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THE LEVEL OF COMPETITION IN THE BANKING SECTOR AND ECONOMIC GROWTH: AN EMPIRICAL ANALYSIS OF TURKISH CASE[1]

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ABSTRACT

It is mostly observed that a competitive system provides a lot of advantages for consumers; such as more goods and services, lower prices and higher quality. We can include this argument for the banking sector. The numerous numbers of theoretical and empirical studies has been made for the sector support this. Therefore, the level of competition is crucial for both borrowers and lenders, which directly affect economic growth of a country. In this context our aim is to investigate the relationship between competition level of the banking sector and economic growth in Turkey.

Keywords: *Banking, Competition, Market Structure, Economic Growth*

JEL Codes: *D40, G20, O40*

1. INTRODUCTION

It is mostly observed that in all the sectors competitive systems provide relatively more profitable means to the customers. Particularly these systems lower the prices and enhance the quality while increasing the production. It is possible to include this argument for the banking sector. The sector itself has a crucial function in the economy. It basically channels the money from lenders to borrowers besides funding the international trade, managing the risk, affecting income and wealth distribution. Moreover it has a significant role in the transmission of the monetary policy and the payment system. Therefore it is important to investigate the consequences of the degree of the competition in the banking sector and the economic performance (Coccorese, 2017).

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Research Article

Within this framework our aim is to examine the relationship between competition level of the banking sector and economic growth in Turkey. In this context, in the following section we will give a brief literature review. Then, after explaining the methodology, we will introduce the data and reveal the results of the analysis. Finally we will terminate the paper with the conclusion section.

2. LITERATURE

In recent years, completion in the banking sector and economic growth relationship is one of the most analyzed topics in the literature. Although there is not seen a straight relationship (Asante et al, 2011), the empricial results of the studies principally are separated into two. The first group studies support the positive relationship (Claessens and Leaven, 2005; Cetorelli and Strahan, 2006; Asanta et al, 2011), while the others emphasize on the negative link between two variables.

Monopolized banking sector would charge higher interest rates to the corporates whereas it would pay lower return rates to the depositors. This would result by a decrease in investments, which would slower the economic growth of a country (Cetorelli, 2001: 38). Therefore competition in the banking sector may trigger the production and research and development, which improve the technology and increase the productivity.

On the other hand increasing competition among banks may decrease the credit supply as a consequence of asymmetric information (Coccorese, 2017). There are some analyses, which assume that more concentrated banking sectors are more stable since profits avoid the fragility and excessive risk taking (Beck, 2008).

Measuring the competition level of the banks is something relatively tougher than the measuring the stability of the banks. The literature in general classifies these measures into three: market structure measures, competition measures and regulatory measures.

Market structure measures mostly indicate both the number of firms in the market and the size distribution of the market (White, 1982). Some of these measures are concentration ratios, the Herfindahl-Hirshman Index (HHI), percentage of sales by N largest firms, so on. HHI, also known as Herfindahl Index, is calculates by squaring the shares (MS) of all firms in the market and its formula is shown as $\sum_{i=1}^{n}(MS)^2$ (Rhoades, 1993). Table 1 illustrates the interpretation of the HHI scores.

Table 1 HHI Score Interpretation

HHI<0.01	Highly competitive market
0.01<HHI<0.15	Unconcentrated market
0.15<HHI<0.25	Moderately concentrated market
HHI>0.25	Highly concentrated market

The most broadly used competition measures are H-statistic, the Lerner Index and the Boone Indicator. Many researchers for the bank analysis employ the Lerner Index. It measures the market power by the difference between price and marginal cost as a percentage of prices. The range is between

0 and 1. If the score is equal to zero, this indicates perfect competition. On the contrary, is it is equal to 1, this means a pure competition. H-statistic was first introduces by Panzar and Rosse (1987) and measures the reaction of output to input prices. The meanings of the scores are equivalent to the Lerner Index scores. Boone indicator measures the competition in the sense of efficiency. The firms with more efficiency gain market share at the cost of the less efficient firms (Świtała, et al., 2013).

Finally regulatory measures contain entry requirements, obstacles about entering to the market, controls on the activities and so on (Coccorese, 2017).

