

**Concentration and Competition in the Azerbaijan
Banking Industry**

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Submitted to the
Institute of Graduate Studies and Research
in partial fulfillment of the requirements for the Degree of

Master of Science
in
Banking and Finance

Eastern Mediterranean University
June 2012
Gazimağusa, North Cyprus

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ABSTRACT

The main purpose of this thesis is to analyze competition and concentration levels in Azerbaijan Banking industry over the periods 2008-2011. In order to study concentration and competition level, 25 large banks were selected based on their market share. Measurement of concentration and competition are important for banks conduction in the banking industry. There are numerous measures to find concentration and competition level. We analyze the degree of concentration by using CR_3 , CR_5 , CR_{10} and Herfindahl-Hirschman Index for the bank assets, deposits and credit portfolios and to measure competition we apply famous Panzar-Rosse H-statistic. A panel regression is used to maintain empirical analysis in order to determine H-statistic. After the 1990 years Azerbaijan banking system has faced many changes, thus the research examines the nature and changes in the banking sector. There were similar works about competition and concentration in Azerbaijan banking sector which have done by F.Huseynov and X.Huseynov (2008), S.Aliyev (2010) for 2003-2007 years and for only 2010 year respectively. Both author used structural methods for determining competition level and k-bank concentration ratio to measure the concentration level. But in our thesis we used non-structural method for competition analyses and two different concentration approaches for concentration level.

Keywords: concentration, competition, Azerbaijan banking industry

ÖZ

Bu tezin temel amacı 2008-2011 dönemleri için Azerbaycan bankacılık sektöründe rekabet ve konsantrasyon düzeylerini analiz etmektir. Konsantrasyon ve rekabet düzeylerini incelemek için pazar payına dayalı olarak 25 büyük banka seçilmiştir. Rekabet ve konsantrasyon analizleri bankacılık sektörü için çok önemlidir ve farklı yollarla ölçülebilir. Banka varlıkları, mevduat ve kredi portföyleri için CR_3, CR_5, CR_{10} , ve Herfindahl-Hirschman Endeksi kullanılarak konsantrasyon seviyesi ölçülmüştür. Ayrıca bankacılık sektöründe rekabet seviyesini ölçmek için ünlü Panzar-Rosse H-statistiği kullanılmıştır. H-statistiği belirlemek amacıyla deneysel araştırma panel veri analizi yapılmıştır. Bu çalışma ayrıca Azerbaycan bankacılık sektörünün gelişimi yaşadığı değişiklikleri incelemiştir. Daha önce Azerbaycan bankacılık sektöründe konsantrasyon ve rekabet düzeyini ölçmek için F.Hüseynov ve X.Hüseynov (2008), S.Aliyev (2010) tarafından araştırmalar yapılmıştır. F.Hüseynov ve X.Hüseynov (2008) araştırmalarını 2003-2007 yılları için, S.Aliyev sadece 2010 yılı için yapmıştır. Her iki araştırmada konsantrasyon düzeyini ölçmek için k- banka yoğunlaşma oranı yöntemi, rekabet düzeyini ölçmek içinse yapısal yöntemler kullanılmıştır. Ama bizim çalışmamızda konsantrasyon analizleri için iki farklı yöntem ve rekabet ölçümü için yapısal olmayan yöntem kullanılmıştır.

Anahtar kelimeler: konsantrasyon, rekabet, Azerbaycan bankacılık sistemi

Dedicated to my cousin Zakir Afandiyev

ACKNOWLEDGMENTS

Foremost, I would like to thank my supervisor Assoc. Prof. Dr Nesrin Ozatac for her continuous support throughout my research and her patience, motivation, enthusiasm and immense knowledge. Her guidance helped me in all the time of research and writing of this thesis. Besides contribution and guidance of this thesis. I would also like to thank Assoc. Prof. Dr. Salih Katircioglu head of the department of Banking and Finance for helping me to develop my background in Econometrics.

I would like to thank my parents, who supported me throughout my studies financially and morally. Without their help my study and my thesis wouldn't have been possible.

Besides that, I also like to thank Nargiz Safarli, who as a good friend, was always willing to help.

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LIST OF ABBREVIATIONS

| | |
|----------|--------------------------------------------------------|
| GDP: | Gross Domestic Product |
| HHI: | Herfindahl-Hirschman Index |
| HTI: | The Hall-Tideman Index |
| HKI: | The Hannah and Kay Index |
| CR: | Concentration Ratio |
| PRH: | Panzar-Rosse H-statistic |
| OECD: | Organization for Economic Co-operation and Development |
| CBAR: | Central Bank of Azerbaijan |
| NBA: | National Bank of Azerbaijan |
| USSR | Union of Soviet Socialist Republics |
| CCI: | The Comprehensive Industrial Concentration Index |
| INF: | Inflation |
| IMF: | International Monetary Fund |
| E-VIEWS: | Econometric views |

Chapter 1

INTRODUCTION

The existence of the modern economy of any country is impossible without efficient banking system. Banks are financial institutions defined as enterprises that engage buying and selling of financial assets (Tobin 1987), which deals with deposits, lend out these deposits as a loans and related with other financial services. Despite the impressive growth in the economy and regulatory reforms over recent years, banking sector of Azerbaijan remains small in relation to the size of the economy. Although oil sector is acting as the main indicator for country's development, the Azerbaijani government is pursued to develop of the non-oil sector. To reduce the economy's oil dependency banking sector should play an important role. The Azerbaijan banking sector had faced many changes after gaining independence. Throughout the years, even there have been a number of regulations, reforms, merger in order to develop banking system Azerbaijan banking system still needs changes. Nowadays, Azerbaijan banking sector consist of 44 banks which 43 of them are private and 1 of them is government bank. In spite of large number of banks, the Azerbaijan banking sector is dominated by few big banks. Thus, the 10 largest banks hold 80 % of total market share of assets, deposits and credit portfolios. If we compare countries with similar size, there are huge number of banks in the country. Presently, the Central Bank of Azerbaijan (CBAR) works on diminishing the half of banks. A.Quliyev (2010) says that, according to the territory and size of

population, 44 banks are too many for the country, thus 20 banks may be considered as an optimal number. Furthermore, on 1st of January 2010, as the result of changes in law on banks Central Bank of Azerbaijan defined capital requirements 10 million manat. However, Central Bank of Azerbaijan (CBAR) works on consolidation process in order to strengthen the financial system. The banking sector is still operating under monopoly and concentration level is high.

1.1 Aim of the Study

The main purpose of this work is to determine level of concentration and competition in the Azerbaijan banking industry over the 2008-2011 periods. There are similar works which have been done by F.Huseynov and X.Huseynov (2008), S.Aliyev (2011) in order to measure concentration and competition level. We analyzed concentration level by using CR₃, CR₅, CR₁₀ and Herfindahl-Hirschman Index for the bank assets, deposits and credit portfolios of selected banks. We used famous Panzar-Rosse H-statistic which is non-structural method to investigate competition level of Azerbaijan banking sector.

1.2 Research to find Out

The research used 25 banks for the analysis based on their market share. Furthermore the study focuses on the impact of government banks or government supported banks on the competition and concentration. Another important issue which research is taking into account is the need for consolidation in the banking system.

1.3 Structure of thesis

The thesis consist of seven chapters. The first Chapter represents Introduction, Chapter 2 characterize Overview of Azerbaijan banking industry, Chapter 3 gives brief information

about Concentration ratios and Competition approaches, Chapter 4 focuses on Literature review of previous similar studies, Chapter 5 is on Data and Methodology, Chapter 6 represents Empirical Analysis and Results and finally Chapter 7 presents Conclusion.

Chapter 2

Overview of Azerbaijan Banking Industry

2.1 The Economic Indicators in Azerbaijan Economy

After the gaining its independency in 1991, the country had faced huge problems in terms of political, economic and social spheres. Especially, between 1991-1995 years political instability resulted with recession, high inflation, increase in unemployment, decrease in production and huge budget deficit. After 1996, as a result of sovereign policy and intensive work through international stage, the country achieved development in economic fields. Huge oil and gas reserves are played an important role in the development of the economy. According to the "Oil and Gas Journal" (2012), Azerbaijan has proven crude oil reserves 7 billion barrels. Agreements which is allowed exporting oil via Baku-Novorossiysk (1996), Baku - Supsa (1999) and Baku-Tbilisi-Ceyhan (2002) pipelines have contributed as significant factor to the economic growth. Thus, oil and gas sector contributed to approximately one-third of the country's gross nominal GDP (Gross Domestic Product). According to the World Bank, in 2006 Azerbaijan become one of the world's fastest growing country by 36 % GDP growth. The Azerbaijan economy depends on oil and gas sector therefore oil share in GDP is 44.4 % (State Statistic Committee, 2011). Foreign investment is an important factor for the financing and the development of the economy, especially for the oil and gas sector. The government of Azerbaijan employ "welcoming policy" for foreign investments.

