Factors Affecting the Profitability of Azerbaijan Banking System

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ABSTRACT

The financial services industry varies day by day and the evaluation of the profitability of the financial institution become an important aspect in nowadays. Banks are the integral part of the financial market, and in order to stay at that level necessary to determine how banks operate and what factors affect their profitability.

This thesis investigates factors influencing the profitability of banks in Azerbaijan. The external and internal factors were reviewed, and the relationship between these factors and the profitability of Azerbaijan banks were hypothesized. The history and the current performance of the banking sector in Azerbaijan were considered and described in details. The previous studies from many countries in the field of the profitability and factors affecting on it were also considered. The CAMEL ratings have identified the major aspect of the profitability of the commercial banks of Azerbaijan by taking into consideration the capital adequacy, asset quality ratio, management quality ratio, earning ability ratio, liquidity ratio, GDP and size of the banks. The secondary data were collected from the official websites of the banks' financial reports for period since 2006 until 2012. The modification of the dependent and independent variables of the regression model were displayed by using the Panel Data Analysis Method. The empirical analysis and the results based on the panel data were employed to find the factors influencing the profitability of the banks.

Keywords: Profitability, Internal Factors, External Factors, Banking System, Azerbaijan, Panel Data, CAMEL Rating.

ÖZ

Finans hizmetleri endüstrisi günden günde değişmektedir ve finansal bir kurumun karlılığının değerlendirilmesi günümüzde çok önemli hale gelmiştir. Bankalar finansal pazarın içine geçmiş bir parçasıdırlar ve bu seviyede kalmak için bankaların nasıl çalıştığını ve karlılıklarını hangi faktörlerin etkilediğini belirlemek gerekir.

Bu çalışma, Azerbaycan'daki bankaların karlılığını etkileyen faktörleri incelemektedir. İç ve dış etkenler incelenmiş ve bu faktörler arasındaki ilişkilerle bankaların karlılık durumları varsayılmıştır. Azerbaycan'daki bankacılık sektörünün tarihi ve mevcut üretkenliği göz önünde bulundurularak detaylı bir şekilde anlatılmıştır. Önceden birçok ülkede karlılık ve karlılığı etkileyen unsurlar üzerine yapılan çalışmalar da göz önünde bulundurulmuştur. Boyutları, likidite oranlarını, sermaye yeterliliğini, yönetim oranını, kazanç oranını, varlık kalite oranını, pazar oranına hassasiyeti, GSYİH, vs. değerlendirilerek CAMELS yöntemi ölçütleriyle Azerbaycan'daki ulusal ve ticari bankaların karlılıklarının ana boyutları belirlenmiştir. İkincil veriler 2006 yılından 2012 yılına kadar olan süreçteki bankaların finansal raporlarının internet sitelerinden toplanmıştır. Regresyon modelinin bağımlı ve bağımsız değişkenlerinde yapılan değişiklikler Panel Veri Analiz Yöntem'i kullanılarak gösterilmiştir. Deneysel analiz ve panel verilerinden elde edilen sonuçlar bankaların karlılıklarını etkileyen faktörleri bulmak için kullanılmıştır.

Anahtar kelimeler: Karlılık, İç Etkenler, Dış Etkenler, Bankacılık Sistemi, Azerbaycan, Panel Veri, CAMEL ölçütleri.

To woman whom I owed everything that I have in my life.

To My Mom

ACKNOWLEDGMENT

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LIST OF ABBREVIATIONS

ROA   Return on Asset

ROE   Return on Equity

NIM   Net Interest Margin

INF   Inflation

MC   Market Capitalization

IBAR   International Bank of Azerbaijan Republic

LLC   Levin, Lin and Chu method

IPS   Im, Pesaran and Shin method

M-W   Maddala and Wu method

USSR   Union of Soviet Socialist Republics

EU   European Union

CIS   The Commonwealth of Independent States

ADR   Azerbaijan Democratic Republic

CBAR   Central Bank of Azerbaijan Republic

AZM   Azerbaijan Banknote

AZN   Azerbaijan New Manat

ATM   Automated Teller Machine

POS   Point of Sale

AR   Azerbaijan Republic

GMM   Generalized Method of Moments

CAMEL   An international Bank-Rating System

CA   Capital Adequacy

AQ   Asset Quality

MQ   Management Quality

EA   Earning Ability

LQD   Liquidity

SIZE   Total Assets of the bank

GDP   Gross Domestic Product per capita

LSIZE   Logarithmic value of the total assets

LGDP   Logarithmic value of Gross Domestic Product per capita

Chapter 1

INTRODUCTION

1.1 Overview of Banking System of Azerbaijan Republic

The financial services industry varies day by day and the evaluation of the profitability of the financial institution became an important aspect. Banks are the integral part of the financial market, and in order to stay at that level; it is necessary to determine how banks operate and what factors affect their profitability. The banking system plays an important role in the functioning of the market economy. Banks are the most significant elements in the infrastructure of modern society, which serve important social functions. Sustainability of their operation significantly affects the performance of the economy as a whole. Therefore, in most countries, banking is the most strictly regulated sector. In this case, the banking system has strong national characteristics, reflecting the specific formation of the national banking system of Azerbaijan. This specificity is determined by many factors which will be elaborated below.

Azerbaijan is an industrial country with a developed agriculture. It has strong petroleum, oil refining industry, growing gas producing production and related chemical industry, machine building, well-developed textile, wine and canning industry. The most developed agricultural activities are cotton, vegetables, horticulture, viticulture, silk, tobacco and tea growing.

The infrastructure of the banking system should reflect the industrial, agricultural and natural potential of the country. In Azerbaijan, a new monetary mechanism is being established and the process of privatization of state enterprises has just started. In the country, there is high rate of inflation and financial market is underdeveloped. There are also other factors influencing the banking system such as the traditional ties with the economically developed neighboring Turkey and Iran as well as the consequences of military action. It is an important to highlight the fact that Azerbaijan, as a sovereign state has arisen as a result of the collapse of the USSR and there are many issues of the economy that retain the flavor of the command and the planning system. Additionally, the country has close economic and political ties with Russia on its way to the creation of a market economy at a faster pace. This creates favorable conditions for the use of the experience of the Russian Federation in order to avoid some of the mistakes on the thorny path to market.

The banking system of Azerbaijan at the present stage of its development is transitional in nature, influenced by structural changes in the economy. An integral part of the changes favor the formation of a new institutional structure of the banking system; suggesting that the maturation of objective conditions will lead to emergence of new type of credit institutions. Related challenges of restructuring the banking system based on market principles include problem-solving organization of the banks in the new environment. Difficulties encountered in the operation of Azerbaijan banks in 1994-1996, as expressed in serious financial difficulties and bankruptcy of several banks exacerbate the situation (Aliyev, 2007).

Reform of the economy and its integration into the world economic system necessitate the harmonization of the principles and practices of domestic banks with international standards. For the banks to take a leading position in the market structure, characteristics of developed countries requires a deep study of the concept and rationale of their development in a market economy. Development problems of the national banking systems have been extensively studied in the literature. Certain scientists took direct part in the development of improving monetary system of the Republic of Azerbaijan. These scientists include R.A. Babaev, G.G. Dzhafarov, A.I. Gasimov, A.M. Kerimov, S.D. Kakhramanov, etc. The scientific works of these authors, as well as many others, have a great theoretical and practical significance. However, the banking system of Azerbaijan is at a new stage in its development, and therefore requires further study. These points determine the relevance of the topic of the thesis.

1.2 The goals and objectives of the study

The purpose of the study is to develop methodological, theoretical and applied aspects of the creation, development and regulation of the banking system and the development of management strategies of the banking system of the Azerbaijan Republic in the period of transition, providing increased role of banks in stimulating economic growth.

In order to achieve this objective; the study sets out and tries to solve the following problems and this also determined the structure and logic of the research:

- to carry out a theoretical analysis of the activities of banks in the transition to a market economy;

- to explore the history of the development of the banking system;

- to analyze the existing system of commercial banks of Azerbaijan, including the dominant state-owned and private banks;

- to give an overall assessment of the commercial banking system of Azerbaijan;

- to disclose the value of the Central Bank in the national banking system, and to identify ways of increasing its role;

- to develop the direction of the transformation of the system of commercial banks, including the restructuring of the system, credit policy and the organization of banking.

The subject of this research is the economic relations in the creation and functioning of the national banking system of Azerbaijan with record to adequate conditions of the country's transition to market economy principles.

The objective of the research is to examine the banking system of Azerbaijan which has developed as a result of the first phase of the market economy with the result of the elimination of the system of banks, inherited from the Soviet Union.

The determinants of the bank profitability can be separated into two groups: internal and external factors. Internal determinants can be distinguished as factors which depend on a bank's management decisions. They are estimated by using both balance sheet and income statement of banks. External determinants are the factors which are out of the bank's management control. Internal factors are divided into subgroups, such as: capital, size, loan and deposits, whereas external factors take into account macroeconomic factors, such as gross domestic product (GDP), inflation (INF), market capitalization (MC).

This study focuses on factors that influence the profitability of banks in Azerbaijan. The study analyzes the external and internal factors by taking into consideration the size, liquidity ratio, capital adequacy, management ratio, earning ratio, asset quality ratio and GDP.

1.3 Hypotheses of the research

The purpose of this research is to explore the connection between internal and external factors with Bank's profitability in the top 15 banks of Azerbaijan. On the basis of the purpose, this study strives for checking to the following hypotheses:

Hypothesis1. There is a positive relationship between some internal factors (such as size of bank and capital) and bank profits.

Hypothesis2. There is a negative relationship between some external factors (macroeconomic growth GDP) and bank profits.

1.4 The Methodological Basis of the Study

The secondary data was collected from the official websites of government and commercial banks of Azerbaijan over the last 7 years. The scope of the research includes 15 banks of Azerbaijan among which are: Access Bank, Bank of Baku, Bank Republic, Zamin Bank, Bank Standard, Demir Bank, IBAR, Kapital Bank, Rabita Bank and others. By using the secondary data, correlation analysis was done and panel unit root test was made in order to reveal whether the data is stationary or not and whether this data should be used in a model or not. The three methods were used to approve the stationarity of the existing data, such as Levin, Lin and Chu method (LLC), Im, Pesaran and Shin (IPS) and Maddala and Wu (M-W).

