



Banking Competition, Financial Liberalization and Economic Growth: Evidence from Turkish Economy during the 1990-2014 Period

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ABSTRACT

After 1950s, economics literature embraced a gradually increasing pattern of studies on economic growth. Empirical studies on the relations among competition in the banking sector, which provides financing to real investments, financial liberalization and economic growth have been increasing since late 1980s. These studies, which have their roots in McKinnon and Shaw approach, investigate whether financial liberalization leads to efficiency rise in the financial sector resulting in economic growth through low cost loans. The objective of this study is to test the relationship among competition in the Turkish banking sector, financial liberalization and economic growth over 1990-2014 period using annual time-series data. The findings suggest that over the study period, competition is positively and liberalization is negatively related to economic growth in Turkey.

Keywords: Banking Competition, H Statistics, Liberalization, Economic Growth, Turkish Economy

JEL Classifications: G21, L11, O11

1. INTRODUCTION

There are many empirical studies in the literature that set out to test the relationship between competition and performance in the banking sector. Traditional SCP approach suggests a linear relation between increase in the level of competition and firm performance. According to this approach, increase in the banking sector competition is expected to lower the costs, thereby increasing real sector firms' access to less costly funds. The resulting effect is likely an increase in the level of investment and economic growth.

Similarly, there are also many empirical studies investigating the effects of international openness of countries on the performance of banking sector and other industries. Being able to attract foreign capital, one of the major financing methods of development, has supported positively the growth efforts of less developed countries with inadequate domestic savings. The process of international openness, which has prevailed in many countries all over the world particularly since the early 80s, has led to significant changes in earnings of countries from foreign trade. Such developments

have resulted in negative consequences for some countries while yielding favourable effects on economic growth performance of some other countries (like China and South Korea).

Early 1980s mark a period of international openness for the Turkish Economy as well. It is a period when Turkey has launched a growth strategy based on international openness. Full liberalization in financial markets was achieved by a legislation package introduced in 1989. Liberalization has caused Turkey to be exposed to foreign competition in every industry. During the analysis period of this study that covers 1990-2014, Turkey experienced two major financial crises one of which was in 1994 and the other in 2001. Throughout these two periods, Turkey faced 5% negative growth on the average. Particularly banking sector was affected most severely by the 2001 crisis and total banking assets depreciated by 35% in that year. Due to the diminishing number of commercial banks during the crisis, banking sector competition has suffered as well. Although the economy was recovering quickly following the crisis, the negative effects of 2008 global crisis led The Turkish economy to shrink again by over 5% in 2009.

There are plenty of empirical studies about the effect of industrial competition and the effect of international openness on economic growth, which are in fact two different fields of study. These studies are generally based on cross-sectional and panel-data studies of some countries. On the other hand, this paper tests the relationship of economic growth with competition in The Turkish Banking Sector and financial liberalization, utilizing time series analysis over 1990-2014 period. Similar studies in the literature have used Herfindahl-Hirschman index (HHI) concentration ratio as the banking sector competition measure. Panzar and Rosse (1987) H index which provides not a general trend but more exact information about competition structure has been used particularly in empirical studies recently. Therefore, as banking sector competition index, Panzar and Rosse H index is forecasted and used in this study as well as HHI concentration ratio. The rest of this study is organized as follows. Literature review is presented in Section 2. Panzar and Rosse H Index forecasting methods and H values are presented in Section 3. Section 4 presents the model results and findings on the relationship of economic growth with banking competition and financial liberalization, and Section 5 concludes the study.