According to the State Statistic Committee total amount of foreign investment in the economy amounted to 2.515.96 billion manat¹. Major foreign investors from Great Britain, US, Japan, France, Norway, the Czech Republic, Turkey and Korea with 2.117.5 billion manat of foreign investment. Particularly, a few years ago the primary share of foreign investments were targeted into the oil sector. Nowadays, non-oil sector - tourism, communication, agriculture, transport and logistic become an attractive for the foreign investors².

Table 2.1 Economic Indicators (2005- 2011)

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| GDP (US \$ billion) | 38.376 | 53.296 | 68.582 | 77.649 | 85.648 | 89.292 | 94.318 |
| Growth of GDP (%) | 26.2 | 36 | 25.0 | 10.8 | 9.3 | 5.0 | 2,8 |
| Inflation (CPI) (%) | 9.7 | 8.4 | 16.6 | 20.8 | 1.4 | 5.7 | 8.1 |
| Unemployment rate (%) | 8.1 | 6.8 | 6.5 | 6.0 | 6.0 | 6.0 | 6.0 |

Source: Central Bank of Azerbaijan, Annual Reports

However, increased oil related financial resources gave advantage to the government to increase population's incomes and social expenditures, there is a decline in non-oil sector and the economy already shows signs of Dutch Deases³. To avoid from oil-related economy Azerbaijan government started regulatory economic reforms in the country. Success of the reforms, improvement in business environment, development of entrepreneurship support of government to the business was reflected in the reports of international organizations. During the global financial crisis despite the recession in the developed countries Azerbaijan continued with macroeconomic stability, economic growth. Geray Musayev (2010) pointed out that; inadequate exchange reserves and

¹ 1.00 AZN = 1.27259 USD

² trend.az/capital/analytical/

³ The Economist, Mar 8th,2007

unclosely position of country's to the financial markets were an important fact to struggle with the crisis easily.

2.2 Historical Development of Azerbaijan banking sector

The Azerbaijani Banking sector has undergone a lot of changes throughout its history. Until the 19th century Azerbaijan had not any state central financial regulatory organization. Regulations in the banking area started in 1861 year when the State Bank of the Russian Empire was opened its Baku branch. Main role of this branch was to generate development of the credit system and to increase trade turnover in the region. During its activity Baku branch realized issue of mortgage credits, transactions on registration of promissory notes and other financial services. Credit-banking system were included 135 small banking agencies, 28 branches of commercial credit banks, 8 mutual credit societies, 7 mortgage banks and 5 banking agencies⁴.

On May 28, 1918 Azerbaijan gained its independency and one year later The Financial Ministry of new government was approved to establish National Central Bank. The net worth of the Central Bank was 50,000000 rubles. Between 1919 and 1923 Central Bank issued its first own currency which was called manat. Main role of the Central Bank was to support trade, industry, agriculture, to simplify money turnover in the system and to strengthen monetary policy. On April 28, 1920 as a result of the occupation of Azerbaijan by the Bolshevists Russia (derived from bolshinstvo," majority") existing financial system was destroyed. By the order of Bolshevists Committee the State Bank of Azerbaijan was renamed to People's Bank of Azerbaijan. Consequently, all banks and

⁴ <http://cbar.az/pages/about-us/history/>

other financial institutions were nationalized and affiliated to the People's Bank. Therefore, Banking system in the country become under monopoly of state till 1991⁵.

Establishment of the national banking system was occurred when Azerbaijan restored its independence on October 18, 1991. The branches of soviet banks, such as Gosbank (Central bank), Agrobrombank (Agricultural bank) and Promstroibank (Industry bank) which were acted in the Azerbaijan under the Soviet system were merged to develop National Bank of Azerbaijan (NBA). The process of creating a legal framework for the banking system was began with the commitment of Law on NBA. On December 1, 1992 NBA was approved by the Milli Medjlis (parliament)⁶. Thus, National Bank was determined as a central bank of the state, which empowered to issue banknotes, accomplishment of monetary policy, control the volume of the credit-banking system and finally to preserve the value of the national currency-manat. National currency manat was introduced on August 15, 1992 and was declared as the only payment facility of the country on 1994⁷.

Table 2.2 Soviet Banks operated in Azerbaijan

| Banks name | Branches |
|------------------------------------------|-----------------|
| Sberbank (Savings Bank) | 82 |
| Agroprombank (Agricultural Bank) | 70 |
| Promstroibank (Industry Bank) | 32 |
| Gosbank (Central Bank) | 2 |

⁵ http://www.azerbaijan.az/portal/StatePower/Committee/committeeConcern_e.html

⁶ The World Bank, (1993), Azerbaijan from crisis to sustained growth

⁷ <http://cbar.az/pages/about-us/history/>

As in the former USSR countries, there has been rapid growth in number of banks in the Azerbaijan after independence, hence, between 1992-1995 years there were 200 banks. Between 1994- 2004 the number of banks has diminished five times due to Central Bank of Azerbaijan Republic (CBAR) strong regulations, such as minimum capital requirements.

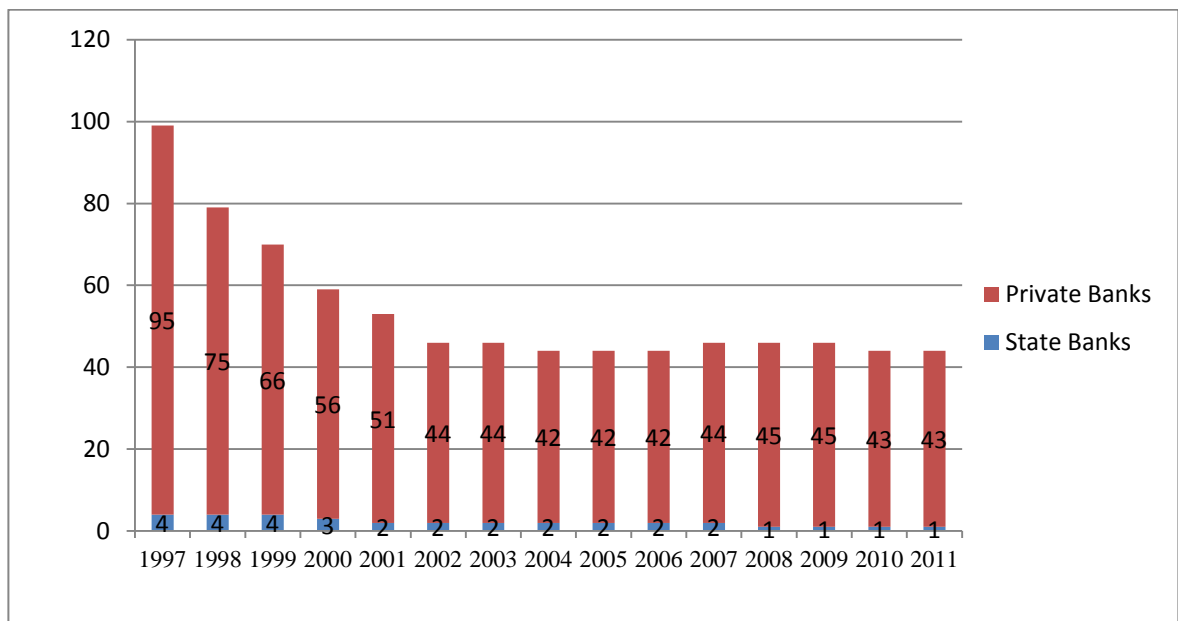


Figure 2.1: Quantity Changes in the banking sector

2.3 Current Condition of Azerbaijan Banking System

Activities of the banking system in Azerbaijan is regulated by the «Law on Banks »⁸. This law defines adaption of banking system law to the international standards, to develop the role of banking system in the economy, strengthening the rights of depositors and creditors, to ensure stable and secure functioning of the banking system, illustrate principles of regulations and liquidation of banks.

⁸"Law on Banks" Law of Azerbaijan Republic, 16 January,2004

According to this law, banking system in Azerbaijan is two-stepped—which consists of the Central Bank of Azerbaijan and credit institutions. Central Bank which is on the top is the central bank of the state and its activities are regulated by the Constitution of the Azerbaijan Republic, « Law on Azerbaijan Republic Central Bank » and by other legal acts. In accordance with the legislation The Central Bank gives license to the banking activities, regulates and carries out supervision of banking activity in the manner prescribed by the law.

