

**COMPARATIVE DYNAMIC ANALYSIS
OF COMMERCIAL BANKS' BEHAVIORAL PATTERNS
IN RUSSIA AND TURKEY**

**Fuad Aleskerov^{a,b*}, Veronika Belousova^c, Hasan Ersel^d, Alexander Ovcharov^c,
Esra Ozgur^e, Maria Serdyuk^c, Vasily Solodkov^{c,f}**

^a *Department of Mathematics, State University – Higher School of Economics (SU-HSE), 20, Myasnitskaya street, Moscow, 101000, Russia, alesk@hse.ru*

^b *Russian Academy of Science, Institute of Control Science, Moscow, Russia*

^c *SU-HSE, Moscow, Russia*

^d *Sabanci University, Istanbul, Turkey*

^e *Economic Research Department, Isbank, Istanbul, Turkey*

^f *Banking Institute, Moscow, Russia*

Abstract: The paper presents a pattern behavioral analysis of Russian commercial banks and Turkish deposit banks during a four-years period: from the second quarter 2004 to the second quarter 2008. Banks' performance indicators are analyzed. Structural similarities of banks' development are examined. A cluster analysis is applied to determine banks with the similar structure of operations. This analysis allows to estimate how the structure of the Russian banking sector in comparison with the Turkish one has been changing over time. In particular, it allows to identify prevailing behavioral patterns of Russian commercial banks and Turkish deposit banks and to analyze stability of banks' position in a particular pattern in a country.

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* Corresponding author

1. INTRODUCTION

The bank operations are very significant in order to make the economy generally operate properly. The services such as the provision of safe deposit facilities for money, the provision of credit and the provision of efficient money transmission services, i.e., the uninterrupted provision of payment facilities are essential and important for continuity of banking services to the economy. Meanwhile the main bank function is a financial intermediation.

From this point it is actual to understand what behavioral patterns banks chose, i.e., whether banks mostly concentrate on credit activity, what the quality of credit activity growth is, how banks manage liquidity and whether banks get profit on its operations and, finally, whether banks use capital effectively.

Another issue is whether banks follow a circumspect policy when limits on external borrowing changing due to the liquidity crisis starting in August of 2007 caused by the crisis at the mortgage market in the USA. Have the banks changed their type of behaviour before the crisis or after it at these markets? In particular, how the banks reacted to the crisis? Have they decreased the volume of loans and changed interest rate policy? How are they managing liquidity now?

In order to get answers to these questions, a more detailed analysis of commercial banks' activity and an analysis of their behavioral patterns is needed.

The goal of the paper is to carry out the comparative pattern behavioral analysis of Russian commercial banks and Turkish deposit banks.

To implement this goal the dynamic pattern behavioral analysis of commercial banks is made. This method is based on clustering commercial banks relatively to the system of indicators describing banks' performance. The system of indicators takes into account the structure of assets and assets quality, the level of banks' capital, profitability and liquidity.

In this paper the Turkish deposit banks and the Russian commercial banks taking 80% of the deposit market on April, 2008 are investigated. The research consists of several steps - to analyze bank's performance indicators, to reveal tendencies of banks' development, and to understand how frequently banks change their pattern behaviour.

The paper is organized as follows. Section 2 gives a brief description of the banking system in Russia and Turkey. Section 3 describes the data used. It also presents the system of indicators based on CAMEL model, which is used for the purpose of banks' performance assessment. Section 4 describes the methodology. The most prevailing behavioral patterns of the Russian largest commercial banks and the Turkish deposit banks are described in Section 5. Section 6 defines dynamic groups of banks. The pattern stability analysis is made in Section 7, and Section 8 summarizes the main results.

2. A QUICK GLANCE AT THE BANKING INDUSTRY STRUCTURE

IN TURKEY AND RUSSIA

2.1 MACROECONOMIC INDICATORS

OF THE BANKING SECTOR FUNCTIONING

A general analysis of the commercial banking sector performance in Turkey and Russia should be made taking into account the macroeconomic and legal environment.

So, the Russian banking sector and the Turkish one are characterized by the stable growth of the fundamental macroeconomic indicators of the banking sector performance, for example, assets to GDP ratio or capital to GDP ratio and other ratios continued to increase (see Table 1). It is also worth saying that the Turkish banking system overcame the Russian banking system in the capital share in GDP. However, to 2007 this indicator in Russia has been comparable with the same one in Turkey. The Russian credit organizations strived for increase of capital; in particular, the Russian largest banks could do it. The level of deposit in GDP in Turkey tripled the same ratio in Russia in 2004 and to 2007 this difference has been diminished a little bit. So, the Russian deposit market has been reinforced since the liquidity crisis of 2004. Deposit Insurance Agency which started its activity after 2004 could influence on increase of household trust to banks and, consequently, could have a positive impact on deposit growth.

Table 1

*Comparison of Macroeconomic Indicators of the Banking Sector Performance
in Russia and Turkey*

Country	Years	Assets/GDP (%)	Capital/GDP ¹ (%)	Deposits/GDP (%)	Credits/GDP ² (%)
Russia	2004	41,9	5,6	11,6	22,8
	2005	45,1	5,7	12,7	25,2
	2006	52,2	6,3	14,1	29,9
	2007	61,4	8,1	15,6	37,3
Turkey	2004	58,7	9,6	37,8	19,8
	2005	61,4	7,8	39,2	23,7
	2006	65,6	8,3	42,3	29,5
	2007	73,5	8,8	46,7	36,7

Data Source: The Banks Association of Turkey, Bank of Russia

If we compare some macroeconomic indicators of the banking system performance in Euro area, Russia and Turkey, we can find out that although the stable growth of the indices was presented in the last periods, these banking markets were still smaller than the banking system in the Euro area (table 2). But these two markets were very similar. For instance, they hold a high

¹ Total Shareholders' Equity is used for the Turkish banks.