3. ANALYSIS

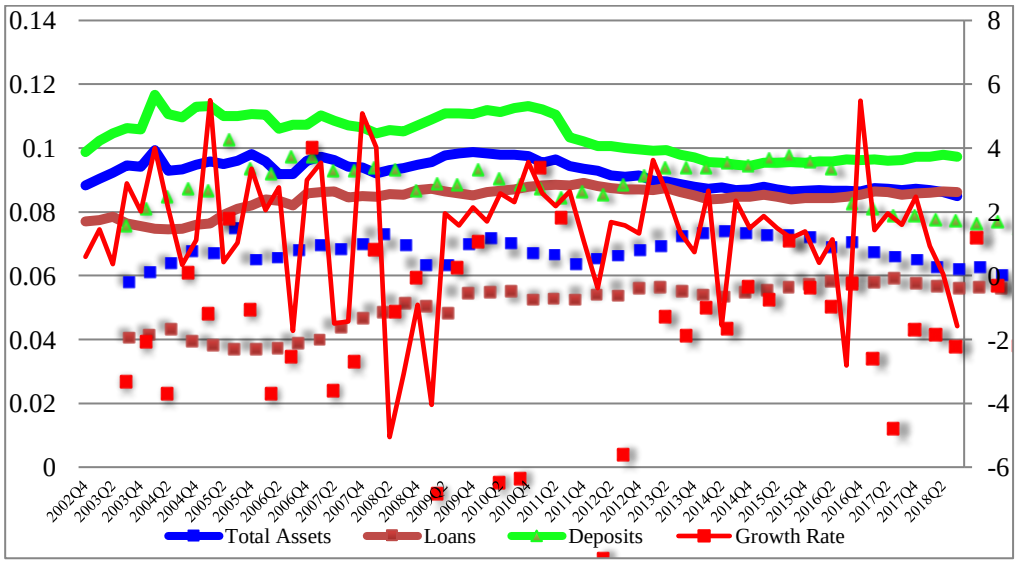
In this section we investigate the relationship between competition level of the banking sector and economic growth in Turkey. In this direction, we first introduce the data and give the results of the analysis we conducted.

3.1. Data

Our data contains the period between 2002Q4 and 2018Q3 on the quarterly basis. In this analysis we calculate HHI as a Proxy of the competition level. We gather the required data to estimate the HHI from The Banks Association of Turkey, and Growth rate data from OECD.

In Figure 1, primary axis displays total assets (TA), total loans, and total deposits (DEP) of the Turkish commercial banks for the years between 2002 and 2018, whereas the secondary axis illustrates the economic growth rates of Turkey. HHI scores are calculated for the three mentioned bank variables.

Figure 1 Data



Accordingly the descriptive statistics are given in the Table 2.

Table 2 Descriptive Statistics

	GROWTH	HHI_DEP	HHI_TA	HHI_LOANS
Mean	1.355274	0.103683	0.092025	0.084093
Median	1.575760	0.104610	0.092528	0.085406
Maximum	5.499646	0.116689	0.099364	0.089092
Minimum	-5.055762	0.094400	0.084937	0.074536
Std. Dev.	2.064406	0.006507	0.004224	0.003900
Skewness	-0.783513	0.071384	-0.002307	-1.289194
Kurtosis	4.121175	1.546115	1.624494	3.495156
Jarque-Bera	9.900274	5.691103	5.045437	18.38204
Probability	0.007082	0.058102	0.080241	0.000102
Sum	86.73756	6.635708	5.889581	5.381927
Sum Sq. Dev.	268.4917	0.002667	0.001124	0.000958
Observations	64	64	64	64

3.3. Empirical Results

The empirical part of the study consists of time series analysis. Within this framework, we run Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), Kwiatkowski-Phillips-Schmidt-Shin (KPSS) and Ng-Perron unit root tests and find that series are stationary with trend. Since the findings are similar for all the HHI data, only results of HHI calculated from deposits are illustrated in this paper.

To determine the lag length, we apply the Information Criteria. As it is seen in the Table 3, the optimum lag length is 1.

Table 3 Lag Values

Lag	LogL	LR	FPE	AIC	SC	HQ
0	124.5248	NA	6.17e-05	-4.017494	-3.877871	-3.962880
1	157.0342	60.68410*	2.39e-05*	-4.967805*	-4.688559*	-4.858577*
2	158.7525	3.093086	2.58e-05	-4.891751	-4.472882	-4.727909
3	160.5431	3.103694	2.78e-05	-4.818104	-4.259612	-4.599647
4	162.2411	2.829872	3.01e-05	-4.741368	-4.043254	-4.468297

* indicates lag order selected by the

LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion, HQ: Hannan-Quinn information criterion

After determining the optimum lag length, we examine autocorrelation and different variance problems with one lag. In addition, it is searched if all inverse roots lie within the unit circle. Table 4, Table 5, and Figure 2 exhibit the results of these tests respectively. The results point out that there is no autocorrelation at a 5 % significance level in one lag length and no different variance. The system is set to be stable, if all the unit roots fall inside unit circle and our data satisfy this.