Credit organizations create second step of the banking system. The activity of the credit organizations are regulated by the Constitution of the Azerbaijan Republic, « Law on Azerbaijan Republic Central Bank » , «Law on non-bank credit organizations» and by « Law on Credit Unions » . Banking activities of credit institutions in the country territory are implemented by the Central Bank license. Credit organizations consists of banks and non-bank credit organizations.

As 2011, there are 169 credit organizations that are carrying out bankig services in the country on the basis of a license issued by the Central Bank.Among them there are 44 banks and 106 non-bank credit unions.An acting bank was founded with the participation of state capital and rest are are private banks.The private banks were founded with participation of foreign capital⁹.

⁹ Statistical bulletin of the Central Bank of Azerbaijan Republic.12/2011, 53

Table 2.3 Azerbaijan Banks – Ranking by Total Assets (as 31 December of, 2011)

(Mln AZN)

| № | Banks | Assets | Credit Portfolio | Aggregate Capital |
|----------|---------------------------------|---------------|-------------------------|--------------------------|
| 1 | Azərbaycan Beynəlxalq Bankı ASC | 5,013,835.98 | 3,308,454.98 | 512,737.79 |
| 2 | Kapital Bank ASC | 1,320,904.80 | 963,551.40 | 85,085.02 |
| 3 | Xalg Bank | 715,214.28 | 452,343.39 | 173,253.97 |
| 4 | Bank Standard QSC KB | 689,379.11 | 461,828.77 | 47,686.91 |
| 5 | TexnikabankASC | 629,333.18 | 440,141.94 | 99,113.61 |
| 6 | Pasha bank ASC | 573,386.34 | 252,682.04 | 145,403.87 |
| 7 | Unibank ASC | 441,356.13 | 329,680.79 | 60,600.85 |
| 8 | Access Bank QSC | 390,378.71 | 297,355.05 | 90,294.93 |
| 9 | Demir Bank ASC | 357,592.00 | 265,503.09 | 49,974.71 |
| 10 | Bank of Baku ASC | 315,226.80 | 262,122.47 | 53,301.59 |
| 11 | AGBank ASC | 314,510.50 | 213,012.38 | 35,561.79 |
| 12 | Bank Respublika ASC | 312,992.50 | 173,828.85 | 57,493.30 |
| 13 | Zamin bank ASC | 270,0591.4 | 173,884.29 | 27,261.21 |
| 14 | Mugan Bank ASC | 243,381.24 | 175,358.29 | 31,648.33 |
| 15 | YapiKredi Bank Azerbaijan QSC | 238,920.57 | 125,299.96 | 57,259.13 |
| 16 | Atabank ASC | 234,047 .31 | 141,530.91 | 29,057.20 |
| 17 | Bank of Azerbaijan ASC | 186,156.14 | 152,221.34 | 24,292.15 |
| 18 | Bank Nikoil ASC | 179,697.49 | 160,581.05 | 31,597.78 |
| 19 | Express bank ASC | 172,309.82 | 81,440.54 | 79,513.77 |
| 20 | Turan Bank ASC | 171,263.52 | 122,569.94 | 25,963.98 |
| 21 | AzərbaycanSenayeBanki ASC | 155,009.93 | 133,375.21 | 28,553.92 |
| 22 | AFB Bank ASC | 149,251.81 | 95,620.37 | 43,582.35 |
| 23 | Rabitebank ASC | 131,229.91 | 95,285.74 | 16,680.81 |
| 24 | Parabank ASC | 104,781.84 | 76,662.85 | 12,639.85 |
| 25 | Amrahbank ASC | 85,058.89 | 54,331.80 | 21,080.45 |
| 26 | Kredo Bank ASC | 85,504.18 | 78,804.12 | 22,549.93 |
| 27 | Silkway bank ASC | 79,306.97 | 26,929.29 | 40,853.32 |
| 28 | Bank Avrasiya ASC | 70,091.84 | 36,216.30 | 19,926.94 |
| 29 | Azer-Turk Bank ASC | 64,929.71 | 41,715.85 | 12,633.12 |
| 30 | NBC Bank ASC | 63,404.19 | 52,519.66 | 17,915.69 |
| 31 | Atrabank ASC | 62,509.12 | 45,84.10 | 11,255.03 |
| 32 | TDB bank | 60,738.40 | 53,159.61 | 12,089.32 |
| 33 | United Credit Bank ASC | 56,523.88 | 49,130.87 | 13,289.43 |
| 34 | VTB Azerbaijan ASC | 50,485.50 | 46,024.54 | 15,607.34 |
| 35 | Gencebank SKB | 48,184.05 | 39,351.80 | 15,594.69 |
| 36 | BTB Bank ASC | 44,085.51 | 35,829.95 | 14,103.41 |
| 37 | Gunaybank ASC | 37,545.10 | 41,920.88 | 12,063.73 |

| | | | | |
|----|--------------------------|--------|-----------|-----------|
| 38 | GafgazInkishaf Bank ASC | 33,514 | 28,780.00 | 10.047.00 |
| 39 | Royal Bank ASC | 33,028 | 27,099.00 | 13,024.00 |
| 40 | Deka Bank ASC | 26,79 | 15,271.00 | 23,815.00 |
| 41 | Melli Iran Bank -Baki | 24,881 | NA | 12,239.08 |
| 42 | Pakistan Milli Bank-Baki | 11,133 | NA | 9,042.092 |
| 43 | Azerbaijan Kredit Bank | NA | NA | NA |
| 44 | Evrobank | NA | NA | NA |

Source: FINEKO Analytical and Information agency

Table 2.3 (cont)

The tendency of the last years shows that there has been a decrease in number of banks. The last 10 years, banks fell from 52 to 44, while there is an increase in the number of non-bank credit organizations. The number of non-bank credit organizations reached to 125 at the end of 2011.

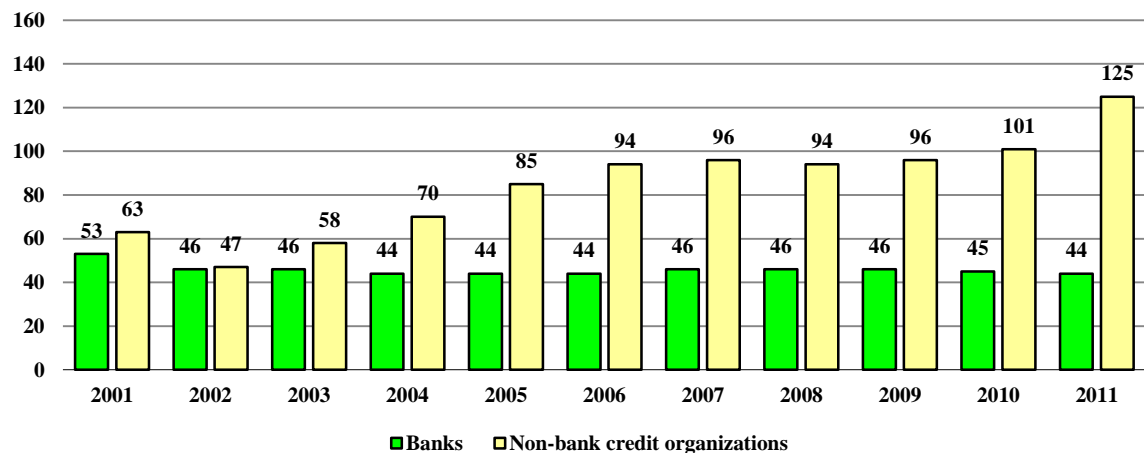


Figure 2.2: Banks and Non-bank credit organizations

The number of banks in the banking system of Azerbaijan is the most discussed aspect. S.Aliyev (2011) proved that, large number of banks in the system show that us there a competition however, it is different in reality. The lack of high quality of services provided by banks to customers, high loan rates, difficult procedures to obtain these

loans, undesirable level of banking system in the economy one of the factors that strengthens, the lack of competition idea¹⁰.

