Determinants of Banks Capital Structure: Empirical Evidence on Listed Commercial Banks in Turkey

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ABSTRACT

Existing literature provides sufficient evidences consistent or/and contradict of the available theories of capital structure. On the other hand, the choice of capital structure for the non-financial firms substantially varies from financial institution especially banks. This motivates enough for further studies in particular in a fast growing country such as Turkey. The present thesis empirically examines the choice of leverage of 9 listed commercial banks as the function of 4 bank characteristics namely profitability, tax shield, collateral and dividend. The present thesis uses panel OLS regression considering the robustness and diagnostic tests of the model. The findings suggest a very small but negative impact of the profitability on the capital structure of the sample banks implying a consistency with the pecking order theory. Tax shields effects were found to be insignificant. Surprisingly, the impact of collateral found to be negative and statistically significant. Finally, we report a positive but very weak association between the dividend and the choice of capital structure of the sample banks.

Keywords: Capital Structure, listed banks, panel data, Turkey

ÖZ

Mevcut literatür, sermaye yapısı teorilerine tutarlı veya / veya çelişen yeterli kanıt sağlamaktadır. Öte yandan, finansal olmayan firmalar için sermaye yapısının seçimi, özellikle bankalar olmak üzere finansal kuruluştan farklılık göstermektedir. Bu, Türkiye gibi hızla büyüyen bir ülkede daha ileri çalışmalar için yeterince motive eder. Mevcut tez, ampirik olarak, 9 banka ticari bankasının kaldıraç seçimini, 4 banka karakteristiği, yani kârlılık, vergi kalkanı, teminat ve temettü fonksiyonu olarak incelemektedir. Mevcut tez, modelin dayanıklılığı ve tanısal testleri göz önünde tutularak panel OLS regresyonunu kullanmaktadır. Bulgular, örnek bankaların sermaye yapısı üzerindeki kârlılığın çok küçük ancak olumsuz bir etkisinin, gagalama düzen teorisine tutarlı olduğunu ima etmektedir. Vergi kalkanlarının etkileri önemsiz bulundu. Şaşırtıcı bir şekilde, teminatın etkisi negatif ve istatistiksel olarak anlamlı bulundu. Son olarak, temettü ile örnek bankaların sermaye yapısının seçimi arasında pozitif ancak çok zayıf bir ilişki bildirdik.

Anahtar Kelimeler: Sermaye Yapısı, listelenen bankalar, panel verileri, Türkiye

To My Family

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ADF	Augmented Dickey Fuller
CL	Collateral
DIV	Dividend
DW	Durbin Watson
GDP	Gross Domestic Product
LLC	Levin, Lin, and Chu test
OLS	Ordinary Least Squares
PP	Philips and Peron
ROE	Return on Equity
TAX	Tax Shield

Chapter 1

INTRODUCTION

1.1 A Narrative on Turkish Banking Sector

Turkey is still one of the fast growing economies in the world it is the member of G20. According to (International Monetary Fund, 2017), Turkey is considered as one of the fast growing countries in the world in 2016 as it's ranked as 15th growth domestic product (PPP) with the share of 1.40% in worlds GDP (PPP).

As reviewed in the (Central Bank of Turkey, 2017) the initiation of banking activity in Turkey belongs to the early 1800s with the so-called money-changers and the Galata bankers. During that period, all quasi-banking activities were executed by money-exchangers and the Galata bankers consisted mostly of the ethnic-minorities in Istanbul. Later on, the Ottoman Bank in 1856 (Osmanli Bankasi) was established where its head office located in London and served as the Central Bank until the 1930's.

The Central Bank of Turkey was established in 11th of June 1930s as a joint stock company performing as conventional central banks, such as issuing banknotes, controlling the exchange rate, and regulating the banking system and credit to private sectors. The Central Bank also finances the government's budget deficits and makes loans to public and private banks. However, since 1983 the Turkish Central

Bank began to decrease lending and stepped up its supervisory Obligations (Central Bank of Turkey, 2017).

Turkish banking system has faced many crises such as in 1991, 1994, 1998, 2001 and 2008 over the past 3 decades. The biggest challenges for Turkish banks were in 2001 and certainly the global crisis of 2008. The Russian crisis of 1998, the Marmara earthquake of 1999 can be some of the reasons of financial crisis in Turkey (Atici & Gursoy, 2011).