After the testing of the data, the regression models were constructed and analyzed for each model. The empirical analysis obtained from the regression analysis of the

models was observed and identified the relationship between the profitability determinants and the factors affecting the profitability.

This research consists of 6 chapters. The first chapter presents the introduction of the study including the goals and objectives, methodology and hypotheses. The second chapter includes the background of the history and the current status of the banking system of Azerbaijan. The literature review on profitability in banking sector written before by other researchers is presented in third chapter. Chapter four covers data and methodology, dependent and independent variables. The numerous analyses are carried out in chapter five. The results obtained from analyses are also presented in chapter five. And the conclusion of all analysis is presented in the sixth chapter.

Chapter 2

REVIEW OF AZERBAIJAN BANKING SYSTEM

2.1 Overview of the History of Banking System in Azerbaijan

Economic arrangements made in the country also contributed to the development of the Azerbaijani banking sector and the banks operating level of service has increased significantly. After acquiring the independence, the Republic of Azerbaijan and the conduct of economic policy in the country has begun to establish new banks.

In the 1990s, starting with the process of independence, structural changes were implemented in all financial systems, including the banking system. The interest rates and the removal of the restrictions in foreign exchange rates played an important role in the rapid settlement of these structural changes. These structural changes in the nature of the reforms provided the development and the growth of the financial system and banking sector. But in the 1990s, development of banking sector has led to a significant deterioration of financial institutions; banks operated under increased attention for a long time. During this period, the growing borrowing requirement and budgetary using of resources for financing the state-owned banks have accelerated this process. When it came to the 2000s, the banking sector has been exposed to a serious risk, the restructuring of the banking sector and the financial structure of banks have become inevitable. As a result of this, some radical changes were made in the Law on Banks of the Republic of Azerbaijan and in the

regulation and supervision of banks was introduced with a new approach (Aliyev, 2007).

In parallel with the efforts of restructuring and integration of international markets, both in the institutional structure of the banks in Azerbaijan and in services and products that they offer, have been implemented serious changes. Thus, "The banking sector" of the economy of Azerbaijan is open to international competition and is headed by the leading sectors are compatible with EU. After creating a free-market model, the restructuring of the banking sector in Azerbaijan was needed again. In terms of the international applications, within the basic elements of the restructuring of the banking system are the improving the regulation and management of the system, the changing of the method and period of taking and management of the risk, the recognition and the reduction of problem assets, the strengthening of the capital, the elimination and proper governance of the political interference in the banking system (Aliyev, 2007).

There are two basic approaches of the rehabilitation or the restructuring of banks. The first approach is the improving and the strengthening of the financial structure of the banks in order to foresee the increase in equity over time plus the profits that would make the most efficient way for the creation of economic environment efforts are made.

The second approach is a short-term approach; it is required to increase the equity immediately. Of course, each depending on the occurrence of the conditions of the two approaches has advantages and disadvantages. When viewing as a method for configuring or bank rehabilitation, considering the conditions in the banks and the

banking system, it is seen that there are different methods that should be applied. The most common methods of the rehabilitation are the strengthening of the bank capital, the improving of the quality of governance, the strengthening of the structure of bank shareholders, the improving of the structure of competitiveness, the providing of a conditional provision for liquidity support to the bank. The methods of restructuring are applications such as the ensuring of public support, the adoption of banks into public administration, the merging, the separating, the reducing, the restructuring and the privatization of loans.

In order to explore the world banking, the work towards harmonization with the global banking system is required. Therefore, for harmonization of Azerbaijani banks with global banks and in the training of Azerbaijani bankers need help and experience of the other countries. At present, the most important issue facing country's banking is characterized as education. Especially in this field, the technology and knowledge are needed. Therefore, the identifying of the new banking techniques by banks and in terms of training of employees will be beneficial the partnership with Turkish banks in a form of joint ventures.

The completely centralization of bank transactions and the practices of the banking system constituted the main feature of Azerbaijan in the period of Soviet Union. Centrality is the main router in the distribution of all resources contributes to the realization of scientific socialism. Long-term experience shows that the banks' activities established by the central management system, business activities and financial results had been away from independent and fair solving and management of banking services was sealed off from other kinds of services. In period 1991-1997,

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the volume of GDP in all CIS countries decreased significantly and deep economic crisis has affected all former Soviet countries considerably (Aliyev, 2007).

Heavy crisis situation has deepened the collapse of the Soviet Union. After the collapse of the USSR, the disconnections in the economic connections of the United Nations had been also effective in extinction of the united economy area (Koychuyev, 2002).

Naturally, this is reflected in the banking system of the country with negativity. The disintegration of the Soviet regime identified problems in Azerbaijan as well. As a result, the establishment of appropriate market economy and banking system for presenting fundamental changes need to be made.

After 1991 the Republic of Azerbaijan gained its independence. Accordance with the requirements of the economy, the market economy start creating and giving head in the country, technological developments, economic and political reforms of the banking system showed effect the re-establishment of the infrastructure. Azerbaijani banking system in the light of recent technological advances to the demands of the market economy to be passed on to the appropriate level in the public sector have been initiated wide-ranging discussion (Aliyev, 2007).

2.2 Banking Sector over a Period of Azerbaijan Democratic Republic

In 28 May 1918 after the establishment of Azerbaijan Democratic Republic, the country's financial system has been the weakest part of the circulation of money. This scarcity of money in the country at the same time has caused the circulation of

other money. In 1918, in ADR beside the «Nikolai» and «Kerenka» Rubles «Baku Bons» was also floating around. These bonds were exported by Baku Governorate and the others by the Baku City Fund. Starting from the middle of 1918, dominance of ADR as «Musavat» (Equality) began to issue their own money and this money was also called the bonds. At the same time the Board of the Caucasus was dealing with money issues. Under the contract, these coins were aimed to divide between Azerbaijan, Georgia and Armenia (Kasumova, 1992).

A huge amount of capital installed for the development of industry and agriculture in Azerbaijan. Entry of foreign capital to Azerbaijan began with the arrival of Nobel to Baku. By referring to one of the German banks Nobel was able to get big amount of loan. Therewith, the extraction of oil has started to work. Inflow of the British capital to Azerbaijan was realized by buying the ready chink from the native bourgeoisie. In 1883 the foreign investor Rothschild has established "Caspian Oil Industry and Trade Company" with a capital of 1.5 million Ruble. Cases such as the increase of foreign capital, the beginning of the development of the agricultural and industrial sectors, etc. has necessitated the presence of banks and financial institutions (Aliyev, 2007).

Before the revolution in 1917 Azerbaijan's financial system covered 28 commercial and mortgage-credit banks, 8 mutually credit institutions, 6 departments of the bank, 13 branches of the treasury, 135 small credit companies and numerous safety deposit boxes. These numerical sources showed that Azerbaijan's financial system had the most powerful and wide network in the Caucasus.

May 5, 1919 the issue about the printing of money was raised by President Mehmed Emin Resulzade in the Parliament of Azerbaijan. The credit branch of the Ministry of

Finance prepared a draft Law on the Central Bank of Azerbaijan and presented to Parliament on 16 September 1919, and this law was approved. So in September 30, 1919 the Central Bank of Azerbaijan was officially inaugurated (Eviashvili, 2000).

The establishment of the CBA had been a major contribution to the regulation of the monetary and credit policy. In December 1, 1919 the amount of bank's total assets was 653 million Manat and in May 1, 1920 it rose to 1 billion 354 million Manat. In November 9, 1919 the first branch of Azerbaijan's Central Bank was opened in Ganja (The Annual Report of CBAR, 1997).

Unfortunately, the life of the CBA was not long like an ADR. In April 28, 1920 independency ended with the occupation of Azerbaijan by the Red Army. During the occupation, Azerbaijan was looted and all gold, silver and other reserves of the country were taken by the Russian army. In addition, while the British were leaving the country precious things in the price of 212 million Manat were exported from the country. (Eviashvili, 2000).

During Soviet period, three state qualified monopolistic banks functioned. These were USSR State Bank, Construction Bank of the USSR and the USSR Foreign Trade Bank. By performing the functions of emission and the loan payment, State Bank of the USSR has converted to organisms of the State administration and control (Lavrushin, 1998).

2.3 Current performance of the Azerbaijan Banking Sector

After restoration of independence, the first national banknotes Manat (AZM) was put into circulation. In accordance with the principles of the market economy of

Azerbaijan to create a legal framework for competitive and modern banking system, two important laws entered into force with the approval of President Ebulfez Elchibey in August 7 1992. These two laws were "Law on the Central Bank" and "Law on Banks and Banking Activities". In addition to these laws, the authority of the law has confirmed by the National Assembly of Azerbaijan (Milli Mejlis). In June 1996 the new "Law on the Central Bank" and "Law on Banks and Banking Activities" had entered into force after approval of the President Heydar Aliyev (The Annual Report of CBAR, 2007).

Article 1 of the Law of the Azerbaijan Republic on Banks, which was signed by the last president of Azerbaijan Ilham Aliyev in 2004, states that

> "Bank is a legal person that implements the attraction of deposits from natural persons and legal entities or other return assets, issuance of credits from its behalf and from its own funds, as well as implementation of payment and cash-desk and money transfer operation by the client request."

The Law "On the Banks" manages the performance of the banking system of Azerbaijan Republic. In accordance with the law, there are two stages in the country's banking system: the Central Bank and the non-bank credit organizations. The law "On the Central Bank of Azerbaijan Republic", the Civil Code, The Constitution of Azerbaijan Republic, and other normative legal acts regulate the first and the main stage of the banking system: the Central Bank of the country and its activities. In concordance with the law of Azerbaijan Republic, the Central Bank licenses and controls the work of the banks implements control over the banking operations in the form defined by the law.

The credit organizations refer to the second stage of the banking system and its activities managed by the Constitution of Azerbaijan Republic, the law "On the

banks", Civil Code, the legislations "On the Central Bank of Azerbaijan Republic", "On the non-bank credit organizations", and "On the credit unions", and other normative and legal acts. Under article 1 of the law of the Azerbaijan Republic,

> "Credit organization is a bank or local branch of foreign bank or nonbank credit organization".

