversification, has a positive and significant effect on bank profitability and financial crisis on the determinants of bank profitability is statistically highly significant and negative.⁴⁷

Also, Djalilov and Piesse investigate the determinants of bank profitability in the early transition countries of Central and Eastern Europe by applying the GMM model for the period 2000–2013. Their research showed that credit risk, capital, size, concentration, GDP growth, inflation, financial freedom and property rights influence the bank profitability.⁴⁸

⁴⁵Goddard, J., Molyneux, P., Wilson, J., (2004). The Profitability of European Banks: A Cross-Sectional and Dynamic Panel Analysis. *Manchester School* 72 (3), p: 363-381.

⁴⁶Athanasoglou P.P., & Delis M. D., & Staikouras C.K., (2006).Determinants of Bank Profitability in the South Eastern European Region, Working Papers 47, Bank of Greece.

⁴⁷Dietrich, A., and Wanzenried, G. (2014). The determinants of commercial banking profitability in low-, middle-, and high-income countries, *The Quarterly Review of Economics and Finance*, Vol. 54(3), p: 337-354.

⁴⁸Djalilov, K. and Piesse,J. (2016).Determinants of bank profitability in transition countries: What matters most?’,*Research in International Business and Finance*, vol. 38(C),p: 69-82.

Likewise, Ahmad et al. empirical research focused on the determinants of banks profitability in 78 Asian and 89 American banks in period from 2003 to 2014. They used regression analyses which indicates that the bank-specific variables rather than the macroeconomic variables influence bank profitability.⁴⁹

Second group of studies which assess banks profitability by specific country includes: Neely and Wheelock (1997), Athanasoglou et al. (2005), Kosmidou et al. (2006), Dietrich and Wanzenried (2011), Muhammed Sajid (2014), Albertazzi et al. (2016), Tan et al. (2016).

Analyses by Neely and Wheelock made a research on why does bank performance vary across states? The conclusions that the bank performance is intensely influenced by state-level economic activity meaning that State per capita income exerts a strong positive statistical effect on state bank earnings.⁵⁰

As well as, Athanasoglou et al. examine the effect of bank specific, industry-specific and macroeconomic determinants of the bank profitability, using an empirical framework that incorporates the traditional Structure-Conduct-Performance (SCP) hypothesis and they apply a GMM technique to a panel of Greek banks which covers the period 1985-2001. According to the empirical results, capital is important in explaining bank profitability and that increased exposure to credit risk lowers profits. Additionally, inflation and cyclical output has a positive and significant impact on profitability, while operating expenses are negatively and strongly linked to it. The estimated effect of size does not provide evidence of economies of scale in banking. Likewise, the ownership status of the banks is insignificant in explaining the profitability, denoting that private banks do not in general make relatively higher profits, at least during the period under consideration.⁵¹

Kosmidou et al., focused empirical analyses the impact of bank-specific and macroeconomic factors of UK owned commercial banks' profits, during the period 1995-2002. As claimed by empirical results, the bank specific factor is: capital strength impact positively the bank's profit, but on the other hand cost-to-income ratio and bank size, are important, but impact

⁴⁹Ahmad, R., Koh E.H.Y., & Shahrudin, Sh.S. (2016). Determinants of bank profitability: A comparative study of East Asia and Latin America. *International Journal of Banking, Accounting and Finance*, vol.7 (1) p: 34–51.

⁵⁰Neely, M., & Wheelock, D., (1997). Why does bank performance vary across states? *Federal Reserve Bank of St. Louis Reviews*, p: 27-38.

⁵¹Athanasoglou, P., P. & Brissimis, S., N. & Delis, M.D., (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*, Elsevier, vol. 18(2), p: 121-136.

negatively on the bank's profit. Macroeconomic factor: GDP and inflation has a positive impact on banks profitability.⁵²

Empirical analyses made by using the system GMM conducted by Dietrich and Wanzenried examined how bank-specific characteristics, industry-specific and macroeconomic factors affect the profitability of commercial banks in Switzerland during the period from 1999 till 2009. They have divided the analyses into two periods before the financial crises which include period till 2006 and the financial crises which include year's 2007, 2008 and 2009. Based on the results they conclude that efficient banks, average loan volume growth, the interest income share, income diversification, ownership and financial crises have a significant impact on Swiss commercial banks profitability.⁵³

In addition, regression analyses done by Muhammed Sajid investigate the effect of banks specific factors and macroeconomics factors on bank profitability United Kingdom, based on the result it can conclude that bank factor such as: extensive assets, capital, deposits, loans, equity, and macro-economic factors such as: interest rate, economic growth and low inflation rate have a significant impact on profitability of banks.⁵⁴

Albertazzi et al. focused to the determinants of profitability of Italian banks over the period 2005 – 2015. By using regression analyses he concluded that the decrease in economic growth is the main cause of low profitability of the Italian banks and this leads to the increase in bad debts.⁵⁵

Additionally, Tan et al. by using the GMM analyses the impacts of risk-taking behaviour, competition and cost efficiency on bank profitability in China the model analyses shows that credit risk, liquidity risk, capital risk, security risk and insolvency risk significantly influence the profitability of Chinese commercial banks.⁵⁶

Based on the above empirically researched banks determinants of profitability there are differences between studies. Regardless of how profitability is measured, the factors to be taken

⁵²Kosmidou, K., Tanna, S., Pasiouras, F. (2008). Determinants of Profitability of Domestic UK Commercial Banks: Panel Evidence from the Period 1995-2002. Coventry University Business School, Economics, Finance and Accounting Applied Research Working Paper Series No. RP08- 4.

⁵³Dietrich, A., and Wanzenried G., (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland, *Journal of International Financial Markets, Institutions and Money*, Vol.21 (3), p: 307-327.

⁵⁴Saeed, M., S. (2014). Bank-related, industry-related and macroeconomic factors affecting bank profitability: A case of the United Kingdom. *Research Journal of Finance and Accounting* 5, p: 42–50.

⁵⁵Albertazzi, U., Notarpietro, A., and Siviero, S. (2016). *An Inquiry into the Determinants of the Profitability of Italian Banks*, Rome: Bank of Italy, Economic Research and International Relations Area. (No. 364).

⁵⁶Tan, Y., Floros, C., & Anchor, J. (2017). The profitability of Chinese banks: Impacts of risk, competition and efficiency. *Review of Accounting and Finance*, 16 (1), p: 86–105.

are categorized into two groups: internal factors, flow from the specific characteristics of each bank, and external factors such as macroeconomic indicators and industry specific factors.

2.2. ROA, ROE, and net income as main profitability indicators

Profit stand as a crucial goal of a commercial bank that main role has to distribution the financial sources to fund demanding units in the economy. All strategies planned and activities that are carried out by the banks have the main aim to realization the objective of profit. However, this does not mean that commercial banks have no other goals. Commercial banks have other goals such as: social and economic. However, the purpose of this study is related to the objective, the profit.

Banks are able to have higher profitability through earning more money than they pay in expenses. There are mainly two sources of bank income:

- the fees a bank charges for the services it provides,
- the interest it earns on its assets

On the other hand, the main source of expenses is the interest it pays on its liabilities and other non-interest expenses, such as personnel expenses and other operating expenses. The major assets of the bank include the loans to individuals, business and other organizations, as well as the securities it holds, while the major bank liabilities are its deposits and money that it borrows, either from other banks or from selling commercial paper on the money market.

The role of banks remains at the centre of economic activity, from where their effectiveness is related to the comprehensive effect they have on the entire economic performance of the country. Banking stability itself contributes significantly to the overall stability of the whole economy.⁵⁷

Management of bank and analysts have count on broadly on the use of ratios in evaluating the financial performance of a bank. Though different ratios can be calculated to track the different aspects of banking activity, some of the ratio are considered to be more significant in determining the financial soundness of a banks. The key profitability indicators mainly include: Return on Assets (ROA), Return on Equity (ROE), and the Net Interest Margin (NIM) as a common measure

⁵⁷Athanasoglou, P.P., Sophocles, N.B. and Matthaïos, D.D. (2005). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. Working paper, Bank of Greece. Vol.18 (2), p: 121-136.

being the most widely use. The ROA, and ROE are the two traditionally financial performance indicators of banks. All these ratios are used to determine the banks' profitability using different aspects of the financial statements of the banks.

The first ratio, ROA is return on assets that measures the overall performance of the bank and it is calculated by dividing net income by total bank assets. In other words, the ROA ratio measure the efficiency of the bank's assets in order to make a profit.⁵⁸

$$ROA = \frac{\text{Net income}}{\text{Total Assets}}$$

The ROA is frequently used in studies to compare the bank's profitability among its competitors. ROA means how well a managerial is using bank's assets, or it shows how effective and efficient the management of banks has been and how they influence to transform the assets they own into revenue. The higher ratio, the higher the performance of banks which could lead to operational efficiency or aggressive lending and investment policies. If the latter is the case, the bank may be assuming increased risk in order to attain higher returns on asset. On the other hand, a low rate may reflect excessive operating expenses or conservative lending and investment policies. Hence ROA it is a useful tool to compare the profitability between past and current performance within the same bank, as well as between the bank itself and other bank or the entire commercial banking system.⁵⁹

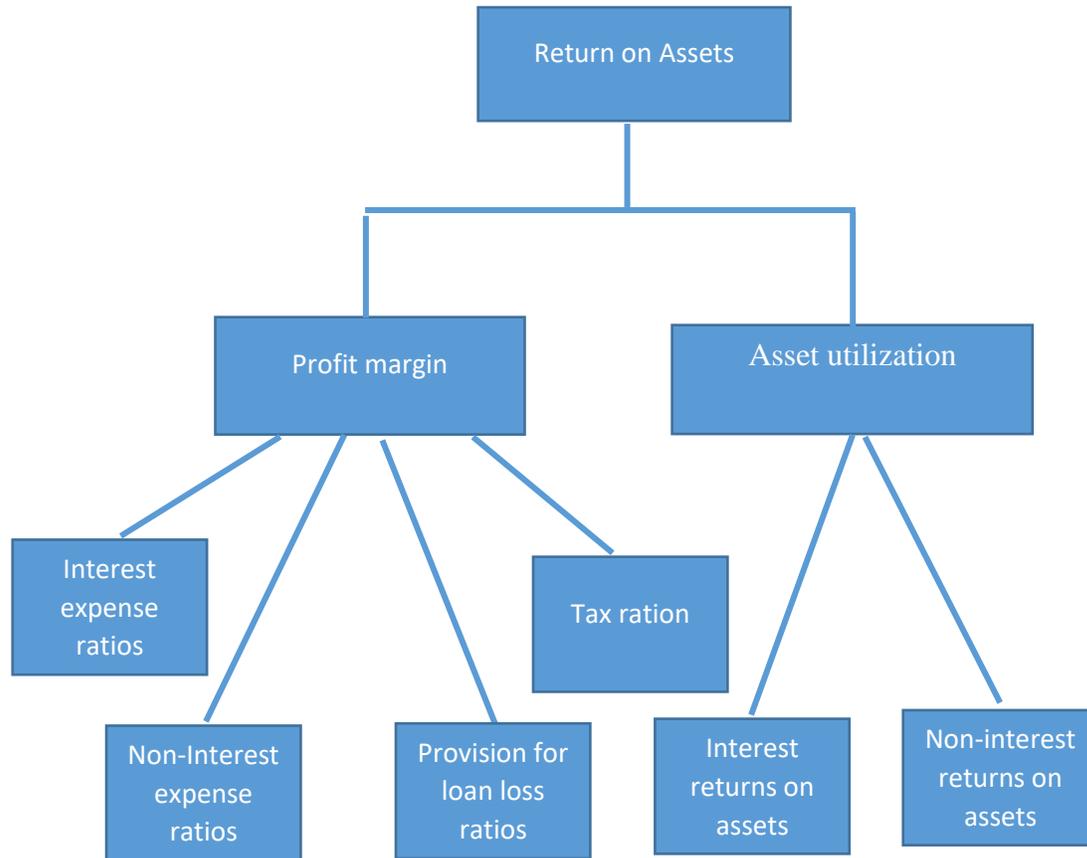
However, the crucial value underlying this ratio is its ability to clarify the financial results on a period through two ratios: profitability (profit margin) and efficiency (asset utilization). Those ratios provide key information about the magnitudes that determine the ROA and how a bank is profitable and efficient.⁶⁰

⁵⁸Mishkin, F.S., & Eakins S. G., (2012). Financial markets and institutions. 7th Edn. Boston: Pearson Prentice Hall.

⁵⁹Micco, A., Panizza, U., Yanez, M., 2007. Bank ownership and performance. Does politics matter? Journal of Banking and Finance 31 (1), p: 219-241.

⁶⁰ Ross, S., Westerfield, R. & Jordan, B. (2012). Fundamentals of Corporate Finance. 10th edition.

Figure 2.1. Decomposition of ROA



Source: Ross, S., Westerfield, R. & Jordan, B. (2012). Fundamentals of Corporate Finance. 10th edition

The profit margin (PM) ratio identifies net income per euro of total revenue. Meaning that if management is effective, they will increase earnings by maximizing revenues and minimizing expenses which will lead to high profit margin. On the other hand, if expenses are not under control and revenues are not increasing it will imply low profit. A low profit margin implies high expenses, high taxes, or both. The profit margin ratios are decomposed further into four ratios: interest expense, non-interest expense, provision for loan loss and tax ratios. Each of four ratios reflect the relative importance of specific types of expenses as well as taxes on banks revenue. Analysing those ratios will enable management to identify areas where cost efficiencies may be realized which will have positive effect on profitability of banks.

The asset utilization (AU) ratio is obtained by dividing total income with total assets. Indicate how effectively assets are being engaged in generating revenues. This ratio is useful to have better view of the success or failure of portfolio policy (e.g., size of portfolio, type of holdings and yield). The asset utilization ratios are decomposed further into two ratios: interest return on assets and non-interest return on assets. Each of two ratios reflects the relative importance of interest and non-interest income on banks assets. Analysing those ratios will enable the management to identify areas where to have more focus on interest or non-interest income. It would be of a high importance analyses ratios non-interest income on bank assets because, over the last decade banking industry has been characterized by the growth of noninterest income meaning that now day banking industry are relying on the noninterest income. Meaning that banks that increase noninterest income could reduce risk and could lead to more diversification. Whereas, in the countries where that financial system is undeveloped and relying in banking, the main source of assets utilization is still based on interest income.

The second ratio, ROE is the return on the shareholder's investment and is calculated by dividing the net income after tax of banks by total capital.⁶¹

$$ROE = \frac{\text{Net income}}{\text{Total capital}}$$

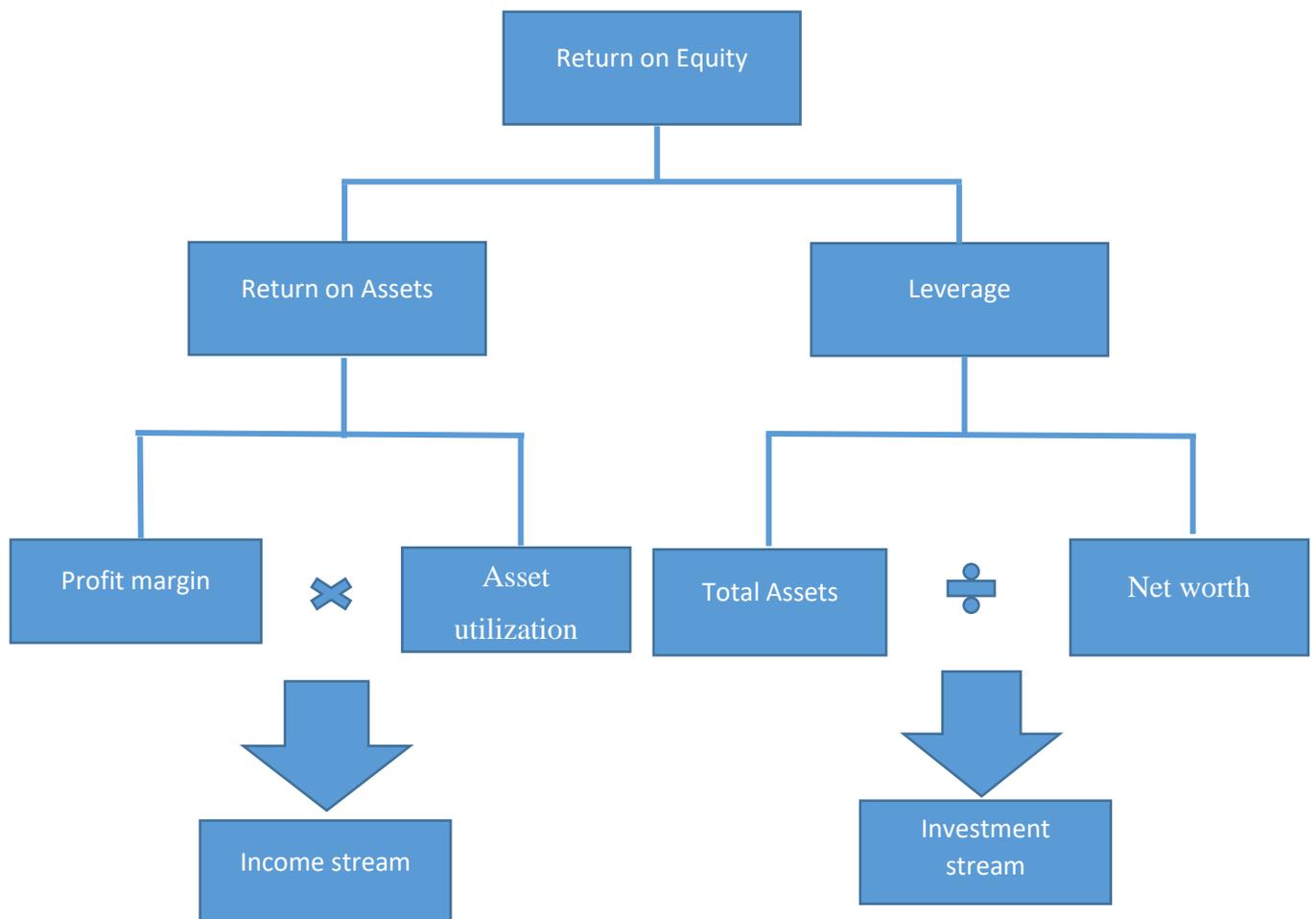
The ROE is used to measure the level of return on a bank's shareholders and expresses a bank's shareholder how much the bank is earning based on its investment. Return on Equity is a two-part ratio in its derivation, because it brings together the income statement and the balance sheet, where net income or profit is compared to the shareholders' equity. This way of measuring profitability is an indicator of what banks earn in relation to shareholder investments, or in other words, represents the total return on equity capital and shows the bank's ability to turn equity investments into profits. A bank with a high return on equity is more likely to be capable of generating shareholder value because it knows how to reinvest its earnings wisely, so as to increase productivity and profits. As a contrast, a declining ROE can mean that the management is making poor decisions on reinvesting capital in unproductive assets. The ROE ratio is especially vital because a main objective for any bank is the maximization of shareholder wealth.⁶²

⁶¹Fries, S. and Taci, A. (2005). Cost efficiency of banks in transition: Evidence from 289 banks in 15 post-communist countries, *Journal of Banking and Finance*, 29, p: 55–81.

⁶²Athanasoglou, P. Brissimis, S. & Delis, M. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*. Vol.8 (2) p: 121-136.

In order to have a profounder view of the ROE it is useful to decompose the profitability ratios into their separate parts which is called the “Dupont analysis”, and is beneficial for closer analysis. Such decomposition can provide a clear signal for the management for the further strategies of the bank, clearly identifying the weakest and the strong parts for maximizing the bank profit.

Figure 2.2. Decomposition of Return on Equity



Source: Roussakis E., (1998). Commercial Banking in an Era of Deregulation, Praeger Westport, Connecticut London, Third Edition, p: 189-195.

Decomposition of ROE ratio provides a broader picture of the return of the banks' earnings on its equity. It states where a banks strength derives from and where there is no room

for improvement. Hence, identifying the advantages and disadvantages of ROE provides an excellent tool for the bank's management when determining ways to increase profits.

The third most used ratio is Net Interest Margin (NIM) reflects how successful a bank's investment decisions are in correlation to its interest income and expenses. Moreover, it is profitability ratio that is expressed by using the difference between the interest income generated and the amount of interest paid out divided by the interest earning assets that measures how well a bank is making investment decisions by comparing the income, expenses, and debt of these investments.⁶³

$$NIM = \frac{(\text{Net Interest income} - \text{Net interest expenses})}{\text{Interest earning assets}}$$

Interest income is generated through interest payments the bank receives on outstanding loans so it is the income of lending money. Whereas interest expenses are the price the lender charges the borrower in a financing transaction. It is the cost of borrowing money. It is the interest that accumulates on outstanding liabilities. Common examples include customer deposits and wholesale financing.

Hence, interest rates change impact both, a bank's interest income and its interest expense. The management must position assets and liabilities to take advantage of rate changes. Thus, both the net interest margin ratio and the spread are the indicators of a bank's ability to manage interest-rate risk.

A negative value indicates that the bank does not make optimal decisions on investment, due to the fact that interest expenses are more than the interest income generated through the loans. On the other hand, positive values have the opposite impact.

In their analyses Demirgüç-Kunt and Huizinga uses the net interest margin (NIM) as a proxy for banks' profitability. The usage of the mentioned proxies of banks' profitability is to some extent controversial because the measures have some drawbacks, examined below.⁶⁴

The NIM does not include all the profits resulting from off balance sheet activities and other non-core banking activities in the numerator, but only some interest revenues and expenses

⁶³ Hubbard, G., & O'Brien, A. (2012). Money, Banking and Financial System. USA: Pearson Education, Inc.

⁶⁴Demirguc-Kunt, A. & Huizinga, H. (1999). Determinants of commercial bank Interest margins and profitability: some international evidence. World Bank Economic Review, vol.13 (2) p: 379-408.

relating to OBS activities. Nevertheless, neglecting non-core banking returns is improper since these activities have become increasingly important contributors to banks' earnings.⁶⁵

The purpose of profitability indicators is to provide wide information on bank returns. In addition to management, lenders and banks owners are concerned in analyzing the bank's profitability. If the profits ratios are adequate, there will be no struggle for the lenders to receive the interest payment and the repayment of the principal. Also, owners want to get the required rate of return on investment. The finance manager requirement is to evaluate the efficiency of the bank, in terms of profitability ratios. Consequently, profitability ratios are essential for anyone related to banks.

2.3. Definitions of banks internal and external factors as profitability determinants

The role of banks in the distribution of financial sources to fund demanding units in the economy so banks remains central in financing economic activity and its effectiveness could exert positive impact on an overall economy and its effectiveness could exert positive impact on overall economy as a healthy and sound banking sector is better able to withstand negative impact and contribute to the stability of the financial system.

Therefore, the determinants of bank performance have attracted the interest of academic research as well as of the bank management, financial markets and bank supervisors since the knowledge of the internal and external determinants of bank profits and margins are essential for various parties.

Profitability reflects a situation where income is incurred during a certain period, exceed the expenses incurred during the same time interval, with the sole purpose of generating revenue. The essential requirements are that income and expenses should occur over the same time interval and revenue must be a direct consequence of expenses. The importance of profit has to do with the fact that it constitutes the main purpose of a business. If profit is thought of as an unattainable goal, then the best solution will be exiting the business.⁶⁶

Evaluating bank's performance is a complex process, which involves the interaction between internal operations, external activities and the surroundings. Hence, determinants that

⁶⁵Goddard, J.A., Molyneux, P., & Wilson J.O.S., (2004). Dynamics of Growth and Profitability in Banking, *Journal of Money, Credit, and Banking*, Vol. 36(6), p: 1069-1090.

⁶⁶ Banwo, S. (1997). The Funds flow Statement: Towards Enhanced Utility. *ICAN News*, p: 23-29.

effect the profitability of commercial banks in most of the academic research are classified into three groups: banks specific factors also known as internal factors, market factor and macroeconomic factors which are known as external factors. Both external and internal factors have influenced the structure and its performance and these factors affect the performance of banks positively or negatively. Respectively, in the literature, banks profitability is usually expressed as a function on internal and external determinants. Internal determinants refer to factors originating from financial statements of banks (balance sheets and/or profits and lost accounts) and therefore they can be defined as banks specific factors determinants of the bank profitability. Internal determinants of banks' profitability are the individual bank characteristics that affect the performance of the bank.

Bank specific factor is defined as those factors that are influenced by management decisions of the bank and domestic policy objectives. Management effects are the result of differences in the management objectives of banks, policies, decisions and actions reflected in changes in banks' operating results, including profitability. Determinants of profitability are credit level risk, provision policies, sufficiency of capital, management cost, size of banks, etc.

Macroeconomic (external) factors are variables that are not related to the management of the bank so those factors are broad sectors or wide-ranging factors of the country that are beyond the control of the banks but that reflect the economic and legal environment which affect the functioning and performance of financial institutions. Among the various studies done so far, the main macroeconomic factors that are related to the identification of determinants of benefit and have impact of profitability are: GDP growth, inflation, interest rate and unemployment.

Market factor are also external factors that measure the concentration of the industry, the common measure for market (industry)-specific determinant is bank-concentration.

2.4. Bank - specific determinants related to profitability

Bank specific factors that affect the performance of banks can be defined as factors that are influenced by the management decisions of banks, policy objectives so those factors are under control of the banks. There are a number of management policies, decisions, and actions that directly affect the financial results of banks. Researchers frequently attribute good bank performance to quality management, it is difficult, if not impossible, to evaluate the quality of

management directly. In fact, it is assumed that such a quality will be reflected in operational performance. As such, it is not uncommon to examine a bank's performance in terms of these financial variables found in these financial statements. From these statements, the balance sheet and income statement are the two most important. Commercial banks as financial institutions are under the constant external impacts as well as the internal factor impacts of environment globally and locally. Among the researchers who have studied the impact of internal determinants on bank profitability are numerous, such as: Haslem (1969), Molyneux and Thornton (1992), Wheelock (1997), Demircuc-Kunt and Huizinga (1999), Abreu and Mendes (2001), Hassan and Bashir (2003) Goddard, Molyneux and Wilson (2004), Staikouras and Wood (2004), Kosmidou et al. (2006), Athanasoglou et al. (2005), Micco et al. (2007), Flamini et al. (2009), Ben Naceur and Omran (2011), Ongore and Kusa (2013). Lee et al. (2014), Muhammed Sajid (2014), Dietrich and Wanzenried (2014), Petria et al. (2015), Menicucci and Paolucci (2016), Deng (2016), Djalilov and Piesse (2016), Ozili (2016), Ahmad et al. (2016), Albertazzi et al. (2016), Tan et al. (2016).

According to Zimmerman research done in California during the period since 1990 to 1994 he came the conclusion that management decisions, especially regarding loan portfolio concentration, were a main factor that contribute in the bank performance.⁶⁷

Based on Poposka the internal factors are the individual bank characteristics that affect the performance of the bank. Such factors are essentially influenced by internal management and board decisions.⁶⁸ Some studies classify those factors into two categories namely financial statement variables and non-financial variables. The variables of the financial statements include factors that are directly related to the bank balance sheet and the income statement. Meanwhile, the variables of non-financial statements include factors that are not directly involved with financial statements such as: the number of branches of a particular bank, the location and size of the bank, number of employees.⁶⁹

There are numerous studies that have attempted to identify key elements of profitability. Studies conducted with internal determinants of bank profitability use variables such as: size,

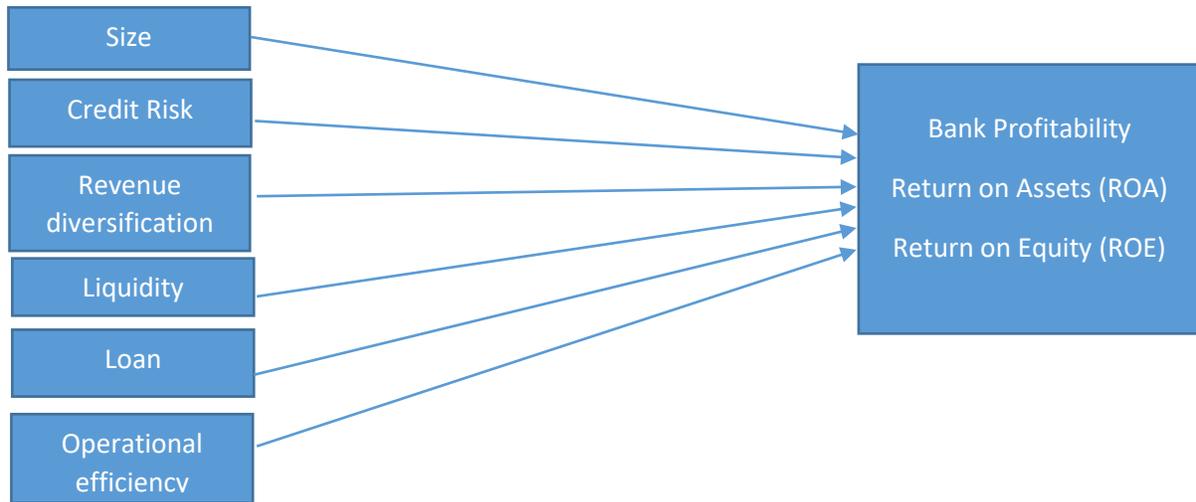
⁶⁷ Zimmerman, G. (1996). Factors influencing community bank performance in California. Federal Reserve Bank of San Francisco 1: 26-41.

⁶⁸ Poposka K., Trpkovski M., Secondary. (2013). Model for Bank Profitability-Test on The case of Macedonian Banking sector. Research Journal of Finance and Accounting, Vol 4(6).

⁶⁹ Haron, S. (2004). Determinants of Islamic Banking Profitability. Global Journal of Finance and Economics; Vol. 1(1) p: 11-33.

capital adequacy, loans, credit risk, revenue diversification, liquidity, leverage, and cost managements, risk management, asset quality, which fall under the control of bank management. Those variables are taken form financial statements of banks, so those factors are directly related to the bank balance sheet and the income statement.

Figure 2.3. Bank specific factor that determinates profitability



Source: Author’s self-conceptualization

The banking system is affected by numerous of internal factors, which has direct impact on it is profitability. Management, lenders, investors and owners of the banks are interested in the analyses of those factor and how they affect the profitability of banks. Since only a strong bank are able to confront negative shock and contribute to the stability of the banking system also of the financial system.

2.4.1. Capital Adequacy

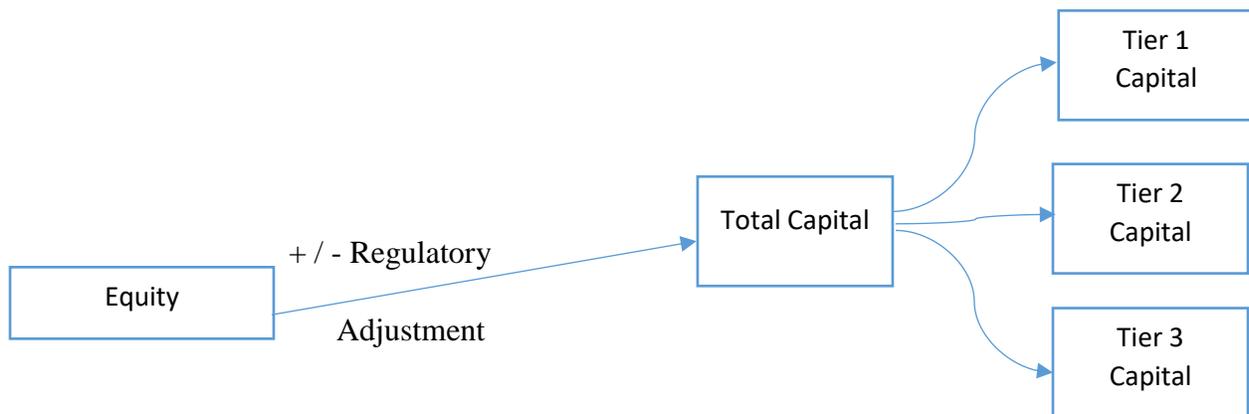
Capital is necessary for the establishment of a commercial bank however although its most important function is to protect depositors and creditors. If the bank wants to continue its activity, its capital must provide the additional trust of the depositors and creditors. Without securing such trust, the bank will not be able to hold existing deposits and attracts new deposits.

In order to avoid bank losses, bank needs to ensure capital adequacy by intervening with certain norms and rules. This intervention has taken the form of laws and rules, which provide for the minimum requirements for this purpose and are defined as norms to ensure capital adequacy.

Commercial bank has different forms of bank capital, as well as different ways of adding a certain form of capital. The choice of the form of capital, the amounts needed in each form and the method of its growth, have important implications in the profitability of the commercial bank.

As it can be seen from the figure, commercial bank has different types of capital that are encounter and generally broken up into three parts: —Tier 1, Tier 2, and Tier 3. Tier 1 is considered the safest. Tier 2 is less safe. Tier 3 is the least safe.⁷⁰

Figure 2.4. Capital component



Source: Gestle, T. V., & Baesens, B. (2009). Credit risk management Basic Concepts: financial risk components, rating analysis, models, economic and regulatory capital, Oxford University press, p: 350-431.

Tier 1 capital represents the core capital that includes equity capital and disclosed reserves. Traditionally, this capital is crucial during the establishment of the bank and also it is necessary to pay special attention during operation of the bank. This is not a simple account but consists of: issued and fully pay common stock, non-cumulative perpetual preferred stocks, retained earnings, minority interest in equity accounts of consolidated subsidiaries and disclosed reserve. Capital requirements get higher under Basel III, as a result of the global financial crisis which started in 2007, hence the minimum of Tier 1 capital ratio, which banks must have is a 6%. Tier 2 capital represent the supplementary layer of a bank's capital which include: cumulative perpetual preferred stocks, undisclosed reserve, asset revelation reserve, general loan loss reserve, hybrid (debt/equity)

⁷⁰Gestle, T. V., & Baesens, B. (2009). Credit risk management Basic Concepts: financial risk components, rating analysis, models, economic and regulatory capital, Oxford University press, p: 350-431.

capital instruments and subordinated long-term debt. Tier 2 capital is considered less reliable than Tier 1 capital, because it is more difficult to accurately calculate and more difficult to liquidate.

Tier 3 capital represent the tertiary capital, which banks hold for the aim to be supported form the market risk, commodities risk and foreign currency that derivate form trading activity. Tier 3 capital contains a more variation of debt than tier 1 and tier 2 capital, but the quality is of a much lower than Tier 1 and Tier 2. Under the Basel III accords, tier 3 capital is being completely abolished.