² Total Loans of the Turkish banks = Short term + Medium and Long Term + Loans under Follow up - Specific Provisions

level of capital adequacy and liquidity. They provided a comparable share of domestic credit in GDP to private sector. At the same time the Turkish banks provided more domestic credit than the Russian ones. However, the share of domestic credit increased in Russia in last years with dynamic GDP growth.

Table 2

Country	Years	Bank capital to assets ratio (%)	Bank liquid reserves to bank assets ratio (%)	Domestic credit provided by banking sector (% of GDP)	Domestic credit to private sector (% of GDP)
Euro area	2004	6	1	123	104
	2005	6	1	128	110
	2006	5	1	132	116
Russia	2004	14	15	25	24
	2005	13	12	21	26
	2006	12	11	21	31
Turkey	2004	14	9	55	23
	2005	13	11	58	29
	2006	11	9	60	34

Source: World Development Indicators, The World Bank Group

In order to analyze the efficiency level of the banking systems return on average assets (ROA) and return on average capital (ROE) are computed. In the case of the Turkish banking system we can assume that foreign banks increased the efficiency level of the Turkish banking sector. While the share of foreign banks was growing up, ROA and ROE practically doubled (see Table 3). In order to explain this assumption in details a more sophisticated analysis is required.³

The expectation like a previous one is not appropriate for the Russian banking system. Even the share of foreign banks has increased; efficiency ratios have showed a move in the opposite direction to 2007. In 2006 there was a slight jump in ROA and ROE under the growth of foreign participation in the Russian bank capital.

³ Some papers are devoted to explaining the efficiency level of the banking systems and seeking the factors impacting these efficiency scores (see, for example, Berger, A.N. and Mester, L.J. (1997), Yildirim, H. S. and Philippatos, G. C. (2002), Caner S. and Kontorovich V. (2004), Styryn K.A. (2005), Golovan, S. et. al. (2007)).

Table 3

Efficiency Ratio

Country	Years	Share of foreign banks (% of total bank capital) ⁴	ROA (%)	ROE (%)
Russia	2005	9,2	4,12	29,76
	2006	12,7	4,40	33,96
	2007	15,7	2,89	23,41
Turkey	2005	7,0	1,62	11,44
	2006	14,1	2,44	19,22
	2007	17,3	2,98	23,63

Data Source: The Banks Association of Turkey (2006, 2005, 2007), Bank of Russia (2005, 2006, 2007)

2.2 INSTITUTIONAL FEATURES OF THE BANKING SECTOR DEVELOPMENT

2.2.1 QUANTITATIVE CHARACTERISTICS

The total number of Turkish banks was 46 on December 31, 2007. There are two types of banks operating in the Turkish banking sector. One of them is deposit banks and the other one is development and investment banks. Deposit banks are prevailing ones in the Turkish banking sector. Their share is presented below (Diagram 1).

Types of the Turkish Banks

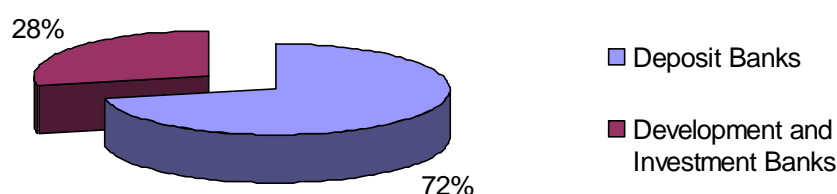


Diagram 1

Source: The Banks Association of Turkey (December, 31, 2007)

The next pie chart shows the breakdown of the Turkish deposit banks by area of the nature of capital. At the end of December 2007 more than 50% of the Turkish deposit banks were owned by foreigners. Deposit privately-owned banks came to about one third of the total. The share of state-owned banks constituted 9% of the total deposit banks, while a bank accounting for the remaining 3% was under the management of Depo. Insurance Fund.

⁴ In Turkey only deposit banks are explored.

The Turkish Deposit Banks by Nature of Capital

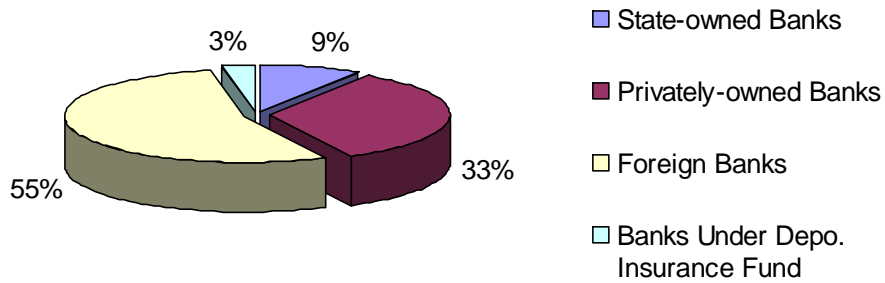


Diagram 2

Source: The Banks Association of Turkey (December, 31, 2007)

The number of the Russian banks is bigger than the Turkish one. The total number of the Russian credit organizations was approximately 27 times higher than in Turkey, i.e., there were 1136 credit organizations, which were allowed to provide banking activity in Russia on January 1, 2008. 80% of them could attract household deposits. At the end of December 2007 of the 1136, 1092 (96%) were commercial banks. The share of non-banking credit organizations was 4%.