The Central Bank is empowered to regulate the activities of all banks operating in the country and currency of the credit system across the country. This bank serves to another banks and government and always works with them, but not with customers. Other banks directly demonstrate the services to the customers.

According to the Decree on Changes of Monetary Units to Nominal Value and the Scale of Prices (Denomination), which was signed by President of AR in 2005, 1 new Manat (AZN) was equal to 5000 old Manats (AZM). A year after the joint use of AZM and AZN, the new banknotes of Manat (AZN) and metal coins (Gapik) were put into circulation (The Annual Report of CBAR, 2005).

According to the report of the Central Bank for 2010, by comparing to previous years, 32 new branches and 15 new departments of banks were opened in a country. Income gained by banks before tax made 140.1 mln AZN and after tax 120.3mln AZN. Banking sector at that period retained its stability, kept to develop and continued increasing the key determinants of the banking performance.

Table 2.1: List of the considered Azerbaijan banks by their size (total assets)

№	Name of the banks	The size of the banks (AZN)
1	Open Joint Stock Company "International Bank of Azerbaijan"	6,173,865,000
2	Open Joint Stock Company "Kapital Bank"	1,103,870,000
3	Open Joint Stock Company "Xalq Bank"	839,412,259
4	Closed Joint Stock Company "Bank Standard"	793,064,000
5	Commercial Bank "UniBank"	578,359,000
6	Closed Joint Stock Company "AccessBank"	515,269,000
7	Open Joint Stock Company "Bank of Baku"	486,181,000
8	Open Joint Stock Company "Bank Respublika"	428,237,000
9	Open Joint Stock Company "DemirBank"	377,593,000
10	Open Joint Stock Company "AGBank"	348,125,000
11	Open Joint Stock Company "ZaminBank"	240,784,358
12	Open Joint Stock Company "TuranBank"	217,073,000
13	Open Joint Stock Company "RabitaBank"	149,232,000
14	Open Joint Stock Company "AmrahBank"	111,131,000
15	Open Joint Stock Company "Azerbaijan Credit Bank"	21,867,560

Source: Central Bank of Azerbaijan, Financial Stability Review 2013

The Central Bank assets increased by 13.9% and made 13.3 bln AZN, whereas bank loans went up by 9% and made 8971.8mln AZN. For 2010, Return on assets (ROA) in total made 1% and return on equity (ROE) was 7.4%. The financial crisis in 2010 beneficially influenced on progress of the payment systems. On the whole 44.7 mln pieces of transactions were carried out through ATM machines and POS-terminals.

The number of bank cards and transactions through Internet banking were increased in 2010 (The Annual Report of CBAR, 2010).

At the end of 2012, referring to the report of the Central Bank, the number of operating banks totals 43 banks, 665 branches and 158 divisions. The half of the private banks, more precisely 22 of them, is held on foreign capital. In a table above were listed 15 banks by their sizes that were considered in this research.

As reported the Central Bank in 2012, assets of the banking system of AR made 17643.4 mln AZN and it went up by 26.5% during the year. Loans went up by 27.8% and made 12399.4 mln AZN. In 2012, banks produced 169.9 mln AZN profit and net profit after tax constituted 130 mln AZN. Total income of banks (interest and non-interest incomes) constituted 1625.1 mln AZN, whereas total expenses of banks (interest and non-interest expenses) made 1296.9 mln AZN. Profitability indicators: Return on assets (ROA) and and Return on equity (ROE) were 4.8% and 7.1% respectively. In 2012 the size of aggregate capital increased and reached 2573 mln AZN (The Annual Report of CBAR, 2012).

Table 2.2: Growth rate of key determinants of the Azerbaijan banking system, %

	2009	2010	2011	2012
Assets	13.6	13.9	7.3	26.5
Loans	17.3	9.0	8.1	27.8
Deposits of legal entities	-18.8	4.3	16.1	-0.2
Deposits of population	22.6	29.8	36.0	24.1
Aggregate capital	17.9	7.8	12.7	36.4

Source: Central Bank of Azerbaijan, Financial Stability Review 2012

Table 2.3: Profits of Azerbaijan banks, AZN million

	2011	2012	Change, %
Interest income	1 099.8	1 257.8	14.4
Interest expense	586.3	661.0	12.7
Non-interest income	321.0	367.3	14.4
Non-interest expense	538.4	635.9	18.1
Total income	1 420.8	1 625.1	14.4
Total expense	1 124.7	1 296.9	15.3
Net operation profit	296.0	328.3	11.0
Deductions to loan loss provisioning	447.3	159.7	-64.3

Source: Central Bank of Azerbaijan, Financial Stability Review 2012
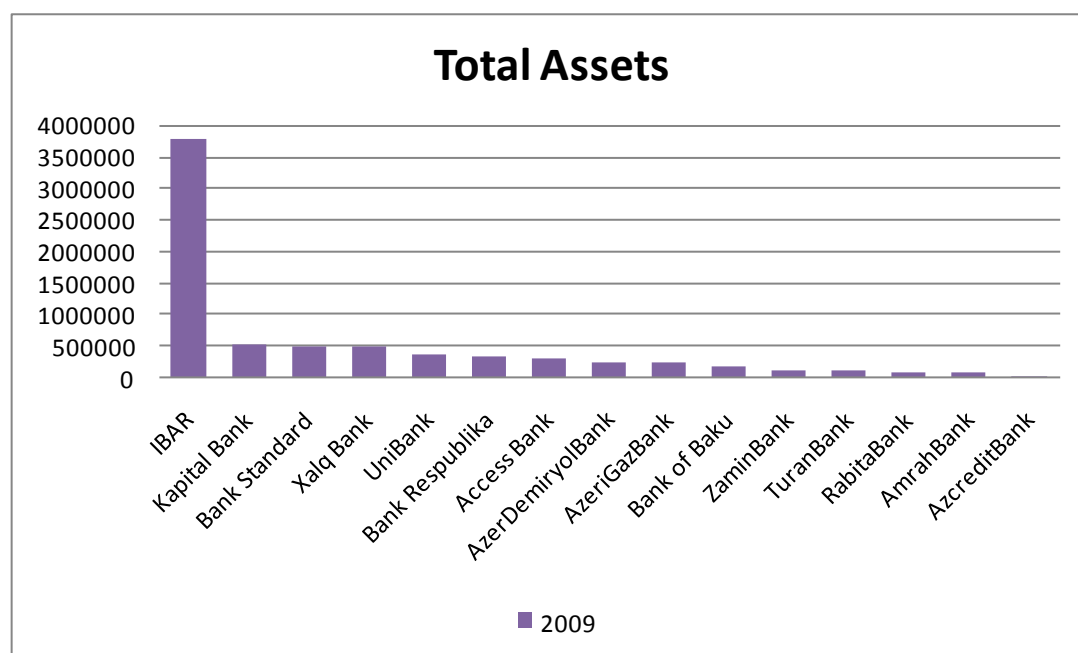
Total Assets

Figure 2.1: List of the Azerbaijan banks ranked by Total Assets (in thousands AZN)

Pursuant to the Figure 2.1, a leading position in a ranking among 15 banks by total assets takes International Bank of Azerbaijan Republic (IBAR) with a highest amount of assets of 3 billion 771.269 million AZN. Kapital Bank is on a second

leading place with a lower amount of assets of 516.540 million AZN. Bank Standard, Xalq Bank, UniBank, Bank Respublika, Access Bank, AzerDemiryolBank, AzeriGazBank, Bank of Baku, ZaminBank, TuranBank, RabitaBank and AmrahBank stand almost next to Kapital Bank. They all vary in a range from 90 million AZN to 515 million AZN. The least amount of assets of 27.048 million AZN has AzcreditBank. According to the annual report of CBAR for 2009, total assets increased and became 11 billion 665.2 million AZN.
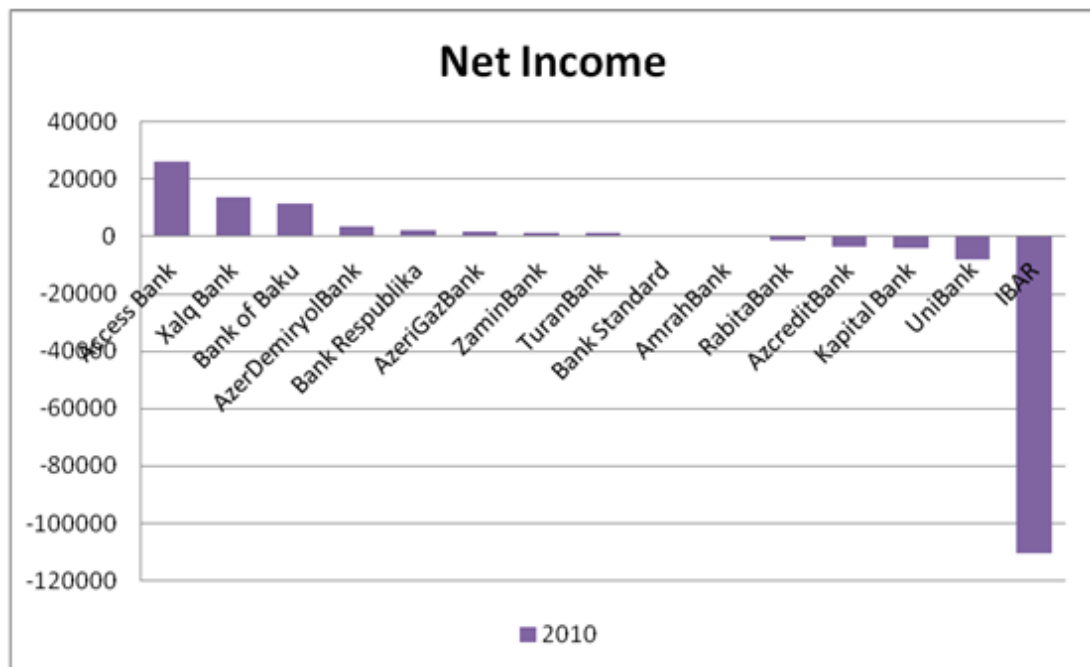
Figure 2.2: List of the Azerbaijan banks ranked by Net Income (in thousands AZN)