The level of development of the banking sector can be measured by the ratio of the total asset to GDP. In the last 10 year the volume of banking assets increased by 15,4 times and in the year 2011 it becomes 14,3 billion AZN. Thus percentage of banking sector total assets to GDP was 32 % approximately. Growth rate of the banking sector assets in the year 2000-2011 exceeded country's GDP growth rate. As a result of global financial crisis, sharp decrease was observed in the growth of assets, thus it was 13.5 % in 2009 and 14 % in 2010 respectively. In recent years, despite the growth of banking assets to GDP ratio Azerbaijan fall behind the former USSR and Eastern European countries for this indicator. Among the former Soviet Union countries Azerbaijan only exceeds Kyrgyzstan (29.5 %) and Tajikistan (29.1%)¹¹.

Table 2.4 The Share of Bank Assets in GDP for the 2000-2011 years

| Years | Gdp mln azn | Volumes of assets mln azn | Assets to gdp % | Volume of assets on average mln azn |
|--------------|------------------------|------------------------------------------|--------------------------------|----------------------------------------------------|
| 2000 | 4718,2 | 865,0 | 18,3 | 14,7 |
| 2001 | 5315,6 | 729,7 | 13,7 | 13,8 |
| 2002 | 6062,5 | 844,7 | 13,9 | 18,4 |
| 2003 | 7146,5 | 993,7 | 13,9 | 21,6 |
| 2004 | 8530,2 | 1628,7 | 19,1 | 37,0 |
| 2005 | 12522,5 | 2199,7 | 17,6 | 49,9 |
| 2006 | 18037,1 | 3778,0 | 20,9 | 86,9 |
| 2007 | 26815,1 | 6725,7 | 25,1 | 146,2 |
| 2008 | 40137,2 | 10273,5 | 25,6 | 223,3 |
| 2009 | 34578,7 | 11665,2 | 33,7 | 253,6 |
| 2010 | 41574,7 | 13290,8 | 32,0 | 295,4 |
| 2011 | 43463,2 | 14259,2 | 33,0 | 324,07 |

¹⁰Evaluation of factors affecting the higher credit rates. Baku-2011

¹¹Fitch Ratings, EM Banking System Datawatch

Chapter 3

BANK CONCENTRATION AND COMPETITION

3.1 Bank Concentration

After the crisis and distress in the financial systems, studies on bank concentration become an important issue to learn existing position of countries banking systems. During the concentration large banks hold great percentage of the funds and prevail smaller banks. Concentration is a situation which leads banking system to monopoly. There are several indices which have been developed by the economists in order to measure concentration level in the banking industry.

3.1.1 The k bank Concentration Ratio

k bank concentration ratio is the most widely applied measure of concentration in the empirical literature. It can be calculated by summing only over the market shares of k largest banks in banking industry:

$$CR_k = \sum_{i=1}^k S_i \quad (3.1)$$

Where,

S_i - the market share

k – leading banks in the market

This technique is an important to examine influence of major banks, thus this ratio can be computed for the largest two (CR_2), three (CR_3) and five (CR_5) bank's total assets,

total deposits, and credit portfolios. The index ranges between 0 and 1. The ratio is 0 when there infinite number of equally sized small banks and in the case of monopoly ratio equal to 1. (J.A.Bikker and K. Haaf, 2000; Alegria and Schaeck, 2006).

3.1.2 The Herfindahl-Hirschman Index

The Herfindahl-Hirschman Index (HHI) is the most popular measurement of concentration level in studies. This index is used by the Department of Justice and Federal Trade Commissions of the United States of America to measure concentration level in the market. HHI index is calculated as below which is the sum of the squares of banks market shares:

$$HHI = \sum_{i=1}^n S_i^2 \quad (3.2)$$

where, n- number of banks in the market, i- an individual bank and S_i is market share of an individual bank . The index might be calculated for the bank's total assets ,total deposits and for the credit portfolios. According to the accepted standards if calculated index is below the 0.10 market is less concentrated , if index is between 0.10 and 0.18 interval market is middle concentrated and if the level of concentration is more than 0.18 market is considered completely concentrated (J.A. Bikker and K. Haaf,2000; Alegria and Schaeck,2006).

3.1.3 The U index

The *U* index is developed by Davies (1980) in order to measure of inequality in the banking industry. Index is calculated as follows:

$$U = I^{*a} n^{-1} \quad (3.3)$$

Where,

$a \geq 0$ and I is a generally accepted measure of inequality

α - is a constant or a parameter (to be estimated empirically)

n - is a number of banks

The index allows flexibility in the weight given to size inequality (I) and the number of banks (n) by varying a . The choice of a is not arbitrary. In order to obtain the value of the a , Davies (1979) suggests simple model of inter-industry variance in price cost margins of the for $\pi_i = aC_i^\beta$, where π_i is price-cost margin and C_i is concentration in the industry. The following regression equation can be written for the U index as the result of replacing C_i by the U index:

$$\log \pi_i = \log a + \beta_1 \log I_i + \beta_2 \log n_i + u_i$$

Whereas $\beta_1 = \alpha\beta$ and $\beta_2 = -\beta$, the estimated value of a can be obtained as $a = -\beta_1/\beta_2$

Davies (1980) pointed out that concentration index should depend on both the inequality of firms shares and n (J. A. Bikker and K. Haaf, 2000).

3.1.4 The Hall–Tideman Index

Another measurement of concentration was developed by Hall and Tideman (1976) which is close to the Herfindahl and Hirschman index. The index is calculated as below:

$$HTI = 1 / (2\sum_{i=1}^n i s - 1) \quad (3.4)$$

Hall and Tideman (1976) stated that in the measurements market share of each banks should be weighted by its ranking and the largest bank receives weight $i=1$. The Hall and Tideman index vary between zero and unity, where zero signs of equal-sized banks and unity mean monopoly (J. A. Bikker and K. Haaf, 2000).

3.1.5 The Comprehensive Industrial Concentration Index

Horvath (1970) submitted the CCI in order to quantify concentration and dispersion of banks within the different industries. CCI calculated by the following formula;

$$CCI = S_1 + \sum_{i=2}^n S_i^2 (1 + (1-s_i)) \quad (3.5)$$

Horvath (1970) argues that, the index is unity in the case of monopoly and it is higher than the dominant bank's certain percentage share for a market with great number of banks (J. A. Bikker and K. Haaf, 2000).

3.1.6 The Hannah and Kay Index

To determine changes in concentration level as the result of opening new banks and closing operated banks in the market Hannah and Kay (1977) suggest another concentration index. HKI takes the form:

$$HKI = \left(\sum_{i=1}^n S_i \right)^{1/(1-\alpha)} \alpha > 0, \alpha \neq 1 \quad (3.6)$$

In addition to the execution of banks in the market, the value of the index is conscious to the parameter α . When α approaches to zero, the index result the number of banks in the industry, and when α equal to the infinity the index encounter the reciprocal of the market share of the largest bank. The numbers equivalent of the Hannah and Kay Index can be solved for $HKI = (n(1/n)^\alpha)^{1/(1-\alpha)}$ as $n_e = HKI$

Hannah and Kay (1977) says that there will be decrease in the concentration level when market faces entry of new bank whose size is equal to the effective average size of existing banks (J. A. Bikker and K. Haaf, 2000) .

3.2 Bank Competition

Competition is a struggle between banks, who want to achieve their goals in the banking market. Moreover, competition means development of banking services, various products to the potential customers, lower credit rates and healthy banking system in the country. In order to measure competition level of banks there are two approaches in the literature: The structural approach and the non-structural approach .Examples of Structural approach are Herfindahl–Hirshchman index (HHI) and CR_4 , CR_5 . Non-structural approach includes Panzar–Rosse model (Panzar and Rosse, 1987), Lerner Index, Breshnan model and the Boone indicator.