However, the number of the Russian credit organizations was decreasing over time. At the same time while the share of credit organizations with domestic capital was falling, credit organizations with foreign capital were expanding (see Diagram 3).

The Russian Credit Organizations by Nature of Capital

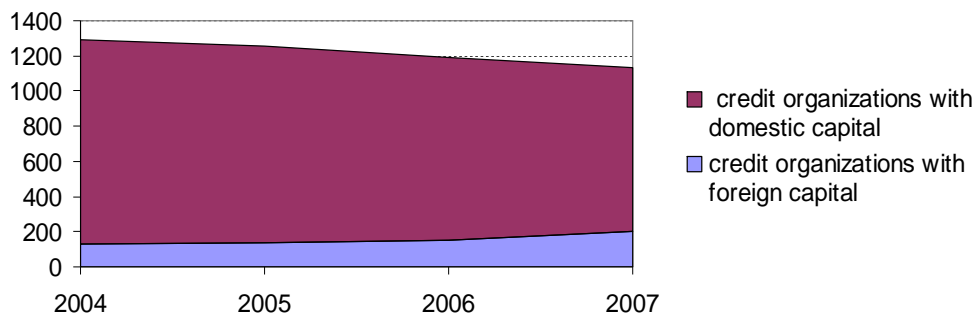


Diagram 3

Source: Bank of Russia

Diagram 4 displays banks with foreign participation by area of their share in bank's capital. Different types of foreign ownership were increasing. The share of credit organizations with 100% foreign share in capital doubled since 2004 to 2007. And the share of credit organizations with more than 50% and less than 100% foreign share in capital tripled.

Capital Share of Foreigners in the Russian Credit Organizations

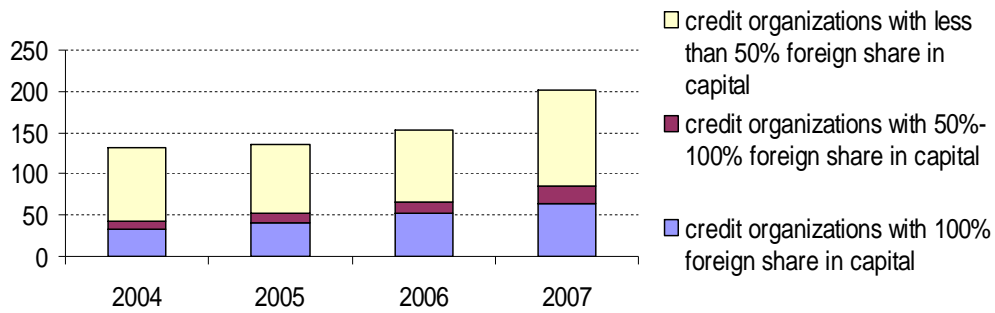


Diagram 4

Source: Bank of Russia

2.2.2 CONCENTRATION OF THE BANKING ACTIVITY

In order to measure concentration of the banking activity in the countries under consideration concentration ratio of five largest banks and Herfindahl-Hirschman Index (HHI) in a particular banking system are estimated for four years. This allows to reveal slowing down of concentration of the banking activities in Russia and Turkey.

In 2007 five largest Turkish deposit banks had a share of 61,9% in the total assets of the sector, while five largest Russian credit organizations formed 42,3% of the total. There is a tendency to decline concentration in the banking sectors. It is shown below (see Diagram 5).

CR_5 by Total Assets

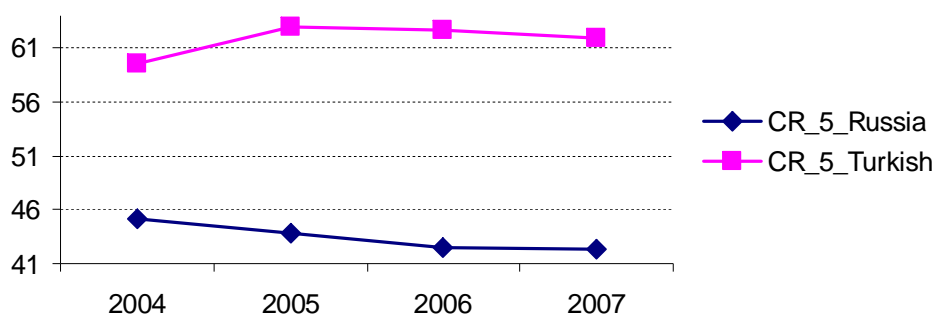


Diagram 5

Data Source: The Banks Association of Turkey, Bank of Russia

As Herfindahl-Hirschman Index by total assets both in Russia and in Turkey over four years have been lower than 0,1 (see Diagram 6), it means that the level of concentration in the banking systems was low. HHI in both countries was decreasing over time.