According to the Figure 2.2, in the ranking of 15 considered Azerbaijan banks by its Net Income for 2010, IBAR has a loss of (-110.605) million AZN and consequently it takes last position of this ranking. The first and leading position takes Access Bank with a highest amount of net profit of 26.249 million AZN. Next two banks: Xalq Bank and Bank of Baku stands next to Access Bank with profit of 13.496 million AZN and 11.597 AZN respectively. They are followed by AzerDemiryolBank, Bank

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Respublika, AzeriGazBank, ZaminBank, TuranBank, Bank Standard and AmrahBank with a profit that vary from 3 million AZN until 100 thousands AZN.
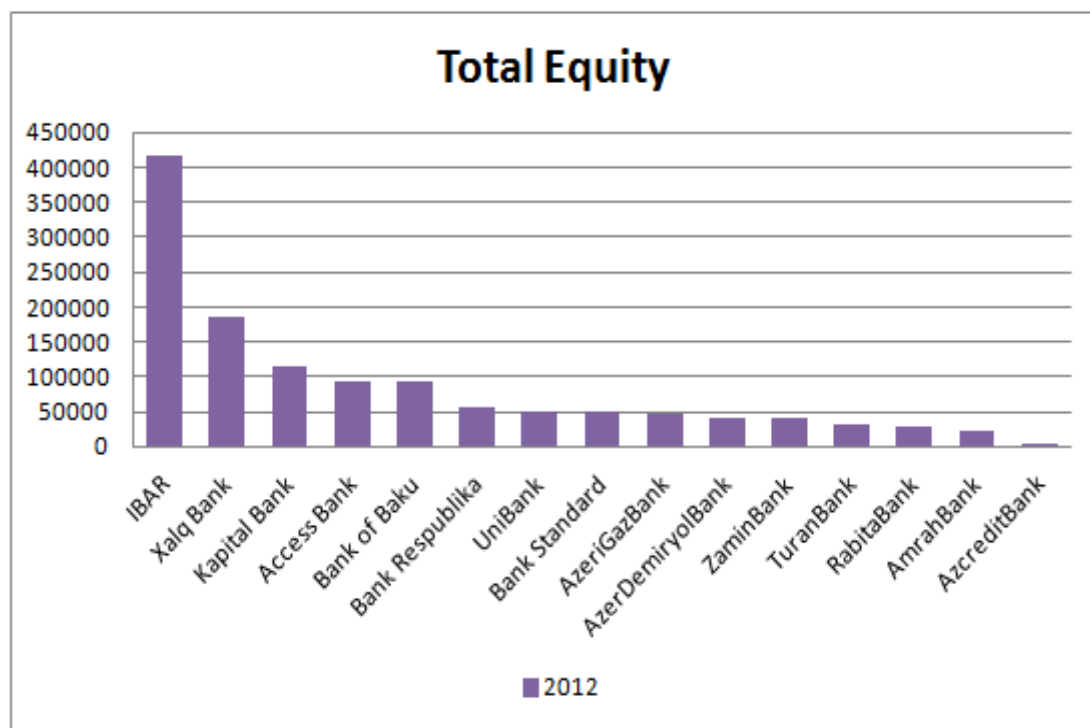
Figure 2.3: List of the Azerbaijan banks ranked by Total Equity (in thousands AZN)

In accordance with the Figure 2.3, in a ranking of 15 banks by its total shareholder's equity for 2012, only IBAR has a highest amount of equity capital of 416 million AZN. Rest 14 banks vary within up to 185 million AZN. AzcreditBank has a lowest amount of equity capital of 4 million AZN.

One of the profitability indicator ratios is a Return on Assets. This profitability ratio shows how beneficial a bank is regarding in relation its own net income to its own total assets. The Return on Assets (ROA) ratio indicates how well management is using the banks total assets to make a profit. The higher the income, the more effective management is in the use of its assets base. The ROA ratio is computed by dividing net income to total assets and expressed in percentage.

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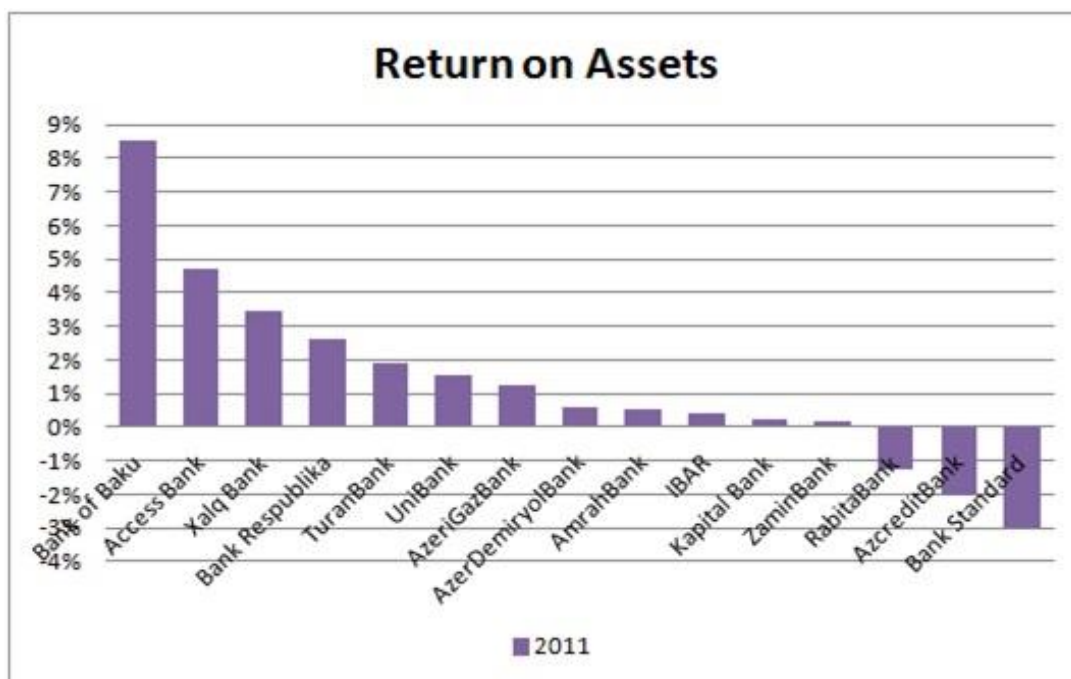
Figure 2.4: List of the Azerbaijan banks ranked by ROA

Under the Figure 2.4, in a ranking among 15 Azerbaijan banks by ROA for 2011, Bank of Baku has a highest ROA of 8.54%. The second highest position takes Access Bank with 4.68%. It is followed by Xalq Bank, Bank Respublika, TuranBank, UniBank,AzeriGazBank, AzerDemiryolBank, AmrahBank, IBAR, Kapital Bank, ZaminBank, RabitaBank and AzcreditBank. They vary in a range from 3.47% to -2.05%. Bank Standard has a lowest ROA of -3% which means that the bank invested a high amount of capital into its production and contemporaneously obtained little profit.

Another one of the profitability indicator ratios is Return on Equity. This profitability ratio shows how profitable a bank is in relation of its net income to its own total equity capital. The Return on Equity (ROE) ratio determines how much the equity holders earned for their investment in the bank. The higher the ratio, the more effective management is in the use of its equity base and more return is to investors.

The ROE ratio is computed by dividing net income to average shareholder equity and expressed in percentage.

Figure 2.5: List of the Azerbaijan banks ranked by ROE

Under the Figure 2.5, in a ranking among 15 Azerbaijan banks by ROE for 2012, Bank of Baku has a highest ROE of 34.85%. The second highest position takes Bank Respublika with 17.23%. Right behind the Bank Respublika goes Access Bank with ROE of 16.72%. It is followed by IBAR, TuranBank, Kapital Bank, UniBank, AmrahBank, Xalq Bank, AzerDemiryolBank, ZaminBank and AzeriGazBank. Rabita Bank and Bank Standard have a negative ROE which are -12.88% and -14.51%. AzcreditBank has a lowest ROE of -76.30% which means that its shareholders are losing the value rather than gaining. This often occurs in a bank's early years.

Chapter 3

LITERATURE REVIEW

There are great deal of different literatures that were written before and which seek to identify the factors affecting the performance of banks. Some studies have concentrated on the profitability of a single country, while others are considering the factors affecting the performance of banks in the panel of countries. Regardless of the number of countries, there are two types of factors affecting the profitability of banks: external and internal factors. In most studies the both determinants were used.

Guorong et al. (2003) in their research attempted to quantify factors affecting the profitability of banks in Hong Kong. They discovered that macroeconomic environment has played a main role in affecting bank profitability between 1992 and 1996. They also found that the equity capital ratio and deposits and the share of loans in total assets are not significantly related to bank profitability.

Goddard et al. (2004) in their research used cross-sectional and dynamic panel estimations to identify selected determinants of profitability in six major European banking sectors: Denmark, France, Germany, Italy, Spain and the UK for the period 1992-1998. They suggested that there is direct relationship between profitability and capital-assets ratio. Similarly they supposed that there is significant size-profitability relationship in some of the estimations.

Vong et al. (2007), in their study about determinants of bank profitability in Macao, by using a 15-year period from 1993 to 2007 with a sample of five different banks in Macao tried to figure out the determinants of profitability. To analyse the internal and external determinants panel regression techniques were used. In a long run, they revealed that the banks with more equity capital are perceived to have more safety and such an advantage can be translated into higher profitability.

The study of Sufian (2009) about the Malaysian banks' profitability it has been shown that the higher loan concentration and credit risk is associated with the lower profitability level during the period 2000-2004. High operational expenses, higher level of capitalization, and higher proportion of income from non-interest sources tend to exhibit higher profitability. His results suggest that high inflation rate has positive effect on Malaysian banks' profitability, while growth in economy has a negative influence on banks' profitability of country.