The capital adequacy ratio based on the capital structure is calculated by dividing a bank's capital by its risk-weighted assets.⁷¹

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

A banks' safety and financial stability can be scrutinized by the use of this ratio. The greater the value of this ratio, the smaller will be the chances of bankruptcy. Therefore, capital adequacy describes the adequacy of the amount of capital that banks can absorb from the shocks they may experience in the course of their operations. It is expected that the higher the ratio of capital to total assets is, the lower the need for foreign financing and therefore the higher the bank's profitability. In addition, well-capitalized banks face a cost lower to bankruptcy, which reduce their financial cost.⁷²

Banks with a ratio of capital to high assets are considered relatively safe, thus being profitable even in difficult economic times. On the other hand, banks with low capital adequacy are considered risky compared to well-capitalized banks. In the case of internal variables, there is a clear positive relationship between capital adequacy and bank profitability.

Analyses of Goddard et al., investigated the determinants of profitability in Spain, Italy, France, Denmark, and the United Kingdom, of 665 banks for the period 1992-1998. The results of empirical analyses found that profitability had a positive relationship with capital adequacy.⁷³

On the same way, Dietrich and Wanzenried focused they analyses on the determinants of bank profitability before and during the crisis in Switzerland, noted a significant positive

⁷¹Menicucci, Elisa, and Guido Paolucci. (2016).The determinants of bank profitability: Empirical evidence from European banking sector. *Journal of Financial Reporting and Accounting* 14, p: 1–23.

⁷²Kosmidou, K. (2008). The determinants of Bank's profit in Greece during the period of EU Financial Integration. *Manegerial Finance*, Vol.34 (3), p: 146 – 159.

⁷³Goddard, J., Molyneux, P., dhe Wilson, J. O. S. (2004).The profitability of European banks: a cross-sectional and dynamic panel analysis. *The Manchester School*, 72(3), p: 363-381.

relationship between capital adequacy and profitability. They result showed that the higher the capital ratio, the more profitable a bank will be.⁷⁴

Therefore “to prevent the bank from bankruptcy it is necessary to maintain a significant level of capital adequacy.”⁷⁵The capital adequacy for banking institutions the ratio should be superior to 8% or we can say that the total capital must be over 8% of its risk weighted assets. According to Basel III these ratios has been increased for the additional buffers such as Capital Conservation Buffer and Countercyclical Buffer.⁷⁶ However, it is important to note that in some countries the required minimum capital may vary depending on the local regulators.

Based on the aforementioned authors, in this study the relationship between capital adequacy ratio and profitability is expected to be positive. Since the higher the capital adequacy ratio means banks are safer in the event of loss or liquidation and remain profitable even during economically difficult times, as well as less chance to bankruptcy besides less dependent on external funding. In the contrast, banks are less protected from insolvency which will bring problems and may easily go to the point where they can bankrupt.

2.4.2. Size

An essential economic concept that relates with the growing size of a bank is the concept of scale economies. Economies of scale occur when the per-unit cost of production falls as the number of units produced increases. As well, by largest size, banks benefit product diversification, which will enable largest banks to have access to markets that small banks cannot entry and improve performance and reduce risk.

In the perspective of banking, scale economies exist when the cost per euro of loans (or assets) declines as the number of loans (or assets) increases. Increasing assets (loans) will allow banks to spread fixed costs over a greater asset base, thereby reducing their average costs, in this way bank will have lower cost and benefit economies of scale.

⁷⁴Dietrich, A. and Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland, *Journal of International Financial Markets, Institutions and Money*, Vol21 (3), p307-327.

⁷⁵Chen, R., & Wong, K., (2004). The determinants of financial health of Asian insurance companies. *The Journal of Risk and Insurance*, Vol. 71(3), p: 469-499.

⁷⁶Poposka K., Stojanovska M., and Iloska-Trajkovska I. (2017). Banking from different angle, contemporary topics- from theory to practice.

Moreover, the size shows how efficiently firms are utilizing the assets and have attained economies of scale, accompanying cost reductions eliminating inefficiencies and reducing risks which may lead to a healthier banking system. Subsequently larger banks are expected to benefit economies of scale; therefore, they will be capable to produce their product or services with lower cost and efficiently compared to the smaller banks. As a result, large banks will earn higher rates of profitability.

According to many studies, in the literature the bank size is emphasized as another important factor of bank profitability. The ratio that measure the size of the company is measured by the total of assets.⁷⁷

$$\text{Size} = \text{Total of Assets}$$

The size variable is a control parameter for cost differences and product and risk diversification. The first factor could lead to a positive relationship between size and bank profitability if there are significant economies of scale (Hanweck and Humphrey, 1987; Boyd and Runkle, 1993; Akhavein et al., 1997; Miller dhe Noulas, 1997; Bourke, 1989; Molyneux and Thornton, 1992; Bikker and Hu, 2002; Goddard et al., 2004; Athanasoglou, Brissimis dhe Delis, 2008; Sufian et al., 2008) while the second could lead to a negative one, if increased diversification leads to higher credit risk and thus lower returns such as Pasiouras and Kosmidou, 2006; Shekhar dhe Lekshmy, 2007, Barros et al., 2007.

Obviously, the empirical studies that include size as one of their explanatory determinants indicates a positive relationship between size and profitability. Berger and Humphrey's analyses review finds consistent evidence that large banks are more efficient on average than small ones, but it is less clear whether large banks significantly benefit from scale economies. Profitability is more likely to be enhanced by emulating industry best practice in terms of technology and management structure than by increasing size per se.⁷⁸

In the same way, empirical research done in Turkey by Alper and Anbar has found a positive and statistically significant relationship between bank size and bank profitability because large banks have higher credit rates and product diversification than small and medium-sized

⁷⁷Regehr, Kristen, and Rajdeep Sengupta. (2016). Has the Relationship between Bank Size and Profitability Changed? Economic Review-Federal Reserve Bank of Kansas City 101: 49–72.

⁷⁸Berger, A. N. and Humphrey, D. B. (1997). Efficiency of Financial Institutions: International Survey and Directions for Future Research, European Journal of Operational Research, Vol. 98(2), p: 175–212.

banks. As well, the positive and significant coefficients of asset size variable provide evidence for the economies of scale theory.⁷⁹

Similarly, Hafiz Malik in his research analyses in Pakistan, has found out that there is significantly positive association between age & size of the company and profitability. The bigger the firm the more may be the profitability of it.⁸⁰

Flamini et.al indicated that size is used to capture the fact that larger firms are better placed than smaller firms in harnessing economies of scale this would imply lower costs for larger banks that they may enjoy a higher level of profits if they do not operate in very competitive environments.⁸¹

In addition, researches showed that a positive relationship indicates that the bank is supported from scale economies when it expands to a larger size. It is explained by the fact that large banks should pay less for their inputs. Succeeding, there may be increasing returns to scale through the allocation of fixed costs (e.g., research or risk management) over a higher volume of services or from efficiency gains from a specialized workforce.⁸²

The results that Rime and Stiroh came to, based on empirical analyse of the performance of Swiss banks from 1996 to 1999, indicate that small and mid-sized banks, benefit for economies of scale, but they have found out that the largest banks do not benefit from scale economies. Furthermore, evidence of scope economies is weak for the largest banks.⁸³

Based on the study led by Andreas & Gabrielle on the factors that affect the profitability of banks during the crisis in Switzerland highlights the positive correlation between bank size and profitability, concluding that large banks tend to be more profitable than the smaller banks. And the reason lays in the fact that the largest banks manage to take advantage of the greater number of products, the diversification of loans as well as the economies of scale.⁸⁴

⁷⁹Alper, D. dhe Anbar, A., (2011). Bank Bank specific and macroeconomic determinants of commercial bank profitability: empirical evidence from Turkey. *Business and Economics Research Journal*.Vol. 2(2), p: 139-152.

⁸⁰Malik, H. (2011). Determinants of Insurance Companies Profitability: An Analysis of Insurance Sector Of Pakistan, *Academic Research International*, Vol.1 (3), p: 315-321.

⁸¹Flamini, V., Schumacher, L., and McDonald C., (2009). The determinants of commercial bank profitability in Sub-Saharan Africa, *International Monetary Fund, Working Paper*.09/15 p:1-32.

⁸²Sufian, F. (2011). Profitability of the Korean Banking Sector: Panel Evidence on Bank-Specific and Macroeconomic Determinants, *Journal of Economics and Management*, Vol 7(1), p: 43-72.

⁸³Rime, B., Stiroh, K., 2003. The performance of universal banks: Evidence from Switzerland. *Journal of Banking and Finance* 27 (11), p: 2121-2150.

⁸⁴Dietrich, A., and Wanzenried G., (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland, *Journal of International Financial Markets, Institutions and Money*, Vol.21 (3), p: 307-327.

On the other hand, Barros et al. finds out that larger banks are more diversified banks, hence they are tending to have higher credit risk which will influence poor return, implying that smaller banks are more specialized although they can reduce asymmetric information problems related to lending and be more profitable.⁸⁵

In general, results show that as the size increases, so does the profitability influence by positive effects of scale and scope economies. Subsequently, in the most studies the relationship between large bank and profitability is expected to be positive, may be able to exert market power through stronger brand image or implicit regulatory (to-big to- fail) protection. Additionally, larger bank is expected to have a higher degree of product/service compared to smaller banks, which will lead in: diversification of product/service, lower risk, as well as the possible cost advantages associated with size (economies of scale) can arise from a larger size. For the benefits that are mentioned above, it is expected a larger size to have a positive effect on bank profitability. On the other hand, size could have a negative impact at banks profitability as a result of increased diversification that could lead to a higher credit risk and thus lower returns.

2.4.3. Credit risk

According to traditional role of banks, they are intermediaries between the surplus and deficit sectors of the economy. Since the lending has the risk that uncertain occasion could occur. In financial terms, a negative occasion is a loss. The most common risk in the banking business is credit risk which occurs when the bank borrowers or counterparty will fail to pay or cannot pay obligations on time and in accordance with the terms they agreed upon, which would cause a certain loss to the bank. There are many cases when unexpected events may prevent the borrower from fulfilling its obligations in certain time, such as:⁸⁶

- the borrower is unable to generate the required amount of cash flow because of financially stressed situation,
- credit loss also occurs when the bank invests in debt of a high-quality borrower where the risk profile has deteriorated

⁸⁵Barros, C. P., Ferreira, C., Willians, J., (2007). Analysing the determinants of performance of best and worst European banks: A mixed logit approach. *Journal of Banking and Finance* Vol.31, p: 2189–2203.

⁸⁶Gestle, T. V., & Baesens, B. (2009). *Credit risk management Basic Concepts: financial risk components, rating analysis, models, economic and regulatory capital*, Oxford University press, p: 40-46.

- The borrower's business suffers losses due to common business risks
- natural disasters (floods, earthquakes)

Banks face several types of risk that require to be identified, understood, measured and managed such as: credit, market, operational, interest rate and liquidity risk. However, credit risk represents the major challenge and its impact to a bank's loan defaults to prevent and control losses resulting from default, banks seek to maintain provision for loan loss in order to be protected. Moreover, provision for loan losses is a key element of a bank's operating expenses and represents an estimate of future loan losses. The loan loss provisions are reported on a bank's income statement.

Since loans are much riskier than alternative bank assets, it implies that the larger the bank's loan portfolio is, the higher the credit risk can be. In order to maintain low rate of credit risk, banks seek to keep high credit standards, diversify loan and investment portfolios, have a good knowledge of the borrower and understanding of his affairs, and also pursue a vigorous collection policy.

One of the main ratios that effect the bank profitability is the credit risk and it is measured as ration of provision for loan losses-to-total loans.⁸⁷

$$Credit\ risk = \frac{Provision\ for\ loan\ losses}{Total\ loans}$$

A higher ratio shows a lower credit quality and, therefore, a lower profitability. That is why it is expecting a negative effect of the loan loss provisions relative to total loans of the bank's profitability. Moreover, the higher the ratio is, the higher is the number of loans given out and this increases the default (credit risk).

One of the main roles of commercial banks is to provide loans to borrowers and this loan is as one of the most important sources of income for commercial banks. In other words, loans represent one of the main assets with high rates of return. It is clear that the more banks offer loans the more it has generated income and more profitability. However, banks need to be careful in offering as many loans as possible, because if they offer more loans to consumers, they significantly increase the risk of liquidity and credit, which negatively affect the bank's profit and its survival. A good example for this is the financial crisis which started in the United States in

⁸⁷Cooper, M., Jackson, W. and Patterson, G. (2003), Evidence of predictability in the cross-section of bank stock returns, *Journal of Banking and Finance*, Vol. 27 (5), p: 817-850.

2007 and 2008. It is well known that most banks engaged in providing more loans, including non-performing loans during this period.⁸⁸

Therefore, the relationship between credit risk and profitability is expected to be negative, interpreting the concept that the more bad loans there are, the more the profitability of the banks will be reduced. Such findings have been explained in the papers of Miller, S.M. and Athanasios G. N.,1994; Athanasoglou et al. ,2006; Kosmidou et al., 2006 Dietrich and Wanzenried, 2011; Rasiah, D., 2010; Bace, E.,2016 etc.

Some authors describe this factor as assets quality which can be usually measured only indirectly by taking into consideration the loan-loss provisions. As provisions roughly indicate the probability of loans to become non-performing, higher provisions are expected to be negatively related to bank profitability.

Additionally, different authors try to capture this effect by using different indicators, for example Athanasoglou et al. use loan-loss provisions to loans ratio and Kosmidou K.et al.loan-loss provision to total assets ratio. In either case the relationship with bank profitability is expected to be negative.⁸⁹

Furthermore, Bace analyzed 13000 of the world's largest deposit taking institutions over the period from 2014 to 2015. The result concludes that there is a significant negative impact between profitability and non-performing loans to total loans ratio.⁹⁰

On the other hand, Miller and Noulas empirical research done in the US banking system they conclude that the credit risk is one of the most important factors that it affects primarily the loan portfolio, which is the largest component of total assets for most banks. They further claim that lower loan loss provisions in many cases leads to higher profit margins. Therefore, by improving credit risk supervision, banks expect to improve their profits.⁹¹

Based on the aforementioned researches, it is submitted that increased exposure to credit risk is usually related with decreased banks profitability and, hence, it is expecting a negative relationship between profitability and credit risk. Therefore, banks in order to decrease credit risk

⁸⁸Rasiah, D., (2010). Theoretical Framework of Profitability as Applied to Commercial Banks in Malaysia. *European Journal of Economics, Finance and Administrative Sciences*, Vol. 19, p: 74-97.

⁸⁹Athanasoglou P.P., & Delis M. D., & Staikouras C.K., (2006). Determinants of Bank Profitability in the South Eastern European Region, Working Papers 47, Bank of Greece.

⁹⁰Bace, E., (2016). Bank profitability: Liquidity, capita and asset quality. *Journal of risk management in financial institutions*, 9(4), p: 327-331.

⁹¹Miller, S.M. and Athanasios G. N. (1994). Portfolio mix and net charge offs at large United States commercial banks. *Applied Economics Letters*, Vol. 1(11), p: 183-186.

and increase profitability should implies such policies as: lending specialization, apply specific standards for the level of loan loss provision to cover losses brought about by risks arisen, ability to foresee, avoid and monitor credit risk.

2.4.4. Revenue diversification

During the last two decades banking sector have faced significant changes, deregulation and technological innovation. These changes include the business model of a banking sector that no longer relies on interest income, therefore banks have shift to non-interest income and this has changed the traditional role of financial intermediation. This change has created opportunities, but it surely has an influence on competition in the industry that demands banks to expand their activities and business lines aside from the traditional activities that generate interest income.

Therefore nowadays banks have begun to diversify by relying on other sources of non-interest income such as having increasingly off-balance sheet activities, underwriting and trading securities, broker-agent, and investment banking, and other activities that generate non-interest income and fees and have decline in interest margins and forced them to search for new sources of revenue.

For example, it may be fee and commission income from various non-financial services such as issuing bank guarantees, letters of credit, shipping guarantees, making import payments, advising letters of credit, handling export documents and export procedures, credit card fee, etc. The other non-interest income sources may include charges for any kind of services provided by the bank to customers, like providing safe deposit lockers, issuing demand drafts, check book charges, clearing checks, underwriting initial public offerings (IPOs), capital gains from dealing in government securities and equity markets, trading income, gains from foreign exchange markets, revaluation of fixed assets such as office buildings, selling miscellaneous assets, monthly or annual account maintenance charges, income from selling insurance, and so on.

The ratio non-interest income to total income is included as a measure of the bank's revenue diversification expected to positively influence profitability.⁹²

⁹²Chiorazzo, V., Milani, C., and Salvini, F. (2008). Income Diversification and Bank Performance: Evidence from Italian Banks. *Journal of Financial Services Research*, Vol33 (3), p: 181–203.

$$\text{Revenue diversification} = \frac{\text{Non – interest income}}{\text{Interest income}}$$

As for income diversification, authors such as; Choi and Kotrozo, 2006; Chiorazzo et al., 2008; Demirgüç-Kunt and Huizinga, 2010; Sanya and Wolfe, 2010; and Elsas et al., 2010 found that banking performance could be enhanced through a revenue diversification. On the other hand, studies from: DeYoung and Roland, 2001; Stiroh, 2004a; Stiroh, 2006; Stiroh and Rumble, 2006; Mercieca et al., 2007; De Jonghe, 2010; and Berger et al., 2010 found that an increase in non-interest income has a negative effect on bank profitability.

In this context, Elsas et al. evidence from nine countries (1996-2003) find that revenue diversification has a positive effect on banks' profitability and their market value, and their performance. Initially, commercial banks typically increase diversification by benefiting from specific economies of scope given that high operationally leveraged banks can enjoy cost advantage.⁹³

Another important empirical research of Choi and Kotrozo argue that bank's ability to leverage managerial efficiency across products or geography, economies of scale and scope and maintaining or increasing market power plays a key role in encouraging diversification. In addition, it was found that diversification has a direct benefit on the performance of banks.⁹⁴

According to Sanya's and Wolfe's empirical analyses done in emerging economies conclude that diversification across and within both interest and non-interest income generating activities decrease insolvency risk. Furthermore, there is a positive relationship with profitability especially for bank that have moderate risk exposures.⁹⁵

On the same way, empirical analyses conducted by Goddard et al determinate three main reasons driving diversification. Firstly, agency problems arising from separation of ownership from management enables managers to take advantage by engaging in empire building behaviour when undertaking diversification. Secondly, banks that diversify can build market power given that they are able to exploit anti-competitive behaviour via cross subsidization and reciprocal

⁹³Elsas, R., Hackethal, A., Holzhäuser, M., (2010). The anatomy of bank diversification Journal of Banking and Finance. Vol 34(6), p: 1274–1287.

⁹⁴Choi, S., and Kotrozo, J., (2006), Diversification, bank risk and performance: A cross country comparison, Rensselaer Polytechnic Institute, 3rd draft, p: 1-52.

⁹⁵Sanya, S., and Wolfe, S. (2010), Can banks in emerging economies benefit from revenue diversification? Journal of Financial Services Research, 40(1), p: 79- 101.

buying. Thirdly, diversified banks can seize upon opportunities to grow and cut costs after having attained economies of scale.⁹⁶

In contrast to above, Mercieca et al. studied small European credit institutions over the period 1997–2003. The conclusion that there is no direct relationship between diversification benefits and non-interest income however there is an inverse association between non-interest income and bank performance.⁹⁷

Moreover, Allen et al. investigate a relationship between diversification and profitability of Chinese banking system over the period 1996–2006. The results showed that diversification resulted in increasing cost and decreasing profits as well as less stability.⁹⁸

Therefore, the result is that the impact of revenue diversification on banking performance has a positive and negative effect but due to the changes that are occurring a further research is needed.

2.4.5. Liquidity

Liquidity is very crucial phenomenon for smooth operation of banking industry. In fact, growth, development and survival of banks depend on liquidity. In specific terms the essence of liquidity is to meet the cash demand, when we need it, or more formally, the ability to provide sufficient cash demand and to perform the obligations at a reasonable price at any time.

Hence, liquidity is needed for banks to offset expected and unforeseen balance sheet fluctuations as well as provide funds for growth. To consider the implications of this definition, we will focus on liquidity functions.⁹⁹

The main functions of liquidity are:

- a. security and confidence of costumers,
- b. ability to meet obligations for the costumers

⁹⁶Goddard, J., McKillop, D., and Wilson, J.O.S. (2008), The diversification and financial performance of US credit unions, *Journal of Banking & Finance*, 32(1), p:1836-1849.

⁹⁷Mercieca, S., Schaeck, K., and Wolfe, S., (2007). Small European banks: Benefits from diversification? *Journal of Banking and Finance* 31, p: 1975–98.

⁹⁸Allen, N.B., Hasan, I. and Zhou, M. (2010). The effects of focus versus diversification on bank performance: Evidence from Chinese banks. *Journal of Banking and Finance* 34, p: 1417–35.

⁹⁹Roussakis E., (1998), *Commercial Banking in an Era of Deregulation*, Praeger Westport, Connecticut London, Third Edition, p: 189-195.

- c. ability to provide loans of costumers,
- d. avoidance of forced sale of assets

a. Security and Confidence of costumers - Banks will make little cash and play insignificant economic roles if their only job is to lend. Banks start working with a core capital and later they try to increase it by taking deposits and borrowing, as well as investing their own capital.

The first and crucial function of liquidity is to provide security and confidence to the bank's creditors. In other words, to offer such conditions, in which the creditors will be completely sure that their deposits or money, which they have deposit to the bank, will be returned. As long as the bank has adequate liquidity, its creditors will not be afraid to deposit their money. However, if they doubt the liquidity of the bank, then it will be very difficult for them to decide to deposit their money in bank.

b. Ability to meet obligation to customers -means a bank having money where they need it particularly to satisfy the withdrawal needs of the customers. The survival of the commercial banks depend greatly on how liquid they are since illiquidity being a sign of imminent distress can easily erode the confidence of the public in the banking sector and results to deposit.

c. Ability to provide loans of consumers- Banks work with their customers, and if they meet the conditions to get loan then the bank issues you a loan, but if not, then the bank is forced to reject it and it will lose it as a customer. Banks need to be prepared and in the event of a sudden increase in demand for credit. To be ready for such a thing, it must always have adequate liquidity.

d. Avoidance of forced sale of assets- If the bank falls into an illiquid position and is unable to meet its obligations as they come, then, one of the options is to sell the securities in unfavourable terms. This would cause losses for the banks, which in the last instance, endanger the capital of the commercial bank itself. In order to maintain liquidity, the bank's policies should be oriented towards providing additional income in the bank's portfolio, in order to cover the operating costs and the commercial bank to continue operating profitably.

As they are being showed in the table below, the liquidity ratios at commercial banks are mainly divided into five rations: L1, L2, L3 and L4.¹⁰⁰

¹⁰⁰Vodova, P., (2011), Determinants of Commercial Banks' Liquidity in the Czech Republic, Recent Researches in Applied and Computational Mathematics, p: 92-97.

Table 2.1. Liquidity Ratios

Liquidity Ration	Formula	Measurement
L1	$\frac{\text{Liquid Assets}}{\text{Total Assets}}$	Cash, short-term claims on other banks (including CDs) and where appropriate the trading portfolio) divided with total assets.
L2	$\frac{\text{Liquid Assets}}{\text{Deposits}}$	(Cash, short-term claims on other banks (including CDs) and where appropriate the trading portfolio) divided with total Customer deposits
L3	$\frac{\text{Loans and Advance}}{\text{Total Assets}}$	Total loans and advances of bank divided with otal assets
L4	$\frac{\text{Loans}}{\text{Deposits}}$	Total loans divided with deposits

Source: Vodova, P., (2011), Determinants of Commercial Banks' Liquidity in the Czech Republic, Recent Researches in Applied and Computational Mathematics, p: 92-97.

Liquidity of commercial banks plays a fundamental role in functioning of financial markets and the banking sector. Liquidity is usually expressed as a function of banks factors and macroeconomic factors.

According to the Bank for International Settlements, the term liquidity refers to the ability of a bank to fund increases in assets and meet obligations as they come due without irreparable losses. Moreover, it is emphasizing that the liquidity expresses the degree to which a bank is capable of fulfilling its respective obligations.¹⁰¹

Banking sector during the two last decades has encountered major transformations in its environment, resulting in significant impacts on its liquidity. Many commercial banks struggled to maintain adequate liquidity during the crises, completely have change market condition and

¹⁰¹Basle Committee on Banking Supervision (2008). Principles for Sound Liquidity Risk Management and Supervision. Basel: Bank for International Settlements, p: 2-10.

determine the advantages of liquidity ahead of profitability. Hence, insufficient liquidity is one of the major reasons of bank failure. Liquidity is necessary to enable banks providing funds on demand and credits needed by customers which are associated with the default risk.

Pandey argues that liquidity is a real asset that must be effectively managed to protect the banks against the risk of insufficient liquidity. Insufficient liquidity in extreme situations can lead to the bank's failure. He further says that there is a conflict between liquidity and profitability. If the firm has not invested enough funds in current assets, it can become illiquid, which is a very risky thing. It can lose profit if some current idle assets gain nothing.¹⁰²

There are a number of studies that have to do with bank liquidity such as: Short 1979, Bryant 1980, Diamond & Dybvig 1983, Bourke 1989 Molyneux and Thornton 1992, Holmstrom & Tirole, 1998 Kashyap et al.2002, Kosmidou dhe Pasiouras 2005, Bunda and Desquilbet 2008, Tyrrel 2010 Vodova 2011. Based on those studies, the relationship between liquidity and profitability were mixed.

Molyneux and Thornton examined the determinants of European banks that influenced banking profitability during the period 1986-1989, among others, found a negative and significant relationship between the level of liquidity and profitability.¹⁰³

Based on empirical analyses of Graham and Bordeleau who examined the impact of liquidity on 55 American banks and 10 Canadian banks from 1997 to 2009. The regression analyses results revealed that the profitability of some banks that had liquid assets improved. However, this came until a certain point, because there was a point in which the holding of liquid assets can reduce the bank profitability.¹⁰⁴

According to Chen and Wong regression analyses showed that liquidity is the important factor influencing of financial soundness of companies with a negative relationship.¹⁰⁵

On the other hand, Anber and Alper investigate the bank-specific and macroeconomic determinants of bank profitability in Turkey over the period 2002-2010 based on fixed effect

¹⁰²Pandey, I.M. (2010). Financial Management, Tenth Edition, Vikas Publishing House PVT LTD,

¹⁰³Molyneux, P., Thornton, J. (1992). Determinants of European Bank Profitability: A Note. *Journal of Banking and Finance*, 16(6) p: 1173-1178.

¹⁰⁴Graham, C. and Bordeleau, E (2010). The Impact of Liquidity on Bank Profitability. *Bank Canada Working Papers*, p: 10-36.

¹⁰⁵Chen, R., & Wong, K. A. (2004). The Determinants of Financial Health of Asian Insurance Companies. *The Journal of Risk and Insurance*, Vol 71(3), p: 469- 499.

model, showed that higher level of liquidity leads to higher profitability of Turkish banks.¹⁰⁶ Also Bourke finds a positive significant link between bank liquidity and profitability.¹⁰⁷

Similarly, Saeed, investigate the impact factor of profitability on 73 UK commercial banks from 2006 to 2012. Based on regression analyses results it is concluded that liquidity have positive impact on both of main determinants of profitability ROA and ROE.¹⁰⁸

Therefore, the conclusion on the impact of liquidity on banking performance remains unclear because the existence of inverse relationship of liquidity to profitability. If the more asset is in cash, banks have access to the funds necessary to fulfil customer needs, maturing liabilities and capital requirements for operational purposes, although the less is the possibility of potential loss. In addition, a highly liquid asset, in the future would give a relatively lower income than a less liquid, and riskier asset and therefore the bank should be willing to accept negative relationship between liquidity and profitability. In other words, the profitability tends to vary inversely with their degree of liquidity.

2.4.6. Operational efficiency

It is widely recognized that the operating efficiency of the banking system is the key factor that supports their functionality and success or failure. Operating efficiency is defined as the ability of the banks to minimizing operating costs (such as administrative costs, staff salaries, and ownership costs, excluding losses due to bad and bad loans) and increasing profits, which is the way bank is accomplishing its objective. This process is fulfilled if banks are working in the proper management of costs with the right combination of resources and in this way the bank will minimize cost and enhance efficiency and profitability.

As internal factor operational efficiency is measured through the total operative cost to total income ratio. The operative cost is defined as operating costs (such as administrative costs, staff salaries, and ownership costs, excluding losses due to bad and bad loans) over the total

¹⁰⁶Anber, A., Alper, D. (2011). Bank specific and macroeconomic determinants of commercial bank profitability: Empirical evidence from Turkey. *Business and Economics Research Journal*, Vol. 2(2), p: 39-152.

¹⁰⁷Bourke, P. (1989). Concentration and other determinants of bank profitability in Europe, North America and Australia. *Journal of Banking and Finance*, 13(1), p: 65-79.

¹⁰⁸Saeed, M. S. (2014), Bank-related, industry-related and macroeconomic factors affecting bank profitability: A case of the United Kingdom,” *Research Journal of Finance and Accounting*, Vol. 5(2), p: 42-50.

generated income. The banks with high cost to income ratio were considered to have lower profitability.¹⁰⁹

$$\text{Operational efficiency} = \frac{\text{Operation cost}}{\text{Total income}}$$

Moreover, the higher rate of this ratio, the less efficient the bank is and this could lead to negative affect to bank profitability, depending on the degree of competition in the market. On the other hand, the lower the rate of this ratio is, the more efficient the bank could be and have positive effect on bank profitability. So, improved management of these costs will increase efficiency and therefore increase profitability of bank.

Based on the research of authors such as Hess and Francis, 2004; Pasiouras dhe Kosmidou, 2007; Athanasoglou et al., 2008; Goddard et al., 2009; Davcev dhe Hourvoulides, 2009; Dietrich dhe Wanzenried, 2011; Ponce, 2012, operational efficiency can directly affect the survival and success of the company, therefore expect higher cost-income ratios to have a negative effect on bank profitability.

Specifically, empirical analyses done in the Switzerland for the period before and during the crises revealed that operational efficiency is negative and highly significant for the whole period before the crisis. On the other hand, the results showed that during the crises the operational efficiency is not significant even though it is also negative.¹¹⁰

Another important empirical analyses about determinates of profitability of commercial banks revealed that operational efficiency has negative and its high statistical significance with ROA and ROE. Confirm the effect of operational efficiency on bank profitability the higher this ratio, the less efficient the bank is and thus may negatively affect returns on operations and / or returns on equity, depending on the degree of competition in the market.¹¹¹

Based on the research about operational efficiency it is expected that this variable will have a negative impact on performance. Managerial ability in controlling costs will increase efficiency and therefore increase profitability of the bank, although efficient banks are expected to operate at

¹⁰⁹Kosmidou, K. (2008). The determinants of banks' profits in Greece during the period of EU financial integration, *Managerial Finance*, Vol. 34(3), p: 146-159.

¹¹⁰Dietrich, A. and Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland, *Journal of International Financial Markets, Institutions and Money*, Vol21 (3), p: 307-327.

¹¹¹Ponce, A., (2013). What determines the profitability of banks? Evidence from Spain *Accounting & Finance*, Vol. 53(2), p: 561-586.

lower costs for a given level of output. Therefore, we conclude that banks should emphasis on managing these costs which will basically reflect on the profit.

2.4.7. Loans

Banks are companies that efficiently provide a wide range of loans for whole society. Therefore, banks have a vital role in the economy and the society of a country.

Their main role is lending to people and enterprises for various investment purposes: company growth, education, homes. Bank lending activity is dependent on the bank's customer deposits. Since deposits must be secure and available at all times for eventual withdrawal by customers, the lending policy must consider some general principles.

Such principles are:¹¹²

- Security - The bank needs to ensure that the loans that have been granted will be repaid on time. Since the repayment of loans depends directly on the solvency of the borrower, the bank must ensure from the beginning that this borrower, whether a clients or company is able to repay the loan on time. In addition, the bank often insists on securing the loan through collateral or mortgage. This property should be adequate, easy to sell in the market and free from any subordinate obligations or mortgage.
- Profit - In order to survive in the market, banks must make continuous profits year after year. This means that the bank must ensure a positive margin between interest on deposits and loans. In this regard, adequate fixing of interest rates on loans and deposits is critical. If interest rates are fixed and margins are adequate, otherwise banks may lose their customers and become unprofitable.
- Liquidity -To maintain liquidity, banks must ensure that the money given in the form of loans are not closed for a long period by planning their maturity appropriately. Also, the bank must collect the loans according to the loan

¹¹²Roussakis E., (1998). Commercial banking in an Era of Deregulation. Praeger Westport, Connecticut London, Third Edition, p: 189-195.

amortization plan. If loan illiquidity increases, then the bank may not be able to repay its liabilities to deposits and other parties.

- Risk diversification- to prevent risk, banks should allocate loans on a large customer base. Diversification should be done according to geographical location, nature of business, type of individuals, in order to be protected from different kind of risk that banks could face.

There are a number of studies that have examine the loan ratio and profitability such as Abreu and Mendes,2002; Bashir, 2003; Kosmidou et al. ,2005; Hassan and Bashir,2005; Heffernan and Fu ,2008; Sufian and Habibullah, 2009.Based on those studies, the relationship between liquidity and profitability were mixed.

Bank leading activity brings the main source of income that are generated by the banks, hence effect of loans on bank profitability is expected to be positive, because the higher the volume of loans is, the higher the income will the bank have and this could result apparently, that the bank will be more profitable in consequence of the added business created. The ratio of total loans over total assets represents a bank's relative lending size.¹¹³

$$Loans = \frac{Loans}{Total\ assets}$$

On the other hand, evidences from different research shows the opposite. The increase in loans portfolio, will increase costs for their funding provisions and also lead to a drop of credit quality in this case the relationship between profitability and loans is expected to be negative.¹¹⁴

Generally, banks' lending activities are enabled by the economic conditions of the country and during slow periods there is a destruction of the quality of the banks' loan portfolio which is inevitably affected by: higher credit and liquidity risk exposure, higher probability of loans to become non-performing indicate high provision for loans loss and this increase the exposure to default leading which ultimately decrease profitability (negative relationship). The opposite may happen when the effect of leading tends to be positive in bank's profitability.