HHI by Total Assets

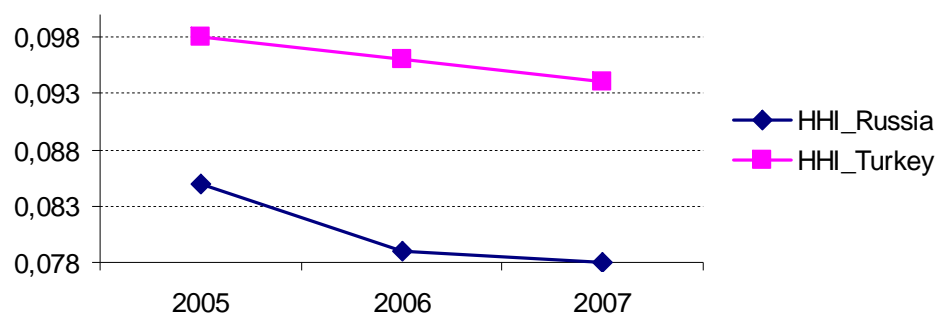


Diagram 6

Data Source: The Banks Association of Turkey, Bank of Russia

3. DATA AND VARIABLE DESCRIPTION

3.1 DATA DESCRIPTION

The period under analysis consists of 17 quarterly reported periods, starting from the second quarter of 2004 and finishing with the second quarter of 2008.

The Russian sample consists of 50 largest commercial banks by total deposits on April, 1st, 2008. They accumulated approximately 80% of the Russian deposit market on April, 1st, 2008. We excluded other Russian banks from the sample, as their share was rather small.

Three state-owned Russian largest banks – Sberbank, Vneshtorgbank (VTB), Vneshtorgbank 24 (VTB 24) - were taking about 40% of the Russian deposit market. Bank of Moscow owned by Government of Moscow was accumulated 3% as well as Gazprombank, a state-affiliated bank. This is comparable with the share of Raifeisenbank Austria, which had 2% of the total. One of the largest private banks – Alfa-Bank– had 2% of the total too. So, these seven banks were taking about a half of the Russian deposit market on April, 1st, 2008.

The data used was collected from balance sheets and profit and loss statements of the Russian commercial banks. This data is available on the official web site of Bank of Russia.

The Turkish sample consists of 29 deposit banks. We did not include Adabank A.Ş., Habib Bank Limited, Unicredit Banca Di Roma S.p.A, Birleşik Fon Bankası A.Ş. into the sample because of the following reasons. Adabank is too small. Its share in deposits is practically zero. This was always a very small bank operating under very special circumstances. Babib Bank is the Turkish branch of a large Pakistani Bank. However its activities in Turkey are very limited. Unicredit-Banco di Roma S.p.A. is dissolved since Unicredit become the controlling partner of the Yapi Kredi Bank. Birleşik Fon Bankası A.Ş. differs from the others, since it is the single bank under the management of Depo. Insurance Fund.

The share of three state-owned banks - Türkiye Cumhuriyeti Ziraat Bankası, Türkiye Halk Bankası A.Ş. and Türkiye Vakıflar Bankası T.A.O. - constituted about 36% of the Turkish deposit market as of March 2008.

The source of the Turkish deposit bank information is the Banks Association of Turkey, where the fundamental ratios used below are calculated.

The information is collected by Bank of Russia and the Banks Association of Turkey.

3.2 PERFORMANCE INDICATORS OF A COMMERCIAL BANK

The indicator system (see Table 4) includes elements of classic CAMEL⁵ model: capital adequacy, asset quality, management features such as banks' specialization, liquidity and profitability ratios.

Table 4

<i>Bank's Performance Indicators</i>		
CAMEL abbreviation	Indicators	Formula
C -Capital	Capital Adequacy (CA) (Capital Liquidity Ratio)	(Total Capital-Fixed assets)/Total Assets ⁶
A - Asset quality	Asset Quality (AQ)	Loan-loss Provision/Loans ⁷
M -Management (Credit Activity)	Coefficient Introduced the Structure of Bank's Assets (CRED)	Total Loans/Total Assets
E - Earning	Profitability Ratio (ROA) ⁸	Net Profit (losses)/Total Assets
L - Liquidity	Liquidity Ratio (LIQ)	Total Loans /Total Deposits

Since one of the main functions of a commercial bank as a financial intermediary is to transform the financial resources obtained in credits to the economy, the ratio of total loans to total assets introduces a variable reflecting banks specialization. This indicator indirectly characterizes the activity of commercial banks in one of the most profitable segment in the banking market. This, in turn, provides the understanding how the expansion of commercial lending operations can be considered as a source of working capital and could be used for investments in fixed capital in the real sector of the economy and a source of household expenditure growth and so on.

⁵ CAMEL is used by supervisory authorities for the purpose of financial sustainability assessment of commercial banks. See, for example, Person O. (1999), Cole R. and Gunther J. (1995), Thomson J. (1991), etc. CAMEL model is also utilized in academic studies in order to evaluate commercial banks' performance, for instance, Derviz A. and Podpiera J. (2008), Singh D. and Kohli G (2006), Otchere I. and Chan J. (2003), etc. The third aim of CAMEL usage is to explain the factors that influence the technical efficiency scores obtained, see Caner S. and Kontorovich V. (2004).

⁶ For the Turkish banks Shareholders' Equity is used.

⁷ For the Turkish deposit banks specific provisions to loans under follow-up ratio is used as a proxy for asset quality.

⁸ For the Russian banks return on average assets is calculated.

However, loans producing higher interest rate could be riskier ones. In order to measure asset quality the ratio of specific provision to loans is used.