In event of Switzerland, Dietrich and Wanzenried (2009) in their study considered 453 commercial banks in Switzerland over the 1999-2006 periods. They concluded that better capitalized bank looks more lucrative and banks with a higher interest income share are less lucrative. The age of the bank doesn't have an effect on bank's performance. Comparing foreign banks with Swiss owned banks, the foreign banks are less profitable. In addition, the GDP positively affects the bank profitability, and market concentration and effective tax rates have significantly negative effect on bank profitability.

Hoffmann (2011) in his study about the US banking industry and the determinants affecting its profitability scrutinized 11 777 US banks over the period from 1995 to

2007. He revealed the negative relationship between capital ratio and profitability of the banks. The facts that banks size has a negative effect on profitability and investment securities have a positive effect were ascertained in this study. The researcher used Generalized Method of Moments (GMM) to deal with endogeneity problems.

Gul et al. (2011) in their study explore macroeconomic indicators and the impact of bank-specific characteristics on banks' performance in Pakistan for the 2005-2009 periods. The determinants of bank profitability in a country are considered as internal and external factors. They hypothesized that microeconomic and external factors have significant impact on profitability of bank.

Safarli and Gumus (2012) in their research which is named as "The Effect of Macroeconomic Factors on the Performance of Azerbaijan Banking System" considered the internal and external factors affecting the profitability of banks in Azerbaijan. By using the panel data regression analyses they tried to define the determinants of profitability. They also used the CAMELS' model to assess the productivity of the banks. In this study they came to think that inflation and GDP have a negative effect on performance of banks.

In the case of Ethiopia, Abera (2012) hypothesized that there is a significant relationship between the bank's profitability and the amount of capital of a bank, between the bank's profitability and the operational efficiency of a bank, between the income diversification of a bank and the bank's profitability, between the liquidity risk of a bank and the bank's profitability, between the size of a bank and the bank's profitability, between the asset quality of a bank and the bank's profitability, between

the concentration of the banking sector and the bank's profitability, between real gross domestic product growth and bank profitability, between inflation and bank profitability.

Kalakkar (2012) studied Indian banks' performance and the key factors in determining the profitability, investigated 83 commercial banks for the period 2009-2011 and by using the regression model analysed the dependent and independent variables. After all computations he concluded that public sector banks on the top over the foreign banks and banks of private sector respect to Total Assets, Total Income, Net profit, Deposits and Advances. According to this study, the key factors of Indian banks' performance are Investment to deposit ratio and Market share.

In the case of Indonesia, under the research of Syafri (2012), the bank's profitability is influenced by total equity, operational efficiency, inflation rate and loans. Despite of other variables, such as credit risk and bank size have considerable effect on banks' profitability, but its impact against the theory. The non interest income and economic growth to total assets has positive effect on profitability but not statistically significant. The inflation rate negatively affects the banking profitability.

Tomola (2013) in the case of Nigeria observed 20 banks of the country in period 2006-2012. The panel secondary data acquired from the financial reports of the 20 banks were used to identify the indicators of profitability. The results exhibited that banks size have a significantly negative effect on profitability: the banks make a more profits that the small banks. The capital, GDP and the variable of interest rate significantly positive affect the bank's profitability.

Acaravci and Calim (2013) in their research which was investigated Turkish banking sector as long-run relationship among macroeconomic, bank specific factors and profitability of foreign, privately-owned and state-owned banks in Turkey during the 1998-2011 period. They concluded that liquidity has significantly negative effect on profitability for state-owned bank and significantly positive effect on profitability for foreign and privately-owned banks. Deposits have significantly positive effect on profitability for state-owned bank, but insignificant effect on profitability for privately-owned and foreign banks. In the case of Asset Quality which can be defined as Total Loans to Total Assets ratio, this variable has significantly direct effect on profitability for foreign banks and significantly indirect effect on profitability for privately-owned banks. Real Gross Domestic Product (GDP) has a significantly direct impact on profitability for state-owned bank and significantly indirect impact on profitability for privately-owned and foreign banks.

Chapter 4

DATA AND METHODOLOGY

4.1 Data Collection

The use of panel data is the most appropriate instrument when the sample includes cross-sectional and time-series data. In this study, the population consists of 43 commercial banks which are listed at Central Bank of Azerbaijan at the end of 2012. 15 commercial banks out of 43 are selected as sample for the aim of this study on the basis of suitable sampling.

The secondary data source since 2006 until 2012 was used in this research. Data of bank variables were collected from financial statements of selected banks (balance sheet and income statement) which are accessible at their official websites and statistical bulletin of financial statement analysis issued by Central Bank of Azerbaijan to make the research.

Concerned banks are International Bank of Azerbaijan Republic (IBAR), Kapital Bank, Bank Standard, Xalq Bank, UniBank, Bank Respublika, Access Bank, AzerDemiryolBank, AzeriGazBank, Bank of Baku, ZaminBank, TuranBank, RabitaBank, AmrahBank, AzcreditBank. The number of observations is 105.

4.2 Methodology

The method of investigation used in this study is a panel data regression model. The panel data model divides by fixed effect and random effect models. The dependent and independent variables are integral part of the regression model.

4.2.1 Dependent Variables of the Regression Model

In our case, the dependent variables are ROA, ROE and NIM which are described in a table below.

Table 4.1: Dependent variables of the regression model

Variables	Description	Formula
ROA	Return on Assets	Net Income/Total Assets
ROE	Return on Equity	Net Income/Total Equity
NIM	Net Interest Margin	Net Interest Income/Total Assets

Return on Assets is a profitability metric that shows how profitable the bank's assets in generating the revenue. Hence the higher percentage of ROA indicates that the bank is more beneficial. ROA computes from the following formula:

Return on Assets = Net Income (Net Profit) / Total Assets

Return on Equity is a profitability metric that measures the ability of a bank to generate the revenue from its shareholders equity. The growth of the ROE shows that a bank increased its proficiency to generate more profits with less capital. ROE computes from the formula below:

Return on Equity = Net Income (Net Profit) / Total Equity

Net Interest Margin is a performance indicator that studies how well the investment decisions of bank are collated with the cases of debt. If the NIM has a negative value, it means that the bank did not make its best decision, because interest expense exceeds interest income. NIM computes from the next formula:

Net Interest Margin = (Interest Income-Interest Expense) / Total Assets =

= Net Interest Income / Total Assets

4.2.2 The Independent Variables of the Regression Model

The independent variables of the regression model were expressed using the CAMEL rating. The aim of the CAMEL ratings is to identify the weaknesses and strengths of the overall condition of the bank. It is international bank rating system where the bank supervisory authorities assess institution in accordance with five factors that are represented as abbreviation CAMEL.

C - Capital adequacy

A - Asset quality

M - Management quality

E - Earning ability

L - Liquidity

CAMEL ratings have a profound impact on banks and every bank director should avoid being potentially subject to any enforcement measure and monitors CAMEL scores and fully understands the factors that can impact on their composition. Banks with rating of 4 or 5 are considered as problem banks. 1 refers to the highest rating that represents the smallest degree of regulatory concern. (Dang, 2011)

Table 4.2: Independent variables of the regression model

Variables	Description	Formula
CA	Capital Adequacy	Total Equity/Total Assets
AQ	Asset Quality	Provision for Loan Losses/Total Loans
MQ	Management Quality	Interest Income/Interest Expense
EA	Earning Ability	Operating Expense/Operating Income
LQD	Liquidity	Liquid Assets/Total Assets
GDP	Gross Domestic Product	GDP per capita
SIZE	Size of a bank	Total Assets

Capital Adequacy is a ratio that can specify the ability of the bank to retain equity capital in sufficient quantity to pay depositors whenever they require their money and still have enough funds to enhance the assets of the bank by means of the extra crediting. It measures the position of the bank's capital and is figured out using the formula in a table above.

Asset Quality is a capital risk measure and furthermore the ratio that defines the quality of the bank's loans. The smaller the ratio, the less problematic the loans are. The quality of the assets on its balance sheet is directly related to the bank profitability, which means, the low credit quality negatively affects the bank's profitability. The formula for calculating the Asset Quality represented in a table above.

Management Quality is an integral part of successful functioning of the bank. The performance of the other CAMEL components depends on the management quality.

The requirement of the professional opinion according to policies and procedure, the ability to risk-taking and development of strategic plans evaluate a bank's management quality. The formula for counting it is written in a table above.

Earning Ability is a capability of the management of the bank to ensure the sufficient quantity of capital via retained earnings. The value of the Earning Ability is measured through the ratio of the administrative and operating expenses to the operating income.

Liquidity is a capability of the management to make cash or quickly convert short term assets into the cash. The more the rating of liquidity, the less sufficient liquid assets to meet creditors and depositors need. Cash and cash equivalents, due from National and other banks refer to the Liquid Assets. The formula for calculating the liquidity rating is presented in the above table.

Under the **Size** implies the size of the banks which is a logarithmic value of the total assets that adjusted by inflation. Under **GDP** implies a Gross Domestic Product per capita that determines the country's economic performance.

4.2.3 Model Estimation Process

Through the Eviews software, the following regression models were estimated:

$$ROA_{i,n} = \alpha + \beta_1(CA)_{i,n} + \beta_2(AQ)_{i,n} + \beta_3(MQ)_{i,n} + \beta_4(EA)_{i,n} + \beta_5(LQD)_{i,n} + \beta_6(SIZE)_{i,n} + \beta_7(GDP)_{i,t} + \varepsilon$$

$$ROE_{i,n} = \alpha + \beta_1(CA)_{i,n} + \beta_2(AQ)_{i,n} + \beta_3(MQ)_{i,n} + \beta_4(EA)_{i,n} + \beta_5(LQD)_{i,n} + \beta_6(SIZE)_{i,n} + \beta_7(GDP)_{i,t} + \varepsilon$$

$$\mathbf{NIM_{i,n}} = \alpha + \beta_1(CA)_{i,n} + \beta_2(AQ)_{i,n} + \beta_3(MQ)_{i,n} + \beta_4(EA)_{i,n} + \beta_5(LQD)_{i,n} + \beta_6(SIZE)_{i,n} +$$

$$+\beta_7(GDP)_{i,t} + \varepsilon$$

where

α - constant

β_{1-7} – coefficients of the regression model

ε – error term

The next step is a testing whether the panel data series are stationary or not. Detailed information for panel unit root tests is provided in the next chapter.