In Jun 2016, the Turkish Bank Association reports the statistics of the banks that are operating in Turkey. Accordingly the total number of the banks that are operating in Turkey is 50, deposit banks constitute 32 of them, 3 banks are state-owned banks, 8 banks are private banks, 21 banks are foreign banks, 13 banks are categorized as development and investment banks and 5 banks are participant banks. The Turkish Bank Associations reports further a significant development over the past 5 development as showed in the table 1.1.

Table 1.1. Selected Balance Sheet Indicators (BN USD)

	1960	1970	1980	1990	2000	2010	2015
Loans and Receivables	1	3	10	27	51	331	489
Securities	0.1	0.4	1	6	18	201	111
Liquid Assets	0.4	1	5	13	32	68	114
Total Assets	2	6	19	58	155	626	769

Source: www.tbb.org.tr

Apart of the performance of banking system in the country, in comparison to the other countries in the world wide and other emerging countries it can be observed that Turkey is growing continuously in line with emerging countries and in some

years or in terms of some indicators the performance of banking sector is better than emerging countries. The comparison of financial sector in Turkey and worldwide and emerging countries is reported in more detail in the following table:

Table 1.2. Selected Indicators of Financial Sector to GDP Ratios Comparison with World and Emerging Countries (Percent)

	2002			**2008**			**2011**			**2013**		
	World	**EM**	**TR**	**World**	**EM**	**TR**	**World**	**EM**	**TR**	**World**	**EM**	**TR**
Banks Assets	264	145	61	160	87	75	158	100	98	160	110	105
Capital Markets	203	59	59	192	79	47	208	74	69	216	78	59
Equities	69	25	16	55	42	19	67	38	40	83	39	32
Bonds and Bills	135	35	43	137	38	28	141	36	30	133	39	27
Total	468	205	120	352	167	121	366	174	167	376	188	164

Source: www.tbb.org.tr

1.2 Theoretical Background

Posterior to the departures from Modigliani and Miller (1958) proposition, there is a huge tradition in the literature of corporate finance to examine the capital structure decisions of companies. However, bank's capital structure decisions got very little attention. Mishkin (2000) argues that banks also hold capital because they are obliged to do so by regulatory authorities. However, bank managers often tend to hold less capital than required by the regulatory authorities because of the high cost of capital. The question arises here are how capital structure of banks differentiate from firms' capital structure? What determines banks' leverage? Is it necessary to investigate banks' financing decision since it has been restricted by regulation?

Bank and non-financial firms have considerable variation in operational system that result in different financing decisions between them. Typically banks have highly leveraged because of the nature of banking industry but non-financial firms try to

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have as small as possible leverage ratio. There are many factors for this dissimilarity as we review some of them.

Although choice of debt financing for non-financial companies positively associates with risk which results in higher cost of capital, non-financial firms are not restricted to have a specific ratio of capital adequacy. Meanwhile, as mentioned earlier, banks are required to follow specific rule and regulations and rely on different instruments to hedge against variations in the financial positions. In particular, the mandatory minimum capital requirement is imposed on banks as to how they handle their balance sheet. Furthermore, Raheman et al,. (2007) argues that another fundamental difference between capital structure of non-financial companies and banks comes from debt preferences. Non-financial firms prefer debt as a cheap source of finance and debt also provides tax shield especially profitable firms which have lower cost of bankruptcy. Hence, firms can add leverage to their capital mix to the level that has no impact on the financial distress cost. Banks have less options but should rely on debts maybe around 80%, most of which comes from deposits as its major and cheapest source of fund to keep smoothing ongoing operations. As highlighted by Flannery (1994), banks typically invest in more complicate assets that cannot be understood easily by the outsiders and have various opportunities for substituting the assets. This will increase the cost of equities due to asymmetric information issue which make banks to prefer debt over equities. The author further states that, debt can be a tool to discipline managers and avoid agency problem cost as they have to concern about the mismatched maturity of debts and liquidity. Moreover, as argue Diamond and Rajan (2001) as opposed to firms banks have more volatile capital

structure to ensure the liquidity and to enable them to manage loans that are less liquid and raising more deposits with higher liquidity.

The above reasons are sufficient to believe that banks' capital structure varies from non-financial firms leverage and they should not be determined by the same factors. In line with the purpose of this thesis we review the factors that we believe they can determine the banks' capital structure in particular.

1.3 Aim of the Study

The present thesis uses 9 listed commercial banks in Turkey over the time horizon of 2004 to 2016 and aims to investigate empirically the impact of bank specific characteristics on the capital structure. In particular, the bank specifics in this study have been chosen based on the theories that already reviewed in the precious section and they are namely tax shield, dividend, profit and collateral to be regressed over the leverage of the banks.