Capital adequacy ratio accumulates some characteristics of capital such as reliability, stability, the ability to resist the adverse factors, to absorb the damage from losses.

In order to take into account how a bank manages liquidity funding liquidity is measured by the ratio of total loans to total deposits. As traditional commercial banks are analyzed, the primary funds are introduced by total deposits, and the primary assets are placed into the analysis by total loans. It allows to understand, whether a bank depends on deposit base, when it provides active credit activity. If there is a worst scenario in the banking sector, i.e., deposit funds are demanded by banks' clients (depositors), whether a bank will be able to manage cash under the unstable conditions such as deposit withdrawals. In other words, whether a bank will be able to avoid liquidity problems?

Finally, ROA reflects how profitable a bank is relative to its total assets.

4. METHODOLOGY OF DYNAMIC ANALYSIS OF BANK'S BEHAVIORAL PATTERNS

For the first time the pattern analysis was applied to structural dissimilarities identification in the Turkish banking sector for the period 1988-1999 [see Aleskerov et. al (1997, 2001)], after that it was used for the Russian banking system for 1999-2003 [see Aleskerov et. al. (2006)]. Then the pattern behavioral analysis of 100 largest by total assets Russian commercial banks from quarter, 1st, 1999 to quarter, 2nd, 2007 was made in the paper by Aleskerov et. al (2008).

Methodology of dynamic analysis of banks' behavioral patterns is based on the cluster analysis of the indicators mentioned above.

Implementation of the dynamic analysis of patterns includes four problems:

1. clustering;
2. determination of patterns;
3. construction of banks' trajectories and their analysis;
4. identification of dynamic groups (stable trajectories).

In order to assess whether banks are similar in their behavioral patterns, at the first step the cluster analysis is used. The definition of clusters is based on the notion of proximity of banks in the space of the selected indicators of a commercial bank (see Table 1). According to the results of the cluster analysis 23 different clusters for Russia and 15 various clusters for Turkey have been obtained, where each contains banks similar in terms of the structure of banks' operations and their financial performance. At the same time, different clusters contain different banks in terms of proximity measure used in Aleskerov et. al. (1997, 2000, 2001).

It is important to note that the number of clusters is determined endogenously.

At the second step a unique pattern is found for each cluster. The pattern is a set of the indicator values, which describe the banks' activity at a certain period of time. This set of indicators describes a particular cluster.

The third step consists of analysis how often banks change their patterns over time and what are the numerical characteristics of a pattern chosen by a bank at a particular time period.

This analysis allows to create a number of patterns, where which defines the particular operation of a bank at the relevant time. This allows to construct a trajectory for each bank as a path of patterns attributed to a bank at each time period.

Dynamic groups are constructed at the fourth step. Commercial banks can be considered as elements of the certain dynamic group, if the banks have the same trajectory.

5. BEHAVIORAL PATTERNS

23 different patterns for the Russian commercial banks are defined (see Diagram 7). The number of the Turkish deposit banks behavioral patterns are 15 (see Diagram 8). The Russian patterns from 12 to 23 are contained only one observation.

Diagrams 7, 8 depict distribution of clustered objects over patterns for the Russian banking sector and the Turkish one respectively. These diagrams characterize what quantity of clustered objects is accumulated in the first five patterns, in the first ten patterns and so on. For example, the first 4 patterns have about 80% of observations in the case of Turkey. For the Russian one the first three patterns contain about 80% of all observations.

Distribution of Clustered Objects over Patterns (Percentage of elements in the first 5, 10, 15, etc. clusters)



Diagram 7

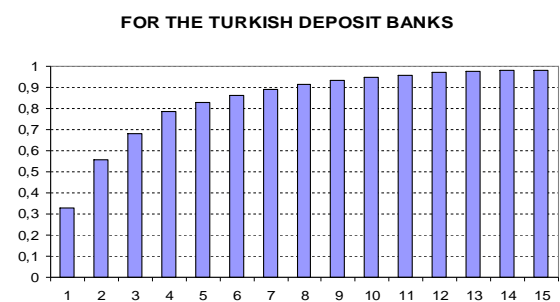


Diagram 8

Such distribution of elements among patterns reveals that banks mostly choose a limited set of behavioral stereotypes both in Turkey and in Russia. So, the Turkish banking sector and the Russian one are quite similar in the number of the patterns chosen by banks in these countries.

In order to compare how much behavioral stereotypes chosen by banks are similar for Turkey and Russia it is necessary to analyze the most prevailing patterns in Turkey and in Russia. Numerical characteristics of the most prevalent behavioral patterns of the Russian commercial banks and the Turkish deposit ones are given in Table 5.

Table 5

Numerical Characteristics of Prevailing Behavioral Patterns

	Number of patterns	Number of elements	CA	CRED	AQ	LIQ	ROA
Russia	1	424	0,005	0,021	0,028	1,126	0,000
	2	114	0,021	0,095	0,034	1,267	0,003
	3	86	0,031	0,161	0,027	1,144	0,003
	4	61	0,005	0,021	0,127	1,281	0,001
Turkey	1	162	0,079	0,550	0,782	0,918	0,010
	2	113	0,072	0,395	0,943	0,607	0,010
	3	60	0,113	0,269	0,956	1,602	0,009

From Table 5 it becomes clear that the Turkish deposit banks focused on the credit activity more than the Russian banks. They also hold a high level of reserves in order to be credit risk-resistant. Pattern 3 for Turkey is characterized a higher level of LIQ and AQ than in other Turkish patterns. One of the reasons could be that the growth of credit overcomes the growth of deposit. The Turkish deposit banks are more capitalized and profitable than the Russian ones. It supports the results obtained early when the comparative analysis of the banking systems at a macro level was done.