Chapter 5

EMPIRICAL ANALYSIS AND RESULTS

5.1 Panel Unit Root Testing

In order to monitor the series, the panel unit root tests were conducted and the result of the different models presented in a table below. The methods of Im, Pesaran and Shin (IPS), Levin, Lin and Chu (LLC) and Maddala and Wu (M-W) were utilized in Panel Unit Root Test for dependent and independent variables of the regression model. The null and alternative hypotheses for Panel Unit Root Test are as follows:

H_0: Series contains a unit root / Series are not stationary

H_1: Series don't have a unit root / Series are stationary

Table 5.1: Panel Unit Root Tests for banks in Azerbaijan

Variables	Test Equation	LLC	IPS	M-W
	τT^1	-6.88*	-0.04	61.97*
ROA	$\tau\mu^2$	-5.13*	-0.63	43.31**
	τ^3	-4.18*	-	70.65*

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[1] τ_T represents the most general model with a drift and trend;

[2] τ_μ is the model with a drift and without trend;

[3] τ is the most restricted model without a drift and trend.

Table 5.1: Panel Unit Root Tests for banks in Azerbaijan (cont'd)

	τ_T	-7.39*	0.22	48.37**
ROE	τ_μ	-4.65*	-0.42	38.05
	τ	-3.32*	-	60.17*
	τ_T	-10.97*	-0.27	81.17*
NIM	τ_μ	-4.65*[4]	-0.38	47.23**[5]
	τ	-0.38	-	26.22
	τ_T	-24.96*	-2.12**	92.40*
CA	τ_μ	-17.99*	-5.39*	66.27*
	τ	-0.87	-	43.16**
	τ_T	-6.45*	0.39	49.48**
AQ	τ_μ	-5.12*	-0.93	46.50**
	τ	-3.05*	-	39.93
	τ_T	-29.37*	-1.99**	89.18*
MQ	τ_μ	-8.95*	-2.64*	80.16*
	τ	-2.58*	-	56.74*
	τ_T	-9.09*	-0.14	66.72*
EA	τ_μ	-6.55*	-1.65**	58.91*
	τ	1.17	-	36.96

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[4] * denotes rejection of the null hypothesis at the 1% level;

[5] ** denotes rejection of the null hypothesis at the 5% level;

Table 5.1: Panel Unit Root Tests for banks in Azerbaijan (cont'd)

LQD	τ_T	-8.29*	-0.29	68.39*
	τ_μ	-7.04*	-1.45***[6]	55.48*
	τ	-1.86**	-	66.85*
LSIZE[7]	τ_T	-15.69*	-1.57**	121.12*
	τ_μ	-14.63*	-7.34*	161.45*
	τ	9.26	-	0.74
LGDP[8]	τ_T	-11.08*	-0.29	113.69*
	τ_μ	-10.67*	-2.41*	114.53*
	τ	7.94	-	0.23

According to the Levin, Lin and Chu methodology, at the level forms of dependent and independent variables without differencing, the null hypothesis of a unit root can be rejected at 1% and 5% significance levels. This means that the data generating process is stationary and can be used in the regression analysis. Accordance with M-W, in the majority of variables, tests reject the null at 1% and 5% significance level which means that the majority of variables is stationary and can uses for regression analysis. In IPS method, the null hypothesis is mainly again rejected at least at 10%

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[6] *** denotes rejection of the null hypothesis at the 10% level. Tests for unit roots have been carried out in E-VIEWS 6. Optimum lag lengths are selected based on Schwartz Criterion.

[7] LSIZE represents logarithmic value of the SIZE (Total Assets);

[8] LGDP is logarithmic value of GDP.

significance level, which means that those variables are stationary and can also be used in the regression models.

All series appears to be stationary and this stability of the variables was taken into account in the next estimations.

5.2 Correlation Analysis

Common feature between correlation and regression analysis is a relationship among variables. The correlation coefficient is an indicator of linear relationship between two variables. The values of the correlation coefficient range from -1 to +1. A correlation coefficient of -1 means that there is negative linear relationship between two variables, the correlation coefficient of +1 means positive linear relationship between two variables. A correlation coefficient of 0.00 means there is no linear relationship between two variables. If the correlation coefficient ranges from 0 to 0.50, this means that there is a positively weak correlation between two variables. In a case if it ranges from -0.50 to 0, it means a negatively weak correlation. If the correlation coefficient ranges from 0.50 to 0.90, this means that there is a positively strong correlation. In a negative case, when the coefficient ranges from -0.90 to -0.50, there is a negatively strong correlation. If the correlation coefficient ranges from 0.90 to 1.00, it means that there is a positively perfect correlation between two variables. In a case if the coefficient ranges from -1.00 to -0.90, there is a negatively perfect correlation.

In this study, the correlation analysis was made to display relationship between all variables and whether there is multicollinearity problem or not.

The correlation coefficients in the form of matrix that has been done by using the data collected from the official websites of the banks is presented in the table below:

Table 5.2: Correlation Analysis of all variables

	ROA	ROE	NIM	CA	AQ	MQ	EA	LQD	LSIZE	LGDP
ROA	1.00									
ROE	0.90	1.00								
NIM	0.53	0.49	1.00							
CA	0.02	-0.06	0.37	1.00						
AQ	0.63	0.56	0.04	-0.16	1.00					
MQ	-0.35	-0.35	-0.44	0.19	0.01	1.00				
EA	-0.08	-0.15	0.02	-0.04	-0.19	-0.05	1.00			
LQD	0.08	0.11	-0.37	-0.33	0.23	-0.02	-0.04	1.00		
LSIZE	0.14	0.18	-0.25	-0.66	0.15	-0.05	0.17	0.30	1.00	
LGDP	-0.15	-0.19	-0.03	-0.19	-0.03	0.05	-0.02	-0.17	0.38	1.00

The table of correlation analysis, which was done in EVIEWS software, shows that multicollineary will not be a problem in regression analyses. In other words, there isn't any evidence of multicollinearity problem. As already known, the problem of multicollinearity occurs when correlation coefficients are either very close to 1 or -1 (when explanatory variables are perfectly correlated with each other) and models contain high R^2 and low t-ratios.

There are only three strong correlations between variables, two of which are positive that are between Return on Asset and Asset Quality (whose coefficient is 0.63), and between Return on Equity and Asset Quality (whose coefficient is 0.56). The other correlation coefficient is negative, which is between Capital Adequacy and the

logarithmic value of the Size of banks. The correlation of these two variables is -0.66.

The detailed examination of all variables showed that Management Quality and logarithmic value of GDP are negatively correlated with all dependent variables. This implies that Interest Income to Interest Expense ratio will reduce with increasing of profitability ratios, likewise LGDP will decrease with increasing of ROA, ROE and NIM.

Capital Adequacy is negatively weak correlated to Return on Equity and positively weak correlated to Net Interest Margin and Return on Asset. This indicates that the higher amount of Total Equity to Total Asset ratio conducts the higher profitability ratios of ROA and NIM. Capital Adequacy is a negatively correlated almost with all independent variables, which are Asset Quality, Earning Ability, Liquidity, LSIZE and LGDP. However, there is a positively weak correlation of 0.19 between Capital Adequacy and Management Quality.

Asset Quality is positively correlated to all dependent variables and at the same time to some independent variables such as MQ, LQD and LSIZE. Earning Ability and LGDP are negatively weak correlated to Asset Quality, which means that the higher the Cost to Revenue ratio, the lower the Provision to Loan Losses to Total Loans ratio.

As previously mentioned, Management Quality is negatively weak correlated to all dependent variables. As regards to the independent variables, one half of them is negatively weak correlated, for example Earning Ability, Liquidity and LSIZE, while

the other half is positively weak correlated to Management Quality, which are Capital Adequacy, Asset Quality and LGDP.

Earning Ability is negatively weak correlated to dependent variables ROA and ROE, but at the same time positively weak correlated to Net Interest Margin. This indicates that increasing in Cost to Revenue ratio will decrease the profitability and will increase the Net Interest Income to Total Asset ratio. In respect to the independent variables, the correlation coefficient of Earning Ability is negatively weak correlated to all independent variables, except for LSIZE.

According to the table of correlation coefficients, Liquidity is positively and weakly correlated to all of the other variables, except Net Interest Margin. As aforementioned, Liquidity is negatively correlated to Capital Adequacy, Management Quality, Earning Ability and LGDP. However; these correlation coefficients are not strong, so it can be assumed that that the higher the amount of liquid assets, the lower amount of these independent variables. But there is also a positive correlation between Liquidity and LSIZE, which denotes that the increasing the size of the bank will conduct the more liquid assets.

 As a macroeconomic factor, LGDP is a negatively correlated to all dependent and independent variables, except for the size of the bank LSIZE and Management Quality MQ. This means that increase in the Gross Domestic Product per capita will negatively effect on the profitability ratios, equity to asset ratio, provision on loan losses, cost to revenue ratio and liquidity.

5.3 Regression Analysis

This part of the research introduces the empirical results that have been composed to interpret how the changes in independent variables affect dependent variables. The three regression analyses for the factors of profitability were estimated.

Prior to the estimation of the models, all models were eliminated from the problem of heteroscedasticity by using the White Test. Only after the appropriate regression model was determined; the regression analysis was run. There are two widely used models of panel estimator functions in financial research:

- Fixed Effect or LSDV Model;

- Random Effect Model.

The Likelihood Ratio and Hausman Tests were run in Eviews Software in order to estimate which model corresponds to the existing data.