2. LITERATURE REVIEW

There is a vast literature dealing with the relationship between financial development and economic growth. A consensus on the existence and the direction of such a relationship has not been reached ever so far. The literature on this subject goes back to several decades ago. McKinnon (1973) and Shaw (1973) suggest that financial development is positively affected by financial liberalization through an increase in the level of competition in terms of product range, service quality and technological improvements. Inspired by their findings, many studies started to investigate the relationship and its effects on economic growth. In a relatively early study for example, using a sample of 59 countries consisting of both developed and less developed countries, Jung (1986) investigated the causality relationship between financial and real development. The findings suggest a causal relationship from financial development to economic development in less developed countries and a causal relationship from economic development to financial development in developed countries. Gregorio and Guidotti (1995) find a positive relationship between financial development and economic growth, although it varies across countries and over time. In the study financial development is proxied by the ratio of loans granted to private sector by banks to the gross domestic product (GDP). On the other hand using the same ratio in another study, Cecchetti and Kharroubi (2012) find that if the ratio exceeds 90%, then economic growth slows down. Demetriades and Hussein (1996) find a bi-directional relation in general, between financial development and economic growth. Calderon and Liu (2003), find that financial development leads to economic growth in all countries in the sample and a two-way causality relationship between them when the sample is split as developed and developing countries. Using time series data of Malaysian companies, Ang and McKibbin (2007) find that economic growth leads to higher financial development but

find that a sizeable gain in the world output would be achieved if all countries were ensured to implement best financial practice. More recently, by using quarterly time series data on Turkey, Mutlugün (2014) finds a short run relationship between financial development and economic growth and suggests a causality relationship from economic growth to financial development.

In the recent past, studies dealing with the relationship between specific aspects of financial development and economic development and growth have emerged. One aspect of financial development stems from the relationship between competition and banking system performance, on which country-specific as well as cross-country studies are done. For example, Smith (1998) suggests that higher bank competition increases the level of economic activity and reduces the severity of business cycles. Levin (2001) focuses on the impact of foreign bank entry on competition in the banking sector and links it to economic growth. Increased domestic banking sector efficiency due to liberalization of restrictions on foreign entry is found to affect economic growth positively. Based on a sample of 74 developed and developing countries, Thorsten et al. (2004) investigate the impact of bank competition on firms' access to loans. The concentration in the banking sector, used as one of the competition dimensions, is found to increase financing obstacles of firms in less developed countries presumably affecting economic growth negatively. On the other hand, the relation of concentration in the banking sector and financing obstacles turns out to be insignificant for middle and high income countries. Using a measure of competition based on industrial organization theory, Claessens and Laeven (2005) investigate the relation between banking sector competition and economic growth. The findings of the study suggest that banking sector competition contributes to financial sector development and in turn economic growth. On the other hand, banking sector competition may have drawbacks. As Andersen and Tarp (2003) state, following financial liberalization banking sector competition will likely increase but may not necessarily lead to efficient financial intermediation. Increased competition resulting from liberalization may generate an unstable banking environment where banks gamble to draw deposits by offering high interest rates and tend to allocate investible funds inefficiently. Saqip (2016) examines the impact of banking sector liberalization on long-term economic growth in Pakistan and finds that banking sector development proxied by financial depth has a direct impact on economic growth, a stable long-term relationship between them. Owusu and Odhiambo (2014) analyze the relationship between financial liberalization and economic growth in Nigeria and finds that financial liberalization is positively related to economic growth both in the short run and long run.

3. BANKING COMPETITION: CONCENTRATION RATIO AND PANZAR AND ROSSE (1987) H STATISTICS IN TURKISH BANKING SECTOR

The traditional structural approach is carried out within the frameworks of the structure-conduct-performance (SCP) paradigm. The collusion hypothesis of the SCP paradigm tests whether high

concentration in an industry causes collusive behaviour among larger banks resulting in higher profits. According to collusion hypothesis developed by Bain (1951), there is a positive relationship between concentration and profitability and negative relationship between concentration and market performance (competition). In the literature there are two different types of concentration ratios. The first type is (CR_N) ratio and the second type is called HHI. (CR_N) index consists of the total market share of banks in the market and the empirical studies in the literature generally use the CR_3 or CR_4 concentration ratios. The HHI is composed of square of total market shares of all firms in the market. In the recent studies HHI is more preferred compared to CR_N index since it has more advantages. Therefore, in this study it is preferred to use HHI index which represents the market concentration. Accordingly, if the value of HHI index is increasing then the level of competition in the market is decreasing or vice versa.