However, the analysis at a micro level allows us to compare the largest banks that can be considered as a driver of further development of the sector. It is also interesting to investigate how often banks change their behavioral patterns, how they have reacted to the liquidity crisis starting in 2007.

6. DYNAMIC GROUPS

Banks with the similar trajectory make dynamic groups. To define dynamic groups the trajectories of the Russian commercial banks and the Turkish deposit banks are analyzed during 17 time periods. Table 6 reveals the existing dynamic groups in Russia and in Turkey.

Table 6

Dynamic groups of the Russian banks

Country	Name of dynamic groups	Number of banks	Share of banks (%)	Pattern
Russia	RA ⁹	14	28	1
Turkey	TA	2	6,9	1
	TB	2	6,9	2
	TC	1	3,4	3
	TD	1	3,4	5

Of 50 Russian commercial banks, 14 are formed a dynamic group which pattern 1 is characterized for. This dynamic group consists of some quite famous and large banks such as Sberbank, VTB, Rosbank, Bank “Uralsib”, Bank of Moscow, ING Bank (Eurasia) and others. Values of indicators in pattern 1 are displaced below (see figure 1). These banks provide credit activity with managing credit and liquidity risks at a profitable level. However, these banks are completely diversified, since their assets do not consist only of loans. As these banks are large, consequently, they have great volume of total assets, so capital compared to total assets is not too large.

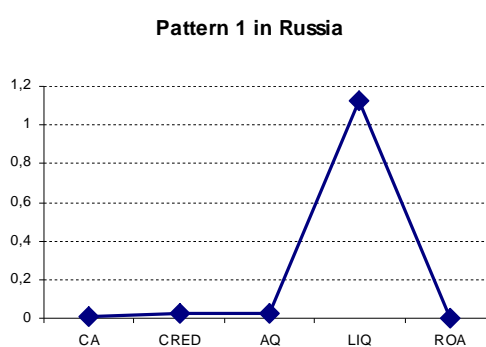


Figure 1

⁹ Including Bank “Saint-Petersburg” and Bank of Khanty-Mansiysk joint stock company. Bank “Saint-Petersburg” has begun to supply its data to the web-site of Bank of Russia since the fourth quarter of 2007. Bank of Khanty-Mansiysk joint stock company has evaluated since the second quarter of 2007.

The Turkish case is completely different from the Russian one. We can see four types of banks; one of them presents an investment bank, JPMorgan Chase Bank N.A., which activity is not connected with loan provisions (see Figure 2). The largest share of its assets is contributed by liquid assets, for example, the ratio of liquid assets to total assets was equal to 94% and the ratio of net financial assets to total assets made up 72% on March, 2008.

There are three different types of credit policy and liquidity management for classic commercial banks (see Figure 3, 4, 5). For example, characteristics of pattern 3 could be attributed to performance of a particular commercial bank (see Figure 5). TC dynamic group is formed by Oyak Bank A.Ş., a foreign-owned bank. Oyak Bank A.Ş. transferred 100% of its shares to ING Bank N.V. in December 24. 2007. Then, Oyak Bank A.Ş. was transferred to foreign banks group as of this date.

Oyak Bank A.Ş. less focuses on loan provision than Fortis Bank A.Ş., a foreign-owned bank and Türkiye Garanti Bankası A.Ş., a privately-owned bank, which activity can be described by Pattern 1 (see Figure 3). Although these three banks have particularly the same level of credit activity, they have different share of loan loss provision in their credit portfolio. It means that they can apply different loan provision policy or provide credits to various industries according to credit risks.

And other two privately-owned banks, Akbank T.A.Ş. and Türkiye İş Bankası A.Ş., have more conservative risk policy than the previous ones (see Figure 4).