3.2.1 Panzar – Rosse Approach

Most widely used methods to study competitive position of banking system is Panzar and Rosse (1987) which was developed by Rosse and Panzar (1977) and Panzar and Rosse (1987). The PR approach investigates the nature of the market structure, i.e monopoly or oligopoly, monopolistic competition and perfect competition by applying the elasticity of total interest revenues function with the respect to changes in the bank's input prices, called H-statistics. Claessens and Laeven (2004) argue that H- statistics is a more appropriate measure for the degree of competition than others. Under the perfect competition PR-H statistic is equal 1, under monopolistic competition PR-H statistic is zero or less than zero and finally in the case of monopolistic competition PR – H statistic

value fall between 0 and 1. In order to estimate the H- statistics following reduced – form revenue equation may be estimated:

$$\ln (P_{it}) = \alpha + \beta_1 \ln (W_{1,it}) + \beta_2 \ln (W_{2, it}) + \beta_3 \ln (W_{3,it}) + \gamma, \ln (Y_{1,it}) + \gamma_2 \ln (Y_{2,it}) + \gamma_3 \ln (Y_{3,it}) + \delta D + \varepsilon_{it} \quad (3.7)$$

where, P_{it} is the ratio of gross interest revenue to total assets , $W_{1,it}$ is the ratio of interest expenses to total deposits , $W_{2, it}$ is the ratio of personnel expenses to total assets , $W_{3,it}$ is the ratio of other operating and administrative expenses to total assets . The subscript I denotes bank and the subscript t denotes year. Moreover, $Y_{1,it}$ is the ratio of equity to total assets , $Y_{2,it}$ is the ratio of net loans to total assets and $Y_{3,it}$ is the total assets. D is a vector of year Dummies. H –statistic is equal to $\beta_1 + \beta_2 + \beta_3$ (Classens and Laeven , 2004 , Schaeckam and Cihak , 2007)

Molyneux et.al (1994) found that H – statistics assumes long – run equilibrium. In order to investigate long – run equilibrium, Panzar and Rosse H – statistics can be analyzed by using return on asset (ROA) as the dependent variable:

$$\ln (ROA_{it}) = \alpha + \beta_1 \ln (W_{1,it}) + \beta_2 \ln (W_{2, it}) + \beta_3 \ln (W_{3,it}) + \gamma, \ln (Y_{1,it}) + \gamma_2 \ln (Y_{2,it}) + \gamma_3 \ln (Y_{3,it}) + \delta D + \varepsilon_{it} \quad (3.8)$$

Long – run market equilibrium indicates that the sum of the coefficients on the input prices equal to zero (Schaeck and Cihak , 2007)

3.2.2 The Boone Approach

Another important approach for measuring competition in the market is Boone indicator. Boone indicator is also desirable method by the researchers because of its advantages

and simplicity in the calculations. It gives the advantage to the researchers to measure competition by using a limited data and gives ability to measure separate banks products such as loans, deposits or just for single bank. The Boone indicator can be calculated as follow by using regression:

$$\text{Ln}S_{ilt} = \alpha + \beta \ln mc_{ilt} + \sum_{t=1, \dots, (T-1)} \gamma_t d_t + u_{ilt} \quad (3.9)$$

Where, S – represents market share, mc- marginal cost, i –refers to bank i, l- refers loan, t – represent year t; d_t is a time dummy, u_{ilt} show the error term and β is Boone indicator.

Chapter 4

LITERATURE REVIEW

Banks mobilize, allocate, and invest much of society's savings, so bank performance has substantive repercussions on capital allocation, firm growth, industrial expansion and economic development¹². The research about bank concentration, competition, efficiency and profitability takes an important place in theoretical literature and as well as in empirical research. The consolidation of banks around the globe in recent years is intensifying the public policy debates on the influences of concentration and competition in the banking industry¹³. Most analysis of bank concentration, competition, efficiency and profitability has been accomplished on developed countries.

Molyneux (1994) studied the level of competition with the Panzar-Rosse approach for the United Kingdom, Germany, France, Spain and Italy by using 1986-1989 years data. He found that there was monopolistic competition in the all analyzed countries except Germany where banking structure was similar to the case of perfect competition. Although economies of these countries are closely related, market structures of banking sectors vary from perfect competition to monopoly (United Kingdom, Germany, France, Spain and Italy).

¹² King and Levine (1993a,b),Jayaratne and Strahan (1996), Demirguc-Kunt and Maksimovic (1998),Levine and Zervos (1998), Rajan and Zingales (1998), Beck, Levine and Loayza (2000)

¹³Berger, Demsetz and Strahan (1999),AsliDemirguc-Kunt, Ross Levine, J.G.Haubrich (2003)

Berger and Hannah (1989), Neumark and Sharpe (1992) analyzed bank concentration and competition for the U.S banks and they come up with the result that banks in more concentrated local markets, as measured by HHI (Herfindahl-Hirschman Index) or CR_n , charge higher rates on loans and pay lower retail deposits.

Bikker and Groeneveld (2000) examine European countries between 1989 and 1996 and they hardly found that there is an increasing in competition during these periods. In the same method, Bikker and Haaf (2002) spread the analysis to 23 OECD countries over the period 1988-1998. Their results describe a monopolistic competition for every single country and competition appears to be stronger for large banks and weaker for small banks.

Beck, Demirguc- Kunt and Levine (2003b) studied relationships of bank concentration and measures of competition with systematic banking crises using massive cross-country data base for 1980 and 1990s. They conclude that, less regulated banking system which is more competitive – tend to be more balanced. Although, they find another issue that financial stability is correlated with higher bank concentration.

Another underlying study belongs to Claessens and Leaven (2004), who employed multi-country analysis of banking competition by computing H-statistic for fifty developed and developing countries between 1991 and 2001. According to the research, monopolistic competition is the best explanation of the markets under consideration. They focus on the factors underlying competition by regressing the estimated H-statistic on a number of country-specific characteristics. These refer to

the presence of foreign banks, entry regime, market structure, activity restrictions, competition from the non-bank sector, general macroeconomic conditions and overall development of the country.

Yildirim and Philippatos (2002) work on the evolution of the competitive conditions in the banking systems of fourteen Central and Eastern European economies for the period 1993-2000. The findings suggest that banking markets of analyzing countries cannot be either perfect competition or monopoly except for FYR of Macedonia and Slovakia. The cross-sectional analysis of competitive structure shows decreasing trend between 1993 and 1996 and increasing trend in competitive conditions after 1996.

Robin and Yosha (1999) analyzed the level of completion by using Breshnan and Lau conjectural-variation method for the Israel banking sector. The result of their research suggests that despite the high levels of concentration, banks lost market power in the impact of financial liberalization. Kubo (2005) by applying same approach for the Thailand banking sector found that it was possible decline in the level of competition following the reforms employed after the East Asian crisis.

An interesting comparison between the Spanish and UK banking systems was undertaken by Ultrero-Gonzalez (2004) . The main aim was to analyze competitive position of both countries due to the initiation of the euro. Results of research an overall scenario of monopolistic competition. The author evaluate the commercial banks and non-profit organizations separately and this was main conception of the paper.

Demirguc-Kunt, Laeven and Levine (2004) study the affect of bank regulations, concentration and national organizations on bank net interest margins using data on 1,400 banks across 72 countries. Results of their research propose that rigid control policy on bank entry, restriction the freedom of bankers to manage the operations and regulation on bank activities increase net interest margins. Furthermore, they found that weak positive relationship between bank margins and concentration breaks down when controlling for institutional progress.

Another special subject, the impact of bank competition and concentration on firm's access to finance were evaluated by Beck, Demirguc-Kunt and Maksimovic (2004) for 74 countries. They find that regulations of bank activities that interfere competition generate huge financing difficulties for the firms. Moreover they find out that bank concentration increases financing obstacles only in countries where development of economic and institutional levels are low.

A study on bank competition and financial stability is also accomplished by Boyd, De Nicolo Smith (2004) and by Allen, Gale (2004). To evaluate the cost of banking crisis in competitive system and under monopoly they examined a monetary general equilibrium economy. Their results show that relative crisis probabilities under the two banking crisis system cannot be measured separately of inflation. Moreover they prove that, probability of banking crisis is always higher under the competition in the case where banks which drain reserve assets and economic turnout falls.

Latin American banking sphere were investigated many times by the authors. Levy – Yeyati and Micco (2003) studied the level of competition by using Panzar-Rosse

approach for the Argentine, Brazil, Chile, Colombia, Costa Rica, El Salvador and Peru. The researchers used 1992-2003 years data for their analyses and ascertain monopolistic competition behavior.

Another research on Latin American banks were made by Philippatos and Yildirim (2007). They tried to measure the level of banking competition for the following countries for 1993 -2000 years ; Argentine, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela. They concluded that profit of the banks has negative correlation with the degree of competition and participation of foreign banks. Furthermore they found that an increase of concentration level in the banking sphere doesn't improve banks performance or doesn't lower the level of competition.

In the case of African developing countries, Hauner and Peiris (2005) studied level of competition for the Ugandan banking sector by taking into account 15 Ugandan banks for period 1999-2004. Authors tried to investigate effects of financial sector reforms and its results on competition level. They found the fact that, despite the financial sector reforms there is monopolistic behavior in the system. Buchs and Mathisen (2005) did same study for the Ghanaian banks for 1998 – 2003. They figure out that, result of analyses shows noncompetitive market structure which slows financial development in the country.

F.Huseynov and X. Huseynov (2008) studied concentration and competition level for Azerbaijan banking system between 2003 and 2007 years. They analyze all banks in each year in the system by using Herfindahl-Hirschman index and Theil index.