Although concentration ratios give some idea about the changes in competition, they do not provide precise information about the competition structure of the market. However, the Panzer and Rosse (1987) that was developed after 1980s can provide more and exact information about both HHI and the competition structure in the market. Therefore, to represent the level of competition in the market, the Panzar and Rosse H statistic index values are calculated in this study. The H statistics, as the theoretical background is given below, has a negative correlation with the level of competition in the market that is different from HHI. Briefly, as H statistics value is closer to 1, the market structure takes competitive levels, as it takes a value close to 0.50 the market structure is called monopolistic competition. And when it takes a value of 0 or negative the market structure is called monopolistic. Basically, contrary to the HHI, the competition level in the market increases as the Panzar and Rosse H statistic value rises or vice versa.

The Panzar and Rosse model requires the estimation of a reduced form revenue equation. The equilibrium total revenue for an individual firm is obtained by multiplying the profit-maximizing quantity and price. Since both of these variables depend on costs, market demand and conduct, the variables that shift cost and demand functions as well as factor prices must be included in the revenue function. Hence, the reduced form revenue equation for the i^{th} firm can be written as follows:

$$\ln R_i = j_0 + \sum_k h_k \ln W_{ki} + j_1 \ln A_i + j_2 \ln K_i + u_i \quad i=1, \dots, n \quad (1)$$

Where W_{ki} is the vector of factor prices, A_i is the vector of variables shifting the demand function, K_i is the vector of variables shifting the cost function, and u_i is the usual error term. The P-R methodology requires first estimating the reduced form revenue function for each firm, and then calculating the sum of the elasticities of the reduced form revenues with respect to factor prices. This sum, labeled by the symbol H, can be used as a measure of competition. Let R_i/w_{ki} denote the derivative of total revenue with respect to the price of the k^{th} input. Then, the Panzar and Rosse H statistic can be written as follows:

$$H = \sum_k \left[\frac{\partial R_i}{\partial w_{ki}} \frac{w_{ki}}{R_i} \right] \quad (2)$$

H represents the percentage variation of the equilibrium revenue resulting from a unit percent increase in the price of all factors used by the firm. Thus, market power is measured in the P-R methodology by the extent to which changes in factor prices are reflected in revenues. H cannot be positive for a monopoly or a perfectly colluding oligopoly because under these market structures an increase in input prices increases marginal costs, reduces equilibrium output and hence reduces total revenues. In the case of symmetric perfect competition, and when firms operate at their long-run equilibrium, the value of H statistic is unity, as a proportional increase in input prices increases both marginal and average costs and leads to an equiproportional increase in gross revenues; the units of output produced remain unchanged, while the output price rises by the same amount as cost. Finally, Panzar and Rosse prove that, under symmetric monopolistic competition, H is less than or equal to one. In a monopolistic competition market, revenues will increase less than proportionally in relation to changes in input prices.

In sum, H is non-positive in the case of monopoly ($H \leq 0$), positive but smaller than one under monopolistic competition ($0 < H < 1$), and equal to one if perfect competition prevails ($H = 1$). In general, H increases with the competitiveness of the industry since it is an increasing function of the absolute price elasticity of demand. In an empirical application, the rejection of the $H \leq 0$ hypothesis excludes the monopoly model, while the rejection of the $H = 1$ hypothesis rules out all three models. The rejection of both the hypothesis of $H \leq 0$ and the hypothesis of $H = 1$ (but not $H \leq 1$) means that, of the three models considered, only the model of monopolistic competition could be consistent with the data (Panzar and Rosse, 1987).