1.4 Disposition

This thesis is organized as follows: the current chapter which reviews of the theories behind the hypotheses in addition of reviewing the banking industry in Turkey. Second chapter consist of the review of the relevant literature to this thesis. In the third chapter we basically review the data and methodology of this thesis. In chapter four we will discuss the finding of our tests. And finally in the fifth chapter we conclude everything about this thesis and will propose suggestions to further researches.

Chapter 2

LITERATURE REVIEW

There are large numbers of studies that investigate the determinants of capital structure in banks and financial institutions using various methods and variables and have been employed over the different countries or territories. The related literature however, reports mixed results of the impact of the internal and external factors on the choice of debt financing of the banks or financial institutions. Among those studies; USA and Europe: (Gropp and Heider, 2010). Turkey: (Asarkaya and Ozcan, 2007; Çağlayan and Şak, 2010; Binici and Köksal, 2012). Australia: Sharpe (1995). China: Firth et al., (2008). Nigeria: (Iwarereand and Akinleye, 2010; Aremu et al., 2013). Germany: Kleff and Weber (2004). Hong Kong: Wong et al. (2005). Taiwan: (Kuo, 2000; Kuo and Chi-Haw, 2003).

In their study Gropp and Heider (2007) have used a big sample of 200 largest listed commercial banks and bank holding companies in the US and 15 developed countries in EU during 1991 to 2004. Although the study is backed by literature on non-financial firms' capital structure, it tries to prove that the leverage is much higher in the banks in comparison to non-financial firms. The authors argue that the standard determinants of corporation leverage are still applicable to the banks' capital structure. They also found that the capital requirements have not significant impact on the leverage. Finally they found that dividend is negatively and statistically significant affected by dividend.

Another study by Frank and Goyal (2009) examines the determinants of capital structure of US publicly traded firms on Compustat over the timespan of 1950 to 2003. They used various proxies as the determinants of leverage including dividend. With respect to dividend they report a strong evidence for the existence of negative and statistically significant association between the dividend and capital structure of the US listed firms implies that the dividend-paying firms tend to have lower leverage. They further argue "The existing capital structure theories have ambiguous predictions on the relation between dividend paying status and firm leverage. In our view, the interpretation of dividends needs further development beyond that contained in the literature."

Further studies investigate the impact of dividend on leverage employed by Octavia and Brown (2010). The study's model is different in which examines the banks' leverage as the function of some other variables jointly including dividend and collateral namely [size, profitability, market-to-book ratio, collateral value and dividend], where the statistically significant coefficient of one of these variables makes it unable to reject the second hypothesis and consequently the standard determinants of banks' capital structure are relevant in explaining the variation in bank market capital. Finally they conclude that the standard bank specifics have a statistically significant impact on the banks' leverage.

Regarding the association between collateral and capital structure, literature provides relatively sufficient evidences however, some studies found positive relationship and some others found negative relationship. Mitton (2008) studied trends in capital structure of more than 11000 firms from 34 emerging markets over the time period of 1980 to 2004. The author studies how rise in leverage was

influenced by firm specific factors and the availability of debt financing at county level. The main finding was the increase in leverages can significantly be attributed to changes in the characteristics of the firms in emerging markets. In particular the study found a significant inverse relationship between collateral and leverage ratio.

Another attempt to examine the effect of collateral on the capital structure is made by Correa et al., (2003). The study aims to investigate the influence of some supposed determinants of capital structure based on the Pecking Order Theory and the Trade-Off Theory. They tested the validity of the mentioned theories empirically over the largest Brazilian firms. Apart from other supposed variables, their findings demonstrate that leverage is negatively related to the collateral implying that firms with fewer tangible assets are more subject to information asymmetry problems, and therefor are more likely to use debts to finance their activities.

In his study Pandey (2001) also has collateral as an explanatory variable of capital structure. The study examines the Malaysian companies and covers the period of 1984 to 1999. The leverage proxy was decomposed into three types of market value and book value of short-term, long-term and total debts. The study finds that the leverage is inversely related to collateral in most of the cases which is contradict to Trade-Off Theory. Similar to the previous reviewed studies Mazur (2007) also found negative impact of collateral on the capital structure.

The opposite conclusion of positive association between collateral and capital structure was made by Rajan and Zingales (1995), Titman and Wessels (1988), Aggarwal and Jamdee (2003) and Frank and Goyal (2005), etc.