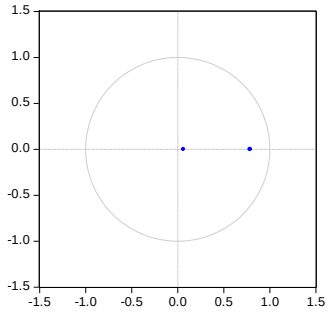
Table 4 LM Autocorrelation Test Results

Lags	LM-Stat	Prob
1	3.277522	0.5125
2	2.290381	0.6825
3	3.392247	0.4945
4	7.699036	0.1032
5	2.785497	0.5943
6	3.779115	0.4367
7	5.264980	0.2612
8	0.869051	0.9290
9	7.703419	0.1031
10	6.144157	0.1886
11	4.379758	0.3570
12	4.803818	0.3080

Table 5 White Heteroskedasticity Results

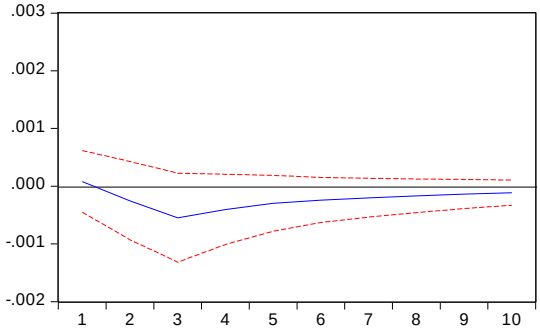
	df	Prob.
24.18252	27	0.6202

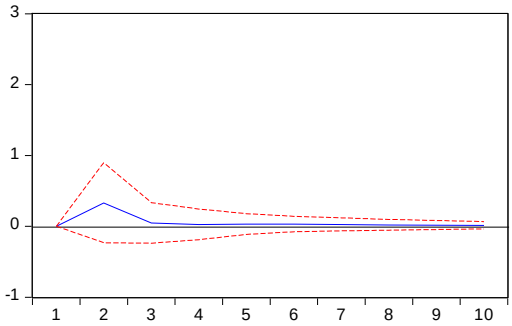
Figure 2 Inverse Roots of AR Characteristic Polynomial



At the following step, the impulse-response analysis is performed. Figure 3 and 4 display the response of HHI to growth and response of growth to HHI, respectively. According to findings, one standard deviation shock in growth affects the HHI negatively, first three periods by decreasing and afterwards by increasing. On the other hand, one standard deviation shock in HHI affect the growth positively fist three periods; however approaches to zero level afterwards.

Figure 4 Response of Growth to HHI





We also analyze the Variance Decomposition results (Table 6). In the first period 99,8% of the prediction error variance of HHI is explained by itself. This rate decreases slightly over time. On the other side, 100% of the prediction error variance of growth is explained by itself. This rate also declines moderately over time.

Table 6 Variance Decomposition

Period	S.E.	GROWTH	HHI_DEP	Period	S.E.	GROWTH	HHI_DEP
1	0.002085	0.157354	99.84265	1	2.105163	100.0000	0.000000
2	0.002677	0.928417	99.07158	2	2.111406	99.69117	0.308831
3	0.002987	1.246653	98.75335	3	2.113769	99.46988	0.530123
4	0.003164	1.391505	98.60849	4	2.115272	99.33193	0.668072
5	0.003268	1.466524	98.53348	5	2.116204	99.24672	0.753275
6	0.003331	1.508383	98.49162	6	2.116780	99.19410	0.805903
7	0.003370	1.532740	98.46726	7	2.117137	99.16157	0.838425
8	0.003393	1.547259	98.45274	8	2.117357	99.14147	0.858530
9	0.003408	1.556041	98.44396	9	2.117494	99.12904	0.870961
10	0.003417	1.561399	98.43860	10	2.117578	99.12135	0.878647

Note: The left four columns of the Table indicate the Variance Decomposition of HHI and the rest shows the Variance Decomposition of growth

We also perform Granger causality test to our data. The findings indicate that there is no causality between market structure (HHI) and the economic growth (g), neither from HHI to g nor from g to HHI.

Null Hypothesis:	Obs	F-Statistic	Prob.
HHI_DEP does not Granger Cause GROWTH	63	1.09285	0.3000
GROWTH does not Granger Cause HHI_DEP		1.78483	0.1866

4. CONCLUSION

The findings indicate that there is no causality between market structure and growth rates in Turkey for the period between 2002Q4 and 2018Q3. Researches that were made before 2000s show that Turkish Banking Sector had more monopolistic or oligopolistic market structure; however particularly after 2002, market structure is more likely unconcentrated. Reforms applied after February 2001 crisis may have a great effect on this.

In our analysis to see the effect of HHI on growth, we run a regression model including control variables such as inflation rate, unemployment rate, interbank rate, government consumption expenditures, investment expenditures, and vix. However we couldn't obtain a significant model including HHI.

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