Dividing banks into the two groups, authors analyze concentration level for government banks and for the private banks. They indicate that as the result of government support, government banks prevents to the fair competition. Moreover, despite the governmental banks role in the system there is downward tendency in the concentration level in these years. F Huseynov and X.Huseynov (2008) point out that however there is descending tendency in concentration level Azerbaijan banks still need financial reforms. Another approach was made by S. Aliyev (2010) who analyzes concentration level in Azerbaijan for the 2010 year. He measured market share of all 46 bank's assets, credit portfolio and authorized capital and find out that country bank system stands in the " shoulder " of the 20 banks. Furthermore, he suggest that there is highest concentration level of the private customers in the banks credit and deposit portfolio which makes risk for the banks in terms of liquidity and credit.

Chapter 5

DATA AND METHODOLOGY

5.1 Data

The study uses 25 major banks of Azerbaijan which are operating for the period from 2008 to 2011. The main source of data is bank's annual reports, the statistic bulletins of Central Bank of Azerbaijan and reports of FINEKO Analytical and Information Agency¹⁴. The ultimate goal is to understand Azerbaijan banking sphere in terms of concentration, competition and efficiency

Table 5.1 The 25 largest Azerbaijan banks based on total assets:

| Rank | Banks | Market Share | Total assets |
|------|-------------------------------|--------------|--------------|
| 1 | AzerbaycanBeynelxalgBanki ASC | 38 % | 5,013,835.00 |
| 2 | Kapital Bank ASC | 10 % | 1,320,904.00 |
| 3 | Xalgbank ASC | 5.42 % | 715,214.00 |
| 4 | Bank Standard QSC KB | 5.23 % | 689,379.00 |
| 5 | Texnika Bank ASC | 4.77 % | 629,333.00 |
| 6 | Pasha Bank ASC | 4.35 % | 573,386.00 |
| 7 | Unibank QSC | 3.35 % | 441,356.00 |
| 8 | Access Bank ASC | 2.96 % | 390,378.00 |
| 9 | Demirbank ASC | 2.71 % | 357,592.00 |
| 10 | Bank of Baku ASC | 2.39 % | 315,226.00 |
| 11 | Azerigazbank ASC | 2.38 % | 314,510.00 |
| 12 | Bank Respublika ASC | 2.37 % | 312,992.00 |

¹⁴<http://en.bank.abc.az/index.php?p=30&mid=27>

| | | | |
|----|-------------------------------|--------|-------------|
| 13 | Zamin Bank ASC | 2.05 % | 270,091.45 |
| 14 | Mugan Bank ASC | 1.84 % | 243,381.00 |
| 15 | YapiKredi Bank Azerbaijan ASC | 1.81 % | 238,920.00 |
| 16 | Atabank ASC | 1.77 % | 234,047.00 |
| 17 | Bank of Azerbaijan ASC | 1.41 % | 186,156.00 |
| 18 | Bank Nikoil ASC | 1.36 % | 179, 697.00 |
| 19 | Turan Bank ASC | 1.30 % | 171,263.00 |
| 20 | AzerbaijanSenayeBanki ASC | 1.18 % | 155,009.00 |
| 21 | Rabite Bank ASC | 0.99 % | 131,229.00 |
| 22 | Parabank ASC | 0.79 % | 104,781.00 |
| 23 | Amrahbank ASC | 0.64 % | 85,058.00 |
| 24 | Bank Avrasiya ASC | 0.53 % | 70,091.00 |
| 25 | Gence bank ASC | 0.37 % | 48,184.00 |
| | Total Assets | | 13,192,012 |

Source: Annual reports of individual banks

Table 5.1 (cont)

5.2 Methodology

5.2.1 Measuring bank concentration

Although there are different measures of concentration level in the literature¹⁵, we have used K bank concentration ratio and the Herfindahl – Hirschman index. These methods of concentration level measurement give more accurate information about market shares of banks in terms of assets, deposits and credit portfolios. In this empirical study we used CR3, CR5 and CR10 in order to compute concentration level of the largest bank's assets, deposits and credit portfolios. As we defined in the Chapter 4 these ratios are calculated by using the formula (3.1). Herfindahl – Hirschman index (HHI) which is another measurement of concentration level is

¹⁵ See J.A.Bikker and K.Haaf, 2000

calculated by adding up the squares of the market shares of all banks. We applied HHI for the bank's assets, deposits and credit portfolios for the banks which are operated between 2008 and 2011 years.

5.2.2 Measuring bank competition

In order to estimate Panzar–Rosse H – statistic, we used annual data of the 25 banks (including government and private banks) over the period from 2008 – 2011. Based on the Panzar and Rosse (1982,1987) approach and following the empirical methodology carried out by Bikker and Haaf (2002) , Gelos and Roldos (2002) , Claessens and Laeven (2004) the H - statistic for the Azerbaijan banking sector is measured by the following regression :

$$\log (IRTA_{it}) = \alpha + \beta_1 \log (IETD_{,it}) + \beta_2 \log (PETA_{,it}) + \beta_3 \log (AETA_{,it}) + \varepsilon_{it}$$

where:

IRTA – is the ratio of interest revenue to total assets,

IETD – is the ratio of interest expenses to total deposits,

PETA – is the ratio of personnel expenses to total assets,

AETA – is the ratio of other operating and administrative expenses to total assets

The H-statistic equals $\beta_1 + \beta_2 + \beta_3$.

Table 5.2 Interpretation of the Panzar – Rosse H statistics

| | |
|-------------|-------------------------------------------|
| $H \leq 0$ | Monopoly or perfectly collusive oligopoly |
| $0 < H < 1$ | Monopoly |
| $H = 1$ | Perfect competition |

Chapter 6

EMPRICAL ANALYSIS AND RESULTS

6.1 Estimated Results of Concentration Level

The research outcome of concentration level which were calculated by CR₃, CR₅, CR₁₀, and HHI for the assets, deposits and credit portfolios of Azerbaijan banking sector for the year 2008-2011 is presented in the following table :

Table 6.1 Concentration level of banking sector for the 2008-2011 years

| CR₃ | 2008 | 2009 | 2010 | 2011 |
|------------------------------|-------------|-------------|-------------|-------------|
| <i>For assets</i> | 0.5652 | 0.5171 | 0.5255 | 0.5344 |
| <i>For deposits</i> | 0.5204 | 0.5474 | 0.4818 | 0.4980 |
| <i>For credit portfolios</i> | 0.5630 | 0.6074 | 0.5659 | 0.5238 |
| CR₅ | | | | |
| <i>For assets</i> | 0.6615 | 0.6180 | 0.6271 | 0.6344 |
| <i>For deposits</i> | 0.6385 | 0.6343 | 0.6060 | 0.6209 |
| <i>For credit portfolios</i> | 0.6675 | 0.6953 | 0.6519 | 0.6226 |
| CR₁₀ | | | | |
| <i>For assets</i> | 0.8291 | 0.7872 | 0.7929 | 0.7919 |
| <i>For deposits</i> | 0.8355 | 0.8075 | 0.7922 | 0.7983 |
| <i>For credit portfolios</i> | 0.8407 | 0.8805 | 0.7885 | 0.7790 |
| HHI | | | | |
| <i>For assets</i> | 0.20600 | 0.18500 | 0.18100 | 0.17100 |
| <i>For deposits</i> | 0.16800 | 0.19400 | 0.14600 | 0.15300 |
| <i>For credit portfolios</i> | 0.22300 | 0.26700 | 0.22000 | 0.16200 |

As we can see from the above table, concentration level of Azerbaijan banking sector is high enough for the 2008-2011 years. According to CR₃ 3 largest banks (Azerbaijan International bank, Bank Standard, Kapital bank) held 56 % of assets, 52 % of deposits and 56 % of credits portfolio in 2008 year. Azerbaijan International bank which is governmental bank hold the largest proportion of market share among the remain two banks. Despite the decrease in the concentration level of assets in 2009 year, deposit and credit portfolio of these 3 largest banks were 54 % and 60 % respectively. During the 2010 and 2011 years there was decline tendency in the concentration level of deposits and credit portfolios. However concentration level in the assets have reached to the 53.44 %. CR₅ takes into account 5 largest banks in the system which are Azerbaijan International bank, Kapital bank, Bank Standard ,Xalqbank and Texnika bank in order to show their concentration levels in the market. Concentration ratio of these 5 banks assets, deposits and credit portfolios were above the 60 % in all the four years. From the 2008 to 2010 year there were observed decrease in the concentration level, but except credit portfolio of 5 largest banks concentration level in deposits and assets became to increase in 2011. Again International bank of Azerbaijan hold larger market share in assets, deposits and credit portfolios than other banks in the market. CR₁₀ which measure 10 largest banks shows more clear position of banking sector that, Azerbaijan banking system stands the "shoulder" of 10 banks. Between 2008-2011 years CR₁₀ shows almost stable trend for assets and falling trend for the deposits and credit portfolios.