¹¹³Abreu, M. and Mendes, V. (2002). Commercial bank interest margins and profitability: evidence from E.U. Countries. University of Porto Working paper Series, No. 122.

¹¹⁴Hassan, M.K. and Bashir, A.M. (2005). Determinants of Islamic banking profitability. Paper presented at the Economic Research Forum (ERF) 10th Annual Conference, Marrakech, 16-18 December.

2.5. Market determinants and profitability

External determinants include those that represent industry (market) and macroeconomic factors. So external factors are variables that are not related to the management of the bank so, those factors are broad sectors or wide-ranging factors of the country that are beyond the control of the banks but that reflect the economic and legal environment that affect the functioning and performance of financial institutions.

According to industry-specific factors, bank profitability is a function of the attributes of the market in which it operates, such as concentration, competition and customers oriented. So, the market factor of the banking industry is also a significant determinant of a bank's potential profitability.

2.5.1. Main market determinants for profitability

Different hypotheses try to explain the concentration of the market and how it affects competition in the market, which in turn affects the market prices and bank profitability such as Schweiger and McGee, 1961; Gilbert, 1984; Berger and Hannan, 1989; Molyneux and Thornton, 1992; Demirguc-Kunt and Huizinga, 2000; Boone and Weigand, 2000; Shaffer and Srinivasan, 2002; Flamini et al., 2009; Van Hoose, 2010; Rumler and Waschiczek, 2016.

The market power theory includes two theories – the traditional structure theory evaluated on the Structure Conduct-Performance (SCP) paradigm and the relative-market power hypotheses.

According to the structure-conduct performance hypothesis, banks in more concentrated markets can impose prices and fees less favourable to consumers and from this bank can earn a favourable interest margin that results higher profits than those operating in less concentrated ones, regardless of their efficiency. A more specific approach of the market power theory in performance hypothesis is the relative-market-power hypothesis, which states that banks which include well differentiated products and services in their portfolio can increase their market share and consequently exercise their market power by setting higher prices, resulting in abnormal profits. Empirically analyses conducted by Gilbert provided a voluminous empirical literature on banking structure and performance evaluating the empirical relevance of the SCP hypothesis, the

preponderance of which was generally supportive. Higher bank market concentration appeared to generate higher loan rates, lower deposit rates, and increased industry profits.¹¹⁵

On the other hand, empirical analyses done by Boone and Weigand suggested that a higher bank concentration might be the result of a tougher competition in the banking industry, which would suggest a negative relationship between performance and market concentration.¹¹⁶ As a result, of empirical analyses the overall effect of market concentration on banking performance is again unambiguously positive – or negative – relationship between bank concentration and banking profitability.

The second hypothesis concerns the efficient-structure hypothesis, according to which market concentration is a result of bank-specific attributes such as higher cost efficiency that allows bank, they become larger, obtain greater market share and earn higher profits which in turn leads to higher market concentration.

The ES hypothesis usually include two different forms– the X-efficiency and scale efficiency hypotheses, depending on the type of efficiency considered. The X-efficiency hypothesis argues that banks with better management, new technology and ability in minimizing costs to produce have lower costs, higher profits and larger market share. The scale-efficiency hypothesis argues some banks achieve better scale of operation and, thus, lower costs. Lower costs lead to higher profit and faster growth for the scale-efficient banks.

Based on the empirical research results is showed that X-efficiency and scale efficiency has effect on profitability such as the research of Smirlock ,1985; Molyneux and Thornton, 1992; Peristianni, S., 1997; Chortareas et al, 2010 and Tajgardoon, Behname and Noormohamadi, 2012. Results shows that higher level of those variables will lead to a larger profitability. A high efficiency causes better management and lower cost therefore the market share and profit will increase. This encourages the banks to focus more in efficient organizational solutions, larger variety of the presented services and stronger management of scale economies. For ES hypothesis, the efficiency has to be positively related to profitability, market share and market concentration.

¹¹⁵Gilbert, R., (1984). Bank Market Structure and Competition: A Survey. *Journal of Money, Credit, and Banking*. Vol 16 (4) p: 617-44.

¹¹⁶Boone, J., and Weigand J., (2000). Measuring competition: how are cost differentials mapped into profit differentials? CPB working document, no. 131.

Research analyses by Smirlock examines the profitability of the US banks during the period 1973-1978 subscribing to the efficiency hypothesis, considers market share as a proxy for efficiency. Results showed that efficiency hypothesis prevails when a significant positive correlation between market share and profitability is signalled and no linkage between concentration and profitability.¹¹⁷

The profitability of US banks is also investigated by Goddard et al. using data for the period 1989-1996. The empirical results show that scale economies and productive efficiency are positively related to profitability.¹¹⁸

The main assumption of the efficient-structure theory is that higher profits realized by companies operating in concentrated markets are a result of the superior efficiency of larger companies which comes from economies of scale.

2.5.2. Customers satisfaction determinants and banks profitability

Customer satisfaction has been one of the top tools for a successful business. There are a lot of definition about customer satisfaction. Pairot defined Customer's satisfaction as the company's ability to accomplish the business, emotional, and psychological needs of its customers. Customer satisfaction is complex process and it is affected by different aspects such as the economic factors, emotional attitudes, and habits of consumers.¹¹⁹

On the other hand, disappointed customers with products or services will move to a different brand and this will influence a negative advertising. Therefore, customer satisfaction has become a focus of attention, not only for researchers, but also for businesses that offer their goods and services to consumers and that are immersed in an increasingly competitive market.

Customer satisfaction is a result of one of the two types of theories: cognitive theories and affective theories. The first group of theories is called cognitive theories, it is based on the certain standard and comparing those with the real results. The costumers after buying and using the

¹¹⁷Smirlock, M. (1985). Evidence on the (none) relationship between concentration and profitability in banking. *Journal of Money, Credit, and Banking* 17 (1), p: 69-83.

¹¹⁸Goddard, J. A., Molyneux, P. M. and Wilson, J. O. S. (2001). *European Banking: Efficiency, Technology and Growth*, Chichester, Wiley.

¹¹⁹Pairot R. (2008), *Members' Satisfaction of Fitness Service Quality: A Case Study of California Wow Xperience Public Company Limited, Presented In Partial Fulfillment Of The Requirements For The Master Of Arts Degree In Business English For International Communication*. At Srinakharinwirot University, October 2008.

product will evaluate the performance and also the experience they got during the process of its buying. After that, they make difference between the real experience and the expectations they have and if it is at least as good as the expected, they become satisfied customers. The second group of theories is called affective theories, and it is based more in the emotional and subjective feelings.¹²⁰

However, Bena in her research analyses of the customer satisfaction on banking sector conclude that the customer satisfaction is a result of a synchronized interaction between two theories: cognitive and affective.¹²¹

Customer satisfaction in the banking sector has its specific impact mostly due to the fact that it is the sector of services and in many research analyses it is showed that a bank with satisfied customers has positive relationship and are more favourable to have higher profitability.

In this view Bernhardt et al., research of satisfaction and profitability divide analyses in two phases: in short term and in long term. Results showed that the relationship between customer satisfaction and the profitability of a bank can be less powerful in a short term (up to 12 months) because of several other factors influencing the financial performance of a bank. On the other hand, the relationship in long term is significantly and positively with profitability.¹²²

In this context Terpstra and Verbeeten, research in the financial service industry confirms that satisfied customers tend to be loyal and willing to buy more of a companies' services at higher prices. Also, a satisfied customer represents a free form of marketing and is tending to purchase other products and this results to a higher return at company.¹²³

As other industry also banking industry is also affected by customer satisfaction and has had an ever-increasing importance in the corresponding research areas. Overall, if the customers are satisfied with a provided goods or a particular service, they use of the service will be increased and this will lead to higher profitability of the company.

¹²⁰Oliver, R.L. (2010). Satisfaction: a behavioural perspective on the consumer. Armonk, N.Y.: M.E. Sharpe

¹²¹Bena, I. (2010). Evaluating Customer Satisfaction in Banking Services. *Management & Marketing*, Vol. 5(2), p: 143-150.

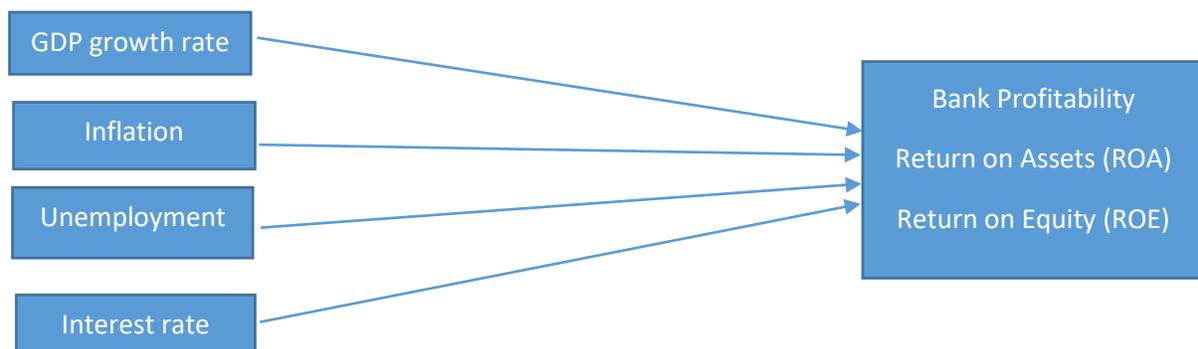
¹²²Bernhardt, K.L., et al. (2000). A Longitudinal Analysis of Satisfaction and Profitability. *Journal of Business Research*, Vol, 47(2), p: 161-171.

¹²³Terpstra, M., Verbeeten, F. H. M. (2014). Customer satisfaction: Cost driver or value driver? Empirical evidence from the financial industry, *European Management Journal*. Vol. 32(3), p: 499-508.

2.6. Macroeconomic determinants and profitability

The environments in which banks operate can affect their performance and also their strategic position. External determinants represent factors that are outside the influence of banks. So external factors are broad sectors or wide-ranging factors of the country that are beyond the control of the company and affect the profitability of the banks.¹²⁴

Figure 2.5. Macroeconomic factors that determinates profitability



Source: Author's self-conceptualization

The external environment defines the legal, political, economic, technological and social picture in which banks operate. Those factors are mainly related to the reflection of the economic and legal environment that affects the operation and performance of banks. These factors are called external because banks have no control over them, although banks can anticipate changes in the external environment and strategically position themselves to take advantage of them.

Depending on the nature other studies and purpose of each study, different factors can be used such as: GDP, inflation, unemployment rate, interest rates and CIP are external factors which are beyond the control or uncontrollable by the bank or the company's management but they affect bank profitability.

¹²⁴Poposka K., Trpkovski M., (2016). Bank Profitability prior and after the Crisis: Evidence from the selected Transitional Economies, Economic Development. Journal of the Institute of Economics, Vol1(2).

Moreover, macroeconomic (external) determinants are variables that are not related to the bank's management but reflect the economic and legal environment that affects the operation and the performance of bank.

2.6.1. GDP growth rate

GDP is one of the measures of economic growth for a country's economy which is measured in terms of the monetary value of all goods and services produced within the borders of a country during a year. Real GDP growth rates are a direct indicator of economic growth rates. Economic growth creates opportunities for employment of the economically active population. Similarly, if GDP is growing faster than the population growth rate, average household income should be rising and the rate of poverty is declining and the society should gradually have more resources to invest in vital social services and infrastructure.

Economic development of country is measured using the GDP growth rate and the extent economic growth contributes to bank's profitability:¹²⁵

$$GDP \text{ growth rate} = \frac{GDP_t - GDP(t-1)}{GDP(t-1)}$$

GDP growth is an important variable as it reflects the direction of demands for product/service of banks. A growing economy creates opportunities for credit activity, shifting the credit demand outward which causes rate to rise. Alternatively, low rate of GDP growth might weaken the demand for product/service. A high GDP growth rate creates many opportunities and leads to better profitability.

In general, increasing economic development of the country is expected to have a positive effect on bank profitability according to the literature review made by Demirguc-Kunt and Huizinga, 1999; Bikker and Hu, 2002; Athanasoglou et al., 2008; Nassreddine et al., 2013; Boitan, 2015. On the other hand, the unfavourable economic development result in credit losses and consequently in a lower bank profitability there is a negative effect based on the research analyses such as Albertazzi and Gambacorta, 2009; Lee and Kim, 2013; Apergis, 2009.

¹²⁵Drakos, K. (2002). The dealership model for interest margins: The case of the Greek banking industry. *Journal of Emerging Market Finance*, Vol.1 (1), p: 75-98.

According to Nassreddine et al. research analyses conclude that a high GDP growth rate lead to a period of high growth leads, investments and consumption. Therefore, economic growth of the country will have a direct impact in increasing the demand for loan as a main asset of the bank, in this way the income and the performance of banks gets better.¹²⁶

Moreover, Boitan research tried to understand the factors that influence bank profitability in the European Union (EU) countries. These results have led to a high and positive coincidence found from GDP growth rate to the bank profitability.¹²⁷

Additionally, an improvement in economic conditions, in addition to improving the solvency of borrowers, increases the demand for credit by individuals and firms, bringing positive effects on the profitability of the banks. Thus, increasing GDP growth is expected to show positive relationships with the profitability of banks.¹²⁸

In contrast, fragile economic conditions can worsen the quality of the loan portfolio, generating credit losses and increasing the provisions that banks have to hold, thus reducing bank profitability.¹²⁹

In general, regarding the relationship between GDP growth and profitability, results fund positive/negative effect. Since during the increase of GDP growth rate banks benefit from the improvement of customers' business and credit solvency, hence is expected to deal with higher demand for bank services/product, lower rate of loan default probability and higher fees and interest for their services/product. Hence, banks simultaneously are eager to increase the loan supply which will have positive affect on their profitability.

As a contrast of this, if GDP growth slows down, especially during recessions, it is believed that the loan portfolio as a majority of bank assets could get worsen the quality of the loan portfolio, defaults increase, can force increasing the provisions banks need to hold and therefore the bank income and returns reduce in this way. That is why there is a negative impact on bank profitability.

¹²⁶Nassreddine, G, Fatman, Sand Anis, J (2013). Determinants of Banks performance' Viewing Test by Cognitive Mapping Technique, A case of Biat', International Review of Management and Business Research, Vol.2(1).

¹²⁷Boitan, I., (2015). Determinants of Sustainable Banks' profitability. Evidence from EU Countries. Financial Studies, Vol. 19(1), p: 21–39.

¹²⁸Athanasoglou, P. Brissimis, S. dhe Delis, M. (2008). Bank-specific. Industry-specific and macroeconomic determinants of bank profitability. Journal of International Financial Markets. Institutions and Money. vol18 (2) p: 121-136.

¹²⁹Albertazzi, U., and Gambacorta, L., (2009). Bank profitability and the business cycle. Journal of Financial Stability, Vol. 5, p: 393-409.

2.6.2. Unemployment rate

Unemployment is one of the most serious macroeconomic “diseases”. The increase of the unemployment rate is often considered as a symptom of the economic recession phase. Unemployment as a macroeconomic problem that also causes costs which we divide into two groups: economic costs and social costs of unemployment.

The economic cost of unemployment causes a decrease in personal income as a result of job loss. Such situation leads to a reduction in living standards, where fewer products and services will be consumed which leads to a decrease in GDP on a national level. Then another aspect is that unemployed are a heavy financial burden for the government.

In addition to economic costs, unemployment is associated with social costs which, although difficult to express in value, are no less important. Social costs of unemployment can be expressed in the form of losses of human capital, declining dignity and deteriorating health of the unemployed and it can also serve as a potential for rising of the criminal actions in the country. The unemployment rate is the percentage of adults who are in labour force and actively looking for work but who do not have jobs.¹³⁰

$$\text{Unemployment rate} = \frac{\text{Unemployed people}}{\text{Total labor force}} \times 100$$

In literature review, the unemployment rate considers to be as one of the most important macroeconomic factors that affect the profitability of commercial banks. Since the unemployment rate has an influence on income. Higher unemployment rate could lead banks to delay the rise of income or even to cut them. On the other hand, lower unemployment rate enables employees to negotiate better working conditions. Therefore, unemployment rate and its changes may also be important for the ability of banks to control their operating expenses.

The literature review also proves that the unemployment rate has a negative effect on banks' profitability. In this context, Bolt et al., conclude that the unemployment rate directly affects average income, so this would affect both the ability of consumers to refund undertaken loans, so banks face augmented losses due to increased loan defaults and their ability to deposit.

¹³⁰Jureviciene, D., and Dofartaite, D., (2013), Commercial banks' activity dependence on macroeconomic indicators”,European Scientific Journal, Vol. 9(31), p: 173-184.

Furthermore, the whole demand for financial services, as well as new loans, is negatively affected by unemployment.¹³¹

In the same vein, Messai and Jouini in their empirical analyses of determinants of non-performing loans, emphasized that unemployment rate negatively affects the profitability of the banking institutions. This occurs as a result of negative impact that quality of loan portfolios has.¹³²

Similarly, research analyses of Jureviciene & Doftartaite of Lithuanian commercial banks revealed a negative relationship between unemployment and bank profitability. Since the higher rate of unemployment will reduce the demand of loan, the profitability will automatically be decreasing.¹³³

Moreover, according to Rauličkis and Jurevičienė the unemployment is negative and significant related to profitability of banks. This happens because the unemployment rate harm demand for new loans and credit risk.¹³⁴

Based on the above authors the unemployment rate is an important macroeconomic factor that negatively affects the profitability of the commercial banks. Since the unemployment rate, directly affects average income, this affect the ability of consumers to repay the already undertaken loans, to take new loans, deposit and overall the demand for other product/service that the bank offers, hence all those factors revealed a negative impact on the banks income and return.

2.6.3. Inflation

Inflation is one of the macroeconomic diseases and is considered a worrying problem for the whole economy as for firms and consumers in particular. Inflation is a general continuous increase of the price level in an entire economy over a period of time. In addition, from the above definition, it is necessary to emphasize that inflation is an economic phenomenon that there is pressure for prices to increase in most markets in the economy. That is why the inflation rate is the rate of changes in the price of any commodity.

¹³¹Bolt, W., de Haan, L., Hoeberichts, M., van Oordt, M. R. C., & Swank, J. (2012). Bank profitability during recessions. *Journal of Banking and Finance*, Vol. 36(9), p: 2552-2564.

¹³²Messai, A.S. and Jouini, F. (2013). Micro and Macro Determinants of Non-Performing Loans. *International Journal of Economics and Financial*, Vol 3(4), p: 852-860.

¹³³Jureviciene, D., and Doftartaite, D., (2013), Commercial banks' activity dependence on macroeconomic indicators", *European Scientific Journal*, Vol.9 (31), p:3-184.

¹³⁴Rauličkis, D., & Jurevičienė, D. (2018). Leading Indicators" Applicability to Forecast Profitability of Commercial Bank: Case Study from Lithuania. *Trends Economics and Management*, 12(31), p: 71-85.

The change of price levels is measured by the inflation rate.¹³⁵

$$\text{Inflation rate} = \frac{\text{Level of price (t)} - \text{Level of price (t - 1)}}{\text{Level of price (t - 1)}} \times 100$$

Moreover, inflation is another important macroeconomic indicator that affects the real value of both bank's expenses and income is the inflation rate. Therefore, inflation as well, reflects aspects of the business cycle. Inflation is an increase in the average level of prices and a price is the rate at which money is exchanged for goods or services. Low or medium levels of inflation in a country can have a positive effect on the business sector. Particularly, high levels of inflation however can harm companies and unexpected, but it can be very costly to an economy profitability by affecting the cost of inputs as well as reducing final demand for its output.

At the same time, inflation generally transfers resources from lender and savers to borrowers, because borrowers can repay their loans with birr that are worth less. In general, high inflation rates are associated with higher credit interest rates and thus higher incomes. On the other hand, sudden increases in inflation cause difficulties in cash flow for borrowers, which can lead to early termination of credit agreements and accelerate loan losses. Indeed, if banks are slow in adjusting their interest rates, there is a possibility that bank costs may rise faster than the bank's income.

An inflation rate that is fully anticipated increases profits as banks can appropriately adjust interest rates in order to increase revenues, while an unexpected change could raise costs due to imperfect interest rate adjustment.¹³⁶

Empirical findings on the relationship between inflation and profitability are mixed. Regarding this, some authors present the issue of the relationship between bank profitability and inflation, stating that the effect of inflation on bank profitability depends on how inflation affects the bank's wages and other operating costs.

The relationship between inflation and profitability was firstly introduced by Ravell when stated that the effect of inflation on bank profitability depends on how inflation affects both salaries and the other operating costs of the bank.¹³⁷ In the same way Grier and Perry analysis conclude

¹³⁵Saeed, M.S., (2014). Bank-related, industry-related and macroeconomic factors affecting bank profitability: A case of the United Kingdom. *Research Journal of Finance and Accounting* 5(2) p: 42–50.

¹³⁶ Ezra, M., (2013). Determinants of Commercial Bank Profitability in Sub-Saharan Africa', *International Journal of Economics and Finance*, vol.5.

¹³⁷ Revell, J., (1979). Inflation and financial institutions. *Financial Times*, London.

that the effect of inflation on banking performance depends on whether the inflation is fully anticipated or only unanticipated. If the inflation rate is fully anticipated and interest rates are adjusted according to the bank's management observation, the bank can adjust interest rates appropriately to increase revenues faster than costs, which should have a positive impact on profitability.¹³⁸

Otherwise, unexpected rises in inflation cause cash flow difficulties for borrowers, which can lead to premature termination of loan arrangements and precipitate loan losses. Indeed, if the banks are sluggish in adjusting their interest rates, there is a possibility that bank costs may increase faster than bank revenues and this will lead to negative effect on banks profitability.¹³⁹

The results of empirical analysis about the relationship between inflation and profitability are mixed. Empirical analysis conducted by Demirgüç-Kunt & Huizinga, 1999, 2001; Guru et al., 2002; Athanasoglou et al., 2005, 2008; Vong & Chan, 2006; Tunay and Silpar, 2006; Pasiouras and Kosmidou, 2007; Alexiou and Sofoklis, 2009; Flamini et al., 2009; Garcia-Herrero et al., 2009; Gul et al., 2011; Ponce, 2013; Lelissa, 2014; Sufian, 2011; Trujillo Frederick, 2015, confirm a positive relationship between inflation and profitability.

In this context, Demirgüç-Kunt and Huizinga analysed the banking sector in 80 different countries by using regression analyses. The results find that the relationship between inflation and bank profitability indicates that bank income increases more because of inflation than do bank costs, and high real interest rates are associated with higher interest margins and profitability. This especially happens in developing countries and may reflect the fact that demand deposits in developing countries frequently pay zero or below-market interest rate. So, they confirmed a positive relationship between the inflation rate and profitability of the banks.¹⁴⁰

However, the studies investigate the impact of the inflation on banking sector in Turkey done by Tunay and Silpar. Data analyses confirmed that inflation is an important macroeconomic determinant of profitability of commercial banks.¹⁴¹

Staikouras, C., Wood, G., 2003. The determinants of bank profitability in Europe. In: European Applied Business Research Conference Proceedings, Venice.

¹³⁸Grier, KB., Peny M.J. (1998), On inflation and inflation uncertainty in the G7 countries, *Journal of International Money and Finance*, 17, p: 671-689.

¹³⁹Perry, P., (1992). Do banks gain or lose from inflation? *Journal of Retail Banking* 14, p: 25–30.

¹⁴⁰Demirgüç-Kunt, A., and Huizinga, H., (1999). Determinants of commercial bank interest margins and profitability: Some international evidence. *The World Bank Economic Review* 13(2), p: 379–408.

¹⁴¹Tunay, K. Batu, and A. Murat Silpar. (2006). *Türk Ticari Bankacılık Sektöründe Karlılığa Dayalı Performans Analizi-I.Araştırma Tebliği Serisi, 1. İstanbul: Türkiye Bankalar Birliği.*

On the other hand, there are empirical analyses conducted by Abreu and Mendes, 2000; Boyd, J. H., & Champ, B, 2006; Saeed, 2014 confirm a negative relationship between inflation and profitability. In this context, Abreu and Mendes studied the determinants of bank's interest margins and profitability for some European countries in the last decade. Regression analyses results find out a negative coefficient of inflation for the European countries.¹⁴²

Also, Saeed analysed the profitability of the banking sector in the United Kingdom before, during, and after the financial crisis of 2008. Based on the regression analysis the conclusion is that inflation rate affects bank profitability negatively for banks in UK.¹⁴³

The overall conclusion about the relationship between inflation and bank profitability is a bit ambiguous. If the inflation rate is fully anticipated it is expected to have positive relationship, but if the opposite happens the banks will mostly sluggish adjusting their rates which might make the link of inflation to come as a negative effect on the profitability of the banks.

2.6.4. Interest rates

Interest rate is defined as a rate that the bank or other lender charges to borrow its money, or the rate a bank pays its savers for keeping money in its safe. Therefore, interest rates influence personal decisions, such as to increase consumption to invest in real estate, to buy a car, to invest in bonds, or to put funds into a savings account. The interest rate is measured¹⁴⁴:

$$\text{Interest rate} = \text{Loans interest rate} - \text{Deposit interest rate}$$

The interest rate levels are also part of the macroeconomic factor that affect the profitability of the bank. Banks pay interest on deposits on one hand and on the other hand they charge interest on loans and advances that have been lent to borrowers. The difference between these two interest rates defines profit and loses during the time. So, the interest rate of the bank is extremely important factor of the bank's profit and changes during time.

It is generally supposed that, in long term, an environment of rising interest rate would lead to higher banking sector profitability by increasing the spread between the saving and the

¹⁴²Abreu, M., & Mendes, V., (2001). Commercial Bank Interest Margins and Profitability: Evidence for Some EU Countries, presented on the 50th International Atlantic Economic Conference, Thessaloniki, Greece.

¹⁴³Saeed, M.S., (2014). Bank-related, industry-related and macroeconomic factors affecting bank profitability: A case of the United Kingdom. *Research Journal of Finance and Accounting*. Vol (5), p: 42–50.

¹⁴⁴Staikouras, C., Wood, G., (2003). The determinants of bank profitability in Europe. *International Business & Economic Research Journal*, Vol. 3(6), p: 57-68.

borrowing rates. On the other hand, an environment of low interest rate has a negative effect on bank profits.

Among the studies that found out a positive relationship between interest rates and bank profitability are we can highlight few such as Samuelson, 1945; Short, 1979; Bourke, 1989; Molyneux and Thornton,1992; Demirguç-Kunt and Huizinga,1999; Staikouras and Wood, 2003; Claeys and Vander Vennet,2008; García-Herrero et al., 2009.

The effect of interest rates in banks profitably was firstly identified by Samuelson in 1945. It is concluded that under common conditions, bank profits increase with rising interest rates.¹⁴⁵ Furthermore, Short in his research analysis done in Canada, Western Europe and Japan, he found a positive relationship between nominal interest rates and return of capital.¹⁴⁶

Regarding this, Molyneux and Thornton also examine the profitability of banks in 18 European countries during the period from 1986 to 1989. Finding showed that there is a significant positive relationship between the profitability and the level of interest rates.¹⁴⁷

Very similar research have been made by Saunders and Schumacher who analysed the effect of interest rate and profit of the banks in Europe and United States. They took in consideration 614 banks in consideration during the period between 1988 to 1995. Results showed that the interest rate has a positive effects on bank's profit.¹⁴⁸

On the other hand, Hanweck and Kilcollin analyse the effect of profitability and interest rate in banks in the USA during the 1976-1984 period. Results show that this relationship that falling interest rates during recession lead to slower growth in loans and increase in loan loss. Consequently, banks, particularly the small ones, may have difficulty in maintaining profit as market rate drops.¹⁴⁹

Mostly, the relationship between interest rate and profitability is expected to be positive and negative. Based on the condition of the environment if we have economic growth and higher

¹⁴⁵ Samuelson, Paul A. (1945). The Effect of Interest Rate Increases on the Banking System. American Economic Review 35, p: 16-27.

¹⁴⁶ Short, B.K., (1979),. The relation between commercial bank profit rate and banking Concentration in Canada, Western Europe and Japan, Journal of Banking & Finance. Vol. 3(3), p: 209-219.

¹⁴⁷Molyneux, P. and J. Thorton, (1992). The determinants of European bank profitability. Journal of Banking and Finance, Vol. 16(6), p: 1173-1178.

¹⁴⁸Saunders, A. & Schumacher, L. (2000). The determinants of bank interest rate margins: an international study. Journal of international Money and Finance, 19(6), p: 813-832.

¹⁴⁹Hanweck, G. and Kilcollin T. (1984). Bank Profitability and Interest Rate Risk. Journal of Economics and Business, Vol. 36, p: 77-84.

expected real returns on investment, interest rates will be rising and have positive affect on banks profitability. If this is not the case than the opposite will happen.

2.7. Methods of measurement of Banks' Profitability

Profitability measures the extent to which a business generates a profit from the factors of production: labour, capital, management and technology. Those factors are crucial for the permanent existence of a bank and its success as a going concern. Moreover, profits represent analysis is focused on the relationship between income and expenses and on the level of profits relative to the size of investment in the business.

In other words, the profit represents the return on equity invested in bank. In fact, it is for this return that shareholders are willing to provide the capital that will enable the bank to fulfil its role as the main credit institution in the economy. Hence, though different ratios from financial statements, it is possible to track the different aspects of banking activity. Only a few are considered to be of primary importance in determining the financial soundness and profitability of a bank. Those rations are involved in different methods of measures banks performance, such as:

- 1) DEA Approach
- 2) CAMELS Approach
- 3) DuPont Analyses

2.7.1. DEA Approach

Data Envelopment Analysis (DEA) is a linear-parametric mathematical (linear) programming approach for assessing the performance of homogenous organizational units and is increasing being used in banking. The first DEA approach was introduced by Charnes, Cooper and Rhodes (1978) is a well-established approach for measuring relative efficiency and can be a management tool in identifying inefficiencies and potential improvements for maintaining and enhancing competitive advantages and is based o the assumption of constant return to scale. Later, in 1984 the model has been modified by Banker, Charnes and Cooper based on the assumption of variable return to scale. Both models are based on the input and output and are applied in many different areas of research.

Most of the banks research analysis efficiency based on DEA use the intermediation approach, which views banks as intermediaries between the surplus units (savers) and deficit units (borrowers). Banks use inputs, i.e. labour and capital, to transform deposits into earning assets. In the intermediation approach mostly used inputs are: salary expenses, value of fixed assets, amortization, interest expenses, non-interest expenses, capital and deposits; Mostly used outputs are: loans, interest income, noninterest income and investment assets. The main assumption is that all banks under investigation face the same technology that defines their production frontier.

First use of DEA approach in research analyses at banking system was by Sherman and Gorld (1985). They used DEA approach to analyse the operating efficiency of 14 saving bank branches. Based on DEA they find out the way how to reduce or eliminate inefficiency by adjusting input and output of inefficient bank branches.¹⁵⁰

Later, Pastor and col. analysed the efficiency of banks in US and in selected countries of Europe. They have compared the difference between European and US banking systems based on the added value approach. The results reveals, that France, Spain and Belgium performed as the countries with the most efficient banking systems, while on the other hand the UK, Austria and Germany show the lowest efficiency levels.¹⁵¹

Casu and Molyneux analysed, based on the non-parametric DEA approach the efficiency of 750 selected European banks in the period between 1993 and 1997. In their studies they used the intermediation approach to specify two outputs (total loans and other earning assets) and two inputs (total costs and total customers and short-term funding). Overall, the results found that the DEA results showed relatively low average efficiency scores. They concluded that there was a difference in the efficiency level across European banking systems and that this difference was due to each country's specific factors related to banking technology.¹⁵²

In the same view Yilmaz and col. measure the efficiency of banking system in Turkey between the years 2007 and 2010. They took in consideration 30 commercial banks, while the intermediation approach was used. In their study they compared the efficiency of foreign and

¹⁵⁰ Sherman HD and F Gold (1985). Bank Branch Operating Efficiency Banking and Finance. Vol. 9(2): p: 297-315.

¹⁵¹Pastor, J. M., F. Pérez and J. Quesada. (1997). Efficiency Analysis in Banking Firms: An International Comparison." European Journal of Operational Research. Vol.98, p: 395-407.

¹⁵²Casu, B. & Molyneux, P, (2003). A Comparative Study of Efficiency in European Banking. Applied Economics, Vol.35, p: 1865-1876.

domestic banks and the results showed that the domestic banks were more efficient in all evaluated years.¹⁵³

Also, Micajkova and Poposka estimate the efficiency of the banking sector of the Republic of Macedonia for the period 2008-2011 and they used Data Envelopment Analysis (DEA), both CCR and BCC model based on the intermediation approach. The results showed that increase of the average efficiency from 2008 to 2010 and an efficiency decrease in 2011, are the main reason of inefficiency and happen due to scale of inefficiencies. Concerning group of banks, the group of large banks has highest pure efficiency scores but the greatest scale of inefficiency. The group of small banks is technically the least efficient.¹⁵⁴

The data envelopment analysis as a non-parametric methodology for measuring the efficiency of decision making in different area is also used in the banking industry. So, DEA approach, being an extreme point method, enables the construction of a frontier or a 'virtual' efficiency benchmark as a linear combination of efficient entities with the best combination of inputs and outputs among the observed entities. Also, DEA results, motivate management to use the results which based on the findings can be further evaluated.

2.7.2. CAMELS Approach

The CAMEL rating system has become an unavoidable tool for bank examiners and regulators. This rating ensures the financial health of the bank by reviewing banking aspects through a variety of information, through different ratios. The Uniform Financial Institution Rating system, commonly referred to the acronym CAMEL, was adopted by the Federal Financial Institution Examination Council on November 13, 1979 and then adopted by the National Credit Union Administration in October 1987. It appears to be an effective internal supervisory tool for evaluating the soundness of a financial firm on the basis of identifying those institutions requiring special attention or concern. CAMEL is acronym for the five components of soundness and financial health of banks:¹⁵⁵

¹⁵³Yilmaz A. A., e all. (2013). Bank Efficiency Analysis in Turkish Banking System. Paper presented at the WEI International Academic Conference, in Antalya, Turkey,

¹⁵⁴Micajkova, V., & Poposka, K. (2013). Efficiency of Macedonian banks: A DEA approach. *Research Journal of Finance and Accounting*, 4(12), 141-149.

¹⁵⁵Uniform Financial Institutions Rating System (1997). *Statements of Policy*. The United States: Federal Deposit Insurance Corporation (FDIC).