Consistent with Pecking Order Theory, as found by most prior researches profit firms prefer no debt or as small as possible of the amount of debt. Highly profitable firms might be able to finance their growth by using retained earnings and by maintaining a constant debt ratio. In contrast, less profitable firms will be forced to resort to debt financing.

Lim (2012) examines the determinants of capital structure of financial firms in China using a relative regression of accounting data for 36 A-share financial listed firms over the span of 2005-2009. Using several firm specifics including profitability as the explanatory variables of capital structure the study has been employed. The study reports a negative and statistically significant relationship between profitability and debt for Chinese listed financial firms. In particular, the result shows that if profitability increases by 1% the total leverage ratio decline by 34.9%.

Similarly, Chen (2004) conducted another study in China. The study develops a preliminary to explore the determinants of capital structure of Chinese listed firms using firm-level data. They show that specific firm characteristics that explaining the capital structure in developed economies are also relevant in China. With respect of profitability it's found to be negatively related to leverage. According to the author this implies "the negative relationship between profitability and debt in Chinese firms seems to support the Pecking order model. However, upon taking another look, there may be other reasons for this negative relationship rather than those proposed by the Pecking order hypothesis such as to avoid underinvestment problems and new projects being mispriced."

Furthermore, among other studies that found negative relation of leverage to profitability are Booth et al., (2001), Aggarwal and Jamdee (2003), Frank and Goyal (2005) and Rajan and Zingales (1995).

Schepens (2013) argues that dissimilar tax treatment in many countries for debt and equity (dividends) whereas the former is tax-deductible gives the financial institutions as any normal firms an extra incentive to take on more debt. The paper documents the effect of the tax discrimination between debt and equity financing on bank capital structure in Belgium. The paper provides strong evidence that reducing relative tax disadvantage of debt has substantial positive impact on bank capital ratios.

Guided by a simple model of banks' funding decision in the presence of both regulatory constraints and tax asymmetries, Keen and Mooij (2012) explorer the effect of corporate tax bias on banks' capital structure of more than 14000 commercial banks in 82 countries over 9 years. The paper presents that the sensitivity of banks' choices of debts proves very similar to that of non-financial firms. As the model predicts, somewhat counter-intuitively, the impact of tax on hybrids is generally weak or insignificant. Responsiveness to taxation varies significantly across banks, however: those holding smaller equity buffers, and larger banks, are noticeably less sensitive to tax.

Examining the capital structure is still getting sufficient attention by the scholars. We review the most recent literature of capital structure starting with (Vo, 2017) who examines the determinants of capital structure in emerging market (Vietnam). The author argues that capital structure is more important in emerging markets

because of unique legal, cultural and institutional characteristics. Using GMM estimator the study utilizes a comprehensive dataset of firms listed on the Ho Chi Minh City stock exchange from 2006 to 2015. We formulate a model which leverage is a function of firm attributes hypothesized from the capital structure theories. The finding offers some interesting results. Particularly, the determinants of capital structure are different for long-term and short-term leverage. Another study by Sheikh and Qureshi (2017) investigates the choice of capital structure for Islamic and conventional banks in Pakistan during 2004-2014. The results of their study indicate that only three variables, namely, profitability, bank size and tangibility, have material effects on capital structure choice of Islamic commercial banks. Profitability and tangibility are negatively while bank size is positively related to book leverage of the Islamic banks. On the other hand, profitability, growth and tangibility are negatively, whereas bank size and earnings volatility are positively, related to book leverage of conventional commercial banks.

Using a sample of 4337 firms from UK and Eurozone Garcia (2016) investigates the effects of firm characteristics and institutional settings on the choice of capital structure. The study interprets the result in light of trade-off, pecking order and market timing theories and reveals that capital structure influenced by similar factors in both UK and Eurozone. Moreover, El-Masry (2016) using 169 banks in MENA area examines the determinants of capital structure in particular the impact of credit rating and finds that credit rating directly affects the capital structure decisions as rated banks use more debts than non-rated banks.

In their study Köksal and Orman (2015) using a comprehensive dataset from non-financial sector firms test for pecking order theory and trade-off theory. In their

findings they argue that trade-off theory provides a better description to the choice of capital structure of all firms in the non-financial sector than pecking order theory.

In the case of India, Handoo and Sharma (2014) performed an investigation of the determinants of capital structure over 870 listed companies and developed a comprehensive model which contains 3 dependent variables and 10 independent variables. They conclude that factors such as profitability, growth, asset tangibility, size, cost of debt, tax rate, and debt serving capacity have significant impact on the leverage structure chosen by firms in the Indian context.