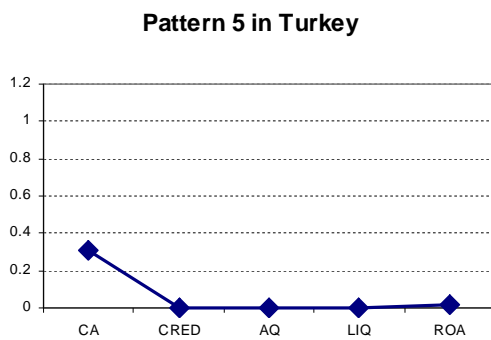


Figure 2

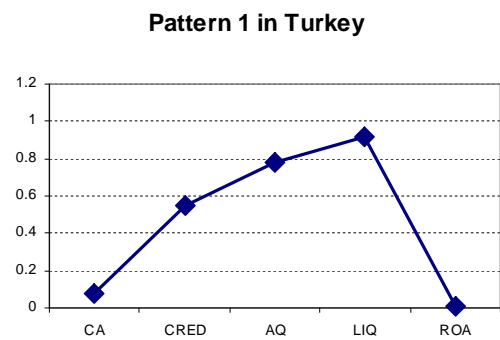


Figure 3

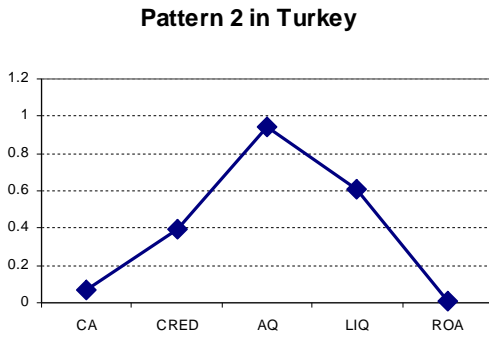


Figure 4

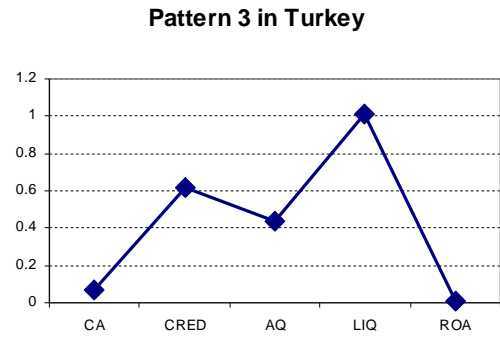


Figure 5

Thus, the existence of only five dynamic groups of commercial banks (four of them are attributed to Turkey and one is referred to Russia) confirms the hypothesis that the process of commercial banks' stable behavioral patterns formation starts at the level of large bank credit institutions in these banking sectors. On the other hand, the fact that the banks preserve behavioral specific models once chosen over time could positively influence the behavioral patterns of other banks.

7. STABILITY ANALYSIS

We consider a bank as “absolutely stable” in its behaviour, if it belongs to one of the dynamic groups, i.e., if during 17 periods a bank has not changed a behavioral pattern, then it is attributed to a category of “absolutely stable” banks. The trajectory of “absolutely stable” banks can be represented as the order of patterns over time, for instance, as 1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1. If during 17 time periods, a bank has made 1-2 changes of patterns, then this bank is included into the category of “semi-stable” commercial banks. The trajectory of “semi-stable” commercial banks can be, for instance, written as 1-2-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1. The bank is “absolutely unstable”, if during 17 periods it has changed 9 or more patterns, for example, 8-8-5-5-5-6-5-6-5-5-5-5-5-8-2-3-2. Other banks are attributed to the category of “unstable” commercial banks. Diagram 9 displays distribution of banks over types of stability.

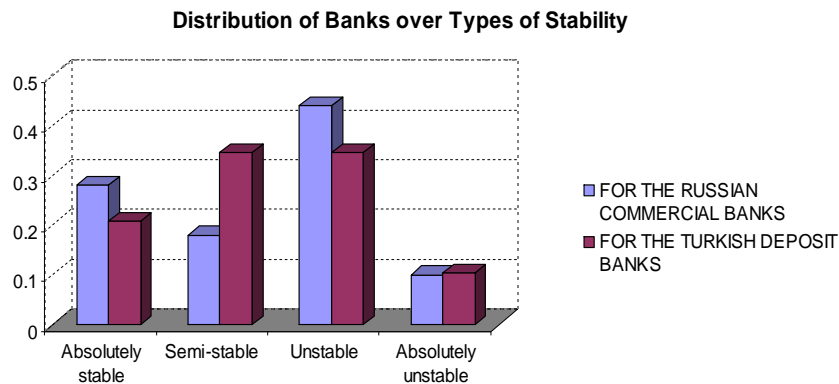


Diagram 9

The largest number of the Russian commercial banks is referred to “unstable” banks, when the most prevailing group of bank types in Turkey is “semi-stable” one. The share of “semi-stable” banks in Turkey is 35%. It is higher by 17 percentage points than in the case of Russia. At the same time Turkey and Russia have the same level of “absolutely unstable” banks. The share of their “absolutely unstable” banks comes to 10% of the total banks.

So, the Russian banking system has more “absolutely stable” banks than the Turkish one does. But the Turkish banks mostly are “semi-stable” and “unstable”. These two types of banks accumulate about 70% of the total in Turkey. For the Russian case it is about 60% of the banks under consideration. Simultaneously the banking systems have the equal level of “absolutely unstable” banks.

However, if we combine “absolutely stable” and “semi-stable” banks in the both countries together, we can observe that about a half of the deposit banks in Turkey is attributed to these two groups. In Russia the number of the same type of banks is comparable and equal to 46%.

Further data on distribution of the Russian commercial banks and the Turkish deposit banks over pattern changes frequency is presented in Tables 7 and 8, respectively.

The Tables show that banks, which have changed from 1 to 3 patterns, constitute 30% of the Russian commercial banks, and there are 41% of the Turkish deposit banks. Activity of 14% of the Russian banks and 6% of the Turkish banks can be described by a unique pattern. Thus, the cumulative percent of banks of these two types in Russia is equal to 58%. Turkey gets approximately the same cumulative percent of banks of these two types. It accounts for 62%.

Thus, pattern behavioral stability of the Russian commercial banks and the Turkish ones is observed. It has a tendency to increase. Large banks in general define their market niche. They have chosen concentration on credit activity as one of the perspective direction for their further development.