Table 5.3: The results of the Likelihood Ratio Test

Dependent Variables	Statistic	Prob.
ROA	6.716095	0.0000
ROE	5.413299	0.0000
NIM	20.798418	0.0000

The null and alternative hypotheses of Likelihood Ratio Test are stated as follows:

H_0: Fixed effects' model is suitable

H_1: Fixed effects' model is not suitable

Table 5.4: The results of the Hausman Test

Dependent Variables	Statistic	Prob.
ROA	31.201632	0.0001
ROE	31.648262	0.0000
NIM	28.080862	0.0002

Accordingly, the null and alternative hypotheses for Hausman Test are as follows:

H_0: Random effects' model is suitable

H_1: Random effects' model is not suitable

As can be observed from the table above, in all three cases the prob. value of the Hausman Test is almost 0.000, which means that the results are significant. So the null hypothesis, which states that random effects are consistent, can be rejected at 5% significance level. Hence, Fixed Effects Model is the consistent model for this panel data. Only after knowing that the Fixed Effects Model is more effective and consistent model for estimating the regression model, the regression analysis can be run.

First and foremost is the regression model for Return on Assets that is estimated and introduced in Table 5.5. According to this table, almost all explanatory variables are statistically significant which are: CA, AQ, MQ, LQD, LSIZE, LGDP and intercept. Only one independent variable is not statistically significant that is Earning Ability (Cost to Revenue ratio). Therefore, the relationship between ROA and EA cannot be measured in this regression model.

Table 5.5: Regression Analysis for ROA

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.250222	0.057171	-4.376746	0.000035
CA	0.193181	0.027752	6.960938	0.000000
AQ	0.587764	0.062005	9.479239	0.000000
MQ	-0.012044	0.001898	-6.344113	0.000000
EA	-0.000669	0.001838	-0.364135	0.716683
LQD	-0.060808	0.023737	-2.561786	0.012221
LSIZE	0.036058	0.006336	5.690660	0.000000
LGDP	-0.055519	0.010878	-5.103686	0.000002
R-squared			0.832987	
Adjusted R-squared			0.790730	
S.E. of regression			0.013954	
F-statistic			19.712665	
Prob(F-statistic)			0.000000	
Durbin-Watson stat			1.985085	

Coming back to significant variables, should be noted that all variables are significant at the 1% significance level, which means that these data are stationary and can explain the relationship with ROA. Starting with the intercept, that is significant and whose coefficient is negative related with ROA. This means that if the independent variables will not change then ROA will decrease. Capital Adequacy has a positive coefficient, which means that Total Equity to Total Asset ratio positively affects ROA. Another significant variable is Asset Quality, whose coefficient is also positive. It implies that PLL to Total Loan ratio is directly

connected to Return on Assets. The next significant independent variable Management Quality is negatively related to ROA, as can be seen from the coefficient of MQ. This means that the change in Interest Income to Interest Expense ratio decrease the dependent variable ROA. Liquidity is also significant variable and has a negative impact on ROA. In addition to the Liquidity, the more Liquid Assets, the lower the performance of the banks. Likewise to others, LSIZE and LGDP variables are significant as well. However the coefficient of LSIZE is positive, which means that the higher the size of the bank, the more profitable bank is. LGDP is also stationary but the coefficient is negative, which shows the negative effect of Gross Domestic Product per capita to determinant of bank profitability of ROA.

In order to test the model for autocorrelation, first of all Durbin-Watson stat should be checked. According to the table 5.5, the value of Durbin-Watson stat is quite high 1.985, which implies there is no problem of autocorrelation in this model. The Prob. value of F-statistic is 0.00 which indicates that this model is statistically significant. The values of R-squared and Adjusted R-squared are also quite high: 0.83 and 0.79, which indicate that the 83% of the dependent variable ROA is explained by CA, AQ, MQ, LQD, LSIZE and LGDP. So because of the high R-squared value can be asserted that, this model is nicely fitted.

The second model is regression model for Return on Equity that estimated and displayed in a table 5.6. According to this table, all variables are stationary with the exception of LQD (Liquid Assets to Total Assets ratio) which means it is statistically insignificant and doesn't affect the profitability determinants of ROE.

Table 5.6: Regression Analysis for ROE

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.240372	0.373534	-3.320645	0.001336
CA	0.623274	0.181323	3.437377	0.000920
AQ	2.659257	0.405122	6.564089	0.000000
MQ	-0.051868	0.012404	-4.181565	0.000071
EA	-0.035173	0.012008	-2.929029	0.004389
LQD	-0.205611	0.155087	-1.325772	0.188553
LSIZE	0.244482	0.041400	5.905396	0.000000
LGDP	-0.421092	0.071074	-5.924704	0.000000

R-squared	0.767162
Adjusted R-squared	0.708251
S.E. of regression	0.091170
F-statistic	13.022418
Prob(F-statistic)	0.000000
Durbin-Watson stat	1.984153

All independent variables that stationary are CA, AQ, MQ, EA, LSIZE, LGDP and intercept. Now by considering the variables one by one, should mention that they are statistically significant at 1% significance level. The Prob. value of the intercept C is significant at 1% level and the coefficient of intercept is -1.24. This means that if the independent variables will not change, then performance of the banks will decrease. Capital Adequacy is positively related to ROE that explain the advantages of banks with good capital with their funds over banks with low ratio of their own equity. The Prob. value of Asset Quality is also stationary, at the same time the coefficient of it is 2.66 which means that the change in Provision for Loan Losses directly connected with Return on Equity. Moreover, the Management Quality is stationary at 1% significance level and the coefficient is -0.05 which means the growth of the Interest Income to Interest Expense ratio negatively affect the determinant of bank

profitability of ROE. Earning Ability is also stationary and inversely connected with ROE. This implies that the more the Cost to Revenue ratio, the worst the performance of bank. LSIZE is significant and the coefficient is positively related to ROE, which explain the increasing of ROE when the size of the bank is increased. LGDP is significant and the coefficient of it is negative. This indicates that the growth of the GDP leads to decrease the performance of the banks.

For testing a model on autocorrelation, the Durbin-Watson stat has been verified and the result showed that here is no problem of autocorrelation. The value of Durbin-Watson stat is very high: 1.98. Furthermore as can be seen from the Prob. value of F-statistic, the whole model is statistically significant and the result of 0.00 confirms it. The results of R-squared and Adjusted R-squared also look significant. Furthermore 0.7671 means that 76.71% of explanatory variables jointly can impress the dependent variable ROE and the remaining 23.29% can be expressed by the intercept. Accordingly with this conclusion can be argued that, this model is a good fitted model.

The last third regression model is constructed for Net Interest Margin. Corresponding table of the regression analysis are presented below in a table 5.7. According to this table CA, MQ, LQD, LSIZE, LGDP and intercept are significant. AQ and EA are statistically insignificant and cannot express the relation with NIM.

Table 5.7: Regression Analysis for NIM

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.204738	0.053753	-3.808876	0.000267
CA	0.213912	0.026093	8.198081	0.000000
AQ	-0.071780	0.058299	-1.231257	0.221704
MQ	-0.009950	0.001785	-5.574366	0.000000
EA	0.000126	0.001728	0.072923	0.942043
LQD	-0.056556	0.022318	-2.534125	0.013152
LSIZE	0.022549	0.005958	3.784892	0.000290
LGDP	-0.025855	0.010228	-2.527883	0.013371

R-squared	0.886376
Adjusted R-squared	0.857627
S.E. of regression	0.013120
F-statistic	30.832206
Prob(F-statistic)	0.000000
Durbin-Watson stat	1.744216

The Prob. value of the intercept is significant at 1% level. The coefficient of C is -0.205 which represents the negative relationship with the Net Interest Margin which in turn means the probability of bad performance of the banks in a case of no change in independent variables. Capital Adequacy is significant and positively connected to Net Interest Margin, which means the increasing of the capital of the bank directly increase the difference between the Interest Income and Interest Expense. The Prob. value of Management Quality is statistically significant at 1% level, at the same time the coefficient is -0.0099 which in turn implies the negative relationship with NIM. The Liquidity is statistically significant at 5% level and the negatively affects the performance of the banks. Because of the minus value of the coefficient, the increasing of the liquid assets reduces the difference of Interest Income and Interest Expense. The value of LSIZE is also significant but the coefficient is positive 0.022,

which justify the increasing of the NIM as a result of the increasing of the bank size. LGDP is a significant at 5% significance level and the coefficient is negative. The negative value of the LGDP denotes that the growth of the Gross Domestic Product is inversely affects the determinant of the bank performance NIM.

Now let's move on to the problem of autocorrelation. As the result of the Durbin-Watson stat displays, here is no problem of autocorrelation. The value of 1.74 confirms this statement. The Prob. value of the F-statistic is 0.00, which states that there is the greater than 99% certainty that the difference didn't occur by chance and the model is statistically significant. The results of R-squared and Adjusted r-squared are 0.886 and 0.858 respectively. This indicated that 88.6% fluctuation in NIM can be explained with the CA, AQ, MQ, EA, LQD, LSIZE and LGDP and the rest 11.6% can be explained by the residuals. Taking into account all aforesaid can be declared that this model is exactly matched.

Chapter 6

CONCLUSION

Azerbaijan Banking System has changed for many years. Currently, compared with the previous years, the number of financial institutions and its size were increased in the country. Respectively, the profit obtained from the banks is also increased. The amount of crediting and capital of bank also increased.

This study examined the relationship between the determinants of banks' profitability and the factors influencing these determinants. As previously described, there are two types of factors: external and internal. To the external factors can be attributed macroeconomic factors, such as GDP, whereas the internals include: capital, provision for loan losses, administrative expense and income, cost and revenue, liquid asset and size of banks. Two hypotheses have been put forward in which it is assumed that there is a positive relationship between the profitability of banks and some internal factors, as well as a direct link between the some external (macroeconomic) factors and profitability. In order to verify the veracity of hypotheses, a number of studies that have been conducted on the example of other countries have been studied. In the considered studies have been found out that many of the researchers preferred the Panel Data Analysis for their research.

In this research 15 Azerbaijan banks were examined over the past 7 years. In general, there are about 105 observations. All data were collected from the official sources of

the respective banks and were used to justify the hypotheses using the EVIEWS software.

By using the EVIEWS, the three regression models with its dependent and independent variables were constructed. With the help of the CAMEL rating were identified the independent variables of the regression model, which are Capital Adequacy, Asset Quality, Management Quality, Earning Ability, Liquidity, Size of the bank and GDP, whereas the dependent variables were defined as Return on Assets, Return on Equity and Net Interest Margin. With the use of methods of LLC, IPS and M-W, the dependent and independent variables were tested for Unit Root whereby it appeared that the variables are stationary and can be used in the regression model.