The present study differentiates from the other studies that examined the capital structure of Turkish commercial banks. In particular, we use debt tax-shield and dividend as the determinants of capital structure which have been examined by a few studies so far and not in the case of Turkey.

Chapter 3

DATA AND METHODOLOGY

3.1 Data

The present study investigates the impact 4 bank specific factors on the leverage ratio of the banks. The sample consists of cross-section of 9 publicly traded commercial banks in Borsa Istanbul in Turkey (see table 3.1) and the time span is considered from 2004 to 2016. Therefore, panel data methodology was the most convenient approach to follow in this study. The data is collected from Thomson Reuters DataStream database.

Table 3.1. the Sample of Listed Commercial Banks in Turkey

1.	Turkiye is Bankasi A.S
2.	Turkiye Garanti Bankasi A.S.
3.	Akbank T.A.S.
4.	Yapi Ve Kredi Bankasi A.S.
5.	Turkiye Halk Bankasi A.S.
6.	Turkiye Vakiflar Bankasi TAO
7.	Denizbank A.S.
8.	Finansbank A.S.
9.	Sekerbank T.A.S.

Panel data approach provides massive merits such as to acquire more information about the researcher's interest area in both time and individual dimensions which enable us to examine the dynamic properties of obtained data in the area of capital structure (Baltagi, 2005).

3.2 Research Questions

Precisely, the current thesis attempts to answer the following questions:

1. Is the *Profit* influencing the choice of debt financing of the listed commercial banks in Turkey?

2. Is the *Debt Tax-Shield influencing* the choice of debt financing of the listed commercial banks in Turkey?

3. Is the *Tangible Asset* influencing the choice of debt financing of the listed commercial banks in Turkey?

4. Is the *Dividend* influencing the choice of debt financing of the listed commercial banks in Turkey?

3.3 Choice of the Variables and Hypotheses

According to pecking order theory profitable firms prefer to use retained earnings first as a source of financing not debt which implies negative relationship between profit and leverage. However, M & M theorem (1963) emphasizes that firms would prefer debt to capture tax shield advantages. On the other hand, agency cost theory proposes that firms would increase the level of leverage to restrict managers' activities and hence, to reduce the financial distress cost which implies a negative relationship between profit and capital structure. Hence, we emphasize our first hypothesis:

H_1: Profitability has a significant impact on banks' capital structure

Gropp and Heider (2007), argue that firms with more collateral have higher leverage. Higher collateral assets can results in reducing the financial distress cost.

Collateral also reduces the agency cost of debt since it can ease the monitoring of using assets. Hence, we emphasize our second hypothesis:

H₂: Collateral a significant impact on banks' capital structure

Smoothing dividends are reflecting the future earnings prospects of the firm. Gropp and Heider (2007) argue that dividend paying firms reducing the asymmetric information which provides better access to debt and equity financing to the firms. Therefore, it's expected to be an association between dividend and capital structure decision of the firm. Hence, we emphasize our third hypothesis:

H₃: Dividend has a significant impact on banks' capital structure

Following Modigliani and Miller (1963) taxes also are expected to have a significant impact on the capital structure decisions of the firm. Firms increase the level of leverage to capture the tax shield benefits of debt up to a certain level which firm optimizes the benefits of debt. Hence we emphasize our fourth hypothesis:

H₄: Tax shield has not a significant impact on banks' capital structure

3.4 The Econometric Model

In the previous sections we demonstrated and discussed of theories of capital structure and a reasonable number of previous literatures which are directly relevant to the scope of this thesis and guide us to emphasize the econometric model of the study as shapes as follow:

$$LEV_{it} = \beta 0 + \beta 1\ ROE_{it} + \beta 2\ TAX_{it} + \beta 3\ CL_{it} + \delta\ DIV_{it} + u_{it}$$

Where: $\beta 0$ is intercept, LEV is leverage ratio for the bank *i* at year *t*, ROE is the profitability for the bank *i* at year *t*, TAX is debt tax-shield for the bank *i* at year *t*,

CL is the collateral for the bank *i* at year *t,* DIV is the dummy variable of dividend

for the bank *i* at year *t* U*it* is the standard errors of the model

In the table 3.2 we explorer the variables in more detail as follow:

Table 3.2. Detail of the Variables

Variables	Proxy	Expected Effect	Measurement
Explained Variable			
Leverage	LEV	---	Total Liability/Total Asset
Explanatory Variables			
Profitability	ROE	Positive & Negative	Net Income / Total Equity
Tax-Shield	TAX	Positive & Negative	Interest Expense * Corporate Tax Rate
Collateral	COL	Positive & Negative	Tangible Assets / Total Asset
Dividend	DIV	Positive & Negative	Dummy Variable: 1 if the bank pays dividend in that

3.5 Econometric and Statistical Techniques

Microsoft office software and Eviews software will be used in order to perform the
empirical study and analysis. Furthermore, the following tests will be conducted and
discussed in detail in the next chapter:

1. *Normality and descriptive statistic:* The test measures the normality of the data
   and central tendency by mean and median and variability by measuring
   Minimum, maximum and skewness and kurtosis of variables. One very common
   test of normality is Jarque-Bera.

2. *Unit root test:* Stationarity is the procedure in econometrics to test the series whether its mean, variance and covariance are the constant over time or not or to detect the level of integration of the data. In particular, this study relies on Augment Dikey-Fuller, Philip-Peron and Levin, Lin &Chu criterion to test for the stationarity.

3. *Correlations among the variables:* the test will be performed to detect the multicollinearity problem. This issue occurs when explanatory variables are highly correlated.

4. *Autocorrelation test:* this test is ought to be investigated in order to build a healthy model. The residuals of the model are supposed to be not correlated. Unfortunately eviews program doesn't provide the test for panel data therefor we will conduct the test using Durbin-Watson criteria following (Gujarati, 2009).

5. *Hausman test:* the test will be performed to identify the most appropriate model [fixed or random] for our panel sample.

Chapter 4

EMPIRICAL RESULTS

4.1 Descriptive Statistics

Descriptive statistic introduces the data set in an informative way. Mean of LEV which stands for total debt over asset is around 89% indicating that the on average banks' capital adequacy ratio is 11% exceeding Basel I and II which accord banks must maintain capital adequacy ratio of 8% at lowest level or more. Listed commercial banks in Turkey have only 10 % of their asset in tangible asset. Mean return on equity which indicates for profitability in this study is 14.7%. However, as reports in the table 4.1 none of the variables are normally distributed.

Table 4.1. Descriptive Statistics

	ROE	TAX	DIV	CL	LEV
Mean	0.146718	856.4871	0.521368	0.105087	0.892288
Median	0.150952	791.2000	1.000000	0.103847	0.894196
Maximum	0.380475	2528.000	1.000000	0.184373	0.935634
Minimum	-1.786524	57.52000	0.000000	0.043441	0.811566
Std. Dev.	0.189682	556.0243	0.501692	0.020481	0.019764
Skewness	-9.118652	0.707716	-0.085548	0.886607	-1.119732
Kurtosis	93.87976	3.028315	1.007319	6.105433	6.116842
Jarque-Bera	41884.68	9.770721	19.50026	62.34151	71.80827
Probability	0.000000	0.007556	0.000058	0.000000	0.000000
Observations	117	117	117	117	117

4.2 Unit Root Test

Investigation for stationarity of the variables is the prior to other econometric tests due to the significance of it. Stationary data refers to a series which has a constant mean, variance and auto-covariance over time. The variables of the study examined for stationarity as reported in the table 4.2. We examined the stationarity with trend and intercept, with only intercept and with no intercept and no trend using LLC, ADF and PP approaches. In most of the cases in particular taking by PP criterion, the variables are stationary at level and they are integrated at order zero I(0).

Table 4.2. Unit Root Tests

Variables		Levin Lin Chu	ADF Fisher Chi square	PP Fisher Chi-square
LEV	τ_T	-0.45903	31.6573**	66.0743*
	τ_μ	1.82803	27.859***	64.3186*
	τ	-1.73820**	28.1740***	33.5906***
ROE	τ_T	-26.3137*	28.3986**	48.5829*
	τ_μ	-29.2813*	50.9363*	95.9258*
	τ	-2.87125*	41.0194*	37.1786*
TAX	τ_T	-4.49748*	32.1882**	50.7171*
	τ_μ	-6.36114*	29.6485**	67.1986*
	τ	-3.91096*	32.4136**	57.8396*
CL	τ_T	-1.75386**	33.5260**	48.4656*
	τ_μ	-0.44814	27.6188***	50.3497*
	τ	0.99892	8.40138	37.0566***

Where: *Null Hypothesis: Data is not stationary. Asterisks (***), (**) & (*) denotes 10%, 5% & 1% significant level respectively. τ_T represents the most common model with a intercept and trend; τ_μ is the model with a intercept and without trend; τ is the most restricted model without a intercept and trend. Optimum lag lengths are selected using Schwartz Criterion.*

4.3 Correlation Analysis

The correlation matrix is been conducted and presented in the bellow table to capture the linear association between the independent variables. Since the correlations in any cases do not exceed 80% we conclude that multicollinearity problem doesn't exist in this study.