However the Herfindahl – Hirschman Index to assets, credit portfolios and deposits showed falling trend through 2008-2011 years. According to the Herfindahl-Hirschman Index rule indices lower than 0.1000 means less concentrated, indices between 0.10000

and 0.1800 middle concentrated and if the calculated concentration level is more than 0.18000 market is considered fully concentrated. Thus, we can say that banking sector assets and credits are highly concentrated. However highly concentration level exists in deposits only in 2009 year. Furthermore, HHI is middle concentrated in the 2011 year for assets, deposits and credit portfolios. The values of concentration ratios are quite similar to the values S.Aliyev (2010) who have found high concentration level in the Azerbaijan banking sector.

6.2 Estimated results of Panzar - Rosse H-statistic

For the Azerbaijan banking sector the Panzar-Rosse H-statistic has been determined for each of the studied time period of 2008-2011. Table 6.2 shows that the Azerbaijan banking sector operating under monopolistic competition.

Table 6.2: Estimated results of yearly H-statistics

| | 2008 | 2009 | 2010 | 2011 |
|-------------|----------|----------|----------|----------|
| H-statistic | 0.122029 | 0.351144 | 0.405082 | 0.652937 |

As we can see from the table 6.2 the estimated H-statistics indicating monopolistic competition for the banking sector in year 2008. Only one explanatory variable log (IETD) is statistically significant, thus $H = \beta_1 = 0.122029$. Table 6.3 presents the regression results for the 2008 year:

Table 6.3 Regression results for year 2008

| Dependent Variable: LOGIRTA | | | | |
|-----------------------------|-------------|-----------------------|-------------|-----------|
| Method: Least Squares | | | | |
| Sample: 1 25 | | | | |
| Included observations: 25 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -0.957359 | 0.436659 | -2.192466 | 0.0398 |
| LOGIETD | 0.122029 | 0.068313 | 1.786325 | 0.0885 |
| LOGPETA | 0.065531 | 0.123369 | 0.531180 | 0.6009 |
| LOGAETA | 0.166868 | 0.152768 | 1.092295 | 0.2871 |
| R-squared | 0.337298 | Mean dependent var | | -2.138802 |
| Adjusted R-squared | 0.242627 | S.D. dependent var | | 0.402958 |
| S.E. of regression | 0.350683 | Akaike info criterion | | 0.887778 |
| Sum squared resid | 2.582548 | Schwarz criterion | | 1.082798 |
| Log likelihood | -7.097222 | Hannan-Quinn criter. | | 0.941868 |
| F-statistic | 3.562825 | Durbin-Watson stat | | 1.590135 |
| Prob(F-statistic) | 0.031571 | | | |

An analysis shows that H-statistic for the 2009 year reached to 0.351144 level which is increased according to the previous year. In this year again only the ratio of interest expenses to total deposits log (IETD) is statistically significant, so $H = \beta_2 = 0.351144$.

Table 6.4 Regression results for year 2009

| Dependent Variable: LOGIRTA | | | | |
|-----------------------------|-------------|-----------------------|-------------|-----------|
| Method: Least Squares | | | | |
| Sample: 1 25 | | | | |
| Included observations: 25 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -0.737793 | 0.511979 | -1.441061 | 0.1643 |
| LOGIETD | 0.351144 | 0.119617 | 2.935567 | 0.0079 |
| LOGPETA | 0.097083 | 0.140045 | 0.693226 | 0.4958 |
| LOGAETA | 0.010882 | 0.123808 | 0.087894 | 0.9308 |
| R-squared | 0.433251 | Mean dependent var | | -2.229538 |
| Adjusted R-squared | 0.352287 | S.D. dependent var | | 0.361487 |
| S.E. of regression | 0.290927 | Akaike info criterion | | 0.514157 |
| Sum squared resid | 1.777408 | Schwarz criterion | | 0.709177 |
| Log likelihood | -2.426966 | Hannan-Quinn criter. | | 0.568248 |
| F-statistic | 5.351143 | Durbin-Watson stat | | 1.926098 |
| Prob(F-statistic) | 0.006761 | | | |

In 2010 year H-statistic reached to 0.405082 level, which means as monopolistic competition of Azerbaijan banks in that year according to the accepted H-statist rules. The coefficient of log (PETA) is only statistically significant at 0.10 significance level, thus H- statistic is equal to the 0.405082.

Table 6.5 Regression results for year 2010

| Dependent Variable: LOGIRTA | | | | |
|-----------------------------|-------------|-----------------------|-------------|-----------|
| Method: Least Squares | | | | |
| Sample: 1 25 | | | | |
| Included observations: 25 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -0.219612 | 0.438795 | -0.500489 | 0.6219 |
| LOGIETD | 0.018134 | 0.058320 | 0.310934 | 0.7589 |
| LOGPETA | 0.405082 | 0.140840 | 2.876192 | 0.0090 |
| LOGAETA | 0.150199 | 0.098769 | 1.520717 | 0.1432 |
| R-squared | 0.555909 | Mean dependent var | | -2.337713 |
| Adjusted R-squared | 0.492467 | S.D. dependent var | | 0.376216 |
| S.E. of regression | 0.268021 | Akaike info criterion | | 0.350147 |
| Sum squared resid | 1.508546 | Schwarz criterion | | 0.545167 |
| Log likelihood | -0.376842 | Hannan-Quinn criter. | | 0.404238 |
| F-statistic | 8.762521 | Durbin-Watson stat | | 2.093318 |
| Prob(F-statistic) | 0.000580 | | | |

Table 6.6 represents regression results for the 2011 year. The coefficient of log (IETD) and log (AETA) is statistically significant at 0.10 significance level, thus H-statistic is equal to the sum of coefficient of log (IETD) and log (AETA) 0.652937, which is monopolistic competition for the end of 2011 year.

Table 6.6 Regression results for year 2011

| Dependent Variable: LOGIRTA | | | | |
|-----------------------------|-------------|-----------------------|-------------|-----------|
| Method: Least Squares | | | | |
| Sample: 1 25 | | | | |
| Included observations: 25 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | -0.266393 | 0.333735 | -0.798217 | 0.4337 |
| LOGIETD | 0.463186 | 0.102044 | 4.539079 | 0.0002 |
| LOGPETA | 0.016156 | 0.055387 | 0.291696 | 0.7734 |
| LOGAETA | 0.189751 | 0.093351 | 2.032653 | 0.0549 |
| R-squared | 0.682769 | Mean dependent var | | -2.469002 |
| Adjusted R-squared | 0.637451 | S.D. dependent var | | 0.460005 |
| S.E. of regression | 0.276978 | Akaike info criterion | | 0.415892 |
| Sum squared resid | 1.611057 | Schwarz criterion | | 0.610912 |
| Log likelihood | -1.198647 | Hannan-Quinn criter. | | 0.469982 |
| F-statistic | 15.06597 | Durbin-Watson stat | | 2.020990 |
| Prob(F-statistic) | 0.000019 | | | |

Chapter 7

CONCLUSION

Using annual reports of individual banks and reports of FINEKO analytical and information agency this research aims to review and analyze the degree of concentration and competition in the Azerbaijan banking industry over the period 2008 to 2011. 25 major banks were selected based on their market share for the study. In order to analyze concentration level we used CR_3, CR_5, CR_{10} and famous Herfindahl-Hirschman Index, while measuring competition degree Panzar-Rosse H-statistic were employed.

Recent researches on competition and concentration for the Azerbaijan banking industry have been studied by S.Aliyev (2010) and F.Huseynov, X.Huseynov (2008). F.Huseynov and X.Huseynov (2008) studied concentration and competition level for the banks which operated between the years of 2003-2007 by using Herfindahl-Hirschman Index, Theil index and M index. Moreover, S.Aliyev (2010) investigates concentration level for the 2010 year by using k -bank concentration ratio. However, both authors used different time horizons for their studies. They all found undesirable market conditions in terms of concentration and competition.