- a) C- Capital Adequacy
- b) A- Assets
- c) M- Menagment Capability
- d) E- Earnings
- e) L-Liquidity

This system was proven by a very successful tool for overseeing and evaluating banks' performance. This is a system of classification composition based on the financial bank. The five key performance dimensions – capital adequacy, asset quality, management quality, earnings ability and liquidity– are to be evaluated on a scale of 1 to 5 in ascending order. Following is a description of the graduations of rating:

- *Rating 1* indicates strong performance: **BEST rating**.
- *Rating 2* reflects satisfactory performance.
- *Rating 3* represents performance that is flawed to some degree.
- *Rating 4* refers to marginal performance and is significantly below average
- *Rating 5* is considered unsatisfactory: **WORST rating**.

The numerical rating in the CAMEL is represented in the following numbers (Table 2.2)

Table 2.2. Numerical ratings in CAMELS

1. STRONG	It is the highest rating and is indicative of performance that is significantly higher than the average.
2. SATISFACTORY	It reflects performance that is average or above; it includes performance that adequately provides for the safe and sound operation of the banks.
3. FAIR	Represent performance that is flawed to some degree. It is neither satisfactory nor unsatisfactory, but is characterized by performance of below average quality.
4. MARGINAL	Performance is significantly at below average; if not changed, such performance might evolve into weaknesses or conditions that could threaten the viability of the bank.
5. UNSATISFACTORY	Represents the lowest rating and indicative of performance that is critically deficient and in need of immediate remedial attention. Such performance by itself or in combination with other weakness, threatens the viability of the institution. Therefore, stakeholders are expected to take the necessary reactive and proactive measures towards the prosperity of the banks.

Source: Poposka Klimentina. “Commercial Banking”; “Success and profitability”. Institute of Economics-Skopje, 2008.

Azizi and Sarkani research is carried out to assess the performance of Mellat Bank by adopting the CAMEL model. Statistical tools were applied to analyse the data. Results of the study indicate that there is a positive significant relationship between the indices of liquidity, quality of management and earnings with financial performance. Yet, no relationship was seen between capital adequacy and assets quality with bank financial performance and multiple regression test showed only a positive significant relationship with financial performance in management quality section. As a result, Mellat Bank has better financial performance in management quality section.¹⁵⁶

According to other researchers, such as Muhmad and Hashim who analyse the performance of domestic and foreign bank operating in Malaysia by utilizing a CAMEL framework in the period of 2008-2012, the outcome shows that capital, asset quality and liquidity have a significant effect on the execution of Malaysian banks.¹⁵⁷

Sangmi and Nazir highlighted that the banks in their study were in sound and satisfactory position and so far as capital adequacy, asset quality, management capability and liquidity were concerned. This evaluation has been done by using CAMEL parameters, the latest model of financial analysis.¹⁵⁸

Atikoğulları M uses a CAMEL framework to assess the financial performance of five major banks in the post period of 2001, although the results suggest that the profitability of banks and management quality have improved, whereas capital adequacy and liquidity level, have deteriorated which requires an exceptional attention for the future of the banking sector. By exploring a number of empirical studies, this is strongly confirmed that a CAMEL framework is widely used to evaluate financial performance of banks.¹⁵⁹

CAMEL approach model plays a crucial role in the supervisory process and in identifying bank problem. Also, through CAMEL approach it is possible to analyse trends over a period of time, along with or ratio-based model used to evaluate the performance of the banks with the help

¹⁵⁶Azizi, M., Sarkani, DYA. (2014). Review Financial Performance of Mellat Bank according To Camel Model.A Journal of Multidisciplinary Research.Vol.3 (1), p: 32-42.

¹⁵⁷Muhmad, S.N., and Hashim, H.A... (2015). Using the Camel Framework in Assessing Bank Performance in Malaysia. International Journal of Economics, Management and Accounting. Vol23 (1), p: 109-127.

¹⁵⁸Sangmi, M., & Nazir, T. (2010). Analyzing financial performance of commercial banks in India: Application of CAMEL model. Pakistan Journal of Commerce and Social Sciences, Vol. 4(1), p: 40-55.

¹⁵⁹Atikoğulları, M., (2009) .An Analysis of the Northern Cyprus banking Sector in the Post - 2001 period Through the CAMEL approach, International Research Journal of Finance and Economics, Vol.32, p:212-229.

of different criteria, viz. Capital Adequacy, Asset Quality, Management Quality, Earnings and Liquidity data is provided by the management analysts, investors and supervisory agencies with information about improving or failing the bank's financial condition.

2.7.3. DuPont Analysis

One of the most important analysis to measure the performance of commercial banks is the analysis of profit-return through return on equity (ROE). The DuPont or REO framework breaks down this ratio into several parts in order to identify existing or potential financial management and risk exposure problems.

The ROE framework starts with the ROE coefficient as the most common coefficient used to measure the profit-flow of banks and then breaks it down into several other elements in order to identify the advantages and disadvantages of the bank's performance.

DuPont comes from DuPont Corporation that started using this formula in 1918 by F. Donaldson Brown, an engineer at Du Pont Corporation who was acquiring to analyse the finances of General Motors of which Du Pont had just purchased 23 percent of its stock. Brown, recognized a mathematical relationship that existed between profitability and return on equity (ROE) that was determined by return on assets (ROA).

As it is known ROA influences both profitability and efficiency, operating decisions of the banks in aspects of planning and controlling and will be more focused on increasing ROA, but after the first modification of the DuPont model shift the concentration from ROA to ROE, including debt or leverage as a third part of attention. This led to the first major modification of the original Du Pont model and made the model a powerful tool for strategic decision making within a bank in order to increase ROE.¹⁶⁰

Lately, there are lots of modification of the DuPont model done, including a combination of five ratios to determinate ROE.

These are first ratios of the modified Du Pont model. These are:

1. Operating profit margin: (Earnings Before Interest & Taxes or EBIT / sales)

¹⁶⁰Collier, H.W., McGowan, C.B. and Muhammad, J. (2006). Financial analysis of financial institutions in an involving environment. University of Wollongong. Faculty of Business Research Online. p: 105-114.

2. Capital turnover: (sales / invested capital)
3. Financial cost ratio: (Earnings Before Taxes or EBT / EBIT)
4. Financial structure ratio: (invested capital / equity)
5. Tax effect ratio: (Earnings After Taxes or EAT / EBT)

ROA helps managers to take decisions on operating and investment activities and indicates the company's profitability for all the capital owners.

Conducted to Mihaela et al. studied, who analyses the top 20 most profitability firms over the World in 2009 using DuPont model, find out that they are not the most attractive ones for investors. They found out that firms do not preserve their ranks when indicators or ratios such as ROA (return on assets), ROE (return on equity) or ROS (return on sales) are taken into consideration.¹⁶¹

Saunders analysis for financial institutions affords a model that is based on the DuPont model analysis return on equity ratio. Based on his research we can conclude that the return on equity model divide performance into the three components that determine return on equity: net profit margin, total asset turnover and the equity multiplier. The ration of profit margin is constructed by components of the income statement. Total asset turnover is constructed by left-hand side of the balance sheet which is composed of the asset accounts. The equity multiplier is constructed by the right-hand side of the balance sheet which is composed of liabilities and owners' equity.¹⁶²

In the same view Carl et al. suggested a model which can be used to analyse the financial position of a bank based on the DuPont model of financial analysis. They used the DuPont model of financial analysis that derived from an analysis of return on equity that involves of three parts:

- 1) operating efficiency as measured by profit margin,
- 2) asset use efficiency as measured by total asset turnover
- 3) financial leverage as measured by the equity multiplier.¹⁶³

¹⁶¹Mihaela H, Claudia, O., and Lucian, B. (2010), A DuPont Analysis of the 20 Most Profitable Companies in the World, 2010 International Conference on Business and Economics Research IACSIT, p:45-48.

¹⁶²Saunders, Anthony (2000), Management of Financial Institutions, Third Edition, McGraw Hill.

¹⁶³Carl, B., J. McGowan, R. Andrew and Z. Stambaugh. (2011). Financial Analysis Of Bank Al Bilad, International Business & Economics Research Journal, Vol.10(3), p:12- 13.

Coefficient trend analysis through DuPont analysis over a period of time, together with the absolute coefficient levels provide management, analysts, investors and supervisory agencies with information regarding the improvement or failure of the bank's financial condition.

3. INNOVATIVE BANKING TECHNOLOGIES AS A FACTOR ON PROFITABILITY OF DYNAMIC BANKING INDUSTRY

3.1. The structure and nature of the concept “innovation”

During the last two decades, innovation has been an important topic for researchers, because of its influence and contribution in economic growth and to the stability of financial systems. Profitability and effective banks are the main important condition for the further economic development of the country also they have effect on the growth rates of country economy. In process of achieving a market condition of managing bank system should implement an innovation technology in order to increase competitiveness.

Based on the literature review, financial innovation has been defined in different ways. According to Schumpeter innovation means something new that may involve a new good or higher quality than their previous counterpart, new production, new source of supply, the opening of new markets.¹⁶⁴

On the same view, Rogers definition for innovation is prescribed as an idea, practice or object that is perceived as new by an individual or group (or organization). He also refers the words “technology” and “innovation” as the same one, meaning that technology is an instrumental action that decrease the uncertainty in the cause-effect relationships in order to achieve wanted outcome.¹⁶⁵ Based on the Solans definition it is mentioned that financial innovation on the same way as technological advances simplify access to information, way of the payment and trading, and the needs for new financial instruments and services, new way of organization which will develop and complete the financial market.¹⁶⁶ Also, Frame and White defined an innovation new concept, a new organizational product that helps to reduce cost or risk for banks, the overcoming

¹⁶⁴Schumpeter, J. A. (1934). The theory of economic development – An inquiry into profits, capital, credit, interest, and the business cycle. Cambridge, MA: Harvard University Press

¹⁶⁵Rogers, E.M. (2003). Diffusion of innovations (5th ed.). New York: Free Press.

¹⁶⁶Solans, D., (2003). Financial innovations and monetary policy. Speech, Delivered at the 38th SEACEN Governors Conference and 22nd Meeting of the SEACEN Board of Governors on Structural Change and Growth.

of agency problems and information asymmetries, and improvement of the service for the whole financial system.¹⁶⁷

While defining financial innovation it is important to mention that innovation can be separated into three groups, according to where innovation takes place:¹⁶⁸

- Process innovation means to a new process that gives the opportunity for a new financial product and service.
- Organizational innovation involves a new organizational structure which will be implemented in the company and will influence the whole system of the company.
- Product innovation are new products or services created to fulfil customers' needs based on the market demands.

On the other hand, Lerner & Tufano, divide innovation into two categories, which are product and process innovations. The products are new derivative contracts, new corporate securities or new forms of pooled investment products, the process are new means of distributing securities, processing transactions or pricing transactions.¹⁶⁹

Nowadays innovation is an alternative word for the development countries, progressive financial system and all other sectors of the economies of the country. Innovation contains two parts: the first one is the act of invention and the second one is diffusion even though those two parts are connected with each other because most of the financial innovations are evolutionary adaptations of prior products.

Financial innovation and technological progress have encouraged the creation of many financial products, services, production processes, and organizational structures. Innovation is not the idea of just the creation of a new thing, but it is actually, bringing it to market, putting into practice and developing it in a method that leads to new products, processes or technologies that add value or improve the quality. Innovation also means walking in the same way and in the same direction with the new technology and trying to use it to generate new value to bring new and significant change in society.

¹⁶⁷Frame W.S., White L.J. (2004) Empirical studies of financial innovation: lots of talk, little action? *Journal of Economic Literature*. Vol. 42, p: 116-144.

¹⁶⁸Vargas, A. R. (2009). Assessing the contribution of financial innovations to the production of implicit services of financial intermediation in Costa Rica. *IFC Bulletin*, Vol.3, p: 445-466.

¹⁶⁹Lerner, J., & Tufano, P. (2011). The consequences of financial innovation: A counterfactual research agenda.

3.2. New banking financial technology with focus on innovations

The banking sector is changing due to technological revolution, globalization, innovation processes, and new ideas. Nowadays banks concentration is in investments for advanced technology and innovation it is made to improve operational procedures in order to serve the customer in accordance with their needs and requirements.

Meanwhile, the improvement of technology and innovation in products, process and organizational of banks could help to minimize the growing risks faced by the sector itself. According to Berger, investment in technological improvements such as ATM's and internet banking, which are considered as product (ATM) and process (internet banking) innovations, are proved to be positively linked with bank profitability and also will reduce costs and increase the quality of lending favour the client.¹⁷⁰

To understand how the banking industry has evolved over time, we need to understand the process of financial innovation, which has transferred the entire financial system. Banking sector develop new products and processes to meet their needs, as well as those of customers driven by the desire to improve profitably.

Financial innovations can lead to higher profits, but can also result in financial disasters. There are cases where banks are not the creator of financial innovation. They also use the innovations developed by other sectors.

The most important source of changes in supply conditions that has stimulated financial innovation is the improvement in technology information. Technology information has had two effects. First, it has reduced the costs of processing financial transactions, creating new financial products and services. Secondly, it has made it easier for investors to get information. Bank's focus should be new technology and innovation to improve efficiency, increase productivity and overall performance.

¹⁷⁰Beck, Th., (2003), Financial Development and Economic Growth: Stock Markets versus Banks? Private Sector Development, Proparco's Magazine, Africa's Financial Markets: A Real Development Tool? Vol.5

The development of technology has led to new product and service and also the ability to provide services electronically. The adoption of new technology in banking system has become a standard as way of securing a competitive advantage in the electronic age.

Banks are interested in increasing customer service that can always be available to customers while generating profit for the bank requires investment costs. Thus, the innovations in banking sector include:

a) Electronic banking

An integral part of a bank in this century is that with the development of technology the need to advance with technology is an imperative. Development of new electronic banking such as mobile software, development of automation and digital security are very important.

The astonishments of modern computer technology have also enabled banks to reduce transaction costs and enable the customer to interact with an electronic banking device in a place with a human being.

Nowadays, banks offer different forms of online banking or electronic banking. The challenge of this industry is to design this new channel for providing banking services in a simple and reliable way to be used by customers. This service provided by banks must meet two basic conditions which are: to be safe and to be functional and for this service clients pay a certain fee.

According to Santo regarding the services that banks offer through e-banking, they are classified into four groups:¹⁷¹

- Informative - The bank uses the online system to inform clients about the products and services it offers in electronic way.
- Communicator - This system enables communication between the client and the bank in electronic way.
- Interaction with the user - The client is informed about the products and services that the bank offers by clicking on each product or service to get the relevant information. If the client is interested in getting a loan, they can calculate the interest rate, the monthly online instalment and can apply online. The same applies to deposits.

¹⁷¹Santos, J. (2003) .E-service quality: a model of virtual service quality dimensions, *Managing Service Quality: An International Journal*, Vol. 13(3), p: 233-246.

- Transactional - The online system enables the client to perform transactions by himself. The client can transfer money within his own bank accounts to any other bank, apply for loans, for debit/credit card and make various payments. So, all the typical services of a traditional banking are performed by online banking.

Compared to traditional banking, electronic banking offers easy, convenience and access for their customers so, that they can use the banking site for all types of transactions in a secure environment. Customers can interact on the banking site 24 hours a day, seven times per week (24/7).

E-banking can improve the efficiency of a bank and increase competitiveness. This way interested and potential customers can benefit more and this will affect transactions way of doing.

So, electronic banking has many benefits such as simpler monitoring of the bank accounts, buying and selling goods and services, paying various bills, transferring money from any place and at any time, reducing cost and saving time.

Electronic banking includes many services such as: credit card, debit card, ATM mobile banking.

b) Debit and credit card

Credit cards are the most standardized instruments that are used to obtain money, property, or service on credit with specific credit terms established by the issuing bank.¹⁷²

The largest spread of use of the credit cards was before the Second World War. These cards had a high cost so, they were issued only to selected individuals and businesses that could afford large purchases. In the late 1960s, technology improvements reduced the transaction costs of providing credit card services, and this increased the likelihood that credit card banking programs would be profitable. Consumers had benefits, because credit cards have been more widely accepted than loans, as a method of paying for purchases, especially abroad and have allowed consumers to get loans easily.

The success of credit cards has led the banks to come up with a banking innovation called debit cards. Debit cards are an essential “tool” which give the costumers access to their funds to pay or to withdraw money at ATM machines.¹⁷³

¹⁷² Woelfel, C.J. (1994). *The Dictionary of Banking*. Illinois, NY: Probus Publishing.

¹⁷³ Fitch, T.P. (2000). *Dictionary of Banking Terms*. Hauppauge, NY: Barron’s Educational Series, Inc.

Thus, debit cards are used for purchases in the same way as credit cards, but unlike a credit card in which the buyer is issued a credit to which he owes, debit card purchases only deduct the amount of the purchase from the cardholder's bank account.

Using debit and credit card have some benefits based on Zimman analyses. Those benefits are:

- Acceptance: credit and debit card have same high acceptance rate
- Security: credit and debit card have same level of protection and incurred the same fraud risk
- Time costs: credit and debit card do not requires going to bank
- Portability: credit and debit card have similar advantages
- Pecuniary costs: the different consequences/costs for a customer that would exceed his line of credit are: over limit fee, decrease of the credit score, penalty pricing.¹⁷⁴

Moreover, debit and credit cards are payment instruments issued by banks, so that customers can access their funds at any time to make payments, as well as to withdraw cash from ATMs. Although bank cards are a technology invented many decades ago, their use in the Republic of North Macedonia and the region still remains in the shadow of cash which dominates payments in the economy. However, the trends of banking customers in recent years are in direction of using digital services, including bank cards.

This trend of increased use of credit cards can be confirmed also in the Macedonian banking sector. The following table shows the number of Credit Card and Debit Card cards for the period 2005-2018 in Republic of North Macedonia. From the table we see that we have a significant increase from year to year in the usage of bank cards offered by banks operating in the Republic of North Macedonia.

Table 3.1. Number of debit and credit card in circulation in the Republic of North Macedonia period 2005-2018

Year	Na. of CREDIT CARD in circulation	Na. of Debit CARD in circulation	Total CARD
2005	75,859	77,783	153,642
2006	115,827	221,617	337,444

¹⁷⁴ Zinman, J. (2009), Debit or Credit? Journal of Banking and Finance, Vol33(2), p: 358-66.

2007	178,630	353,551	532,181
2008	197,740	481,477	679,217
2009	267,947	559,198	827,145
2010	374,159	1,048,183	1,422,342
2011	351,545	1,098,800	1,450,345
2012	350,580	1,156,562	1,507,142
2013	368,135	1,188,947	1,557,082
2014	369,953	1,231,492	1,601,445
2015	381,639	1,289,126	1,670,765
2016	564,691	1,316,985	1,881,676
2017	548,968	1,273,029	1,821,997
2018	550,088	1,271,395	1,821,483

Source: Authors' compilation based on the Report on the use of payment cards and devices for their use in the country, National Bank of the Republic of Macedonia.

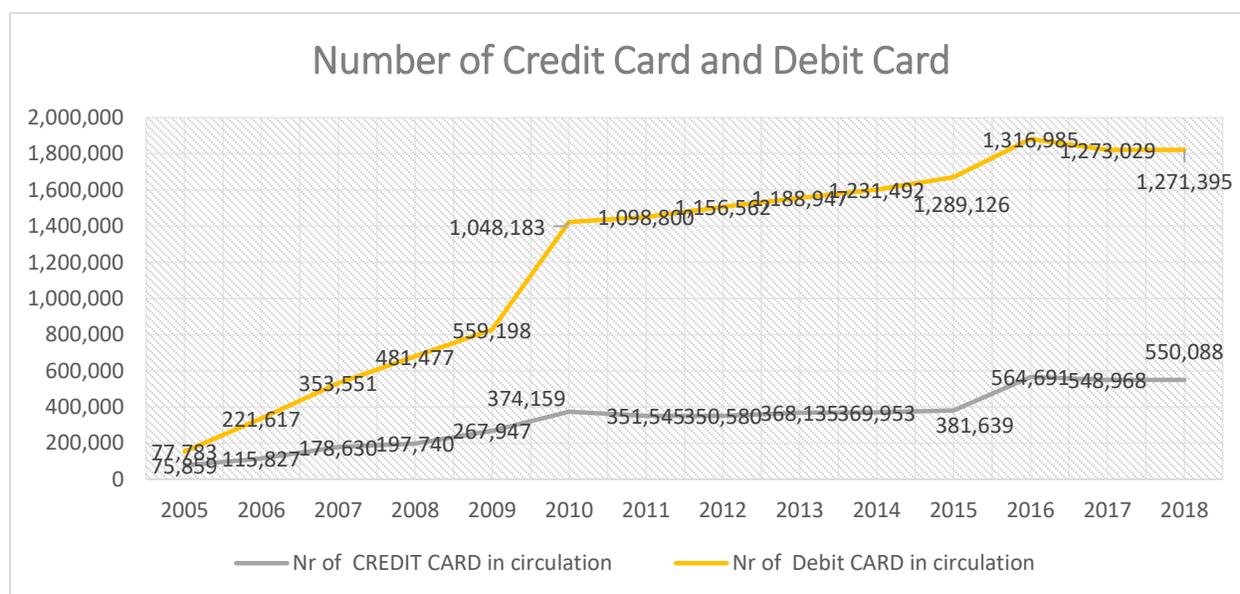
At the end of 2018, the number of cards in use was about 1.82 million cards, 550 thousands of which are Credit Cards and 1.27 million Debit Card. The trend of the largest increase of cards in use was recorded in the period 2005 - 2010. 1.42 million cards were in use by the end of 2010 which represents an increase of 826% or 1.27 million cards more than in 2005. The peak of usage during this period was recorded for Debit Cards which at the end of 2010 was about 1.05 million cards in use, marking an increase of 1248% or about 970 thousand cards more than in 2005. Credit Cards had also marked a significant increase during this period, at the end of 2010, about 374 thousand Credit Cards were in circulation, marking an increase of 393% or 298 thousand more cards than in 2005.

The trend of increasing the number of cards in use has continued in the period 2010-2015. Thus, at the end of 2015, there were 1.67 million cards in use, which represents a slight increase of 17.5% compared to 2010. Out of 1.67 million cards in use at the time, 1.29 million were Debit Cards and 382 thousand were Credit Cards. The biggest impact on this increase of cards in use during this period had the Debit Card marking an increase of 23% or 241 thousand more Debit Cards, while Credit Card during this period had a number almost the same as in 2010 marking a slight increase of 2% or 7,460 Credit Card more.

From 2015 to 2018 we have a stabilization of the momentum of card use growth. That is why in 2018, about 1.82 million cards were registered in use, marking a slight increase of 9% compared to 2015. This is insignificant because compared to the period 2010-2015 where the number of Credit Cards did not have a large growth trend, from 2015 onwards the number of Credit Cards has started to increase significantly marking an increase of 44% more in 2018 than in 2015. The numbers of Debit Cards in use has almost remained the same as in 2015.¹⁷⁵

The following chart explains the trend of moving the number of bank cards in the Republic of North Macedonia in the best way:

Figure 3.1 Number of Credit and Debit Card on Republic of North Macedonia period 2005-2018



Source: Authors' compilation based on the report on the use of payment cards and devices for their use in the country, National Bank of the Republic of Macedonia

This confirms that the behaviour of the clients also have a key role in introducing new products. The increasement in bank card transactions is a positive indicator both for the replacement of cash with card transactions which in direct way have impact on increasing the non-interest income for banks and for the whole economy of the country as well. There are many benefits and advantages using the bank cards to pay and here are some of the most important.

¹⁷⁵ Report on the use of payment cards and devices for their use in the country, National Bank of the Republic of Macedonia.

- Higher security and efficiency in payments, enabling payment even for transactions for small and daily amounts;
- Bank card payments can be made on all POS equipment in the Republic of North Macedonia banks, without commission and regardless of the amount you pay;
- Bank card payments help fight the informal economy and prevent the spread of counterfeit money;
- Easier and faster control of payments through electronic banking report;
- Increase noninterest income for banks which has a direct contribution on bank profitability

The banking sector in the Republic of North Macedonia continuously contributes to the digitalization of the process although there is a positive trend of increased number of credit cards and debit cards and increased value of payments made with them because improvement and modernization have already started.

c) ATM

An important form of an electronic banking device is the Automated Teller Machines (ATM). Automated teller machines (ATMs), are another financial innovation introduced in the early 1970s and diffused rapidly through the 1980s which resulted from the desire to avoid the restrictions of branching.

ATMs give the customer an opportunity to withdraw money, to deposit, opportunity to transfer fund from one account to another and also check the account balance. ATMs are available for use 24 hours a day. They not only accomplish cheaper transaction for bank, but they also offer more facility to the customer.

The reduce cost of computer and telecommunications technology enabled banks to provide ATMs at lower costs, making them profitable innovations. Due to their low cost, ATMs can be placed in different places by the bank or its branches, they reduce the crowds at the branches, while clients can receive services as at the bank also increasing the comfort of the customers. Therefore, the low cost has encouraged banks to install them on places where they do not have a bank branch, such as shopping malls, office buildings, train stations, airports, etc. Moreover, empirical analyses done in UK during the period of 1976–1996, proposed that the higher the number of ATMs

installed by the bank, the higher the bank profitability is.¹⁷⁶ Also, another empirical analysis done in 11 European countries, highlights that the number of ATMs and electronic payments have positive effect on bank profitability by reducing the operating cost to asset value.¹⁷⁷

Analysis of electronic payment system (EPS) in the Republic of North Macedonia shows that electronic payment system (EPS) is new compared to other European countries, the key reform started in 2000 and lasted till 2002. This reform has changed the environment of banking industry and bring new modern ways of payment such as: ATMs, imprinters and POS terminals.

The trend of increasing use of ATMs can be assumed as a based implantation of reforms in the Macedonian banking sector. The following table shows the ATM and POS for the period 2005 - 2018 in the Republic of North Macedonia. From the table we see that we have a significant increase from year to year in the use of banking innovation offered by banks operating in the Republic of North Macedonia.

Table 3.2. Number of ATM and POS on Republic of North Macedonia period 2005-2018

Year	ATM	POS
2005	157	5,914
2006	297	9,546
2007	529	17,884
2008	761	29,153
2009	832	31,447
2010	869	31,491
2011	876	33,435
2012	852	33,267
2013	930	37,167
2014	959	39,027
2015	1,049	40,501
2016	1,039	34,826

¹⁷⁶Holden, K., El-Bannany, M., (2004). Investment in information technology systems and other determinants of bank profitability in the UK. *Applied Financial Economics*, Vol.14(5), p:361-365.

¹⁷⁷Valverde, S.C., Humphrey, D.B., (2009). Technological innovation in banking: the shift to ATMs and implicit pricing of network convenience. In: Anderloni, L., Llewellyn, D.T., Schmidt, R.H. (Eds.), *Financial Innovation in Retail and Corporate Banking*. Edward Elgar, Cheltenham, UK.

2017	1,031	31,995
2018	1,040	31,542

Source: Authors' compilation based on the report on the use of payment cards and devices for their use in the country, National Bank of the Republic of Macedonia.

The number of ATMs in the Republic of North Macedonia has increased from year to year. Thus, if we compare the period 2005 - 2018, the number of ATMs has increased from 157 ATMs as they were in 2005 to 1040 ATMs in 2018, which indicates an increase of 883 ATMs or expressed in percentage it will be 662%.

The largest increase was recorded from 2005 to 2010, when in only 5-year period an increase of 712 ATMs or 453% was recorded as a result of the full implementation of reforms in the ESP. Then in the second 5 years 2010 - 2015 there was a slight gradual increase from year to year marking an increase of 20.7% at the end of 2015 compared to 2010. From 2015 to 2018 we have an almost equal state of the number of ATMs. By the end of 2018 there is a decrease of 0.86% regarding the number of ATMs.¹⁷⁸

The following chart best explains the trend of ATM number changes

Figure 3.2. AMTs trend on Republic of North Macedonia period 2005-2018



Source: Authors' compilation based on the report on the use of payment cards and devices for their use in the country, National Bank of the Republic of Macedonia.

From the figure it is visible that banking industry in the Republic of North Macedonia is constantly strengthening the infrastructure for credit card usage by increasing of the POS and ATM terminals. The increasement of computerized payment systems promises to reduce employee time and the paperwork involved in transferring funds. The use of automatic payment machines (ATMs)

¹⁷⁸ Report on the use of payment cards and devices for their use in the country, National Bank of the Republic of Macedonia.

provides computerized systems that allow 24-hour banking services, such as electronic withdrawal of money from the deposit account, making deposits and loan payments, as well as the transfer of funds between accounts. Highly advanced ATMs offer customers additional services such as accessing their mutual fund accounts, buying or selling shares, paying utility and store bills, as well as printing bank statements.

Overall, banking industry in the Republic of North Macedonia has adopted information technology to offer classic services in online form, the growing use of electronic payment systems (EPS) combining both, the cost savings and the increased convenience to customers.

First, reduce costs and improve the quality of customer service and also to provide standardization of basic services.

Second, the number of bank branches and the number of employees has been reduced in order to minimize cost and increasing the efficiency of banks. In other words, many customers can receive the same service at the same time, without the help of cashiers or bank clerks, reducing administrative work and also the costs and consequently the reduction of fees that banks apply to their customers.

In addition, with the help of information technologies and communication technology, it is possible to overcome schedules, waste of time and bureaucratic aspects of traditional banking and to facilitate the personal finances to be faster and more efficient.

3.3. Financial technology as a factor influencing bank profitability

Fintech (i.e. Financial Technology) is an important topic that have come into view in banking industry, however its concept is not new. Fintech is defined as a combination of Finance, Technology Management and Innovation Management, from those combination it is possible to bring new idea which could lead to bringing new products, new services or new processes that could solve different business issues, create business models or even new businesses.¹⁷⁹

On the same view, Vasiljeva and Lukanova defined Fintech as a process that is oriented in the direction of clients and industries, to provide customers with the lowest cost possible and in

¹⁷⁹Leong, K. and Sung, A. (2018). FinTech (Financial Technology): What is It and How to Use Technologies to Create Business Value in Fintech Way?', International Journal of Innovation, Management and Technology. Vol.9(2) ,p:74-78.

the most efficient way, guaranteeing this through innovation and technology.¹⁸⁰ Nowadays, development of Fintech is strictly related to the development of technologies and that is rapidly transforming and impacting banking industry, in terms of operations, regulation, customer experience, consumers' behaviour and their understanding of financial services and lots of other activities. Furthermore, Fintech as integrated part of banking industry is primarily focused on the development of banking services and products, which will contribute to the improving of customer satisfaction, increasing access, enrich awareness for risk management, enhancing customer service, increasing market speed and agility, strengthening operations and controls, and transforming institutional cost structures.

At this time, embrace of financial technologies in banking industry has become a crucial for development and enhancing of profit in banking industry and has influence the application of electronic banking, digital technology, alternative payment methods, block chain and cryptocurrencies, artificial intelligence and machine learning, etc.

Those new factors that are applied in banking industry could improve the "health" of banking and lead to a positive relationship between financial technology and bank profitability such as the research conclusion demonstrated in the papers of Onay et al. ,2008; Alber, 2011; Peters and Panayi, 2015; Wood and Buchanen, 2015; Li, Spigt and Swinkels ,2017; El Charani and El Abiad, 2018; Ky et al., 2019.

Research analyses about the application of new technology and the performance of Turkish banks during the period 1996 - 2005 confirms that the adoption of online banking has significant impact on the performance of the commercial bank.¹⁸¹ In the same context , the research analysis that has been done in UK retail banks for the period 2010 to 2016 with the purpose to explain the role and impact of Fintech digital banking start-ups in the financial industry, the result conclude that Fintech has a positive effect on incumbents' stock returns.¹⁸²

Furthermore, analyses done on Lebanese bank for the period 2010 to 2017 studied the influence of technological innovation on bank performance. Findings suggest that financial

¹⁸⁰Vasiljeva, T., & Lukanova, K. (2016). Commercial Banks and Fintech companies in the digital transformation: Challenges for the future. *Journal of Business Management*, Vol.11, p : 25-33.

¹⁸¹Onay, C., Ozsoz, E., & Helvacioğlu, A. P. D. A. D. (2008). The impact of internet-banking on bank profitability-The case of Turkey. In 2008 Oxford Business & Economics Conference Program, St. Hugh's College , Oxford, UK.

¹⁸²Li, Y., Spigt, R., & Swinkels, L. (2017). The impact of FinTech start-ups on incumbent retail banks' share prices. *Financial Innovation*.Vol.3(1), p:1-6.

innovation such as: internet banking, mobile banking, ATMs and investment in computer software had a positive impact on the bank profitability.¹⁸³ Broadly speaking based on the above research, findings conclude that Fintech supports the development of banking industry and that Fintech services would also have a positive impact on banks' performance.

On top, development and application of a variety of financial technology has improve the way of doing business and enhance competitiveness of commercial banks by reducing bank operating costs, improving service efficiency, strengthening risk control capabilities, and creating enhanced customer-oriented business models dedicated to customers.

¹⁸³El-Chaarani,H., & El-Abiad, Z.(2018). The impact of technological innovation on bank performance, Journal of Internet Banking and Commerce. Vol. 23(3) p: 1-33.

4. RESEARCH DESIGN AND METHODOLOGY ON BANK PROFITABILITY

4.1. Data source and collection Methods

The research include data about banks in the Republic of North Macedonia and covers period quarterly data since 2005 to 2020. Due to time constraints and data availability, the study is based on secondary data, at the macroeconomic level. Data needed for my study, related to internal factors - bank specifics are collected from National bank of the Republic of Macedonia Central Bank website. Data for external macroeconomic factors are obtained from the International Monetary Fund (IMF) and the World Bank.

According Stewart and Kamins research analysis, data which is also used has the advantage of a good quality info compared to the primary generated data by the researcher himself.¹⁸⁴ Dietrich and Wanzenried conclude almost the same: that the use of secondary data is seen as a priority, as they have a higher quality compared to the primary data collected by researchers and are also more reliable, as they are a source of data. Since they are public, the level of reliability of the study with this data is very high.¹⁸⁵

For the measures of commercial banks profitability, estimations utilized using the time series VECM model and descriptive statistics in static framework. Both bank-specific and macroeconomic variables are used in the estimation methods.

Bank specific variables include:

- size
- revenue diversification
- credit ris
- liquidity,
- operational efficiency

¹⁸⁴ Stewart, D. W., & Kamins, M. A. (1993). *Secondary Research: Information Sources and Methods*. Newbury Park, CA: Sage.