Table 4.3. Correlation Matrix between the Independent Variables

	ROE	TAX	DIV	CL
ROE	1			
TAX	-0.00551	1		
DIV	0.07436	0.6420	1	
CL	0.090503	-0.04482	0.20292	1

4.4 Autocorrelation test

Obtaining efficient estimation of the coefficients requires the absence of autocorrelation problem. The standard errors of the models ought to be not correlated not positively or negatively. The Value of Durbin Watson is one way to detect the problem of autocorrelation. In the regression model of this study the value of D-W is [1.942350] which implies the absence of the issue since it's very close to 2. Precisely, in the D-W test we test the hypothesis as

H_0: *There is no positive autocorrelation*
H_1: *There is positive autocorrelation*

The rule of thumb is: If d < dL reject H0; If d > dU do not reject H0; If dL < d < dU test is inconclusive. The corresponding values in the DW table for significance points of dL and dU at 0.05 level of significance are 1.592 and 1.758 respectively.

Thus, since the value of D-W is [1.942350] and its greater than dL [1.758] then we cannot reject the null hypothesis means that there is no autocorrelation problem.

4.5 Regression Analysis

In line with the research methodology mentioned in the previous chapter, the panel data for the models is examined through Hausman test in order to determine whether the fixed effect model or the random effect model is the most appropriate. According to Hausman test the null hypothesis indicates that the random effect is appropriate. As presented in the bellow table we reject the null hypothesis which implies that the fixed effect is appropriate for the model of this thesis.

Table 4.4. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	71.101111	4	0.0000

As we just reviewed above the robustness tests of our model are indicating for the efficiency of the model as the estimation will be efficient. Thus, in this section the regression output using OLS estimator is presented in table 4.6. In this section we review the regression findings and discuss it. Another robustness diagnostics of the regression is R-squared or the coefficient of the determination as its [0.97] substantially high in our model. That's 97% of the variation in the leverage of our sample banks are explained by the independent variables namely [profitability, tax shield, collateral and dividend]. F-statistic is also another significant test in the regression model. It's indicates for the overall significance of the regression model. The null hypothesis of this test states in the following way:

$$H_0: \beta_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$$

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$H_1: At\ least\ one\ of\ them \neq 0$

Obviously, there is strong evidence against the null hypothesis which is rejected at

1% level of significant.

Table 4.5. Regression Results

Independent Variable	Coefficient	t-Statistic	Prob.
ROE	-0.005218	-2.503435	0.0141
TAX	4.24E-06	0.001767	0.9986
CL	-0.932282	-41.20022	0.0000
DIV	0.002583	2.067798	0.0415
C	0.989650	63.10203	0.0000
R-squared	0.970818		
Adjusted R-squared	0.963205		
F-statistic	127.5262		
Prob(F-statistic)	0.000000		
Durbin-Watson stat	1.942350		

Although the coefficient is very small almost zero, profitability effects on the capital

structure found to be negative and statistically significant at 5% level of significant

that's as return on equity increase by 1% the leverage will decrease by 0.52%. The

finding is consistent with (2001), Aggarwal and Jamdee (2003), Frank and Goyal

(2005), Chen (2004) and Lim (2012) who found negative and statistically significant

impact of profitability on the debt financing choice of the firms. The finding is also

support pecking order theory as profitable firms tend to have as small as possible

debt and try to finance new projects by retained earnings.

Regarding tax shield impacts on the capital structure of the banks, it's reported to be

approximately zero coefficient and statistically insignificant, in contrast to the non-

financial firms where the choice of debt financing is affected substantially positive

by the taxes. The finding is in line with the well-known study of Keen and Mooij

(2012) who provide global evidence from 82 countries and huge sample of more than 1400 commercial banks. They argue that, the impact of tax on hybrids is generally weak or insignificant. Responsiveness to taxation varies significantly across banks, however: those holding smaller equity buffers, and larger banks, are noticeably less sensitive to tax.