In this thesis, we tried to present detailed information about banking industry in Azerbaijan. In the first chapter aim of the study and the research to find out is represented. While, in the second chapter we give brief information about overview of

Azerbaijan banking sector, its historical stages, current position and overall economic indicators. We focused on concentration ratios and competition approaches in third chapter. The well-known ratios and approaches which are used in the empirical literature are described in detail. Similar previous studies are presented in the next chapter. Data and methodology part of our thesis which gives information about data and techniques in order to measure concentration and competition level takes place in fifth chapter. Results of our empirical analysis for the years 2008-2011 presented in chapter seven.

As we defined in the previous chapter our findings suggest high concentration level for the Azerbaijan banking sector between 2008 and 2011 years. The main reason for the highest level of concentration is the governmental bank - Azerbaijan International bank which hold major market share in assets, deposit and credit portfolios. In average almost 40 % market share of assets, 37 % market share of deposits and 44 % of credit portfolios belongs to Azerbaijan International bank over the year 2008-2011. If we look result of CR_{10} over the 2008-2011 years easily we can see that 10 largest bank hold 80% of bank assets, deposits and credit portfolios. Thus, we may say that Azerbaijan banking sector consists of 10 banks. This means that, other banks that carries out banking activities in the country don't have serious effect on the economy. Despite of regulations of the Central Bank in order to reduce number of small banks and directly or indirectly effect of government on the banks, the problem have not been solved yet. Even though presidential decree on privatization of state banks, this issue was not fully implemented. Only in 2007 year 50 % of government owned Kapital bank privatized. As the result of privatization 50 % of shares have been purchased by major participants of market Xalgbank and Atabank and this issue also didn't help to decrease level of concentration

and competition. Thus empirical analysis shows that the level of competition which is another important issue studied in this thesis is not good for the banking sector. We find monopolistic competition for all analyzed years. The dominant role of Azerbaijan International bank and government supported Kapital bank have negative effect on competition level. The lack of competition in the banking system has negative effect on bank services, thus banking services become expensive and low-quality.

Despite the minimum losses in the banking system after financial crisis, Azerbaijan banking system is not in good position in terms of concentration and competition according to our results. In order to solve these problems and make overall banking system competitive Central bank of Azerbaijan announce consolidation plan of banks in near future. The bank consolidation trend in the world and as well as financial analysis of Azerbaijan banks make necessity of consolidation. According to A.Quliyev who is the first deputy chairman of Central bank (2010), 46 banks is a large number for a country such as Azerbaijan and he also suggest that 15-20 bank is normal for the sector. If reducing number of banks serve strengthen banking system on the other hand this system will face in danger of monopolization.

As a result of merge of smaller banks, 2-3 larger banks will occur in the market. These banks may end up monopolistic situation, with the possibility of providing low quality banking services in the future. Thus, consolidation of banks should bring strong, liquid banking institutions and high quality banking services not monopoly.

REFERENCES

Angelini,P. and Cetorelli, N.(2000). Bank competition and regulatory reform: The case of the Italian banking Industry. Federal Reserve Bank of Chicago, *Working Paper Series, Research Development*, WP.32-99

Allen, F., Gale, D. (2004), Competition and Financial stability. *Journal of Money, Credit and Banking*, Vol. 36:3, 453-480

Aliyev.S (2010) Consolidation of Azerbaijan banks, *Center for Media and Public Initiatives*

Beck, T., Demirgüç-Kunt, A.,Levine, R.(2006a). Bank Concentration, Competition and Crises: First Results, *Journal of Banking and Finance* Vol.30:5, 1581-1603

Beck, T., Demirgüç-Kunt, A. and Maksimovic V.,(2004).Bank Competition and access to finance: International evidence. *Journal of Money, Credit and Banking* Vol.36 ,627-648

Berger, A. N., Demirgüç-Kunt, A.,Levine, R and Joseph G.Haubrich,(2004).Bank Concentration and Competition: An Evolution in the Making, *Journal of Money, Credit and Banking*, Vol.36,No.3,434-450.

Berger, A., Klapper, L., Turk-Ariss, R.,(2008).Bank Competition and Financial Stability. *World Bank Policy Research Working Paper 4696*.

Bikker J. A. and Haaf K. (2001a), Measures of Competition and Concentration: A Review of Literature. *De Nederlandsche Bank, Amsterdam*

Bikker, J.A. and K. Haaf(2002). Competition, Concentration and Their Relationship: An Empirical Analysis of the Banking Industry. *Journal of Banking and Finance*, Vol.26, No.11,2191-2214.

Bikker, J.A. and J.M.Groeneveld (2002).Competition and Concentration in the EU Banking Industry.*Kredit und Kapital*, 33,62-98.

Boone, J.(2008). A new way to measure Competition. *The Economic Journal*, Vol.118, Issue 531, 1245-1261

Claessens, Stijn and Luc Laeven (2004). What drives Bank Competition? Some International Evidence.*Journal of Money, Credit and Banking*, Vol.36, No.3 (Part 2), 563-583.

Cetorelli, N. (2004), Bank Concentration and Competition in Europe.*Journal of Money, Credit and Banking*, Vol. 36, 544-559

D.Anzoategui, M.S.M Peria and M.Melecky(2010).Banking Sector Competition in Russia. *World Bank Policy Research Working Paper*, 5449

De Bandt, O. and Davis, P.(2000). Competition, contestability and market structure in European banking sectors on the eve of EMU. *Journal of Banking and Finance*, Vol.24, 1045-1066

Drakos, K. and Konstantinou, P.(2001).Competition and contestability in transition banking: An empirical analysis. EEFS Conference, Heraklion,Crete

EM Banking System Datawatch: Managing the Credit Build Up.Fitch Ratings, June 2011

F.Huseynov and X.Huseynov (2008).Concentration in the Azerbaijan banking sector.*Economic Research Center*, 2008

Gelos, G. and Roldos, J. (2002). Consolidation and Market Structure in emerging Market Banking Systems.*International Monetary Fund Working Paper*, 02/186.

Gunalp,B. and Celik, T. (2006). Competition in the Turkish Banking Industry.*Applied Economics*, 38, 2335-1342.

Hempell, H.S.(2002). Testing for competition among German banks.*Economic Research Centre, Deutsche Bundesbank*, Discussion Paper 04/02

Jansen, D. and DeHaan, J. (2003).Increasing concentration in European banking: A macro-level analysis. *De Nederlandsche Bank, Research Memorandum WO*, No.743, September.

JulijaStaroselkaja (2011). The influence of concentration on the competition in the banking industry, *Economics and Management Journal* Vol.16, 373-379.

Law on Azerbaijan Republic Central Bank, Law of Azerbaijan Republic, Baku 10 December 2004, No 802 IIQ

Law on non-credit organizations, Law of Azerbaijan Republic, Baku, 25 december 2009. No 933-IIIQ

LuzGuiterez de Rozas (2007). Testing for competition in the Spanish banking industry: The Panzar-Rosse approach revisited. *Banco de Trabajo* No.0726 9-46

Mamatzakis, E., Staikouras, C. and Koutsomanoli-Fillipaki, N. (2005). Competition and Concentration in the Banking Sector of the South Eastern European Region. *Journal of Emerging Market Review*, 6, 192-209.

Molyneux, P., Lloyd-Williams, D.M. and Thornton, J. (1994). Competitive Conditions in European banking. *Journal of Banking and Finance*, 18, 445-459.

Moody's Annual Survey of Russian and CIS Banks Single-Client Concentrations annual report. 2010

Nathan, A. and Neave, E.H. (1989). Competition and Contestability in Canada's financial system: empirical results, *Canadian Journal of Economics*, 22, 576-594.

O.F. Abbasoglu, A.F. Aysan, A. Gunes (2007). Concentration, Competition, Efficiency and Profitability of the Turkish Banking Sector in the Post-Crisis Period, *Journal of Banks and Bank Systems*, Vol.2, Issue 3, 106-115.

Prasad, A. and Ghosh, S. (2005). Competition in Indian banking. *IMF Working Paper* No.05/41.

Statistical bulletins of Central Bank of Azerbaijan through 2008-2011 years

Yildirim, H.S. and Philippatos, G.C., (2002). Competition and contestability in Central and Eastern European banking markets, *FMA International Annual Meeting, Dublin: Ireland*.

Yuan, Y.(2006). The state of competition of the Chinese banking industry, *Journal of Asian Economics*, Vol.17, 519-534.

<http://cbar.az/pages/about-us/history/>

http://www.azerbaijan.az/portal/StatePower/Committee/committeeConcern_e.html

<http://cbar.az/pages/about-us/history/>