¹⁸⁵Dietrich, A., and Wanzenried G., (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland, *Journal of International Financial Markets, Institutions and Money*, Vol.21 (3), p: 307-327.

- loans

The macroeconomic variables include:

- GDP growth,
- inflation and
- interest rates

Based on literature review all those have internal and external factors and have influence on bank performance and were included in the estimation. In estimating the models, bank profitability is represented by two main ratios of profitability: return on assets (ROA) and return on equity (ROE).

The analysed data are presented using the descriptive method and VECM method, starting from the testing of hypotheses, the interpretation of the regression coefficients from which they are derived and the results of the study together with the recommendations for the addressed problems.

4.2. Model design

Modern econometricians highlight a method to establish the relational model among economic variables in a non-structural way. The statistical methods used to analyse the relationship between several influencing variables for time series data are: Vector Autoregressive Model (VAR) and Vector Error Correction Model (VECM).

The vector autoregressive (VAR) model is used for the analysis of data time series which involve more than one variable (multivariate time series), also in general framework used to describe the dynamic interrelationship among stationary variables. Vector autoregressive (VAR) model are common in economics and other scientific analysis for the reason that they are flexible and simple models for multivariate time series data. VAR model is actually a combination of several models of autoregressive (AR), where these models form a vector between the variables affect each other. VAR model is a quantitative forecasting approach usually applied to multivariate time series data. This model describes the relationship between observations on a particular variable at a time with his own observations on the variables at earlier times and also its association with observations on other variables at previous times. Stationary is the main assumption that must be considered from the time series data in order to set up a VAR. If the time series are not stationary

then the VAR framework needs to be modified to allow consistent estimation of the relationships among the series. The vector error correction (VEC) model is just a special case of the VAR for variables that are stationary in their differences (i.e., $I(1)$). Since the theory proposes that if some time series are non-stationary in levels, the combination of such differenced time series may have one or several co-integrating connections and therefore be $I(1)$ co-integrated. The Vector Error Correction Model (VECM) is employed.

VECM (Vector Error Correction Model) is one of the models in the Multivariate Time Series. VECM model is suitable to give information for short and long run as it distinguishes between stationary and non-stationary variables.¹⁸⁶ In general, after examining the long-run relationship between the variables, standard Granger causality based on VAR system or Granger causality based on vector error correction model are used to determine the direction of causality between the variables.

4.2.1. Stationary test

One of the main assumptions for model construction is the stationarity of the time series of the variables involved. The series stationarity test is used to determine the integration of time series. It is essential to test stationarity in time series data to avoid a meaningless regression for example finding a connection when it does not exist. The stationarity of time series indicates that its mean and variance are independent in time. If a series have variance and change over time, it indicates that it has a unit root.

Unit root test is required to avoid spurious regression in data analysis. It is performed on the variables to prepare the data set for co-integration and causality tests.¹⁸⁷ For co-integration analysis to be usable, the unit root test investigates whether the order of integration of the variables of interest is similar – specifically, whether the order of integration is shown to be greater than zero. It may be made stationary by differencing d times.¹⁸⁸ The variable, once established as stationary,

¹⁸⁶Onafowora, O.A., & Owoye, O. (1998). Can trade liberalization stimulate economic growth in Africa? World Development, Vol. 26(3), p: 497-506.

¹⁸⁷ Gujarati, D. N. (2004), "Basic Econometrics", 4th Edition, The McGraw-Hill Companies.

¹⁸⁸ Dickey, D. A., Fuller, W. A. (1981). Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root. Econometrica, Vol.49, p: 1057-72.

is then referred to as integrated of order d or $I(d)$. To investigate whether time series are non-stationary the Augmented Dickey-Fuller test should be carried out.¹⁸⁹

Augmented Dickey-Fuller test is performed to ensure the stationarity of the explanatory variables. If it is found that the variables are not stationary at the level, but another is the difference of the variables in the first difference, and the second and so on and then the testing are stations after the transformations. Hypotheses raised by Augmented Dickey-Fuller (ADF)

H0: Variables are not stationary or it has a stochastic trend

H1: Variables are stationary or has a non-stochastic trend

Augmented Dickey-Fuller test are used to test the null hypothesis that a series has unit (non-stationary) roots versus the alternative stationarity hypothesis. If the value of the statistical test is lower than the critical value of McKinnon the null hypothesis is rejected, and the variables are considered stationary.

4.2.2. Co-integration test

Another important test is test for co-integration of the time series, if it is confirmed that all the variables included in the cause test are integrated in different orders, next step is to test in independent way the existence of co integration relationship between each bank's specific and macroeconomics factor and bank profitability.

Time series variables are considered to be co-integrated if they have a linear line and both are integrated in the same way. If there are evaluating non-stationary and non-co-integrating series using the long-term stability test, then we can get a result in an incorrect regression. This regression problem arises in a case where unrelated series has been seen with each other to make connections due to the fact that they make a tendency in the same time. To avoid this problem, we do need to ensure that time series of use are stationary or co integrating.

The overall concept of co -integration test between variables suggests that there exists an equilibrium or a long-run relationship between a set of time-series variables, provided that the series is integrated in the same order. Therefore, Johansen's co-integration test is used to determine the long-term relationship amongst the research variables, which the research uses to

¹⁸⁹Dickey, D. A., Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Stat. Association.* Vol.74, p: 427–431.

tell the direction of causality between research variables.¹⁹⁰In the model, the cointegration link is performed by Johansen testing with Unrestricted Co-integration Rank Test (Trace).

The hypotheses raised for this test are:

H0: Variables are not co integrated

H1: The variables are co integrate

4.2.3. Normality test

The next, test to carry out to fulfil the assumption of regression analysis is the normality test. Brooks states that the assumption of normality ($ut \sim N(0, \sigma^2)$) is necessary to implement for single test or together to hypothesize about the parameters of the model.¹⁹¹

The normality of error term can be examined in two ways through informal way which is using the graph to detect the pattern of the residual or the formal way is the Jarque-Bera test statistics. Jarque-Bera test is based on the classical measures of skewness and kurtosis, and it is important to mention that Jarque-Bera test of normality is not able to detect normality in the presence of outlying values.¹⁹²

Therefore, Jarque Bera test is usually run before one of these tests to confirm normality. The hypothesis raised for this test diagnosis are:

H0: The error term is normally distributed

H1: The error term is not normally distributed

Jarque Bera test is used to test the null hypothesis that error term is normally distributed versus the error term is not normally distributed hypothesis. The p-value for Jarqua-Bera statistic <significance level (1%), otherwise do not reject H0.

4.2.4. Autocorrelation

¹⁹⁰Johansen, S., (1988). Statistical analysis of co integration vectors, Journal of Economic Dynamics and Control, Vol. 12(2-3), p: 231-254.

¹⁹¹Brooks, C. (2008), Introductory Econometrics for Finance, 2nd edition, Cambridge University Press, New York.

¹⁹²Bera A., Jarque C. (1981). Efficient tests for normality, heteroskedasticity and serial independence of regression residuals: Monte Carlo evidence. Economics Letter. Vol.7(4), p: 313 – 318.

Additional important assumption that must be tested before starting to interpret the regression model is autocorrelation or serial correlation. Autocorrelation states the degree of correlation between the values of the same variables across different observations in the data.

The concept of autocorrelation is most often discussed in the context of time series data in which observations occur at different points in time. If there is a connection between the error terms of different series then the problem of serial connection occurs as autocorrelation arises. In other words, it is assumed that the errors are unrelated to each other. If the errors are related to each other, it will be said that they are "auto related", or that they are "connected in series". A test for this assumption is necessary. A common method to test for the presence of autocorrelation is the Durbin-Watson test and correlograms and Q-Statistics. The hypothesis raised for this diagnostic test is:

H₀: residuals do not represent serial correlation.

H₁: residuals represent serial correlation

4.2.5. Heteroskedasticity

One of the key assumptions of linear regression model is that the residuals must have the same variance for several choices, i.e. they must not suffer from the condition of heteroscedasticity.

Heteroscedasticity can be defined as the problem when variance varies between observations. If the errors do not have a persistent variance, they are said to be heteroskedastic. What has been assumed so far is that the variance of the errors is constant. The issue of heteroscedasticity needs to be properly addressed because it could cause model to be inefficient even though the model is unbiased and consistent. Ignoring heteroscedasticity could cause incorrect standard errors of estimated coefficient, which could lead to misleading inferences.

There are many tests to test heteroscedasticity, however there is no answer which one is the best. In case the test does not reject the null hypothesis then we have no evidence to suspect heteroscedasticity. Otherwise the model will have to be reconsidered or derivative estimators for standard errors and will have to be used for the model to be better, linear and irreversible. To test residuals for the presence of heteroskedasticity in the study, we use the Breusch-Pagan-Godfrey test. The raised hypothesis for this diagnostic test is:

H₀: The error variance is homoscedasticity.

H1: The error variance is heteroscedasticity.

If the p-value is >(above) 0.05 the null hypothesis does not have heteroscedasticity, so we accept the null hypothesis.

4.3. Researches variables for model designs

In terms of a research study in economics or in the social field there are two main approaches:

- 1) The deductive approach - develop a hypothesis (or hypotheses) based on existing theory, and then designing a research strategy to test the hypothesis. This approach presents a high level of objectivity in research work, through external observation, insofar as the choice of questions is not subjective.
- 2) Inductive approach - which finds data and develop theories as a result of data analysis. This approach offers a high level of subjectivity and a number of theoretical possibilities based on the context of the individual research situation.

The deductive approach will be used for the study, as previous findings in the literature will be reviewed first, and then the results will be applied to current practical parameters. Therefore, the overall objective of the study is to identify the strengthening and existence of the connection that exists between various internal (bank specifics) factors and external (macroeconomic) factors that affect the profitability of the Republic of North Macedonia commercial bank by testing hypotheses to determine the relationships of independent variables to their dependents (ROA and ROE) that will measure the profitability of banks.

The hypothesis of this study is intended to examine the impact of particular banking factors and macroeconomic factors in bank profitability. The following econometric model has been formulated to achieve the research objectives.

$$Y_{-it} = \beta_0 + \beta_1 * X_{1it} + \beta_2 * X_{2it} + \beta_3 * X_{3it} + \beta_4 * X_{4it} + \beta_5 * X_{5it} + \beta_6 * X_{6it} + \beta_7 * X_{7it} + \beta_8 * X_{8it} + \beta_9 * X_{9it} + \beta_{10} * X_{10it} + \epsilon_t$$

When:

Y_{-it} represent the bank profitability represented with ROA and ROE in the models presented in addition.

X_1 – Size

X_2 – Credit risk

X_3 – Loans

X4 – Liquidity

X5 – Revenue diversification

X6 – Operational efficiency

X7 – Reservation for loan loss net interest income (Credit risk 2)

X8 – GDP

X9 – Inflation

X10 – Interest rate

B0-constant which indicates the expected value of the dependent variable if all independent variables take the value equal to zero

β_{1-10} -the impact of dependent form the independent variables are to be determined from the coefficients

i - Corresponds to the examined variable of the sample, t to the quarter within the observed year

ε

- is the error term.

4.3.1. Models dependent variables

The main objective of the research is to determine the extent to which bank-specific, macroeconomic, measures influenced profitability. Although the definition of profitability differs among banking studies. In the same way with previous literature that examined the determinants of bank's profitability, we rely on two most commonly used measures of bank profitability: return on assets (ROA), return on equity (ROE). Two models are tested in the analysis, and each one includes a different measure of profitability (dependent variable).

Return on Assets (ROA) is one of the most common and simple measure of overall bank profitability. Therefore, it is frequently used as the key ration in studies to estimate bank profitability. Return on Assets (ROA) is define as the ratio of net income after tax to total assets.

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It measures the managerial efficiency; in other words, it reveals the capability of a bank to generate profits from its asset management functions and shows how effective and efficient the management of banks. The higher this ratio, the higher the performance of bank. On the other

¹⁹³Golin, J., (2001). The Bank Credit Analysis Handbook: A Guide for Analysts, Bankers and Investors. John Wiley & Sons (Asia).

hand the lower this ration is, the lower will be the performance of bank be. It is a useful tool to compare the profitability of one bank with others or the entire commercial banking system.

In accordance with earlier studies that examined bank profitability the second ration that is most commonly used to measure bank profitability is return on equity (ROE). This indicator reflects the capability of a bank in utilizing its equity to generate profits. Return on equity (ROE) is define as the ratio of net income to total equity. In the other words, it is a financial report that shows how much profit a company generates compared to the total amount of funds invested in the bank by shareholders or found in the balance sheet.

This indicator reflects the capability of a bank in utilizing its equity to generate profits. A bank with a high ratio of return on equity is more likely to be capable of generating cash internally and profitability. A bank that has a high return on equity is more likely to become profitable at generating revenue.¹⁹⁴

Based on literature review, it is finding out that it is not the best indicator of profitability and ROE is not as widely used as ROA. For example, banks that report a lower leverage ratio (higher capital) have a higher ROA, but a lower ROE. Assuming that, ration of ROE ignores the high risk that is associated with the high leverage ratio.¹⁹⁵ ROE is not as widely used as ROA but it is considered that the ROA and ROE are better measures of profitability and are used as the main dependent variables.

4.3.2. Models independent variables

This part describes the independent variables that have been chosen to be used to analyse bank profitability in the North Republic of Macedonia. They contain internal factors (bank-specific) and external factors (macroeconomic) that determine bank profitability.

- Internal factors (bank-specific) factors include:

a) Size

¹⁹⁴Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bankspecific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions, and Money*, 18(2), p: 121–136.

¹⁹⁵ Dietrich, A. and Wanzenried, G. (2011). Determinants of bank profitability before and during the crisis: Evidence from Switzerland, *Journal of International Financial Markets, Institutions and Money*, Vol. 21(3), p: 307-327.

In this study, the size of the company is one of the determinants that is chosen as an internal factor. The effect of size as an internal factor could have a positive impact in relationship between size and bank profitability only if there are significant economies of scale and size. Since that larger banks are used to capture the fact are better placed than the smaller banks in harnessing economies of scale, in transactions and enjoy a higher level of profits. Such conclusions have been found in Hanweck and Humphrey, 1987; Boyd and Runkle, 1993; Akhavein et al., 1997; Miller dhe Noulas, 1997; Bourke, 1989; Molyneux and Thornton, 1992; Bikker and Hu, 2002; Goddard et al., 2004; Athanasoglou, Brissimis dhe Delis, 2008; Sufian et al., 2008.

While the other group finds out that size could lead to a negative impact on bank profitability, since larger banks could have increased diversification which tend to have higher credit risk and thus lower returns such as in the findings of Pasiouras and Kosmidou, 2006; Shekhar dhe Lekshmy, 2007, Barros et al., 2007.

The total assets are used in this thesis to measure the bank size. According to the literature review, the following hypothesis of testing the relationship between individuality (ROA / ROE) and bank size is taken in consideration:

H0: There is no significant relationship between company size and profitability of commercial banks

H1: There is a significant relationship between bank size and profitability of commercial banks

b. Credit risk

The second internal determinant that effect bank profitability is the credit risk. Credit risk and profitability are expected to be negative. Interpreting the concept that the more bad loans there are, the more the profitability of banks will be reduced as in the Miller, S.M. and Athanasios G. N.,1994; Athanasoglou et al. ,2006; Kosmidou et al.,2006 Dietrich and Wanzenried ,2011; Rasiyah, D., 2010; Bace, E.,2016.

Provision for loan loss to total loans and reservation for loan loss to total income are used in this thesis to measure the credit risk ratios. According to the literature review the following hypothesis of testing the relationship between individuality (ROA / ROE) and credit risk is valid:

H0: There is no significant relationship between credit risk and profitability of commercial banks

H2: There is a significant relationship between credit risk and profitability of commercial banks

c. Loans

The main source of income generated by the banks are loans and the effect of loans on bank profitability is expected to be positive, because the higher volume of loans, the higher the income of bank and this could result positive on profitability such as in the findings of Abreu and Mendes, 2002; Kosmidou et al., 2005; Heffernan and Fu ,2008; Sufian and Habibullah, 2009.

On the other hand, the increase in loans portfolio, will increase costs for their funding provisions and also lead to a drop of credit quality. In this case the relationship between profitability and loans is expected to be negative, such as in Bashir, 2003; Hassan and Bashir, 2005.

Total loans to total assets ratio are used in this thesis to measure the loans of the bank. According to the literature review I have no mention the following hypothesis of testing the relationship between individuality (ROA / ROE) and loans:

H0: There is a no significant relationship between loans and profitability of commercial banks

H3: There is a significant relationship between loans and profitability of commercial banks

d. Liquidity

Liquidity of commercial banks plays a fundamental role on functioning of financial markets and the banking sector. Lacks of sufficient liquidity in banks could lead to fails in paying its depositors and financing its routine payments. In this way liquidity is necessary to enable banks providing funds on demand and credits needed by customers which are associated with the default risk.

Therefore, liquidity and profitability, or better the relationship between liquidity and profitability were mixed such as in the findings of Short 1979, Bryant 1980; Diamond & Dybvig 1983, Bourke 1989 Molyneux and Thornton 1992, Holmstrom & Tirole 1998, Kashyap et al.2002, Kosmidou dhe Pasiouras, 2005; Bunda dhe Desquilbet, 2008; Tyrrel ,2010; Vodova 2011. Consequently, liquidity is a real asset that must be effectively managed to protect the bank against the risk of insufficient liquidity that can lead to the bank failure and excess liquidity should be managed because it will bring bank to the position that does not know how to use the assets properly.

Total loans to total deposit ratio are used in this thesis to measure banks liquidity. According to the literature review, the following hypothesis of testing the relationship between individuality (ROA / ROE) and loans can be applied:

H0: There is a no significant relationship between liquidity and profitability of commercial banks

H4: There is a significant relationship between liquidity and profitability of commercial banks

e. Revenue diversification

Revenue diversification is one of the most important factors that is taken as an internal factor. The decline in interest margins during the last decade has changed the traditional role of banks and forced them to search for new sources of revenue and shifting to non-interest income. As for income diversification, the papers of Stiroh and Rumble, 2006; Choi and Kotozo ,2006; Chiorazzo et al. ,2008; Goddard et al,2008; Demirguc-Kunt and Huizinga,2010; Sanya and Wolfe,2010; Elsas et al., 2010; Nisar, 2015; Javaid, 2016; Albertazzi et al., 2016, found that banking performance could be enhanced through a revenue diversification.

Non-interest income to interest income is used in this thesis to measure revenue diversification. According to the literature review, the following hypothesis of testing the relationship between individuality (ROA / ROE) and revenue diversification we can set like this:

H0: There is no significant relationship between revenue diversification and profitability of commercial banks

H5: There is a significant relationship between revenue diversification and profitability of commercial banks

f. Operational efficiency

As internal factor operational efficiency can be assumed and explained as, the less efficient the bank is it leads to negative affect on the bank profitability, depending on the degree of competition in the market. In contrast, the lower the rate of this ration, the more efficient the bank could be and have positive effect on bank profitability. So improved management of these costs will increase efficiency and therefore increase profitability of the bank. These findings have been proved in the research of Hess dhe Francis, 2004; Pasiouras dhe Kosmidou, 2007; Athanasoglou

et al., 2008; Goddard et al., 2009; Davcev dhe Hourvouliades, 2009; Dietrich dhe Wanzenried ,2011;Ponce 2012 where operational efficiency can directly affect the survival and success of the company, therefore expect higher cost-income ratios to have a negative effect on bank profitability, but if the opposite happens, it tends to have positive effect.

Operational cost to total income is used in this thesis to measure operational efficiency. According to the literature review, the following hypothesis of testing the relationship between individuality (ROA / ROE) and operational efficiency is used:

H0: There is no significant relationship between operational efficiency and profitability of commercial banks

H6: There is a significant relationship between operational efficiency and profitability of commercial banks

In the next part, our analysis includes a set of three macroeconomic characteristics that we assume to have an impact of, in bank profitability. Macroeconomic factors are mainly related to the reflection of the economic and legal environment that affects the operation and performance of banks. Depending on the nature and purpose of each study, different variables can be used.

➤ External factors (macroeconomic) included are:

a. GDP growth

GDP growth as one of the macroeconomic factors is expected to have a positive effect on bank profitability if there is a favourable economic development and increasing the demand/supply for financial product/service. Such findings have been detected in Demirguc-Kunt and Huizinga, 1999; Bikker and Hu, 2002; Athanasoglou et al., 2008; Nassreddine *et al.*, 2013; Kiganda, 2014; Saeed, 2014; Al-Jafari and Alchami, 2014; Boitan, 2015. In contrast, the unfavourable economic development results in credit loss and consequently the lower bank profitability has the negative effect based on the research analyses such as Albertazzi and Gambacorta, 2009; Lee and Kim, 2013; Apergis, 2009.

Based on the literature review the following hypothesis and the purpose of testing the relationship between individuality (ROA / ROE) and GDP growth has been presented:

H0: There is no significant relationship between growth of GDP and profitability of commercial banks

H8: There is a significant relationship between growth of GDP and profitability of commercial banks

b. Inflation

Inflation as another macroeconomic factor is found in the empirical analysis and relationship between inflation and profitability are mixed. Empirical analyses conducted by Demirgüç-Kunt & Huizinga, 1999, 2001; Guru et al., 2002; Athanasoglou et al., 2005, 2008; Vong & Chan, 2006; Tunay and Silpar, 2006; Pasiouras and Kosmidou, 2007; Alexiou and Sofoklis, 2009; Flamini et al., 2009; Garcia-Herrero et al., 2009; Gul et al., 2011; Ponce, 2013; Lelissa, 2014; Sufian, 2011; Trujillo Frederick, 2015 confirms a positive relationship between inflation and profitability in case the inflation is expected reflecting in high demand for banks product/service which turns into higher income for the bank.

On the other hand, there are empirical analyses conducted by Abreu and Mendes, 2000; Boyd, J. H., & Champ, B, 2006; Saeed, 2014, confirm a negative relationship between inflation and profitability in case inflation is high and unexpected it can be very costly to the economy.

Based on the literature review the following hypothesis and the purpose of testing the relationship between individuality (ROA / ROE) and inflation are demonstrated in this way:

H0: There is no significant relationship between inflation and profitability of commercial banks

H9: There is a significant relationship between inflation and profitability of commercial banks

c. Interest rates

The interest rate levels are also part of the macroeconomic factor that affect the profitability of the bank. An environment of low interest rates joined with fierce competition among banks could limit the possibilities for banks to establish appropriate prices for their loans and deposits, putting pressure on the operating margin and negatively affecting banks' profitability. Studies that have found out a positive relationship between interest rates and bank profitability are Samuelson,

1945; Short, 1979; Bourke, 1989; Molyneux and Thornton ,1992; Demirgüç-Kunt and Huizinga, 1999; Staikouras and Wood ,2003; Claeys and Vander Vennet ,2008; García-Herrero et al., 2009; Saeed ,2014; Ariyadasa et al., 2016; Boitan 2015; Noman et al. 2015.

Based on the literature review the following hypothesis and the purpose of testing the relationship between individuality (ROA / ROE) and interest rate are demonstrated this way:

H0: There is no significant relationship between interest rate and profitability of commercial banks

H10: There is a significant relationship between interest rate and profitability of commercial banks

Table 4.1. Summary of proposed hypothesis

	Variables	Ration	Hypothesis	Expected effect
Dependent	Return on Assets	ROA=Net Income/Total Assets		
Dependent	Return on equity	ROE=Net income/Total equity		
Independent	Size	Size= Total Assets	H1	+/-
Independent	Credit risk	Credit risk=Provision for loan loss/Total loans	H2	+/-
Independent	Loans	Loans=Total loans/Total assets	H3	+/-
Independent	Liquidity	Liquidity=Total loan/Total deposit	H4	+/-
Independent	Revenue diversification	Revenue diversification=Non-inters income/Inters income	H5	+/-
Independent	Operational efficiency	Operational efficiency=Operation cost/Total income	H6	+/-
Independent	Credit risk 2	Credit risk =Reservation for loan loss/ Total income	H7	+/-
Independent	GDP	GDP growth rate = GDP t – GDP (t-1) / GDP (t-1)	H8	+/-

Independent	Inflation	Inflation rate = $\frac{\text{Level of price (t)} - \text{Level of price (t-1)}}{\text{Level of price (t-1)}} \times 100$	H9	+/-
Independent	Net Interest rate	Loans interest rate – Deposit interest rate	H10	+/-

Source: author

To meet the broad research objective, the thesis raised those ten hypotheses based on the literature review. Moreover, the model specification includes the definition of dependents and independent variables which are included in the model and the expectations regarding the signs and the size of the function parameters.

5. DETERMINANTS OF PROFITABILITY OF COMMERCIAL BANKS IN THE REPUBLIC OF NORTH MACEDONIA – EMPIRICAL RESEARCH

5.1. Analysis of the financial sector in the Republic of North Macedonia (2005 -2020)

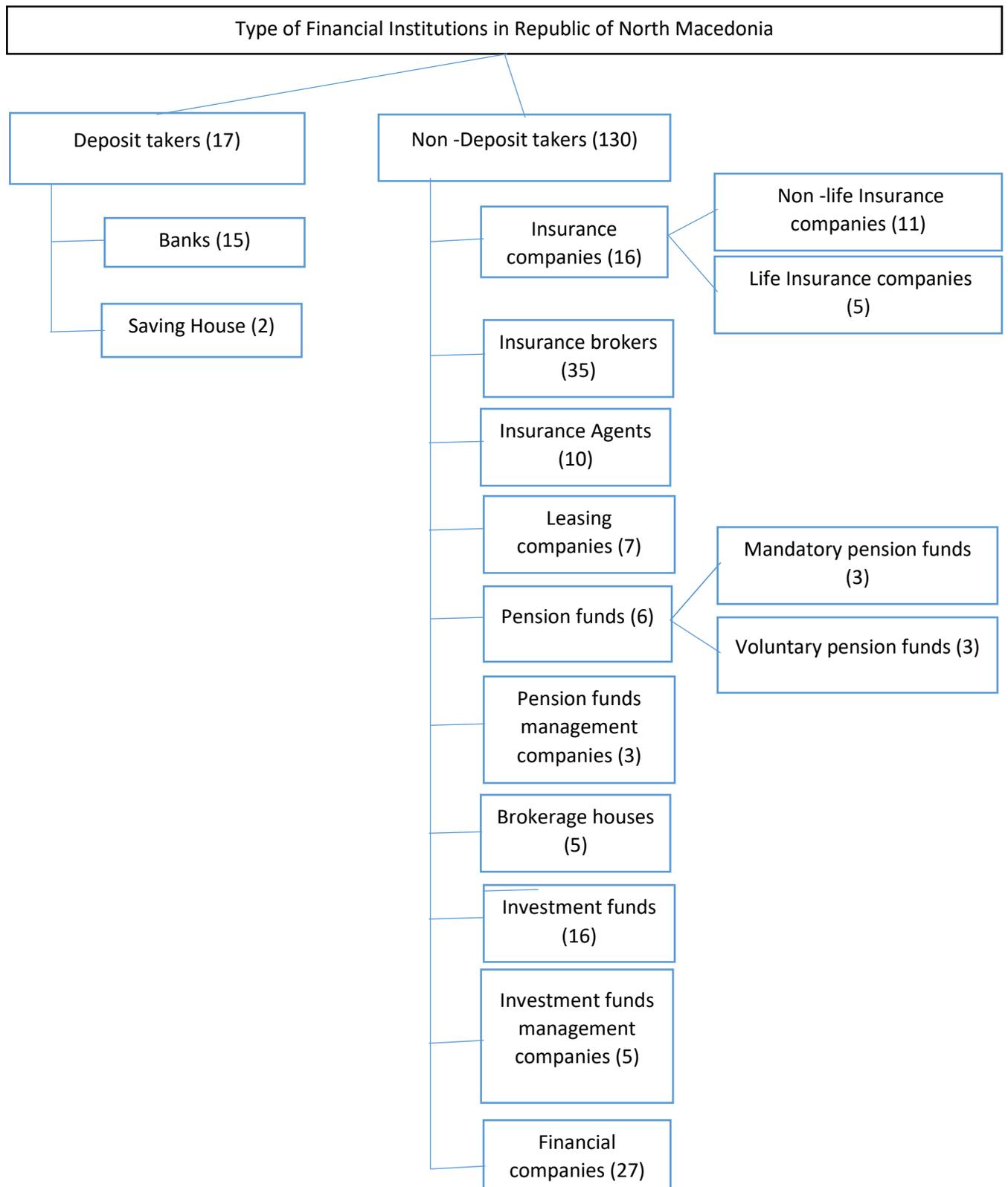
The financial system in Macedonia consists of the National Bank of the Republic of North Macedonia (NBRNM), commercial banks, financial companies, saving houses, exchange offices, the Deposit Insurance Fund, insurance companies, pension funds, investment funds, brokerage firms, and a stock exchange.

The Nacional Bank of the Republic of North Macedonia established as independent central bank in 1992, is the institute for the stability of the national banking system, money-issuing institution responsible for price stability, stability of the national currency (Denar), stability of the financial system, liquidity of payments within the country and abroad, and the conduct of monetary policy and foreign exchange policy. It made continuous efforts to establish a regulatory and supervisory framework for the establishment of a stable banking sector. The Supervision Department at NBRNM serves as the main regulatory body responsible for the supervision of all banking institutions and saving houses.

The legislation which was introduced in 2000 and 2001 created the legal framework for the modernization and consolidation of the banking sector according to the line of banking directives of the European Union and international standards. A temporary return caused by a deteriorating the economic situation in 2002 has been quickly overcome, anyway. However, its current stage of development, measured by the level of financial intermediation is still lower compared to the other transition countries (of Central and Eastern Europe) and to the EU member states.

Often when we talk about the financial system in our country, we mean the banking system. This statement is not technically correct, but the reason why it happens is that over 80 percent of the financial system in Republic of North Macedonia consists of commercial banks. If the profitability of commercial banks is threatened in the Republic of North Macedonia, the whole financial system is threatened, as well as the country economy. The following graph clearly presents the composition of the financial system in the Republic of North Macedonia. The data for the construction of the graph (Graph no.5.1.) refer to year 2019.

Figure 5.1. Financial system in Republic of North Macedonia:



Source: National Bank of Republic of North Macedonia, Financial Stability Report for the Republic of North Macedonia in 2019.

According to the National Bank the financial system in the Republic of North Macedonia consists of two main groups of institutions. The first group includes takers or banks and Saving Houses, while on the other hand second group consist on: Insurance companies (non-life and life), insurance brokers, insurance agents, leasing companies, pension funds (mandatory and voluntary), pension funds management, brokerage house, investment funds, investment funds management and financial companies.

The National Bank oversees saving houses, deposit-taking, non-banking, microfinance organizations which need to be in line with banking law in all aspects of performance and satisfaction, such as capital and liquidity demand, reporting mandatory, transparency, credit terms, internal control system, audit, etc. The Ministry of Finance supervises financial companies and conducts planned and unplanned inspections.

Banks play a key role in the structure and activity of the financial system. In the end of 2019, 81.4% of the activity of the banking sector supports financial sector. Therefore, for the assessment of financial stability it is sufficient to identify and assess the risks arising from banking activity. The table below illustrates the share of the banking sector in financial system over the years (2005-2019).

Table 5.1. Structure of total assets of the banking sector in the Republic of North Macedonia

Years	Total Assets	Structure in %
2006	174,117	88.99%
2007	223,659	90.50%
2008	250,704	89.20%
2009	268,543	88.60%
2010	305,290	89.20%
2011	331,176	88.60%
2012	352,886	88.50%
2013	369,505	87.60%
2014	400,281	86.80%
2015	423,668	85.80%
2016	444,680	84.70%
2017	461,992	83.00%
2018	503,469	82.50%
2019	549,969	81.40%

Source: Authors' compilation based on the National Bank of the Republic of North Macedonia, Financial Stability Report for the Republic of North Macedonia (2006- 2019).

As we can see in the table, banks within the financial architecture, banks are dominant, and therefore to a large extent cause the movements in the financial system, although it gradually decreases over the years and is still quite high and goes up to 81.4% as of 31.12.2019. Although the banking sector has a major role in the maintenance of the financial stability, because of the size that have in the financial system.

The slow decrease of the banking sector and the increase of other participants of financial institutions have influenced the diversification of the financial system. The banking sector is estimated to be exposed to a significant extent, by the non-banking financial segment (insurance companies, leasing companies, pension funds and financial companies). Moreover, the stagnation of the banking sector is related to the growing importance of non-bank institutions, such as mandatory pension funds, non-life and life insurance companies, as well as the share of investment funds. However, these segments do not pose a direct risk to the banking sector.

The second largest and most important segment of the financial sector are the pension funds, both (mandatory and voluntary) whose share in the assets of the financial system constantly grows. Pension funds, as financial intermediaries, are important for the maintenance of the long-term financial stability, and the assets invested in the pension funds make up a relatively significant portion with amounts to 11.5% as of 31.12.2019 of the financial assets of the household sector.

Table 5.2. Structure of total assets of the pension funds sector in the Republic of North Macedonia

Years	Total Assets	Structure in %
2006	1,242	0.63%
2007	3,124	1.26%
2008	5,037	1.80%
2009	8,752	2.90%
2010	12,494	3.70%
2011	16,131	4.30%
2012	21,315	5.30%
2013	27,118	6.40%
2014	33,580	7.30%

2015	40,802	8.30%
2016	49,074	9.40%
2017	58,239	10.50%
2018	65,941	10.80%
2019	77,620	11.50%

Source: Authors' compilation based on the Nacional Bank of Republic of North Macedonia, Financial Stability Report for the Republic of North Macedonia (2005- 2019).

As it is showed in the table during the years the pension funds has had rapidly grew, mainly as a result of the incensement in their number. Mandatory funds establishment emerged on the market (in 2006), and they currently account for 11.5% of the total assets of the financial system. On the other hand, Voluntary fund establishment and emergence lately on the market respectively in 2009 with two companies which indicate to increase the number of institutions in four (two mandatory and two voluntary). Similarly, in 2019, there was a slight increase in the number of mandatory pension funds and volunteers with one more company per each. As well, the continuous growth of assets of mandatory and voluntary also contributed to the quick growth of the financial system's assets.

Pension funds (mandatory and voluntary pension funds) absorb a large part of the pension savings of employees and have a young membership, which guarantees them a further solid growth of the assets and makes them the most important non-banking institutional investor in the country. These two segments of pension funds are extremely important for the maintenance of the financial stability, not only because of their size.