For the Turkish banking sector, Panzar and Rosse H statistic was estimated for each individual year between 1990 and 2014 by the econometric model below:

$$\ln TR_i = \alpha_0 + \alpha_{1ln} PRSL_i + \alpha_2 \ln FXD_i + \alpha_{3ln} INTI_i + \alpha_{4ln} DPST_i + \alpha_{5ln} LOAN_i + \alpha_{6ln} NOI_i + \varepsilon_i \quad (3)$$

Descriptions of the variables in the equations are given below:

Dependent variable¹:

TR_i : i.firm total revenue (interest and non-interest income)

Independent variables:

$PRSL_i$: i.firm the ratio of total wages to total number of personnel

FXD_i : i.firm the ratio of total fixed costs to total fixed assets

$INTI_i$: i.firm the ratio of total interest expense to total funds

$DPST_i$: i.firm the ratio of total deposits to total funds

$LOAN_i$: i.firm the ratio of total loans to total assets

NOI_i : i.firm the ratio of non-operating income (NOI) to total assets

ε_i : Error term.

The first three of the variables in the equations given above, PRSL, FXD and INTI are the inputs of the banking sector. These variables constitute the elements of the vector W_k in equation (1). Panzar and Rosse H statistic value consists of the sum ($H = \alpha_1 + \alpha_2 + \alpha_3$) of the coefficient of variables. Essentially, if these three coefficients

1 Annual data for each variable in the model were obtained from balance sheets of banks provided by The Banks Association of Turkey.

statistically are equal or less than 0, the market structure is assumed to be monopolistic, if they are greater than 0 but less than 1, the market structure will be monopolistic competition, and if they are equal to 1, the market structure will be perfectly competitive.

The ratio of total deposits to total liabilities (DPST) in this model is included as a control variable that affects the total revenue. As banks collect more deposits, they generally provide more loans to borrowers and therefore receive more interest income. However, collecting deposits more than that could be offered as loans will cause banks to incur some income losses. For this reason, the coefficient of the variable DPST in this forecast can be either positive or negative. The ratio of total loans to total assets LOAN is added to the model as another control variable that affects the total revenue. This variable also reflects the bank's credit risk. Banks that have higher total loans to total assets ratio will have both higher credit risk and interest income. Therefore, the sign of the variable is expected to be positive. The NOI to total assets (NOI) in this model is included as an important control variable that affects the total revenue. In Turkish banking sector, NOI has a significant impact on total revenue of banks. Therefore the sign of the variable is expected to be positive.

In most of the studies available in the literature, total assets are used as an important control variable which represents the banks' scale. It is assumed that the higher the total assets will be, the higher the scale that banks will have. However, Bikker et al. (2006) have found that inclusion of total assets as a variable in a model would yield a biased result. Thus, in this study, total assets are not used as a variable for estimating correct market structure with H index in equation (2). In the Table 1, annual H index values, which were obtained by equation (3), are given for 1990 and 2014 period. HHI values calculated in terms of total assets in the banking sector are presented in the same table.

Level of competition increases as H index rises and it decreases as H index falls. On the other hand, level of competition decreases as HHI index rises and it increases as HHI index falls. In recent years both indices are often preferred in sectoral competition analyses. A number of studies have examined the market structure of the Turkish banking sector by employing Panzar and Rosse H index. Kasman (2001) for 1983-1996, Claessens and Leaven (2004) for 1994-2001, Günalp and Celik (2006) for 1990-2000, Aysan et al. (2007) for 2001-2005, Karabay and Okay (2012) for 2002-2009, Yildirim (2014) for 2002-2011, Repkova and Stavarek (2014) for 2002-2010 period found that the Turkish banking market had monopolistic competition.

4. BANKING COMPETITION, FINANCIAL LIBERALIZATION AND ECONOMIC GROWTH IN TURKEY: ECONOMETRIC MODEL AND ESTIMATION RESULTS

The effects of competition in the Turkish banking sector and the financial liberalization on the economic growth is tested with the regression equation as follows. All variables presented in Model (4) are given as growth rates.