Distribution of Banks over Pattern Changes Frequency

FOR THE RUSSIAN COMMERCIAL BANKS

Frequency	Number of banks	Cumulative percent
0	14	0,28
1	17	0,34
2	23	0,46
3	29	0,58
4	39	0,78
5	42	0,84
6	42	0,84
7	45	0,90
8	45	0,90
9	46	0,92
10	48	0,96
11	49	0,98
12	49	0,98
13	50	1,00

Table 7

FOR THE TURKISH DEPOSIT BANKS

Frequency	Number of banks	Cumulative percent
0	6	0.21
1	14	0.48
2	16	0.55
3	18	0.62
4	20	0.69
5	23	0.79
6	25	0.86
7	26	0.90
10	28	0.97
11	29	1.00
0	6	0.21
1	14	0.48

Table 8

The last issue is concerned with, whether banks have changed their behavioral patterns after summer of 2007 due to liquidity crisis. In order to track whether banks have changed their behavioral patterns we study 5 quarterly reported periods, starting from the first quarter of 2007 and finishing with the first quarter of 2008. In Russia the number of “stable” banks increased by two times. Only one bank (Moscow Industrial Bank) chose pattern 2 (see Figure 6), the rest one was attributed to pattern 1 (see Figure 1). Banks of pattern 2 are more capitalized, focused more on loan provision, hence as a result a higher level of reservation rate is observed than in patter 1.

Pattern 2 in Russia

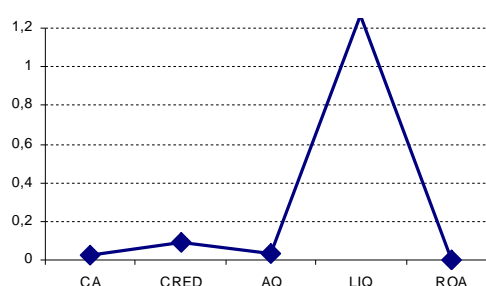


Figure 6

So, about a half of 50 Russian largest banks by total deposits on April, 1st, 2008 were stable under liquidity crisis. In Turkey only 37% of the deposit banks followed the behavioral patterns chosen before the crisis. Pattern 1 is the most prevailing for the Turkish deposit banks (see Figure 3).

8. CONCLUSION

Thus, the comparative pattern behavioral analysis of the Russian commercial banks accumulated 80% of the deposit market and the Turkish deposit banks was made. Some key issues are provided below.

- The positive dynamics of the main fundamental macroeconomic indicators of the banking systems is the evidence that importance of the banking systems at these two markets continued to increase. However, there exists a space for further development of the banking systems in the countries, as the banking system of Euro area is bigger and more advanced than the banking system of Russia and Turkey.

- The Turkish banking system was smaller than the Russian one by the number of banks (credit organizations). In Turkey foreign banks were dominant, while the Russian banking system was defined mostly by domestic-owned banks than the foreign ones. Since the share of foreign banks was increasing over time with the simultaneously growth of ROA and ROE we assumed that the entry of foreign banks made the Turkish banking system more effective. In the Russian case the link between foreign banks entrance and banking system efficiency increase was not so obvious.

- Bank competition in the banking sectors was growing up. However, the Turkish banking sector was more concentrated than the Russian one. Particularly, CR₅ for the Turkish banks was higher than CR₅ for the Russian banks by 36% in 2007. HHI of the Russian banking sector was lower than the Turkish HHI by 21% in 2007.

- 23 different patterns are identified for the Russian commercial banks. The Turkish deposit banks behaviour is characterized by 15 various patterns.

- Most of the Russian commercial banks have behavioral models that describe the numerical characteristics of pattern 1. 54% of total observations are concentrated on pattern 1. As for Turkey pattern 1 is the most prevailing one, it accumulates 33% of the total observations. This indicates that banks choose a limited set of the possible behavioral patterns.

- The distribution of elements among patterns reveals that the Turkish banking sector and the Russian one are quite similar in terms of number of the patterns chosen by banks in these countries.

- Five dynamic groups are identified. One of them is in Russia. It contains 28% of the Russian banks under consideration. Sberbank, VTB, Rosbank, Bank “Uralsib”, Bank of Moscow, ING Bank (Eurasia) and other large banks are there. Pattern 1 is characterized for this dynamic group. There are four different dynamic groups in Turkey. Three of them are presented by Oyak Bank A.Ş. owned by ING Bank N.V., Fortis Bank A.Ş., and Türkiye Garanti Bankası A.Ş., Akbank T.A.Ş. and Türkiye İş Bankası A.Ş.. They are mostly focused on providing loans

to the economy. The fourth dynamic group consists of JPMorgan Chase Bank N.A., an investment bank, which activity description is referred to pattern 5. ING Group is in a dynamic group both in Russia and Turkey, i.e., it has not changed its behavioral model over time.

- Comparison of “absolutely stable” and “semi-stable” banks in the both countries reveals that in Russia 46% of the banks belong to these two groups. In Turkey about a half of the same type of banks is attributed to these groups.

- In Turkey only 37% of the banks followed the behavioral patterns chosen before the crisis. About a half of 50 Russian largest banks by total deposits on April, 1st, 2008 is “stable” under liquidity crisis.

Thus, the use of dynamic analysis of banks’ behavioral patterns in Russia and Turkey allows us to analyze the commercial banks’ sustainability to external conditions, i.e., understand how banks adapt to the macro - environment, identify trends in the development of these commercial banks, i.e., determine whether banks focus on loan provision. This analysis also helps to assess the sustainability of a bank in a certain pattern over time.

In addition, the identification of banks, which are characterized by volatile trajectories of development, provides information about those banks that can be considered as sources of high volatility in the banking sector.

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