With the help of the correlation matrix, the independent and dependent variables were tested for multicolleniarity problem. In a sum it turned out that there are no multicolleniarity problem between the dependent and independent variables, were identified only three strong correlations between the variables ROA and AQ, ROE and AQ, as well as CA and LGDP. The correlation of each variables were extensively discussed and then regression analyzes were started.

During the regression analysis, three types of models have been advanced and by testing an econometric model with Likelihood and Hausman Test, and as a result, the fixed effects model was employed for the study. The next step was to build of the three regression models and on the basis of the empirical results have been explained the relationship between the independent and dependent variables of the model.

According to the regression model with the dependent variable ROA, almost all independent variables affect the performance determinant of the banks ROA except Earning Ability, because Prob. value of EA is not stationary. CA, AQ and Size have a positive relationship with ROA, whereas MQ, EA, LQD and LGDP have a negative relationship with ROA.

According to the results of Durbin-Watson stat, R-squared and F-statistic, it became apparent that the regression model with the dependent variable ROA is statistically significant and fitted well.

Considering the second model with the dependent variable ROE, it became known that all independent variables except liquidity are stationary and affect the profitability determinant of the Azerbaijan banks ROE. As seen from the results of the coefficients, CA, AQ and LSIZE have a positive relationship with ROE, whereas MQ, EA and LGDP negatively affect ROE. According to the results of R-squared, F-statistic and the Durbin-Watson, this model is statistically significant and well fitted.

And at last was considered a model with dependent variable NIM, whereby it was revealed that AQ, EA are statistically insignificant and cannot influence on the NIM. Among the stationary variables, the direct relationship with NIM has CA and LSIZE, whereas the rest variables inversely related to NIM. Model with NIM is also stationary and well fitted, and proof of this statement are the results of R-squared, F-statistic and Durbin-Watson stat.

In conclusion, I would like to highlight that the external (macroeconomic) factor GDP is negatively related to bank profitability. At the same time, Capital and Size of

the banks are positively related to the profitability determinants in all three models. This leads to the conclusion that the hypotheses putted forward by us are reasonable and with increasing of the capital and the size of the bank the bank profitability in Banking System of Azerbaijan increases. Likewise, with reducing of the Gross Domestic Product increases the bank profitability.

REFERENCES

Aliyev, E. (2007). The Development of the Banking Sector in Azerbaijan: Problems and Recommendations for Solutions. *Master Thesis.* Dokuz Eylül University, Istanbul, 47-103.

Abera, A. (2012). Factors Affecting Profitability: An Empirical Study on Ethiopian Banking Industry. *Master Thesis.* Addis Ababa University, Addis Ababa, Ethiopia, 40.

Acaravci, S.K. and Calim, A. E. (2013). Turkish Banking Sector's Profitability Factors. *International Journal of Economics and Financial Issues.* 3 (1): 27-41.

Bilal, M., Saeed, A., Gull, A. A., and Toquer, A. (2013). Influence of Bank Specific and Macroeconomic Factors on Profitability of Commercial Banks: A Case Study of Pakistan. *Research Journal of Finance and Accounting,* 4 (2) : 108-116.

Dang, U. (2011). The CAMEL rating system in banking supervision. A case study of Arcada University of Applied Sciences, International Business. *Working Paper Series,* 20(19), 14-27

Dietrich, A. and Wanzenried, G. (2009). What Determines the Profitability of Commercial Banks? New Evidence from Switzerland. *Working Paper.*, 35-40

Eviashvili N. D. (2000). Banks and Financial Institutions. *The Journal Yunost*, 119-120,173

Goddard, J., Molyneux, P., and Wilson, J. O. S. (2004). The Profitability of European Banks: A Cross-Sectional and Dynamic Panel Analysis. *University Paper.* UK, 72(3), June 2004, 1463–6786 363–381.

Gul, S., Irshad, F., Zaman, Kh. (2011). Factors Affecting Bank Profitability in Pakistan. *The Romanian Economic Journal,* 39 (14): 61-89.

Guorong, J., Nancy, T., Eve, L., and Angela, S. (2003). The Profitability of the Banking Sector in Hong Kong. *Hong Kong Monetary Authority Quarterly Bulletin,* 4 (2) : 150-162 .

Hoffmann, P. S. (2011). Determinants of the Profitability of the US Banking Industry. *International Journal of Business and Social Science, 2(2*): 56-72

Kalakkar, S. (2012). Key Factors in Determining the Financial Performance of the Indian Banking Sector. *Working Paper.* University of East London, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2121351

Kasumova, A.M. (1992). Banking Institutions in Azerbaijan in the First Years of Soviet Power (1921-1925). *Azerbaijan Publishing House* 1992, Baku, 227.

Koychuyev T. (2002). Restructuring after Soviet period. *University Publications*. Biskek; Kyrgyzstan – Turkey Manas 23, Textbook Series 17, 131.

Lavrushin, O. (1998). Reconstruction of the Banking in the USSR period. *Finance and Statistics.* Moscow, 56-58.

Safarli, E. and Gumus, G. K. (2010). The effect of Macroeconomic Factors on the
Performance of Azerbaijan Banking System. *Master Thesis.* Dokuz Eylul
University, 11, 56-69

Sufian, F. (2009). Factors Influencing Bank Profitability in a Developing Economy:
Empirical Evidence from Malaysia. *Global Business Review.* 10 (2): 225-214.

Syafri (2012). Factors Affecting Bank Profitability in Indonesia. *The International
Conference on Business and Management.* September 6-7, Phuket, Thailand,
236-241.

The Annual Report of CBAR (1997). *Financial Stability Review,* http://en.cbar.az

The Annual Report of CBAR (2005). *Financial Stability Review,* http://en.cbar.az

The Annual Report of CBAR (2007). *Financial Stability Review,* http://en.cbar.az

The Annual Report of CBAR (2010). *Financial Stability Review.* http://en.cbar.az

The Annual Report of CBAR (2012). *Financial Stability Review,* http://en.cbar.az

Tomola, M. O. (2013). Determinants of Banks' Profitability in Developing
Economy: Evidence from Nigeria. *Working Paper.* ISSN 2029-4581, VOL. 4,
No. 2(8).

Vong, P. I., Anna, Chan, Hoi Si (2007). Determinants of Bank Profitability in

Macau, *Macau Monetary Research Bulletin*, 12, 93-113.

APPENDICES

Appendix A: Regression Analysis of ROA

Dependent Variable: ROA				
Method: Panel Least Squares				
Date: 06/09/14 Time: 11:15				
Sample: 2006 2012				
Periods included: 7				
Cross-sections included: 15				
Total panel (balanced) observations: 105				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.250222	0.057171	-4.376746	0.000035
CA	0.193181	0.027752	6.960938	0.000000
AQ	0.587764	0.062005	9.479239	0.000000
MQ	-0.012044	0.001898	-6.344113	0.000000
EA	-0.000669	0.001838	-0.364135	0.716683
LQD	-0.060808	0.023737	-2.561786	0.012221
LSIZE	0.036058	0.006336	5.690660	0.000000
LGDP	-0.055519	0.010878	-5.103686	0.000002
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.832987	Mean dependent var		0.013389
Adjusted R-squared	0.790730	S.D. dependent var		0.030503
S.E. of regression	0.013954	Akaike info criterion		-5.522190
Sum squared resid	0.016161	Schwarz criterion		-4.966122
Log likelihood	311.914981	Hannan-Quinn criter.		-5.296860
F-statistic	19.712665	Durbin-Watson stat		1.985085
Prob(F-statistic)	0.000000			

Appendix B: Regression Analysis of ROE

Dependent Variable: ROE				
Method: Panel Least Squares				
Date: 06/09/14 Time: 11:36				
Sample: 2006 2012				
Periods included: 7				
Cross-sections included: 15				
Total panel (balanced) observations: 105				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.240372	0.373534	-3.320645	0.001336
CA	0.623274	0.181323	3.437377	0.000920
AQ	2.659257	0.405122	6.564089	0.000000
MQ	-0.051868	0.012404	-4.181565	0.000071
EA	-0.035173	0.012008	-2.929029	0.004389
LQD	-0.205611	0.155087	-1.325772	0.188553
LSIZE	0.244482	0.041400	5.905396	0.000000
LGDP	-0.421092	0.071074	-5.924704	0.000000
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.767162	Mean dependent var		0.085114
Adjusted R-squared	0.708251	S.D. dependent var		0.168790
S.E. of regression	0.091170	Akaike info criterion		-1.768258
Sum squared resid	0.689891	Schwarz criterion		-1.212190
Log likelihood	114.833548	Hannan-Quinn criter.		-1.542928
F-statistic	13.022418	Durbin-Watson stat		1.984153
Prob(F-statistic)	0.000000			

Appendix C: Regression Analysis of NIM

Dependent Variable: NIM				
Method: Panel Least Squares				
Date: 06/09/14 Time: 11:38				
Sample: 2006 2012				
Periods included: 7				
Cross-sections included: 15				
Total panel (balanced) observations: 105				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.204738	0.053753	-3.808876	0.000267
CA	0.213912	0.026093	8.198081	0.000000
AQ	-0.071780	0.058299	-1.231257	0.221704
MQ	-0.009950	0.001785	-5.574366	0.000000
EA	0.000126	0.001728	0.072923	0.942043
LQD	-0.056556	0.022318	-2.534125	0.013152
LSIZE	0.022549	0.005958	3.784892	0.000290
LGDP	-0.025855	0.010228	-2.527883	0.013371
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.886376	Mean dependent var		0.062625
Adjusted R-squared	0.857627	S.D. dependent var		0.034770
S.E. of regression	0.013120	Akaike info criterion		-5.645482
Sum squared resid	0.014286	Schwarz criterion		-5.089414
Log likelihood	318.387785	Hannan-Quinn criter.		-5.420152
F-statistic	30.832206	Durbin-Watson stat		1.744216
Prob(F-statistic)	0.000000			