The third largest and most important segment of the financial sector are insurance companies (non-life and life), whose share in the assets of the financial system do not lead much with their absolute growth, which is relatively similar during fifteen years to that registered in the open-end investment funds. The insurance companies have a crucial role in the industry that they operate which in the long run leads to the overall success of the economy composition and a moderately significant portion with amounts to 3.5 as of 31.12.2019 of the financial assets of the household sector.

Table 5.3. Structure of total assets of the insurance companies in the Republic of North Macedonia

Years	Total Assets	Structure in %
2006	14,608	7.46%

2007	11,075	4.48%
2008	11,920	4.20%
2009	12,202	4.00%
2010	11,963	3.50%
2011	12,886	3.40%
2012	13,067	3.30%
2013	13,883	3.30%
2014	16,416	3.60%
2015	17,562	3.60%
2016	18,480	3.50%
2017	20,030	3.60%
2018	21,369	3.50%
2019	23,918	3.50%

Source: Authors' compilation based on the National Bank of Republic of North Macedonia, Financial Stability Report for the Republic of North Macedonia (2005- 2019)

The insurance companies (non-life and life) providers offer diversity of products, provides economic protection from identified risks occurring or discovered within a specified period. It helps an individual and organization to minimize the consequences of risk which impart significant cause on the growth and development of insurance industry.

As it is showed in the table the insurance sector has significant potential to further develop both segments of insurance, although its share in the assets of the financial system registered a minimal decrease during the years. The main important development is the significantly growth of life insurance companies (Denar 5,003 million or 153.3% for the last five years), even though they are still a far minor segment, compared to non-life companies.

The key characteristics of the financial system and the structure of the growth of the assets in 2019 do not deviate significantly from the trend registered in the last fifteen years. Banks, pension funds and insurance companies, are the most important segments of the financial system.

The other segments of the financial system, despite the dynamic growth in some of them, occupy a modest part of the total assets of the financial sector. Specifically, in the past fourteen years, the assets of the financial system increased by Denar 479,860 million. The largest contribution to this growth was made by the assets of the banking system and the pension funds. On the other hand, financial companies and investment funds register the most dynamic growth and in the last years and increased their assets by more than five and four times, respectively.

5.2. Analysis of the Banking sector in the Republic of North Macedonia

The restructuring of the banking sector in Republic of North Macedonia has begun relatively late, in 1994, after it experienced a crisis and a bank run when 70 percent of loans were non-performing and several banks were insolvent and had to bankrupt. The restructuring has begun with Bank Rehabilitation and Restructuring Act (ARB) which assisted the Government in rehabilitating the banking sector.

This act was focused on the assumption of bad loans in dinars and the management of liabilities related to foreign currency lending as well as the supervision of treasury bills issued by the Government. The cost of rehabilitating the banking sector was one of the most expensive in the world, reaching 42% of Gross Domestic Product (GDP) at the end of 1995, 12% of which belonged to the clearing of bad loans from bank balance sheets and 30% was related to the repayment of “frozen” foreign savings. This amount reached 45.8% of GDP after the recapitalization of Stopanska Banka.¹⁹⁶

The banking system is the main industry of the financial market in the Republic of North Macedonia which is consisted of:

1. The National Bank of the Republic of North Macedonia as a major monetary institution and
2. Sector of commercial banks, which operated with the authorization of national banks at the level of the Republic.

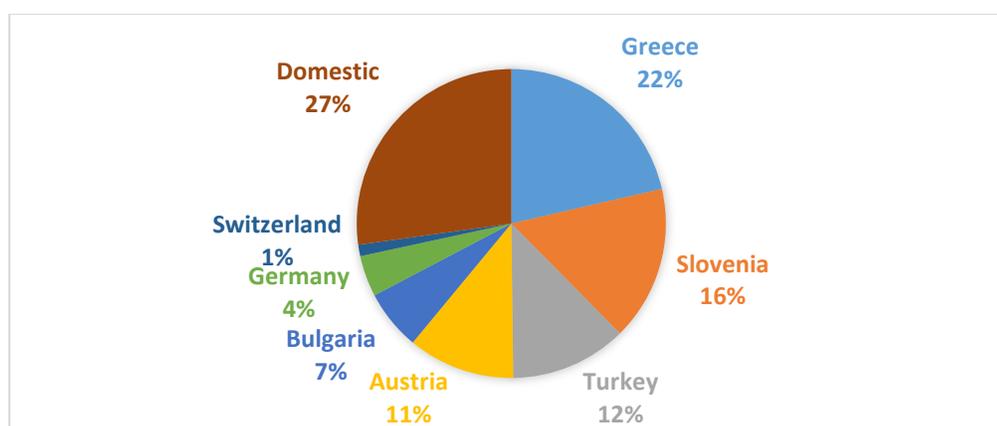
Along with the Law on the National Bank of the Republic of North Macedonia and the Banking Law, the National Bank is the only supervisory authority responsible for licensing and supervision of banks and saving houses in the Republic of North Macedonia.

Commercial banks that operate in the Republic of North Macedonia contained 15 banks, 14 of them are privately owned, while as MBDP is the only state owned bank and 2 Saving House, where 4 large banks (Komericialna Bank AD Skopje, Stopanska Bank AD Skopje NLB Tutunska Bank AD Skopje, and Ohridska Bank AD Ohrid) together it owns about 70% of the loan portfolio and 74% of the banking system deposit.

¹⁹⁶ Šević, Ž., (2002). Banking Reforms in South-East Europe. Edward Elgar Publishing. p:50-150.

Based on the graph below in 2019, foreign banks are dominant in the bank's activity, owning 73% of the foreign capital, additionally present in 14 and was dominant in 11 banks, controlling 71.6 percent of total banking sector assets, 80 percent of total loans, and 71.8 percent of total deposits. Through the country origin, dominant participation in the Macedonian banking system is the capital from Greece 22%, Slovenia 16%, Turkey 12% and Austria 11%, Bulgaria 7%, Germany 4% and Switzerland 1%. On the other hand, only 27% of the total banks' assets belong to banks dominantly owned by shareholders from the Republic of North Macedonia.¹⁹⁷

Figure 5.2. Capital structure in banking sector in Republic of North Macedonia organizations by origin.



Source: National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2019.

The presence of banks originating from countries with advanced financial system has been a driving factor in adapting the most modern banking practices in the Republic of North Macedonia, with special emphasis on the continuous launch of new banking products. It has an impact on the quality of banking supervision as well as modern risk assessment practices. On the other hand, the high presence of banks with foreign capital is another problem for banking system. This is due to the fact that the financial difficulties of the parent banks can be reflected in their banks in Republic of North Macedonia. This type of systematic risk transfer, but not only occurs immediately, but with a time delay.

¹⁹⁷ Source: National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2019.

According to the size of the assets, the banks are divided into three groups: large, medium and small and they are presented in this way.

The group of large banks consists of five banks with assets of more than 37,95 billion denars on 31.12.2019. In the group of large banks are listed starting from the largest:

1. Komercijalna Bank AD Skopje
2. Stopanska Bank AD Skopje
3. NLB Tutunska Bank AD Skopje
4. Halk Bank AD Skopje
5. Orhidska Bank AD Skopje

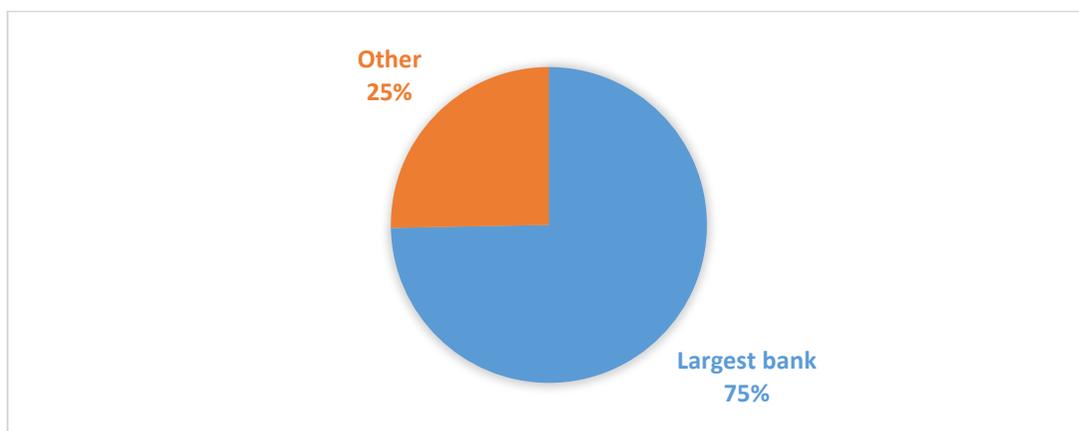
The group of medium sized banks consist of seven banks with assets between 9,45 and 37,95 billion denars on 31.12. 2019.The group of medium-sized banks includes:

1. Procredit Bank AD Skopje
2. Sparkase Bank Macedonia AD Skopje
3. Universal Investment Bank AD Skopje
4. Stopanska Banka AD Bitol
5. Centralna Kooperativna Banka AD Skopje
6. Development Bank of North Macedonia AD Skopje

The group of small banks consists of three banks with assets of less than 9,45 billion denars. In the group of small banks are listed:

1. TTK AD Bank Skopje
2. Silk Bank AD Skopje
3. Kapital AD Bank Skopje

Figure 5.3. Market Share of top 5 banks by Total Assets



Source: National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2019.

Macedonian banking sector is relatively concentrated, with top five banks holding 75 % of total assets. Hence, those five banks are key for the total banking sector and the domestic economy. In this way, their financial result will be reflected in the entire banking system in the Republic of Northern Macedonia.

In the aspect of regional concentration, the Macedonian banking system does not present a significant concentration in a certain region and this can be considered as a positive element due to the effects of diversification. If we refer to the below table, we notice a very wide range of branches of the banks, from where they offer a wide range of services to customers everywhere in the Republic of North Macedonia. The following table shows the indicators of the banking network extension for the entire banking system during year 2010-2019.

Table 5.4. Banking network extension indicators during year 2010-2019 in the Republic of North Macedonia

Year	Number of banks	Number of branches	Skopje region	Vardar region	Southeast region	Southwest region	East region	Pelagorian region	Northeast region	Polog region
2019	15	420	176	34	36	40	41	43	21	29
2018	15	420	178	33	36	40	40	43	21	29
2017	15	427	185	33	35	41	39	42	22	30
2016	15	433	186	35	34	42	39	45	21	31
2015	15	427	185	35	34	39	37	45	21	31
2014	15	429	190	36	33	40	37	43	20	30
2013	16	426	182	32	36	39	39	43	23	32
2012	16	423	180	32	36	40	38	42	23	32
2011	17	413	170	33	36	41	37	40	24	32
2010	18	436	175	33	36	38	42	51	27	34

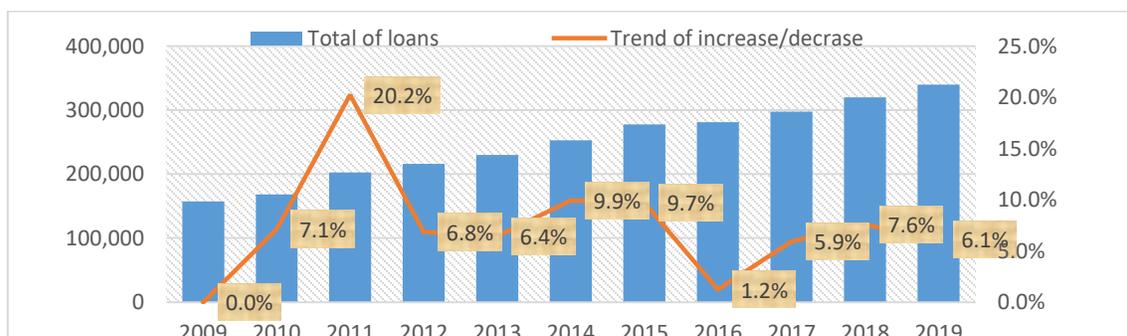
Source: Authors' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2010-2019.

Through the years 2010 – 2019 the growth of branches has been consistently observed, except years 2011, 2017 and 2019 which has a slight reduction expressed in percentage of 5,27% in 2011 compared to 2010, 1,38% in 2017 compared to 2016 and 1,63% in 2018 compared to 2017. Regarding the data in the table at the end of 2019, banks operate through 420 branches / agencies located within all cities on the territory of the of the Republic of North Macedonia, which is divided into 8 regions (Skopje, Vardar, Southwest, Southeast, East, Pelagonian North and Polog region). On the other hand, the number of banks has a slight decrease expressed by the number reduced by 3 banks or in 20 % compared with 2010.¹⁹⁸

Regarding the expansion of the banking network until 2019, Skopje area (according to the geographical distribution of banking branches and agencies within the territory of the Republic of North Macedonia by regions), still remains the territory with the largest number of branches and agencies with 176 unites or 40%, as it has the highest concentration of business units with 42%, from which it is noticed that the distribution of branches and banking agencies is in direct proportion to the population. Compared with other regions, this region still offers the best access to banking services as measured by the number of inhabitants per business unit. Overall, the access to banking branches and agencies in regions has experienced a slight change during the years with ups and downs in the number of residents per business unit.

The banking system is a very good representative of our financial system, playing its very important role in economic growth and in the economic - financial stability of the country. From the latest data it was noted that lending activity at the end of 2019 reached 48.7% of GDP of the country.

Figure 5.4. Annual growth of total loans in banking system in the Republic of North Macedonia (2009-2019)



¹⁹⁸ National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2010-2019.

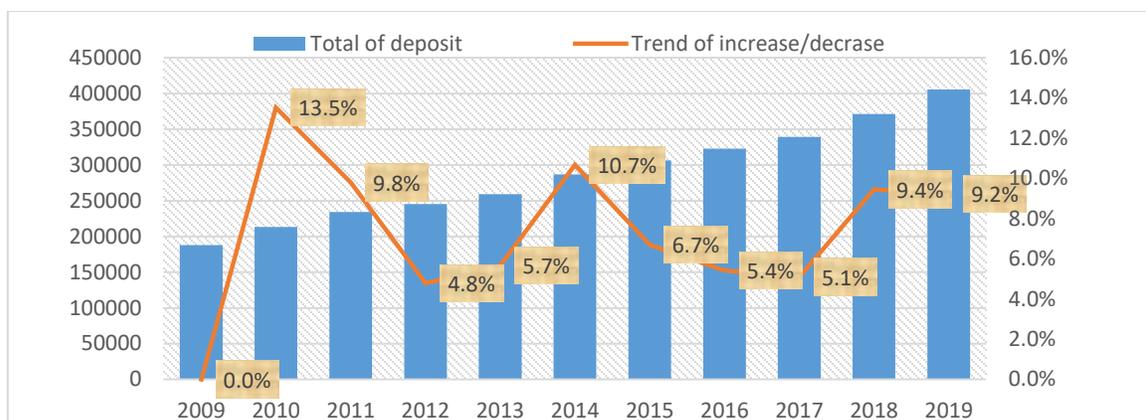
Source: Authors ' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2010-2019.

While referring to the growth from year to year, we note that the annual growth of the credit stock for 2009 marks ups and downs, while the year 2011 there was the highest annual growth of 20.2% on the other hand the smallest growth was recorded in 2016 with a percentage of 1.6%. This slowdown mainly reflects the weakness of credit demand as a result of the uncertainty of economic agents for future economic developments. Banks have also shown greater caution in the customer selection process and in the implementation of lending and monitoring procedures. The main factors that influenced the tightening of the criteria for granting loans are considered the general economic situation and specific industries as well as the risk associated with the realization of collateral.

As mentioned at the beginning, the activity of the banking system is supported by deposits, which constitute 74% of assets in 2019. As it is shown in the table the trend of deposits has ups and downs during the years, in 2019, there were 405,587 million denars, while in 2018 there were 371,333 million Denars which is an annual increase of 34,254 million Denars, or 9.2 % which was slightly lower compared to the previous.

The slowdown of total deposit growth in recent years seems to be natural, given the fact that the financial system recently marks a growth the influx of non-bank institutions, such as mandatory pension funds, non-life and life insurance companies, as well as the share of investment funds, the impact of the financial crisis amidst psychological pressures on the domestic entities and their uncertainty regarding the effects and duration that has affected the reduction of courses by citizens and economic families, the reduction of the number of banks and the political crisis and uncertainty.

Figure 5.5. Annual growth of total deposit in banking system in Republic of North Macedonia (2009-2019)



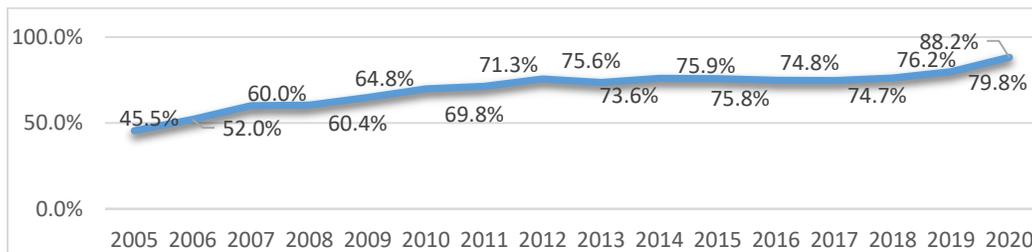
Source: Authors' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2010-2019.

Slowdown of growth in 2019 mainly come from household depositors which significantly decreased their assets in banks, by Denar 19,635 million, or 7.6% compared by previous year 9.5% in 2018. On the other hand, deposits of non-financial companies registered a more moderate annual increase of the Denar 13,905 million compared to the growth of household deposits, but their growth rate (13.8%) had a solid acceleration compared to 2018 (when it reached 9.2%). From the currency aspect, over three quarters of the total deposit growth noted for the Macedonian Denar deposits with a smaller contribution from foreign currency deposits. Also deposit in domestic currency showed growth of the share of Denar deposits in the total deposit base, which at the end of 2019 raised to 59.2% and is by 1.7 percent higher compared to 31 December 2018.

Furthermore, Macedonian banking system is characterized with a moderately simple structure from a perspective of the type of financial institutions and the assortment of products and services they offer. The increase of the number of banks in the system, the restructuring, the establishment of new banks with domestic capital along with the increase of investments in banks with foreign capital, have given the Macedonia banking system a dynamic environment, where all banks fought to get a better position in the market. Nowadays, banks are working in a dynamic business environment, where they are experiencing competition experiences and changes in customer requirements. Therefore understanding the changing needs and expectations of customers is an essential prerequisite for the financial sector.

Furthermore, to have a deeper view of banking sector in the Republic of North Macedonia we analyze the trend of the main financial indicators such as: financial intermediation, capital adequacy, non-performing loans and liquidity.

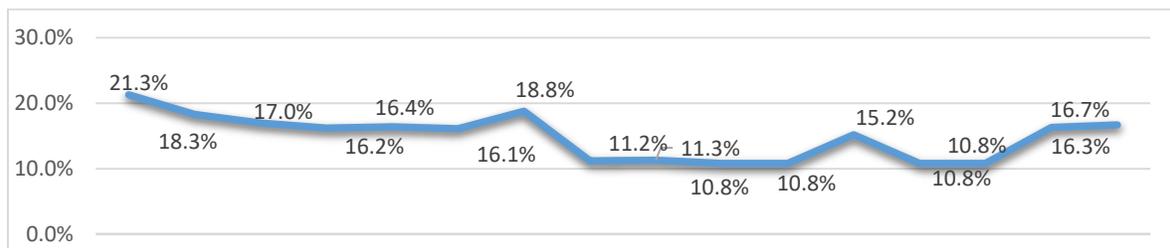
Figure 5.6. Financial intermediation indicator in banking system in the Republic of North Macedonia (2005-2020)



Source: Authors' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2005-2020.

Banks play a key role in the structure of the financial system. At the end of 2020, 88.2% of the financial system assets of the country's GDP belonged to the banking sector. Therefore, for the assessment of financial stability it is very important to identify and assess the risks arising from banking activity. In the Republic of North Macedonia economy, the presence of the banking system has appeared dominant, as there has been an increase in the share of total assets to GDP, which can be illustrated by the figure above, having an upward trend from year to year (study period under construction 2005-2020).

Figure 5.7. Capital adequacy indicator in banking system in the Republic of North Macedonia (2005-2020)

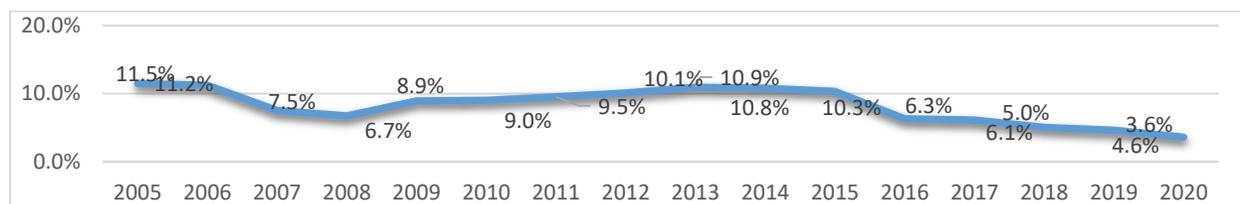


Source: Authors' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2005-2020.

The banking system continues to remain liquid and stable, with a capital adequacy ratio of 16.7% at the end of December 2019 from 16.3% at the end of 2018, hence the capital adequacy ratio is above the minimum regulatory level of 8% which is the minimum rate required by the National Bank of Republic of North Macedonia. Therefore, we can say that in almost all time of the period (2005-2020) it is twice as high as the minimum requirement, which is crucial for the stability of each bank and the overall banking system. Additionally, the level of capitalization is

at moderate levels, and the regulatory capital has also had a positive performance influenced by the improvement of the financial result of the sector and the increase of capital.

Figure 5.8. Non-performing loans indicator in banking system in the Republic of North Macedonia (2005-2020)



Source: Authors' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2005-2020

Generally, the percent of non-performing loans in the Republic of North Macedonia is declining during the study period, specifically in the 2020 it reached the minimum level at 3.6%. Meaning that the declining trend represents a good impact on the other indicators such as liquidity and capital adequacy. Moreover, this condition indicates that as long as the non-performing loans are declining the banking system is stable and profitable.

Figure 5.9. Liquidity coverage ratio indicator in banking system in the Republic of North Macedonia (2005-2020)



Source: Authors' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2005-2020.

The liquidity situation of the banking system remains satisfactory, the liquidity coverage indicator reached 21.5% at the end of 2020, with a decrease of 2.5 percentage points compared to the end of last year. Furthermore, the banking sector continued to manage the levels of liquidity and repayment, maintaining a stable and solid liquidity position that ensures smooth operation indicated by the declined non-performing loan ratio, although the credit risk is assessed as high and worrying. Financial crises 2007-2008 and European debt crisis 2012 that affect the liquidity confirm that the banking system in Republic of North Macedonia maintain a satisfactory level of

liquidity assets which enables proper management with the liquidity risk and satisfactory resilience to the suspected extreme liquidity outflows.

Financial stability indicators provide good assessment of the Macedonia banking industry. The financial intermediation showed that the banking system has appeared dominant, as there has been an increase in the share of total assets to GDP, the capital adequacy is well above the regular requirement and non- performing loans are declining in the last few years which indicates in liquidity to maintaining a stable and solid liquidity position that ensures smooth operation.

This part of analysis shows that the financial system in the Republic of North Macedonia is sound, though it is still underdeveloped. It is dominated by banks which have high share in total assets of the financial sector, as well as in the financial intermediation. Hence, the “health” of the financial system and the depth of financial intermediation are mainly influenced by the bank as an important financial participant of general access to finance.

5.3. Analysis of the Indicators for profitability in commercial banks

Profitability is defined as the ability of the banks to generate profits from the activity it carries out. In other words, profitability is an indicator of performance.

The profitability of the banking system in the Republic of North Macedonia, estimated through the indicators ROAA (Return on Average Assets) and ROAE (Return on Average Share Capital) is positive, but lower from year to year, due to the decline in net income caused by various factors.

Table 5.5. Main indicators of profitability in percentage (cumulative) 2005-2020.

Indicator	ROAA	ROAE
2005	1.30%	8.10%
2006	1.80%	12.30%
2007	1.80%	15.20%
2008	1.40%	12.50%
2009	0.60%	5.60%
2010	0.80%	7.30%
2011	0.40%	3.40%
2012	0.40%	3.80%
2013	0.60%	5.70%

2014	0.80%	7.40%
2015	1.10%	10.40%
2016	1.50%	13.60%
2017	1.40%	13.50%
2018	1.70%	16.00%
2019	1.30%	11.70%
2020	1.30%	11.30%

Source: Authors' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2005-2020.

The analysis of the performance of ROAA/ROAE indicators during the study period shows that the highest level was reached in 2007 with 1.80 % respectively 15.20%, while the lowest level was in the 2011 with 0.4% respectively 3.4%. Table 5.5 shows that for the period from 2005 - 2020 the ROAE/ROAA indicators are in a slight decreasing rate as a consequence of the negative influences of financial crises 2007-2008 and European debt crisis 2012, while in the period after 2013, a positive trend can be seen till 2018, the growth of these rates during this period is mainly due to the significant positive movements of the profit margin. Continuing growth of the profit margin has the highest influence on the ROAA and ROAE increasing. The analysis of the factors that have contributed to such a positive trend, has shown that it is about improved indicators of the profitability and efficiency of the banking system, as a consequence of the improved revenue and expenditure efficiency of the banks. Year 2019 and 2020 shows slight decline in both ration due to the Covid pandemia, a condition that has also influenced the banking system. This shows that the banking system in the Republic of North Macedonia is influenced by the effects of the global financial crisis, but with a one-year delay.¹⁹⁹

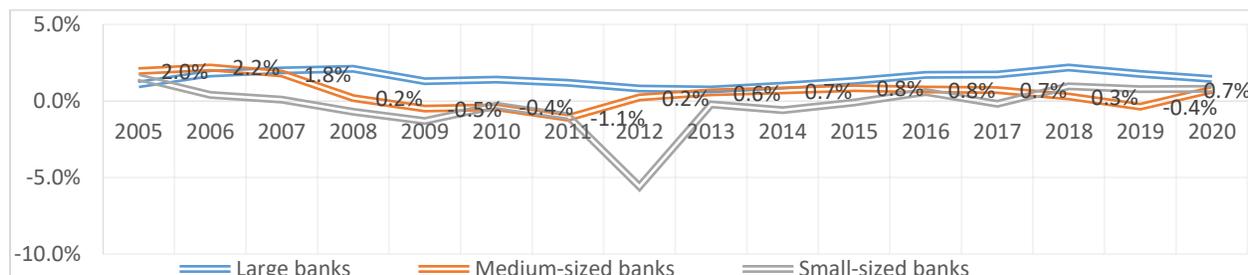
In order to structure the analysis based on the size of banks by assets, this research divides the banking system into three groups based on the specific weight of each bank in relation to the weight of the banking system.

In the first group, banks whose specific weight is less than 3.3% of the total weight of the banking system are classified; the second group includes banks which specific weight varies from 21.9 % and the third group includes banks which specific weight of assets exceeds the value of

¹⁹⁹ National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2005-2020.

74.7% on 31.12.2019 of the weight of the banking system as a whole. In order to have a deeper view the analysis will focus on those classification groups of banks.

Figure 5.10. ROAA indicator in banking system in Republic of North Macedonia (2005-2020)



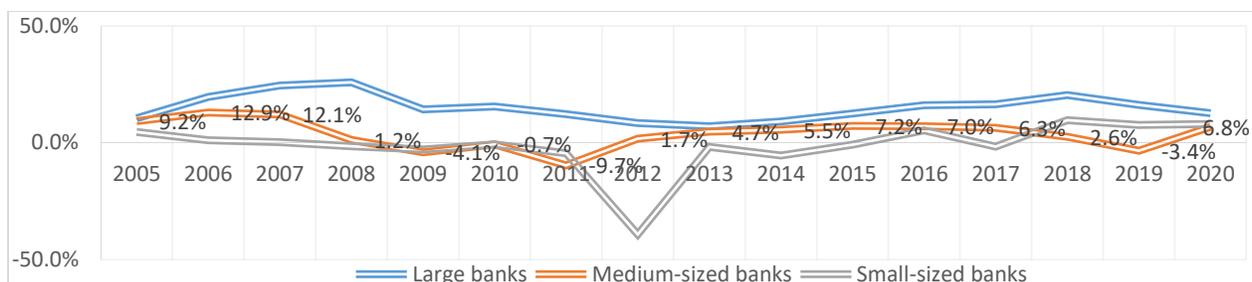
Source: Authors' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2005-2020.

The analysis of the ROAA based on group, showed that the largest banks are main carrier of the positive finance of all banking system of the Republic on North Macedonia because 75 % of the total financial results are concentrated with them. Moreover, it can be seen that the largest banks show positive results during all the period. Second group which include medium size bank shows also positive result of ROAA apart from 2009, 2010 and 2011 which are characterized by negative financial results as a consequence of the effect of financial crises 2007-2008.

Exceptions are small sized banks, which have not generated sufficiently high and stable incomes, which will enable them to have positive financial results and long-term prospects for survival. Specifically, small size banks are characterized by negative financial results during the period 2008 till 2016 and 2018.

The reasons for such a situation of the small banks are mainly due to the small market share of the group of small banks in the banking system of the Republic of North Macedonia (only 3.3%), although those banks have lower credit activity, lower of the amount of deposits and the reduction of the efficiency of the operation of these banks. Therefore, it is most likely that some of them will face the need to change the business model or change the work strategy. For these reasons, one of the processes that will be recommended in the future is the concentration of capital in the banking sector through the merger of smaller banks.

Figure 5.11. ROAE indicator in banking system in the Republic of North Macedonia (2005-2020)



Source: Authors' compilation based on the National Bank of the Republic of North Macedonia Financial Stability, Banking Regulations and Resolution Department, 2005-2020.

The analysis of the ROAE same as the ROAA showed positive results. Moreover, it can be seen that the largest banks show positive result during all the period. Second group which include medium size banks, also shows a positive result of ROAE apart from 2009, 2010, 2011 and 2019 which are characterized by negative financial results due to the effect of financial crises 2007-2008 and Covid pandemia which started in 2019. On the other hand, small size banks are characterized by negative financial results during the period 2008 till 2016 and 2018, the reasons for such results of those group of banks has: small market share, lower credit activity and they are more sensitive to the economic condition.

5.4. Empirical analysis of the determinants of the commercial bank's profitability in the Republic North of Macedonia

5.4.1. Empirical results of the determinants of banks' profitability with model 1(ROE)

Before proceeding further with the econometric analysis of the data, the first step to be taken is to test the validity of the models (ROA / ROE), verifying between the relevant tests if the assumptions of the VECM regression model have been met. Hence, the specification for constructed model should provide evidence for the assumptions of stationarity, co-integration, normality, heteroscedasticity, autocorrelation and as basic assumptions of the constructed model.

a) Stationarity

One of the main assumptions for model construction is the stationarity of the time series of the variables involved. Thus, in addition are the results from the stationarity tests at level and in first difference performed with Augmented Dickey-Fuller test on all variables for the selected time period.

The values from the provided results in the table provide evidence of the data stationarity of variable time series at level and at first difference. This indicates that the main assumption of stationarity of the time series is fulfilled as a condition to further construction of VAR model. Worth mentioning is that all the variables are significant at 1% except for the time series of the variable Loans to deposit which is stationary at 10% margin.

Table 5.6. Augmented Dickey–Fuller test p-values at level and at first difference

Variable	p-value at level	p-value at first_diff
Assets	0.989016	0.009676***
Credit risk	0.736462	1.14E-09***
Loans	0.335414	0.015492**
Loans to deposits	0.088365*	0.066414*
Net_point_income_total_income	0.392107	0.000007***
Operative costs total income	0.555533	1.72E-15***
Reservations net interest income	0.406456	8.22E-13***
GDP	0.000002***	0.00001***
Inflation	0.096923*	0.005335***
Net interest	0.001135***	5.21E-07***
ROA	0.406185	0.000252***
ROE	0.434464	0.000858***

Source: Authors calculations

*** significant at 1%

** significant at 5%

* significant at 10%

All the variables are significant at 1% except for the time series of the variable Loans to deposit is stationary at 10% margin.

a) Co-integration test

Another important test is a test for co-integration of the time series, if it is confirmed that all the variables included in the cause test are integrated in different orders. Therefore, we continue

to test for co-integration of the time series for the purpose of the definition of the use of VAR of VECM model. The key point of the Johansen Co-integration testing is to determine whether time series are co-integrated. In case of co-integrating we proceed with VECM model, and in other case we proceed with VAR model. In addition are the results from Johansen testing with Unrestricted Co-integration Rank Test (Trace).

Table 5.7. Johansen testing with Unrestricted Co-integration Rank Test (Trace)

Sample (adjusted): 2006Q1 2020Q4

Included observations: 60 after adjustments

Trend assumption: Linear deterministic trend

Series: ROE RESERVATIONS_NET_INTERES OPERATIVE_COSTS_TOTAL_IN
NET_NONINT_INCOME_TOTAL_ NET_INTEREST LOANS_TO_DEPOSITS
LOANS INFLATION GDP CREDIT_RISK ASSETS

Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.966652	856.4852	285.1425	0.0000
At most 1 *	0.929237	652.4403	239.2354	0.0000
At most 2 *	0.891355	493.5353	197.3709	0.0001
At most 3 *	0.801923	360.3552	159.5297	0.0000
At most 4 *	0.750981	263.2093	125.6154	0.0000
At most 5 *	0.694594	179.7958	95.75366	0.0000
At most 6 *	0.481463	108.6290	69.81889	0.0000
At most 7 *	0.401100	69.22433	47.85613	0.0002
At most 8 *	0.334430	38.46464	29.79707	0.0039
At most 9	0.191179	14.03792	15.49471	0.0819
At most 10	0.021552	1.307238	3.841466	0.2529

Trace test indicates 9 cointegrating eqn (s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

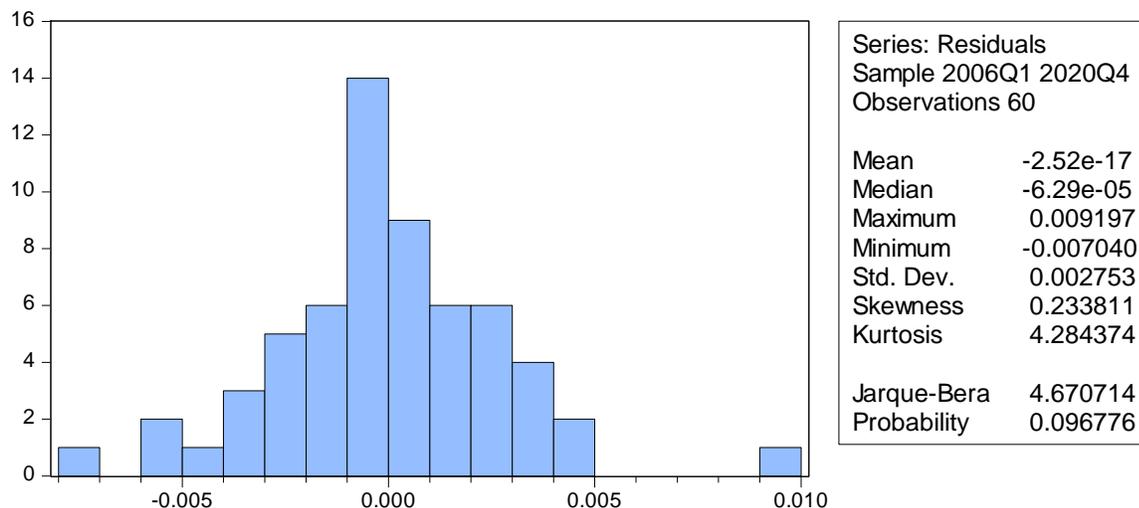
Source: Author's calculations

Unrestricted Co-integration Rank Test (Trace) indicates high level of co-integration with high probability with eight time series from ten selected. Thus, we continue to construct VECM model and provide estimation of the coefficients of the variables involved.

b) Normality test

One more important test to carry out to fulfil the assumption of regression analyses is the test of normality. The normality of error term can be examined in two way through informal way which is using the graph to detect the pattern of the residual or the formal way is the Jarque-Bera test statistics.