Table 1: P and R H index and concentration in the Turkish banking sector

Year	H-index	HHI
1990	0.67	713
1991	-0.22	656
1992	0.76	648
1993	0.55	600
1994	-0.11	690
1995	0.55	673
1996	0.38	671
1997	0.98	608
1998	0.79	613
1999	0.22	638
2000	-0.79	643
2001	-0.88	836
2002	-0.12	865
2003	0.25	928
2004	0.03	937
2005	0.34	966
2006	0.66	959
2007	0.28	938
2008	-0.11	948
2009	-0.24	987
2010	0.27	974
2011	0.41	934
2012	0.34	913
2013	0.09	879
2014	-0.16	870

HHI: Herfindahl-Hirschman index

$$GDP = \alpha_0 + \alpha_1 HHI + \alpha_2 CRD + \alpha_3 H + \alpha_4 LIB + \alpha_5 DUM + e_i \quad (4)$$

Dependent variable²:

GDP: GDP growth rate of the Turkish economy

Independent variables:

HHI: Herfindahl-Hirschman index in the Turkish banking sector.

CRD: Credit growth of the Turkish banking sector.

H: Panzar and Rosse competition index in the Turkish banking sector.

LIB: Liberalization index in the Turkish economy (hotmoney/current account).

DUM: Crisis dummy of the Turkish economy (1994, 2001 and 2009).

CRD is the first variable that represents growth rate of the total loans extended by banks in Turkey. It is included in the model because it is assumed that loan growth has a positive impact on the economy. The sign of the coefficient of the CRD variable is expected to be positive since loan growth will have a positive impact on production level and therefore it will increase the economic growth. The other variables in the models are HHI and Panzar and Rosse H index where the first one indicates the squares of the market shares of the banks in the sample and the second one represents the level of competition in the banking sector. As HHI value increases, the level of competition in the banking sector decreases and hence the real cost of loans in the sector is being increased by banks depending on the inter-bank cooperation. Therefore we expect a negative relationship between HHI and economic growth. Likewise, as indicated previously,

2 Macroeconomic Data used in the model were obtained from statistics provided by The Central Bank of Republic of Turkey.

the level of competition in the market increases as the value of Panzar and Rosse H value increases. Therefore, unlike the HHI index, the relationship between economic growth and H index is expected to be positive. LIB is another variable in the model and is an indication of the liberalization of the economy. The long-term and economical financing from international (external) financial markets, specifically for the banking sector, increases the domestic investment as well as production. Thus the relation between LIB (financial liberalization) and economic growth is expected to be positive if financial liberalization have increased banking efficiency resulting in increased real investments. The direction of the relation might be negative if liberalization couldn't increase financial efficiency and foreign savings couldn't be used for productive real investments. DUM is the last variable in the model which represents financial crisis periods in Turkey. It takes the value of 1 for the years 1994, 2001 and 2009 and zero for the other years. The crisis periods are expected to have negative effect on the economic growth³.

Recent research on time series analysis shows that many macroeconomic time series containing unit-roots and non-stationary regressors may invalidate most of the standard empirical results (Engle and Granger, 1987). Therefore, it is important to determine the stochastic properties of the series before undertaking a modeling exercise in order to avoid spurious results. Such an analysis was undertaken for each of the variables of interest considered at levels using the Augmented Dickey-Fuller (ADF). The ADF statistics were calculated for the series including intercept and trend in the underlying Dickey-Fuller regressions. Considering the fact that in the presence of a structural break in a stationary series ADF test may reject the null of a unit root process where as in fact it is stationary, we also tested the level of integration of series using the Phillips-Perron (PP) test. The result of both the ADF and PP tests for the levels of variables are shown in Table 2.

Unit root tests indicate that all variables used in model (4) are stationary at their levels. Forecasted model results are presented in Table 3.

The coefficient estimates between economic growth and HHI concentration ratio in Turkey was found negative, as expected, and significant a 10% significance level. During the sample period, 25 years, the economic growth reduced as the level of competition in banking sector have decreased depending on the increasing level of concentration in the sector. Likewise, Panzar and Rosse H index, another market structure indicator in the banking sector, is also found positive and statistically significant at 90 % confidence level. As indicated above, Unlike the HHI index, as H statistics index as well as the level of competition in the banking sector increases, the rate of economic growth also rises. The coefficient sign of the financial liberalization index (LIB) variable in the model is found as negative and statistically significant at 1% significance level. Over the sample period in this study, the financial liberalization facilitated the short-term

3 The global financial crisis that the world faced in 2008 showed its negative effects on Turkey with one year delay in 2009.