Figure 5.12. Normality test



Source: Author's calculations

The next assumption of regression model is the assumption of normality. This assumption should not be violated, in order to be treated as correctly specified. The form the histogram

indicates on normal distribution of the residual and with the probability of Jarque- Bera probability value of 0.096776 lower than 10% we confirm that the assumption of normality is not violated.

c) Autocorrelation test

Additionally, key assumption, we need to be sure it is not violated which is approved by the existence of autocorrelation in the residuals of the constructed model. Autocorrelation must be tested before starting to interpret the regression model. For this purpose, we reach out to correlogram and Q statistics for determination of the existence of autocorrelation in residuals.

Table 5.8 CoRrelogram and Q statistics

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.* .	* .	1	-0.167	-0.167	1.7612	0.184
* .	** .	2	-0.189	-0.223	4.0507	0.132
* .	* .	3	-0.105	-0.196	4.7668	0.190
. .	* .	4	-0.036	-0.162	4.8518	0.303
. * .	. .	5	0.125	0.013	5.9090	0.315
* .	* .	6	-0.135	-0.188	7.1614	0.306
. .	. .	7	0.033	-0.041	7.2367	0.405
. .	* .	8	-0.007	-0.079	7.2405	0.511
. .	* .	9	-0.048	-0.119	7.4102	0.594
. * .	. * .	10	0.153	0.078	9.1566	0.517
* .	* .	11	-0.122	-0.110	10.287	0.505
. .	* .	12	-0.036	-0.095	10.388	0.582
. .	. .	13	0.065	0.016	10.718	0.634
. * .	. * .	14	0.109	0.104	11.678	0.632
. .	. .	15	-0.037	-0.033	11.789	0.695
* .	* .	16	-0.179	-0.106	14.496	0.562
. .	. .	17	0.038	-0.035	14.624	0.623
. .	* .	18	-0.005	-0.105	14.626	0.687
. .	* .	19	-0.060	-0.167	14.956	0.725
. .	* .	20	0.011	-0.132	14.968	0.778
. .	. .	21	0.044	-0.061	15.153	0.815
. * .	. .	22	0.128	0.039	16.762	0.776
. .	. .	23	0.031	0.064	16.857	0.816

. .	. .	24	-0.057	-0.011	17.187	0.841
. .	. .	25	-0.063	-0.022	17.614	0.858
.* .	.* .	26	-0.087	-0.089	18.436	0.859
. *.	. .	27	0.140	0.027	20.659	0.802
. .	. .	28	-0.024	-0.064	20.725	0.837

Source: Author's calculations

The correlogram presented does not have spikes at any lags calculated. The Q-statistics is not significant at all lags, indicating that there is not significant serial correlation in the residuals. This means that there is no autocorrelation in the residuals and the model is not violating the assumption of autocorrelation.

d) Heteroscedasticity test

For the proof of homoscedasticity, we refer to Breusch-Pagan-Godfrey Test which is a test for heteroscedasticity of errors in regression. Existence in homoscedasticity in regression is key assumption which if the assumption is violated, we cannot use regression analysis. In this case the values to probability of Chi-Square of 0.3282 offers evidence that the homoscedasticity assumption is not violated.

Table 5.9. Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.309391	Prob. F (44,15)	0.2920
Obs*R-squared	47.60556	Prob. Chi-Square (44)	0.3282
Scaled explained SS	15.93048	Prob. Chi-Square (44)	1.0000

Source: Author's calculation

Models in this research has intention to determine the relationship between the profitability and the bank specific and macroeconomic indicator values used in the banking industry. The secondary aspect of this research aims to determine the impact of those variables on the banking sector in the Republic of North Macedonia.

The model selection was based upon the desire to determine the long run relationship of the bank's specific indicator and their relationship with the profitability indicators. Hence, the selection of panel VECM model was the next logical step and primary option for the model methodology.

Model equation of specified models subject of this research takes the following form:

$$Y_{-it} = \beta_0 + \beta_1 * X_{1it} + \beta_2 * X_{2it} + \beta_3 * X_{3it} + \beta_4 * X_{4it} + \beta_5 * X_{5it} + \beta_6 * X_{6it} + \beta_7 * X_{7it} + \beta_8 * X_{8it} + \beta_9 * X_{9it} + \beta_{10} * X_{10it} + \varepsilon_t$$

Where Y_{-it} represents the bank, profitability is represented with ROA and ROE in the models presented in addition. Independent variables X_{1-10} are represented with set of bank's specific and macroeconomic indicators. The impact of dependent form the independent variables is to be determined from the coefficients β_{1-10} . Note that i corresponds to the examined variable of the sample, t to the quarter within the observed year and ε is the error term.

Table 5.11. Dependent and independent variables included in the specified models

	Model ROA	Model ROE
Y	ROA	ROE
x1	Assets	Assets
x2	Credit risk	Credit risk
x3	Loans	Loans
x4	Loans to_ deposits	Loans _to_ deposits
x5	Net_ nonint_ income_ total _income	Net_ nonint_ income _total_ income
x6	Operative costs_ total_ income	Operative costs _total_ income
x7	Reservations_ net_ interest_ income	Reservations_ net_ interest_ income
x8	GDP	GDP
x9	Inflation	Inflation
x10	Net interest	Net interest

Source: Authors calculations

Table 5.12. Descriptive statistic of ROA, ROE and macroeconomic variables

GDP Inflation Net interest ROA ROE

Mean	2.717389	1.813698	5.018750	0.011285	0.094455
Median	2.800000	1.230000	4.595000	0.012979	0.093200
Maximum	10.70000	9.936667	8.370000	0.030966	0.280259
Minimum	-14.92341	-2.110000	3.680000	-0.002757	-0.024553
Std. Dev.	3.996148	2.358035	1.263828	0.007088	0.059813

Source: Author's calculations

The values of descriptive statistics of ROA, ROE and macroeconomic variables suggests low volatility in the case of ROA and net interest variables included in the specified models. High volatility is registered in the case of GDP, inflation, and ROE. In the cases of GDP and inflation we have standard deviation larger than mean and median values, while in the case of ROE standard deviation is a bit lower than mean and median values. This situation is a clear indicator that these values of this indicators are extremely sensitive to ongoing economic risk and different economic conditions during the time periods.

Table 5.13. Descriptive statistic of the models banks specific variables

	Size	Credit risk	Loans	Liquidity	Revenue Diversification	Operational Efficiency	Reservation to interest income	net income
Mean	346168.1	0.061968	215715.4	0.855260	0.396095	0.575053	0.354973	
Median	354268.7	0.065000	216815.9	0.875819	0.396417	0.583947	0.351627	
Maximum	585500.5	0.096000	353502.3	0.977750	0.475867	0.721000	0.619620	
Minimum	124955.0	0.028749	60341.00	0.674199	0.322115	0.422026	0.019562	
Std. Dev.	125459.9	0.016295	83860.48	0.069475	0.039020	0.073512	0.112145	

Source: Author's calculations

The values of descriptive statistics of the bank's specific variables suggests low volatility in the case of most bank specific variables included in the specified models. However medium level of volatility is registered in the case of assets, loans and reservations to net interest income values. Form this group of medium volatile variables the values of the loans differ with higher

proportion of the standard deviation values to mean and median values. This observation and the fact that medium volatility is related to variables of the type's asset, having in mind the growth of the banking sector, indicates that the growth is from generic nature. This thesis is supported from the fact that there is a low volatility in the values of other ratio-based indicators related to the bank's performance.

In addition, the results of the VECM estimation on the constructed model with ROE as the dependent variable and the set of macroeconomic and bank specific variables are presented.

Table 5.14. VECM model with ROE as the dependent variable

	Model ROE	Coefficient	t statistics
x1	Size	-5.21E-07	[-2.00107]**
x2	Credit risk	-0.211985	[-2.04310]**
x3	Loans	1.70E-06	[4.37784]***
x4	Liquidity	-0.159718	[4.37784]***
x5	Revenue Diversification	-0.383950	[-9.97960]***
x6	Operational efficiency	0.719293	[25.1910]***
x7	Reservations net to interest income	0.407302	[20.2960]***
x8	GDP	0.005562	[15.7589]***
x9	Inflation	0.003357	[6.31710]***
x10	Net interest	0.026699	[5.39155]***
	ConitEq1	-0.261960	[-0.42082]
Critical- table values on 60 observation			

	1%	5%	10%		
	1.658	1.980	2.617		
R-squared		0.613312		Mean dependent var	0.000539
Adjusted R-squared	0.087416			S.D. dependent var	0.038294
S.E. of regression	0.036582			Akaike info criterion	-3.487345
Sum squared residue	0.033455			Schwarz criterion	-2.265644
Log likelihood	139.6204			Hannan-Quinn criter.	-3.009471
Durbin-Watson stat	2.317752				

*** significant at 1%

** significant at 5%

* significant at 10%

Source: Author's calculations

Since R-squared (Coefficient of Determination) marks the value 0.613312 or more simply 61.33%, shows that the variables we have taken into consideration in the study explain the regression model to the extent of 61.33% the variability of the dependent variable. Clearly, this figure is satisfactory because in the study there are not taken into consideration many other internal and external factors that may affect the profitability of the Republic of North Macedonia banking system. So, we conclude that this value indicates a relatively high explanatory nature of the variables that we took in our study and that are quite representative in our study.

If we also refer to the values that the Durbin Watson index takes is 2.37752, it means that our model is built to test the relationship between profitability and specific banking and macroeconomic factors, does not suffer from autocorrelation, which indicates and proves to us once again, that the model constructed by our study does not suffer from autocorrelation.

Based on regression analyses, we can draw certain conclusions regarding the interpretation of regression coefficients that have an impact on the dependent variable that measures the profitability and performance of a bank, which is ROE.

According to the presented results in VECM estimation results, the **size** variable from the long run perspective is significantly at level of 5% with the dependent coefficient indicator which has a negative sign, and is an indicator of negative relation and causality with ROE variables as dependent variables. This indicates that increased assets in our banking system during the observed period when not managed properly could even mean low values of ROE. In this case we

need to mention that the observed period in the model also includes the two period with high impact for the banking system such as financial crises 2007-2008 and European debt crisis 2012. In this period of crises and their general implication, Macedonian banking system despite the growth in assets could not efficiently materialize it in profitability indicators.

The long- run parameter of the deposits **credit risk** is negative and significant at level of 5%. This fact shows that the credit risk in the case of Macedonian banking sector has logical flow to bank's profitability. This suggest that good management of the credit risk can have a positive impact to the ROE as a profitability indicator.

The long run coefficient representing the **loans** variable indicates positive and significant relation to ROE. Also, in this case the model represents the logical flow from the reality where the higher amount of loans should generally contribute to the bank's profitability. Main assumption in this process is that banks should have high level of risk management related to the credit risk and liquidity in order to transform the nominal increase of the loans to profitability ratios as in this case ROE indicator.

The long run coefficient representing the **liquidity** variable indicates negative and significant relation in this model. Loans to deposit indicator as liquidity indicator and its relationship suggest that for the higher values of ROE, we need to have lower values of loans to deposits. This replicates the banks management continuous intention to have a largest deposits amount related to the amount of loans in order to have comfortable position to other operative aspects on banking management. However, in this case bank managers need to pay attention to the level of the interest rates of the loans and deposits portfolios and its structure, and not only to the nominal values of the loans and deposits. Unbalanced approach to the relationship between profitability and liquidity indicators such as loans to deposit, can mean that banks will pay high price for their profitability involving high liquidity risks. From this aspect the role of the Central bank is crucial in terms of monitoring the liquidity risks as in this case valued for high importance for ROE indicator.

Revenue diversification parameter is negative and significant, showing that the increase of non-interest income in total income will not lead to the bank's profitability represented with the value of ROE. In developed banking the non-interest income would represent trigger for

development and higher profit due to the non-traditional banking and process. As an argument for this, we must relate to the observation period which includes the data from 2005-2020. We must have in mind that the business conducted by the banks almost in all period is based on interest income. Also, if we have in mind that Macedonian banking system is mainly traditional, we may find the arguments for the negative relationship between net non-interest income and ROE during the observed period 2005-2020.

Operational efficiency variable forms of the long run perspective is highly significant with the dependent variables ROE. The coefficient indicator has a positive sign, which indicates the strong proportion of operative costs included in total income and are translated in the profitability values of ROE. This situation is in one sense aligned with situations related to the traditional banking systems where the profit is generated with higher operations costs, for example higher involvement of employees. This situation should be a sign that banks in the Macedonian banking system need to work harder on using the benefits from technology improvement on systematic level. This also means that banks need to find a way to raise the level productivity and efficiency in order to generate higher profitability levels.

The long- run parameter of the **reservation net to total income** is negative and significant in relation to ROE dependent variable. This fact shows that the proportion of the reservations of the loans in proportion of total net interest income has negative impact to ROE variable. Generally, this is a logic similarity in connection to the reality where high level of loan reserves and low level of net interest income are transmitted to the lower level of profitability as in this case ROE indicator. The negative impact happens because the bank management have to set high reservation based on bank credit risk assessment process and control commensurate with the size, nature and complexity of its lending operations to consistent accordance with the bank's stated policies and procedures, the applicable accounting framework and supervisory guidance.

All bank specific indicators have shown significance in relation to ROE, however worth mentioning is that asset and credit risk have lower level of significance of 5% related to all other bank specific indicators which have significance level of 1%. Thus, we may argue that the assets and credit risk variables are significant in relationship to ROE, and other variables bank specific

variables related to higher significance level, have higher importance and contribution to profitability.

The long run coefficient representing the **GDP** variable indicates positive and significant relation in ROE model. Highly significant GDP indicates that GDP growth levels are followed with high profitability levels of ROE in the observed time period. This relates to economic practice where economic agents and individuals use loans to invest or for consumption. Similar situation is presented in the Macedonian banking system and economy where the economic growth is closely related to banks profitability level due to increased banking activities for the growth purpose.

Inflation parameter is positive and significant, showing that the increase of inflation will increase the bank's profitability. This situation suggests that the high level of inflation will be followed by the high level of banking profitability in ROE terms. This positive impact of inflation needs to be treated with respect to the possible perception of the inflation by the management and referent change and adaptation to the level of inflation. This proactive means that inflation will be participated and will be used as an input in risk of the credit and deposit policies of the bank. This relates to the recent COVID inflations – financial repercussions where banks are recognized as institutions which can well balance the inflation impact from the economy.

The long run coefficient representing the **net interest** variable indicates positive and significant relation in the case of ROE. The strong significance suggests that net interest rate as a difference form of loans and deposit rates at banking level has a positive impact to profitability related to ROE indicator. Higher level of net interest presents distinctive example of how good foundation in interest risk related to banks loans and deposit can result to banks profitability in ROE terms.

Error correction coefficient in this model is not significant and indicates that the long run equilibrium cannot be determined. However, we still are considering the long run relationship provided with bank specific and macroeconomic indicators with ROE.

Table 5.15. Summary of study hypotheses (model with ROE as the dependent variable)

Hypothesis	Decision	Impact
There is a significant relationship between bank size and profitability of commercial banks	Accepted	Negative
There is a significant relationship between credit risk and profitability of commercial banks	Accepted	Negative
There is a significant relationship between loans and profitability of commercial banks	Accepted	Positive
There is a significant relationship between liquidity and profitability of commercial banks	Accepted	Positive
There is a significant relationship between revenue diversification and profitability of commercial banks	Accepted	Negative
There is a significant relationship between operational efficiency and profitability of commercial banks	Accepted	Positive
There is a significant relationship between reservations net interest income and profitability of commercial banks	Accepted	Positive
There is a significant relationship between growth of GDP and profitability of commercial banks	Accepted	Positive
There is a significant relationship between inflation and profitability of commercial banks	Accepted	Positive
There is a significant relationship between interest rate and profitability of commercial banks	Accepted	Positive

Source: Summarized by the Author.

All macroeconomic variables in ROE model are highly significant and positive relationship with ROE. This means that profitability measured by ROE can always count on macroeconomic contribution to the ratio of profit and equity.

This ROE model analysed the relationship between the profitability measured by ROE of the Macedonian banking sector and the different types of factor (internal and external) which the banks have been faced with, in the period among the years from 2005 to 2020, by using the panel VECM model. In this case banking sector profitability is represented with the ROE models which are including banks specific and macroeconomic variables as independent variables.

Presented by the results, the profitability of the Macedonian banking sector in ROE terms is determined by the selected macroeconomic and bank's specific variables. The variables size, credit risk, liquidity, revenue diversification presents the negative impact to ROE, while all other present the positive relationship to profitability in ROE terms.

The results directly suggest that the Macedonian banks' profitability is in ROE terms and has a good perception if macroeconomic factor represented by the selected variables. However, there are clear indication that profitability needs to be increased by the higher productivity and efficiency level. In recent banking industry development, technology, digitalization and innovation are the main drivers to the higher productivity and efficiency level.

5.4.2. Empirical results of the determinants of banks' profitability with model 2(ROA)

After the phase of stationarity testing and providing data insight with descriptive statistic the construction of the model requires the first step of model construction. We continued testing for co-integration of the time series for the purpose of the definition of the use of VAR of VECM model.

a) Co-integration test

The key point of the Johansen Co-integration testing is to determine whether time series are co-integrated. In case of co-integrating we proceed with VECM model, and in other case we proceed with VAR model. In addition are the results from Johansen testing with Unrestricted Co-integration Rank Test (Trace).

Table 5.16. Johansen testing with Unrestricted Co-integration Rank Test (Trace15

Sample (adjusted): 2006Q1 2020Q4

Included observations: 60 after adjustments

Trend assumption: Linear deterministic trend

Series: ROA RESERVATIONS_NET_INTERES

OPERATIVE_COSTS_TOTAL_IN

NET_NONINT_INCOME_TOTAL_ NET_INTEREST

LOANS_TO_DEPOSITS LOANS INFLATION GDP CREDIT_RISK

ASSETS

Lags interval (in first differences): 1 to 3

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.943387	785.9455	285.1425	0.0000
At most 1 *	0.914581	613.6545	239.2354	0.0000
At most 2 *	0.865196	466.0436	197.3709	0.0001
At most 3 *	0.746505	345.8076	159.5297	0.0000
At most 4 *	0.722496	263.4629	125.6154	0.0000
At most 5 *	0.673700	186.5477	95.75366	0.0000
At most 6 *	0.486669	119.3513	69.81889	0.0000
At most 7 *	0.426626	79.34127	47.85613	0.0000
At most 8 *	0.378217	45.96820	29.79707	0.0003
At most 9 *	0.236430	17.45834	15.49471	0.0250
At most 10	0.020999	1.273332	3.841466	0.2591

Trace test indicates 10 cointegrating eqn (s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

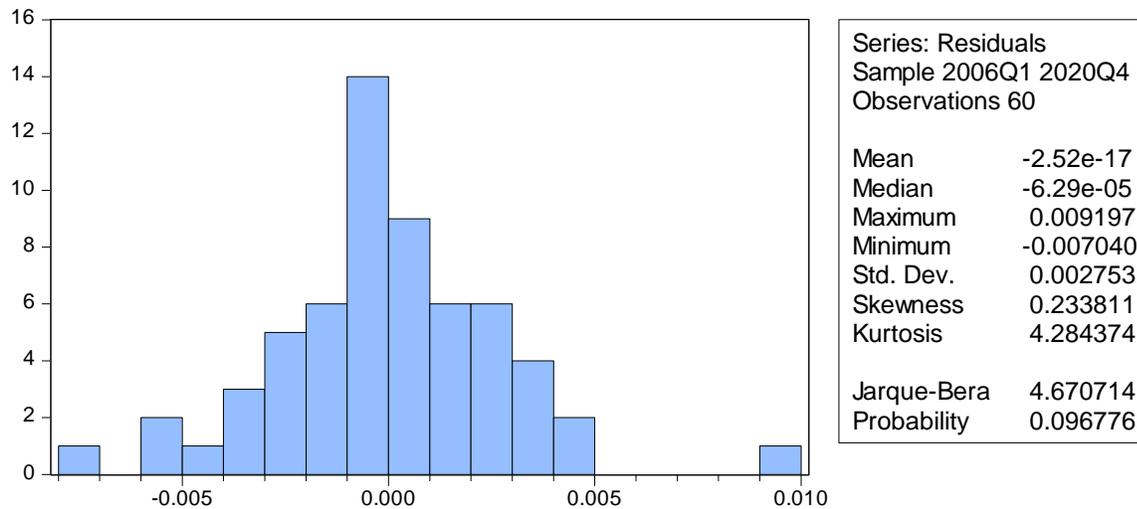
Source: Author's calculations

Unrestricted Co-integration Rank Test (Trace) indicates high level of co-integration with high probability with nine time series from 10 selected. Thus, we continue to construct VECM model and provide estimation of the coefficients of the variables involved.

Model specification for constructed model should provide evidence for the assumptions of heteroscedasticity, autocorrelation, and normality as basic assumptions of the constructed model.

b) Normality test

Figure 5.13. Normality test



Source: Author's calculations

The next and final assumption of regression model is the assumption of normality. This assumption should not be violated in order model to be treated as correctly specified. The form the histogram indicates on normal distribution of the residual and with the probability of Jarque- Bera probability value of 0.096776 lower than 10% we confirm that the assumption of normality is not violated.

c) Autocorrelation

Another key assumption we need to be sure is not violated, is the existence of autocorrelation in the residuals of the constructed model. For this purpose, we reach out to correlogram and Q statistics for determination of the existence of autocorrelation in residuals.

Table 5.17. CoRrelogram and Q statistics

Sample: 2005Q1 2020Q4

Included observations: 60

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
.*.	.*.	1	-0.166	-0.166	1.7298 0.188
.*.	.*.	2	-0.160	-0.193	3.3745 0.185
.*.	** .	3	-0.153	-0.231	4.8934 0.180

. .	.* .	4	-0.006	-0.135	4.8959	0.298
. .	. .	5	0.061	-0.053	5.1475	0.398
.* .	** .	6	-0.133	-0.222	6.3666	0.383
. .	.* .	7	0.019	-0.109	6.3921	0.495
. .	.* .	8	-0.003	-0.125	6.3925	0.603
. .	.* .	9	-0.018	-0.170	6.4168	0.698
. * .	. .	10	0.154	0.046	8.1756	0.612
.* .	.* .	11	-0.085	-0.113	8.7303	0.647
. .	.* .	12	-0.041	-0.126	8.8575	0.715
. .	. .	13	0.035	-0.018	8.9520	0.777
. * .	. .	14	0.101	0.056	9.7809	0.778
. .	. .	15	-0.029	-0.033	9.8489	0.829
.* .	.* .	16	-0.171	-0.130	12.313	0.722
. .	. .	17	0.072	0.002	12.759	0.752
. .	.* .	18	-0.028	-0.117	12.828	0.802
. .	.* .	19	-0.026	-0.138	12.889	0.844
. .	.* .	20	-0.020	-0.148	12.924	0.881
. .	.* .	21	0.057	-0.088	13.230	0.900
. * .	. .	22	0.096	-0.040	14.124	0.897
. .	. .	23	0.039	0.016	14.275	0.919
. .	. .	24	-0.040	-0.065	14.442	0.936
. .	.* .	25	-0.064	-0.073	14.872	0.944
.* .	.* .	26	-0.070	-0.096	15.411	0.949
. * .	. .	27	0.147	0.045	17.855	0.908
. .	. .	28	-0.051	-0.063	18.156	0.922

Source: Author's calculations

The correlogram presented does not have spikes at any lags calculated. The Q-statistics is not significant at all lags, indicating that there is not significant serial correlation in the residuals. This means that there is no autocorrelation in the residuals and the model is not violating the assumption of autocorrelation.

d) Heteroscedasticity

For the proof of homoscedasticity, we refer to Breusch-Pagan-Godfrey Test which is a test for heteroscedasticity of errors in regression. Existence in homoscedasticity in regression is the key assumption which if the assumption is violated, we cannot use regression analysis. In this case the values to probability of Chi-Square of 0.2502 offers evidence that the homoscedasticity assumption is not violated.

Table 5.18. Heteroskedasticity Test:

Breusch-Pagan-Godfrey Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.685867	Prob. F (44,15)	0.1358
Obs * R-squared	49.90784	Prob. Chi-Square (44)	0.2502
Scaled explained SS	14.22882	Prob. Chi-Square (44)	1.0000

Source: Author's calculations

VECM Estimation

In addition, presented are the results of the VECM estimation on the constructed model with ROA as the dependent variable and the set of macroeconomic and bank specific variables.

Table 5.19. VECM model with ROA as the dependent variable

	Model ROA	Coefficient	t statistics
x1	Size	-1.05E-07	[-2.72269]***
x2	Credit risk	-0.042197	[-2.80690]***
x3	Loans	2.17E-07	[3.75761]***
x4	Liquidity	-0.067436	[-5.05716]***
x5	Revenue Diversification	-0.099214	[-17.6799]***
x6	Operational efficiency	0.054408	[13.2987]***
x7	Reservations net to interest income	0.042909	[15.0074]***
x8	GDP	0.000326	[6.47227]***

x9	Inflation	-1.12E-05	[-0.14590]
x10	Net interest	-0.002068	[-2.90892]***
	ConitEq1	0.065463	[0.10134]
Critical- table values on 60 observation			
1%	5%	10%	
1.658	1.980	2.617	
R-squared	0.629063	Mean dependent var	-6.85E-06
Adjusted R-squared	0.124589	S.D. dependent var	0.004521
S.E. of regression	0.004230	Akaike info criterion	-7.802204
Sum squared reside	0.000447	Schwarz criterion	-6.580503
Log likelihood	269.0661	Hannan-Quinn criter.	-7.324330
Durbin-Watson stat	2.304496		

*** significant at 1%

** significant at 5%

* significant at 10%

Source: Author's calculations

Since R-squared (Coefficient of Determination) marks the value 0.629063 or more simply 62.90%, shows that the variables we have taken in the study explain in the regression model up to the extent of 62.90% the variability of the dependent variable. Evidently, this figure is satisfactory because in the study many other internal and external factors that may affect the profitability of the Republic of North Macedonia banking system are not taken into consideration. Consequently, we conclude that this value indicates a relatively high explanatory nature of the variables that we took in our study and that are quite representative in our study.

Also, if we refer to the values that the Durbin Watson index takes is 2.304496, it means that our model built to test the relationship between profitability and specific banking and macroeconomic factors, does not suffer from autocorrelation, this indicator proves once again that the model constructed by our study does not suffer from autocorrelation.

Based on regression analyses we draw conclusions regarding the interpretation of regression coefficients that have an impact on the dependent variable that measures the profitability and performance of a bank, which is ROA.

According to the presented results in VECM estimation results, the **size** variable from the long run perspective is significantly at level of 1% with the dependent coefficient indicator which has a negative sign, and as in the case of ROE model is an indicator of negative relation and causality with ROA variables as dependent variables. This indicates that as in the case of ROE model, increased assets in our banking system during the observed period when not managed properly could even mean low values of ROA. In this case we need to mention that the observed period in the model also includes the two period with high impact for the banking system such as financial crises 2007-2008 and European debt crisis 2012.

The long- run parameter of the deposits **credit risk** is negative and significant at level of 1%. This fact shows that according to the credit risk same as in the ROE model, Macedonian banking sector has logical flow to bank's profitability. In this case also the suggestion is that good management of the credit risk can have a positive impact to the ROA as profitability indicator.

The long run coefficient representing the **loans** variable indicates positive and significant relation to ROA. Also, in this case the same as in the ROE model, the results indicate the logical flow from the real practice where the higher amount of loans should generally contribute to the banks industry profitability. Main assumption is similar as in the ROE model example where the suggestion is that the banks should have high level of risk management related to the credit risk and liquidity in order to transform the nominal increase of the loans to profitability ratios as in this case ROA indicator.

The long run coefficient in the ROA representing the **liquidity** variable indicates negative and significant relation in this model. This loans to deposit indicator as liquidity indicator and its relationship to ROA profitability suggest that for the higher values of ROA, we need to have lower values of loans to deposit ratio. The same as in the case of ROE model, this finding reveals banks management continuous intention to have a largest deposits amount related to the amount of loans in order to have comfortable position to other operative aspects on banking management. However, in this case bank managers need to pay attention to the level of the interest rates of the loans and

deposits portfolios and its structure, and not only to the nominal values of the loans and deposits. In this terms Central Bank can contribute with measures and regulations to balance the desired level of banking industry liquidity risk.

Revenue Diversification parameter is negative and significant, showing that the increase of non-interest income in total income will not lead to the bank's profitability represented with the value of ROA. For the cause of this evidence, we also, as in the case of ROE model must relate to the observation period which includes the data from 2005-2020. We must have in mind the traditional nature of Macedonian banking sector and that the business conducted on industry level is coming on interest income.

Operational Efficiency variable from the long run perspective is highly significantly with the dependent variables ROA. The coefficient indicator has a positive sign, which indicates the strong proportion of operative costs included in total income are translated in the profitability values of ROA. This situation is the same as in the ROE model previously elaborated, and is in one sense aligned with situations related to the traditional banking systems where the profit is generated with higher operation costs, for example higher involvement of employees. This situation should be a sign that banks in the Macedonian banking industry need to move to technology, innovation and digitalization drivers for productivity and efficiency improvement. This also means that banks need to find a way to raise the level productivity and efficiency in order to generate higher profitability levels.

The long- run parameter of the **reservation net to interest income** is positive and significant in relation to ROA dependent variable. This fact as in the case of ROE, shows that the proportion of the reservations of the loans in proportion of total net interest income has negative impact to ROA variable. Generally, this is a logic similar to the reality where high level of loan reserves and low level of net interest income are transmitted to the lower level of profitability as in this case ROA indicator.

The long run coefficient representing the **GDP** variable indicates positive and significant relation in ROA model. As in the case of ROE model GDP highly significant and indicates that GDP growth levels are followed with high profitability levels of ROA in the observed time period. This relates to economic practice where economic agents and individual use loans to invest or for

consumption. Similar situation is presented in Macedonian banking system and economy where the economic growth is closely related to banks profitability level due to increased banking activities for the growth purpose.

Inflation parameter is negative and not significant, this situation is opposite to the ROE previously elaborated where the inflation indicator was found significant. This situation suggests that banking industry anticipates the inflation risk to the level of which the inflation cannot disturb the profitability level measured by ROA.

The long run coefficient representing the **net interest** variable indicates negative and significant relation in the case of ROA. The strong significance suggests that lower net interest rate as a difference from loans and deposit rates at banking level will have a negative impact to profitability related to ROA indicator and vice versa. For this causality we can refer to the level of proportion of assets calculated in ROA ratio. The level of assets involved can make bias inference that lower net interest rate will lead to higher profitability measured by ROA.

Error correction coefficient in this model as in the case of ROE model is not significant and indicates that the long run equilibrium cannot be determined. However, we still are considering the long run relationship provided with bank specific and macroeconomic indicators with ROA.

Table 5.20. Summary of study hypotheses (model with ROA as the dependent variable)

Hypothesis	Decision	Impact
There is a significant relationship between bank size and profitability of commercial banks	Accepted	Negative
There is a significant relationship between credit risk and profitability of commercial banks	Accepted	Negative
There is a significant relationship between loans and profitability of commercial banks	Accepted	Positive
There is a significant relationship between liquidity and profitability of commercial banks	Accepted	Negative
There is a significant relationship between revenue diversification and profitability of commercial banks	Accepted	Negative

There is a significant relationship between operational efficiency and profitability of commercial banks	Accepted	Positive
There is a significant relationship between reservations net interest income and profitability of commercial banks	Accepted	Positive
There is a significant relationship between growth of GDP and profitability of commercial banks	Accepted	Positive
There is a significant relationship between inflation and profitability of commercial banks	Accepted	Negative
There is a significant relationship between interest rate and profitability of commercial banks	Accepted	Negative

Source: Summarized by the Author.

This model analyses the relationship between the profitability measured by ROA of the Macedonian banking sector and the different types of factor (bank specific and macroeconomic) which the banks have been faced with, in the period between the years from 2005 to 2020, by using the panel VECM model. In this case banking sector profitability as in the case of ROE model is represented with the ROA models including banks specific and macroeconomic variables as independent variables.

Suggested by the results, the profitability of the Macedonian banking sector in ROA terms is determined by some of the selected macroeconomic (except inflation) and banks specific variables. The variable of size, credit risk, liquidity and revenue diversification the same as in ROA model presented negative impact to ROA, while all other presented positive relationship to profitability in ROE terms.

Macroeconomic factors such as: GDP and net interest in ROA model are highly significant and positive relationship with ROA. This means that profitability measured by ROA can always count on those macroeconomic contribution to the ratio of profit and assets.

The results the same as in the ROE model case directly suggests that the Macedonian banks' profitability in ROA terms has a good perception if profitability is represented by the selected variables. However, in this case as in the case of ROE model, there are clear indication that profitability needs to be increased by the higher productivity and efficiency level and progress of banking industry promotes economic development resulting in increased welfare. Moreover, it must follow the steps of technology, digitalization and innovation as the main drivers to the higher productivity and efficiency level on banking industry.

Management of bank needs to know factor internal factor that effect the bank profitability and to make profitable decisions. Hence, based on empirical analyses it is recommended that:

Commercial banks should be encouraged to look beyond the domestic market and expand their operations to other geographic markets and other sectors of the economy or to expand their operational activity in foreign country. It is also recommended that the agriculture and tourism sector may still be a potential market for commercial banks. Therefore, it is recommended that focusing on the management of the assets as an indicator for size in this way bank can increase the opportunity to create a high performance, as well as their performance.

Credit risk management team are recommended actions that will lead to higher results and performance such as: wider participation and planning in loan portfolio management, promoting work with stakeholders (businesses and individuals), while assessing the awareness of the risk that will accompany, qualification and recruitment of persons with high experience in the field and management of this risk, increase the technology in database processing for the loan portfolio as well as to improve communication and to create a fast bridge between risk exposure and management and its control in the fastest possible time.

Banks management is recommended to be vigilant when granting and controlling loans because, a high increase in the volume of loans can result in a decrease in the quality of credit and consequently in a reduced income. Moreover, large loan portfolio can lead to a reduction in bank profits if it includes mainly high-risk loans which can cause lower returns and financial losses.

Banks management must engage funds in the form of liquidity reserves and give advise to ensure that they have efficient liquidity management, so that commercial banks are able to pay their liabilities in the short and long term.

As well, it is recommended to increase non-interest income since it is known that non-interest income is an avenue through which risk in banking, which would usually be concentrated in a bank's loan portfolio, can be spread to other non-interest income-generating activities, thereby increasing profitability.

CONCLUSION AND RECOMMENDATION FOR FUTURE RESEARCH

Bank profitability represents an important criterion for financial stability, especially in a changing banking environment. Considering the weight that the banking sector occupies the financial system, the constant changes of the economic environment due to developments in the country, the region and beyond, the focus on monitoring and measuring performance indicators in the banking industry attract vast need for research and analysis.

Hence, indicators that have impact on profitability are important contributors to economic progress through the influence on a bank's investment and saving decisions. The research of profitability in banking industry is important not only because of the information it provides about the “health” of the economy in any given year, but also because earnings are a key determinant of growth and employment in the medium term.

This thesis aimed at investigating the relationship between bank and macroeconomic factors and to discover the extent to which these determinants influenced profitability with focus on banking sector in the Republic of North Macedonia. In this context, it started with investigation of banks role as a concept of financial intermediations which enable intermediation of banks between other sectors (economic units, country, clients) and accelerates the process of transferring from those who have sufficient of financial resources to those that have deficit of financial resources meaning that they act like a bridge form saver to borrowers as a primer task. This is why the efficient financial system should demonstrate improvements in profitability.

Consequently, banking activity plays an essential role in the process of channelling borrower funds, which have the opportunity to make productive investments. This financial activity is important to ensure the financial system and the economy function normally and efficiently. Commercial banks through the role of intermediation between savers and investors have influenced the volume, as well as the accumulation of savings, ensuring the market diversification of instruments that will meet the exact liquidity needs of savers and at the same time providing financial resources available to investors for a relatively long period according to their needs.

As long as the banking industry is business, they meet the needs of the market, by providing services/product and charging customers for those services/products. Broadly speaking, banks

create interest income through accelerating the process of transferring funds from savers to borrowers, by ensuring risk sharing. Clearly, the bank is able to take advantage of the interest rate difference, which is the difference between the interest paid and the interest received. Non-interest income is another source very attractive to banks as they are relatively stable over time and do not fluctuate. It is useful, especially during economic downturns, where interest rates may be artificially low and capital market activity slows. In this way the bank makes a profit as the first line of protection against losses from credit impairment. Evidently, the intermediations concept is fundamental in developing countries where the whole financial system is based on bank industry and there is of lack of stock exchange, all economic activity it is based on traditional banking.

Another core concept that bank is involved is credit creation through which banks expand deposit, and through this process banks should take care about two fundamental aspects: liquidity and profitability. Meaning that banks are obliged to pay money to their depositors when they exercise their right to demand money against their depositors.

Moreover, banks are a business institution which strives to maximize profits through loans and deposit advances. This is a reason why the bank should lend in such a way that will help to earn higher interest than what it pays for its deposits. The bank's credit process is based entirely on the assumption that at any given time only a few customers will really need cash. Also, on the other hand banks assume that all their customers will not go out in search of cash against their deposits at some point in time. Hence, through the process of credit creation commercial banks provide with funds to all sectors of the economy thus making them more developed than before. Consequently, the credit creation by commercial banks is one of most important and sources to generate income.

The literature on banks profitability theories and empirical evidence in the area were critically reviewed. The first market power theory: structure conduct hypothesis (SCP hypothesis), suggest that may be a collusive behaviour if the market is dominated by a few big banks and higher profits are due to anti-competitive price setting in concentrated market. The higher the market concentration, the higher their profit as a result of a collusive behaviour. Hence, in a market with a high degree of concentration, firms have more market power which allows them to set prices above marginal costs and achieve higher profitability.

The second market power theory: Relative market power (RMP) suggests that some banks are able to understand mergers and acquisitions, as a results banks end up with large market share

through which can exert market power by applying higher spreads to their clients and therefore enhance profitability. As a result of higher speed (lower deposit rate and higher loan rate) bank achieve higher profitability. Moreover, theory confirms that only large banks with well – differentiated product can influence pricing and have higher profit.

Structure conduct hypothesis (SCP hypothesis), has been challenged by Efficiency structure hypothesis (ES hypothesis), which suggest that bank with superior management or production process can operate at a lower cost and consequently higher profit, also with scales efficiency firm operates at an optimal scale with lower cost and this will result in higher profit. Moreover, assuming that the efficient is the key reason to get higher profit by companies, meaning that banks are operating with low cost that get higher profit for the result to be efficient. The efficient theory in banking sector has the meaning that banks that are more competitive will result to be efficient. Nowadays, to be competitive, banks should not only focus on operating with low cost, but they have to have a good management, adequate product and service, and to be on time with the innovation technology.

The expense preference behaviour theory state that firm primarily is driven by the goal of profit maximization, whether by maximizing revenue or by minimizing costs.

The second part presented the need to elaborate on theoretical aspects that explain the profitability of banks, based on the basic assumption that banks as financial intermediaries operate like any firm in other sectors. Profitability is a major criterion for measuring banks performance, in a changing banking system the environment is also one of the main reasons for the existence of banks, and they will continue exist only if they operate with profit year by year.

Clearly, profitability is the term that refers to the ability of the organization to maintain its profit constantly. The two main measures that are widely used today in the banking industry are return on activity (ROA) and return on equity (ROE). Therefore, the key profitability measurement in this thesis was performed by using two dependent variables: return on Assets (ROA) and return on equity (ROE)

ROA is defined as a net post-tax income, as a percentage of average assets held over a year, and indicates how much a bank is for its activity, although it may not be an event due to off-balance sheet activity. On the other hand, ROE is a random indicator that shows the importance in maximizing shareholder returns, reflecting a bank's ability in its ability and capital to generate profits. The research of identifying determinates that affect profitability of the bank is not only a

reason for the information that gives about “health” of economy in each year, but also because profits are major goal of growth and employment in the medium-term period. Changes in profitability have a potential contribution to the economic progress because of the impact that a bank's investment and savings decisions have. Moreover, it is showed that when profitability grows, value and shareholders can grow to an understandable extent.

This study aim is to identify the main specific banking and macroeconomic factors that may affect the profitability of the Republic of North Macedonia and to find out to what extent these determinants had an impact on profitability. In this context, previous studies on the profitability of banks have been reviewed and it has been concluded that the profitability of banks is usually expressed as a function of internal and external determinants. Internal determinants relate to factors that originate from bank accounts and can therefore be called micro or specific bank profit determinants. External determinants are variables which are not related to bank management, but reflect the economic and legal environment that affect the functioning and operation of financial institutions.

Empirical results from previous studies conclude that internal factors explain a large part of banks' profitability, however external factors also have an impact on profitability. A large number of explanatory variables have been proposed for both categories, according to the nature and purpose of each study. Studies that have dealt with internal determinants have used variables such as size, capital adequacy, credit risk, asset quality, loans, operational efficiency, asset liquidity, revenue diversification, etc., while for external determinants, a distinction has been made between variables. That describes the macroeconomic environment, such as inflation, interest rates, economic growth, and the exchange rate, unemployment and variables that represent market characteristics such as concentration, industry size, and ownership status.

An overview of the method of use for measuring profitability such as: DEA Approach, CAMELS Approach and DuPont Analyses it is possible to track the different aspects of banking activity, a few are considered to be of primary importance in determining the financial soundness and profitability of a bank.

The data envelopment analysis as a non-parametric methodology for measuring the efficiency of decision making in different area is also used in the banking industry. So, DEA approach, being an extreme point method, enables the construction of a frontier or a 'virtual' efficiency benchmark as a linear combination of efficient entities with the best combination of

inputs and outputs among the observed entities. Also, DEA results, motivate management to use the results and based on the finding would have be further evaluated.

CAMEL is a system that is used to evaluate the performance of financial institutions in a complete and uniform way. This system provides a quantitative assessment, both at the individual and at the general level for a bank of the rations under consideration, based on the classification of the five essential components of the activity and conditions of financial institutions. Besides, through CAMEL approach it is possible to analyses of trends over a period of time, along with or ratio-based model used to evaluate the performance of banks with the help of different criteria, viz. Capital Adequacy, Asset Quality, Management Quality, Earnings and Liquidity which provide management, analysts, investors, and supervisory agencies with information about improving or failing the bank's financial condition. Wherefore, CAMEL approach model plays a crucial role in the supervisory process and in identifying bank problem.

Coefficient trend analysis through DuPont analysis over a period of time, together with the absolute coefficient levels provide management, analysts, investors and supervisory agencies with information regarding the improvement or failure of the bank's financial condition.

Those methods enable to measure the profitability in the banking sector and through this is possible to analysing and identifying factor that affect profitability. Consequently, the profitability of banks is of interest not only at the level of individual banks, but is also important at a broader macroeconomic level. Thus, identifying those factors will help interested groups such as managers, board members, regulators, supervisors, owners, investors, researchers, financial analysts and supervisory authorities to build strong banks and also it is significant for policy makers in order to plan effective and efficient regulatory rules for the banking industry and take appropriate measures.

The next part, of this thesis continues with the concept of financial innovation and technological information. These innovation and technological information, have a direct effect on progress and leadto the creation of many financial products, services, production processes, and organizational structures. Through new product/service such as: electronic banking, debit and credit card and ATM, banking system in the Republic of North Macedonia it is showed that increase customer service are always available to customers, while generating profit for the bank requires investment costs.

Furthermore, based on the trending analyses the development of increased use of: electronic banking, debit and credit cards and ATM in the Macedonian banking sector is also showed. Hence, adopted information technology to offer classic services in the online form, showed that electronic services has many benefits for the banking industry and also for clients such as: reduce costs and improve the quality of customer service as well as to provide standardization of basic services, minimize cost and increasing the efficiency of banks through reducing the number of bank branches and the number of employees. In other words, many customers can receive the same service at the same time, without the help of cashiers or bank clerks, reducing administrative work and together with that, also the costs and consequently the reduction of fees that banks apply to their customers.

Delved into the analysis of the banking system as the main industry of the financial market in the Republic of North Macedonia which consists of:

1. The National Bank of the Republic of North Macedonia as a major monetary institution and

2. Sector of commercial banks, which operated with the authorization of national banks for the whole the Republic. Commercial banks that operate in Republic of North Macedonia contained 15 banks, 14 of which are privately owned, while MBDP is the only state owned bank and 2 Saving Houses, where 4 large banks (Komerrijalna Bank AD Skopje, Stopanska Bank AD Skopje NLB Tutunska Bank AD Skopje, and Ohridska Bank AD Ohrid) together, own about 70% of the loan portfolio and 74% of the banking system deposit.

Analysing deep within the financial architecture of financial system in the Republic of North Macedonia, it is revealed that banks are dominant, and therefore to a large extent cause the movements in the financial system, although the size gradually decreases over the years, it is still quite high size of total assets compared to other participants. Hence, banking sector has a major role in the maintenance of the financial stability because of the size that it has in the financial system. Foreign banks are dominant in the bank's activity, owning 73% of the capital foreign capital, additionally present in 14 and was dominant in 11 banks, controlling 71.6 percent of total banking sector assets, 80 percent of total loans, and 71.8 percent of total deposits. As per the country of origin, dominant participation in the Macedonian banking system is the capital from Greece 22%, Slovenia 16%, Turkey 12% and Austria 11%, Bulgaria 7%, Germany 4% and Switzerland 1%. On the other hand, only 27% of the total banks' assets belong to banks dominantly

owned by shareholders from the Republic of North Macedonia. Macedonian banking sector is relatively concentrated, with top five banks holding 75 % of total assets. Those five banks are the key ones for the total banking sector and the domestic economy. In this way, their financial result will be reflected in the entire banking system in the Republic of Northern Macedonia.

Financial stability indicators provide good assessment of the Macedonia banking industry. The financial intermediation showed that the banking system has appeared dominant, as there has been an increase in the share of total assets to GDP. The capital adequacy is well above the regular requirement and non- performing loans are declining in the last few years which indicate in liquidity to maintain a stable and solid liquidity position that ensures smooth operation.

The presence of banks originating from countries with advanced financial system has been a driving factor in adapting the most modern banking practices in the Republic of North Macedonia, with special emphasis on the continuous launch of new banking products which has had an impact on the quality of the banking supervision as well as modern risk assessment practices. On the other hand, the high presence of banks with foreign capital is another problem for the banking system. This is due to the fact that the financial difficulties of the parent banks can be reflected in their banks in the Republic of North Macedonia. This type of systematic risk transfer does not only occur immediately, but with a time delay.

Based on the review of previous studies and banking theories, this study investigated the impact of several factors divided into specific banking and macroeconomic factors in the Republic of North Macedonia banking system during the period 2005-2020. Identifying those factors is really important since the banking system contains over 80% of the financial system, the violation of the profitability of this system, causes a deep shock for the whole system in the Republic of North Macedonia commercial banks. Undoubtedly, if the profitability of commercial banks in the country is threatened, the whole financial system and the country economy is threatened, as well.

In order to identifying and have closer look of potential impacts of internal and external factors, this thesis uses specific banking factors which include variables such as bank size, revenue diversification, credit risk, liquidity, operational efficiency and loans. On the other hand, in this study macroeconomic factors such as GDP growth, inflation and interest rate are included. To meet the main object of research, the study is mainly based on the quantitative research method which is complemented with a qualitative method.

Quantitative data were obtained mainly from the Nacional Bank of the Republic of North Macedonia, International Monetary Fund (IMF) and the World Bank, in order to make the empirical analyses necessary to identify and measure the determinants of banks' profitability. In particular, multiple regression analysis has been used to measure the effect of bank profit determinants quantitatively. For testing the research hypotheses, the necessary financial data was considered, meaning the entire population aggregated data for banking system for the period from 2005 to 2020. Empirical analyses were performed for two models, since we considered two indicators (ROA and ROE) to measure profitability. The stationarity, co-integration, normality, autocorrelation and heteroscedasticity were also undertaken for both models to fulfil the main assumptions for model construction. In addition to the empirical analysis, applied to the entire time series data considering all banks together, further more detailed analysis was undertaken according to the division of banks factors into groups, to see out of which group of factors the banks have the greatest impact on the banking system as a whole. EViews software was used to perform the empirical analysis for the models.

Empirical findings to determine the factors influencing profitability suggest the following conclusions and enables the answer to the ten raised hypothesis:

- First, the results showed a significant relationship between size variable and profitability in both models in the ROA and ROE respectively from the long run at level of 5% and 1%, but with negative relation. This conclusion is not in line with expectations, because large commercial banks are expected to perform better than small commercial banks because large banks can benefit from economies of scale and also by increasing size some costs can be reduced for. Otherwise, it is said that large banks have their size advantage to generate more returns. This indicates that increased assets in our banking system during the observed period when not managed properly could even mean low values of ROA/ROE or caused by costs related to the management of extremely large firms, overheads of bureaucratic processes and agency costs. In this case we need to mention that the observed period in the model also includes the two periods with high impact for the banking system such as financial crises 2007-2008 and European debt crisis 2012. In this period of crises and their general implication, Macedonian banking system despite the growth in assets could not efficiently materialize it in profitability indicators.

- Second, credit risk has an inverse relationship with profitability in both models and is statistically significant at 5% and 1% respectively in the ROA and ROE models respectively. Credit risk is by far the most important risk faced by commercial banks and the success of a business depends on its accurate measurement and efficient management, to a greater extent than any other type of risk. The relationship between credit risk and profitability (ROA / ROE) was expected to be negative, interpreting the concept that the worse loans a bank has, the more its profitability will be reduced. This fact shows that the credit risk in the case of the Macedonian banking sector has logical flow to bank's profitability. This suggests that good management of the credit risk could change situation and has a positive impact to the ROE and ROA as profitability indicator.
- Third, the long run of loans ratio has a positive impact on profitability (ROA / ROE), with a statistically significant 1% for the ROE and ROA model. Also, in this case the model represents the logical flow from the reality where the higher amount of loans should generally contribute to the bank's profitability. Moreover, bank leading activity brings the main source of income that are generated by the banks, although the effect of loans on banks' profitability is positive, because the higher volume of loans the higher income of the bank and this result will apparently be more profitable in consequence of the added business created. Main assumption in this process is that banks should have high level of risk management related to the credit risk and liquidity in order to transform the nominal increase of the loans to profitability ratios as in this case ROE and ROA indicator.
- Fourth, liquidity has a positive relationship with profitability in models with ROE whereas it is statistically significant at 1% significance level. On the other hand, results showed a negative relationship in profitability models with ROA whereas it is statistically showed at 1% significance level. Keeping assets in a very liquid form tends to reduce income, as liquid assets are associated with lower rates of return. Thus, reducing the level of liquid assets will inevitably lead to increased profits. In addition, a highly liquid asset, would give a relatively lower income than a less liquid and an asset with more risk. However, in case if the more asset is in the liquid form banks have access to the funds necessary to fulfil

customer needs, maturing liabilities and capital requirements for operational purposes hence the less is the possibility of potential loss. From this aspect, the role of the Central bank is crucial in terms of monitoring the liquidity risks as in this case valued for high importance for ROE/ROA indicator.

- Fifth, revenue diversification factor has negative relationship with profitability in models with ROE/ROA and significant at 1% significance level at both models. Showing that the increase of non-interest income in total income will not lead to the bank's profitability represented with the value of ROE/ROA. This negative impact is due to the fact that the business conducted by the bank almost in all the period is founded on interest income. Also, if we have in mind that Macedonian banking system is mainly traditional, that may be the reason for the negative relationship between net non-interest income and ROE/ROA during the observed period 2005-2020.
- Six, the empirical findings showed a positive correlation between operational efficiency and profitability (ROA / ROE), but with strong statistical significance for the both models. Showing that minimizing operating costs in commercial banks certainly affects the improvement of banks' performance. Operational efficiency is used to show how changes relative to cost changes in revenue, to show how quickly costs increase or decrease when changes in revenue occur. This situation is in one sense associated with situations related to the traditional banking systems where the profit is generated with higher operations costs and for example higher involvement of employees. This situation should be a sign that banks in the Macedonian banking system need to work harder on using the benefits from technology improvement on systematic level. This also means that banks need to find a way to raise the level productivity and efficiency in order to generate higher profitability levels.
- Seven, the result showed that reservation net to interest income has a negative relationship with profitability and significant at 1% significance level at both models (ROE/ROA). This fact shows that the proportion of the reservations of the loans in proportion of total net interest income has negative impact to ROE/ROA variable. Generally, this is a logic similar

to the reality where high level of loan reserves and low level of net interest income are transmitted to the lower level of profitability as in this case ROE/ROA indicator.

- Eight, in terms of macroeconomic factors, GDP growth has a positive relationship with profitability (ROA / ROE) and is statistically significant for both models. GDP highly significant indicate that GDP growth levels are followed with high profitability levels of ROE/ROA in the observed time period. This relates to economic practice where economic agents and individuals use loans to invest or for consumption. Having in mind that while the increase of GDP growth rate, banks benefit from the improvement of customers' businesses and credit solvency and have higher demand for bank services/product, lower rate of loan default probability and higher fees and interest for their services/product, all those have results to have positive affect on banks profitability. Similar situation is presented in the Macedonian banking system and economy where the economic growth is closely related to banks profitability level due to increased banking activities for the growth purpose.
- Nine, inflation macroeconomic factor has a positive and significant relationship with ROA model, on the other hand it is insignificant with the model ROA. Showing that the increase of inflation will increase the bank's profitability. This situation suggests the high level of inflation will be followed by the high level of banking profitability in ROE terms. This may suggest that due to the ability of banks to anticipate inflation, they attempt to reach out from the inflationary environment to increase profits. This positive impact of inflation needs to be treated with respect to the possible perception of the inflation by the management and referent change and adaptation to the level of inflation. This proactive means that inflation will be participated and will be used as an input in risk, credit and deposit policies of the bank. This relates to the recent COVID inflations – financial repercussions where banks are recognized as institution which can well balance the inflation impact from the economy.
- Ten, the coefficient representing the net interest variable indicates positive and significant relation in the case of ROE, while negative and significant in case of ROA. The strong significance suggests that net interest rate as a difference form loans and deposit rates at banking level has a positive impact to profitability related to ROE indicator. Higher level

of net interest presents distinctive example of how good foundation in interest risk related to banks loans and deposit can result to banks profitability in ROE terms. On the other hand, negative and non-significant relationship with ROA, suggests that banking industry anticipates the inflation risk to the level of which the inflation cannot disturb the profitability level measured by ROA.

The models analysed the relationship between the profitability measured by ROE/ROA of the Republic of North Macedonian banking sector and the different types of factors (both internal and external) which the banks have been faced with, in the period between the years from 2005 to 2020, by using the VECM model.

Every bank specific indicator has shown significance in relation to both models ROE/ROA, however worth mentioning is that size and credit risk have lower level of significance of 5% at model with ROE. On the other hand, related to all other bank specific indicators such as: liquidity, revenue diversification, operational efficiency and reservation for loan loss have significance level of 1%. Thus, we may argue that the size and credit risk variables are significant in relationship to ROE and other variables bank specific variables related to higher significance level have a higher importance and contribution to profitability with both models (ROE/ROA).

All macroeconomic variables in ROE model are highly significant and positively related with ROE. This means that profitability measured by ROE can always count on macroeconomic contribution to the ratio of profit and equity. On the other hand, macroeconomic factors such as: GDP and net interest in ROA model are highly significant and positively related to ROA. This means that profitability measured by ROA can always count on those macroeconomic contribution to the ratio of profit and assets.

Profitability research analyses gives useful information for stakeholders, managers of banks, to understand the capacities in which they work against the possibilities they have, to compare with other banks, to analyze, review and improve the strategies used so far. The results directly suggest that the Macedonian banks' profitability in ROE/ROA terms has a good perception if profitability is represented by the selected variables. However, there are clear indication that profitability needs to be increased by the higher productivity and efficiency level. The "health" of the banking sector is a necessary condition for a stable financial system as a dominate participant while its progress promotes economic development resulting in increased welfare. Recently, banking industry development, technology, digitalization and innovation are the main drivers to

the higher productivity and efficiency level and banking industry in the Republic of North Macedonia must follow those steps.

Listed below are some recommendations on research and study findings:

Bank specific and macroeconomic variables presented are strongly important to explain the changes of profitability (ROE/ROA) for banking system in the Republic of North Macedonia. Therefore, it is recommended for all banks to participate in banking industry to ensure for inside and macroeconomic environment when drafting the strategy for developing their performance or profits.

Bank size, is significant indicator of the profitability of commercial banks in the Republic of North Macedonia but with negative impact. Economies of scale is derived from the size of the bank that plays a crucial role in the profitability of commercial banks. The benefit of bank size is reflected in the ability to reach wider markets. Therefore, commercial banks should be encouraged to look beyond the domestic market and expand their operations to other geographic markets and other sectors of the economy. It is recommended that commercial banks may expand their operational activity in a foreign country. It is also recommended that the agriculture and tourism sector may still be a potential market for commercial banks. Therefore, it is recommended that focusing on the management of the assets as an indicator for size in this way, a bank can increase the opportunity to create a high performance, as well as their performance.

Assumed that our study found that credit risk and reservations net to interest income indicators had a significant impact on profitability, the credit risk management team should be responsible for the following actions that will lead to higher results and performance: wider participation and planning in loan portfolio management, promoting work with stakeholders (businesses and individuals), while assessing the awareness of the risk that will accompany, qualification and recruitment of persons with high experience in the field and management of this risk in the Central Directorate, increase the technology in database processing for the loan portfolio as well as to improve communication and to create a fast bridge between risk exposure and management and its control in the fastest possible time.

Loans are the main source of income, hence in our case are estimated significant and positive impact on banks profitability. Consequently, a bank with a higher growth rate of its loan volume, apparently, would be more profitable as a result of the added business created. However, it is recommended for banks management to be vigilant when granting and controlling loans

because, a high increase in the volume of loans can result in a decrease in the quality of credit and consequently in a reduced income. Moreover, large loan portfolio can lead to a reduction in bank profits if it includes mainly high-risk loans which can cause lower returns and financial losses.

In banking industry there is often a confrontation between the principle of liquidity and profitability. But, banks must engage funds in the form of liquidity reserves and managers are advised to ensure that they have efficient liquidity management so that commercial banks are able to pay their liabilities in the short and long term.

The impact of revenue diversification on bank performance is expected to be significant and positive because diversified banks benefit from economies of scope which improve performance and reduce risk but in our case it had significant, but negative impact meaning that the Macedonian banking system is still traditional and it is grounded on main bank activity that is lending. Hence, it is recommended to increase non-interest income, since it is known that non-interest income is a banking risk, which would usually be concentrated in a bank's loan portfolio, or can be spread to other non-interest income-generating activities and thereby increasing profitability.

As supported by the literature, economy growth of a country is an essential for a healthy banking system. Therefore, the positive relationship between GDP and banking affection is expected to exist. Consequently, government policies for labour and investment need to be intensified to increase a banking industry. In an economy where the government stimulates job selection and creates the right investment climate for domestic and foreign investors, commercial banks are likely to strengthen even more. On the other hand, inflation as macroeconomic indicator in our case has a significant and positive effect on profitability. Although it is recommended for banks to continue to adapt their interest rate according to this expected inflation rate and has this impact on banking industry. Also, the exposure of the banking sector to unfavourable interest rate movements should be regularly assessed and carefully monitored. Unwanted and sudden movements in the nominal effective interest rate pose a threat to the bank's income and capital.

LIMITATIONS

This thesis, similar to most other research projects, encountered a number of unexpected problems and became a subject to a number of limitations. The main limitation is the lack of primary data extracted by the banks themselves. Due to the unavailability of information from banks, the study is limited to the information generated mainly from the National Bank of the Republic of North Macedonia for the banking system during the period of sixteen years 2005-2020 on a 3-month basis. Also, limitation originates as a result of the nature of the aggregated data. Although aggregated data helps to assess strengths and weaknesses of the banking system financial and managerial performance, it does not reveal the amount of its components and the quality of its individual components. Consequently, it may deviate from the research results if there is an improvement in the report data, which derives from the increase or decrease of one of the individual components.

c. Recommendation for the future research

This study's aim is to prove the existence of a relationship between some specific banking and macroeconomic factors with the profitability of banks (measured by ROE/ROA) in the Republic of North Macedonia. Certainly, it cannot be said that this study is comprehensive from which it can be claimed that there is no room for further suggestions. There are several ways in which this research can be expanded such as:

- The capability to extend the geographic sample beyond banking sector of the Republic of North Macedonia includes other SEE countries such as: Albania, Kosovo, Bosnia and Herzegovina and Serbia which would provide more variation in the sample and facilitate better econometric analysis and more robust results and would also provide insights on the behaviour of profitability of commercial banks on the developing country.
- Furthermore, adding some additional macroeconomic, industrial and bank specific factor data which combined with these factors that we have included in this study could give us a clearer picture of the impact of each factor on the level of profitability.
- Moreover, possibilities for analysis of the impact of the pandemic on the profitability of banks from several aspects: the changes caused as a result of the accelerated digitalization which additionally influences the organizational, personnel and other changes in the way of functioning of the banks, with a potential impact on the profitability; changes in the

quality of the loan portfolio, which in turn will cause changes in the side of reservations and the financial result of banks and stress test scenarios with predictions how the change of certain key variables in the operations of banks would affect the profitability indicators.

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Appendix

As in previous model after the phase of stationarity testing and providing data insight with descriptive statistic the construction of the model requires, actually means determining the lag length for the VAR model which involves possible iterations of lag length within preliminary constructed VAR model.

Table 1. LAG length

VAR Lag Order Selection Criteria

Endogenous variables: ROE RESERVATIONS_NET_INTERES
 OPERATIVE_COSTS_TOTAL_IN NET_NONINT_INCOME_TOTAL_
 NET_INTEREST_LOANS_TO_DEPOSITS LOANS INFLATION GDP CREDIT_RISK
 ASSETS

Exogenous variables: C

Date: 05/20/21 Time: 18:17

Sample: 2005Q1 2020Q4

Included observations: 60

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-792.5202	NA	0.011883	26.78401	27.16797	26.93420
1	-232.8734	895.4349	5.64e-09	12.16245	16.77000*	13.96472
2	-98.31604	165.9541	5.32e-09	11.71053	20.54169	15.16488
3	44.21819	123.5297	8.76e-09	10.99273	24.04747	16.09916
4	367.1798	161.4808*	2.65e-10*	4.260674*	21.53902	11.01918*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

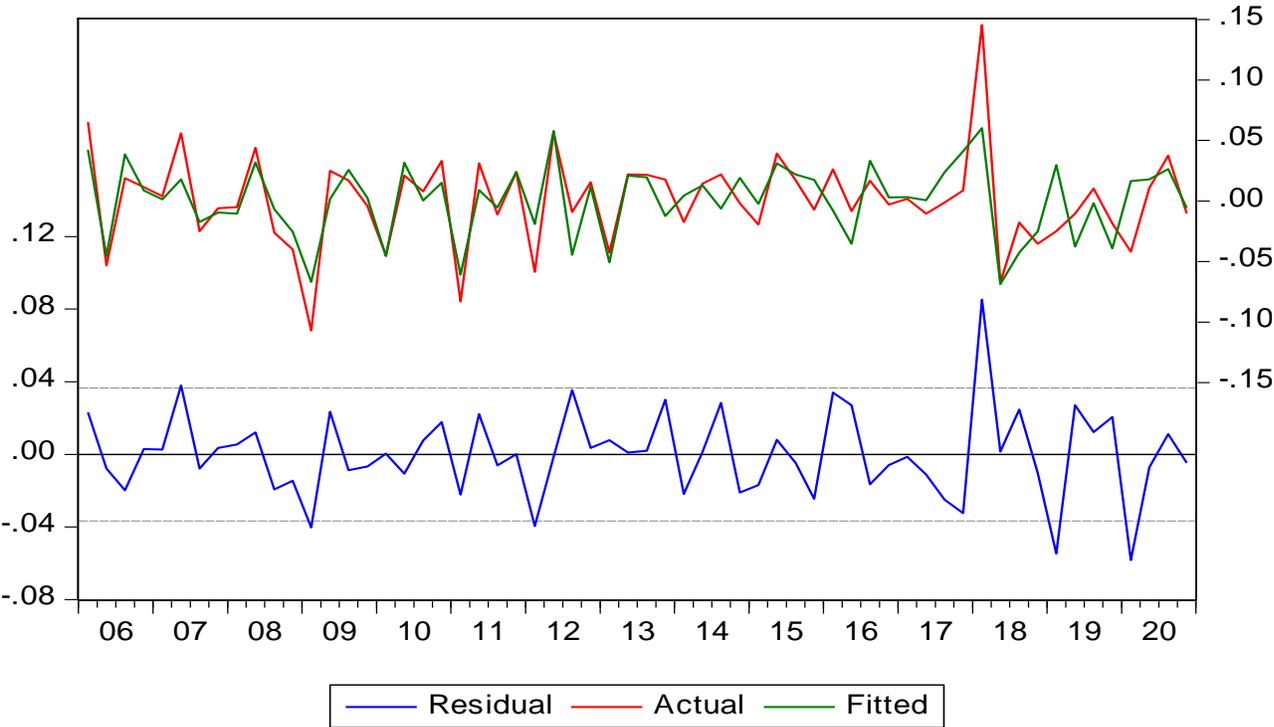
HQ: Hannan-Quinn information criterion

Source: Author's calculations

The results indicate that according to all criteria we need to proceed with the construction of the VAR model with 4 lags.

In terms of residuals from the models below is the plot of actual and fitted residuals. The graph suggests that actual and the residuals from the model are well fitted and within the margin provided.

Table2. Model residuals plot



What they represent, how they are calculated and what they indicate related to the exhibit

After the phase of stationarity testing and providing data insight with descriptive statistic, the construction of the model requires the first step of model construction, which means determining the lag length for the VAR model which involves possible iterations of lag length within preliminary constructed VAR model.

Table 3. VAR Lag Order Selection Criteria on preliminary constructed VAR model

VAR Lag Order Selection Criteria

Endogenous variables: ROA RESERVATIONS_NET_INTERES
 OPERATIVE_COSTS_TOTAL_IN NET_NONINT_INCOME_TOTAL_
 NET_INTEREST_LOANS_TO_DEPOSITS LOANS INFLATION GDP CREDIT_RISK
 ASSETS

Exogenous variables: C

Date: 05/20/21 Time: 18:16

Sample: 2005Q1 2020Q4

Included observations: 60

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-667.5224	NA	0.000184	22.61741	23.00138	22.76760
1	-105.9683	898.4865	8.20e-11	7.932278	12.53984*	9.734547
2	18.85517	153.9490*	1.07e-10	7.804828	16.63598	11.25918
3	164.1271	125.9024	1.61e-10	6.995762	20.05051	12.10219
4	454.0547	144.9638	1.46e-11*	1.364845*	18.64319	8.123355*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source: Author's calculations

The results indicate that according to all criteria we need to proceed with the construction of the VAR model with 4 lags.