Table 2: Unit root tests of variables

Variables	ADF test results		PP test results	
	Intercept	Intercept and trend	Intercept	Intercept and trend
GDP	-5.51 (0)*	-5.38 (0)*	-5.74 (3)*	-5.61 (3)*
LIB	-3.23 (0)**	-3.73 (0)**	-3.26 (2)**	-3.76 (2)**
H	-4.40 (0)*	-4.47 (0)*	-4.37 (3)*	-4.47 (3)*
HHI	-4.76 (0)*	-4.66 (0)*	-4.79 (2)*	-4.69 (2)*
CRD	-3.17 (0)**	-3.34 (0)**	-3.17 (1)**	-3.33 (0)**

The number in brackets are the lag lengths. The selection of lag lengths for the PP test is determined based on the Newey-West bandwidth criterion. *, **: Indicates meaningfulness level on 1% and 5%. HHI: Herfindahl-Hirschman index, ADF: Augmented Dickey-Fuller, GDP: Gross domestic product, LIB: Liberalization, PP: Phillips-Perron

Table 3: Estimation results

Variable	Coefficient	Standard error	T statistic	P
HHI	-0.068123	0.035397	-1.924555	0.0694***
CRD	0.012538	0.048372	0.259204	0.7983
LIB	-0.026406	0.007190	-3.672405	0.0016*
DUM	-0.114972	0.018275	-6.291233	0.0000*
H	0.003861	0.002203	1.752826	0.0958***
C	0.534419	0.239376	2.232550	0.0378**
R ²	0.780898	P (F statistic)		0.000010
Adjusted R ²	0.763240	Durbin-Watson stat		1.862571
F statistic	13.54354			

*****: Indicates meaningfulness level on 1%, 5% and 10%. HHI: Herfindahl-Hirschman index, LIB: Liberalization

financing rather than promoting foreign direct investment and this increased the economic fragility. Thus we conclude that financial liberalization had an adverse impact on the economic growth. Although the sign of coefficient of the CRD variable, the growth rate of loans made by Turkish banking sector, is found to be positive, as we expected, the coefficient is insignificant at all levels. The possible reason of this may be that the loans made by Turkish banking sector finance the consumption rather than real investments. The Central Bank of Republic of Turkey's data show that the share of consumer loans within total loans granted by banks rose from 2% in 2001 to around 40% in 2014. That consumer loans are particularly used for import boosting expenditures is a widely known fact for Turkey. The dummy variable in our model, which tests the impact of economic crises on the economic growth, is found as negative and statistically significant at 1 % significance level. This finding is consistent with the widely known fact that 3 major crises (1994 2001 and 2009) in the sample period adversely affected the economic growth in Turkey.

5. CONCLUSION

After 1990, Turkish economy entered a period of full liberalization and foreign openness. Although Turkish economy faced serious economic fluctuations in the post-1990 period, a general fast economic growth in the entire period was witnessed as well. As is the case in all other industries, financial liberalization led to some major changes in Turkish Banking Sector resulting in continuous changes in the competition structure while entry and exit of foreign banks in the sector were taking place. This study

tests the relationship among competition, financial liberalization and economic growth over 1990-2014 period using time series analysis. HHI Index and Panzar and Rosse H Index were used as measures of competition and in line with the theoretical expectation, increase in the level of banking competition was found to statistically affect the economic growth in Turkey. On the other hand, financial liberalization turns out to have a statistically negative effect while loans extended by banks do not have a statistically significant effect on economic growth in Turkey. As a final point, in line with the natural expectation this study finds that three major economic crises which had serious effects on Turkey are negatively related to economic growth in the period of analysis.

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