We surprisingly, report that collateral is negatively and statistically significantly (1% level of significant) influence the capital structure of the banks. The interpretation is when the tangible assets as the percentage of total asset of the banks increase by 1% the capital structure decreases by 0.93%. This finding can be due to the nature of the business that's banks tend to have as much as liquid asset as possible to match the unexpected claims from the depositors and heavily relies on the deposits and making profits through the lending borrowing spread. in contrary of the non-financial firms whereas if tangible assets increases the financial distress cost decreases and consequently the firms with higher tangible assets are able to access to cheaper debt.

Finally, and not surprisingly dividend effects are positive and statistically significant at 5% level of significant. Implying that banks that paying dividend have much capital structure that those which don't pay dividend by 0.26%. As argue Gropp and Heider (2007), dividend paying firms reduce the asymmetric information which provides better access to debt and equity financing to the firms. However, they argue that the existing theories of capital structure were not able to clarify the precise relation between dividend and choice of capital structure.

Chapter 5

CONCLUSION

5.1 Summary of the Thesis

The present thesis empirically examines the capital structure of the listed commercial banks in Turkey as a function of four bank specifics namely profitability, tax shield, tangibility and dividend. Panel data approach employed since the sample consist of cross-section of 9 publicly traded commercial banks in Borsa Istanbul in Turkey and the time span is considered from 2004 to 2016. The variables were found to be stationary as reported in the chapter 4. Before conducting the regression, according the Hausman test we found the fixed regression model fits our model. And the study performs the panel data ordinary least square model to employ the regression between the regressors and the regressand. The model of this study was robust in terms of autocorrelation and multicollinearity issues.

The findings suggest a very small but negative impact of the profitability on the capital structure of the sample banks implying a consistency with the pecking order theory as profitable firms tend to have as small as possible debt and try to finance new projects by retained earnings. In contrast to the non-financial firms where the choice of debt financing is affected substantially positive by the taxes, tax shields are not statistically significantly affecting the choice of the debt financing of the banks. We surprisingly, report that collateral is negatively and statistically significantly influence the capital structure of the banks. The finding can be due to

the nature of banking business which heavily relies on the deposits and making profits through the lending borrowing spread. We further report a positive but very weak association between the dividend and the choice of capital structure of the sample banks. That's paying dividend banks reduce the asymmetric information between the banks and the lenders consequently they can access to cheaper debt.

5.2 Recommendations

At the bottom line we conclude that the capital structures of the banks are substantially vary from non-financial institutions. In particular, the tax shield and collateral effects on the leverage are found to be exactly opposite to which as expected in the non-financial firms. Furthermore, the theories of capital structure are not able to demonstrate precisely the choice of capital structure of the banks or it's inconclusive. This allows for more research in the field using various models, variables or samples.

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APPENDICES

Appendix A: The Descriptive Statistics Test

	ROE	TAX	DIV	CL	LEV
Mean	0.146718	856.4871	0.521368	0.105087	0.892288
Median	0.150952	791.2000	1.000000	0.103847	0.894196
Maximum	0.380475	2528.000	1.000000	0.184373	0.935634
Minimum	-1.786524	57.52000	0.000000	0.043441	0.811566
Std. Dev.	0.189682	556.0243	0.501692	0.020481	0.019764
Skewness	-9.118652	0.707716	-0.085548	0.886607	-1.119732
Kurtosis	93.87976	3.028315	1.007319	6.105433	6.116842
Jarque-Bera	41884.68	9.770721	19.50026	62.34151	71.80827
Probability	0.000000	0.007556	0.000058	0.000000	0.000000
Sum	17.16599	100209.0	61.00000	12.29516	104.3977
Sum Sq. Dev.	4.173592	35862911	29.19658	0.048660	0.045313
Observations	117	117	117	117	117

Appendix B: The Hausman Test

Correlated Random Effects - Hausman Test
Equation: FINAL
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	71.101111	4	0.0000

** WARNING: estimated cross-section random effects variance is zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
ROE	-0.006005	-0.001640	0.000000	0.0000
LNTAX	0.000391	-0.000966	0.000000	0.0457
CL	-0.942545	-0.951345	0.000109	0.3997
DIV	0.001577	0.003722	0.000000	0.0013

Cross-section random effects test equation:
Dependent Variable: LEV
Method: Panel Least Squares
Date: 01/02/18   Time: 23:36
Sample: 2004 2016
Periods included: 13
Cross-sections included: 9
Total panel (balanced) observations: 117

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.988865	0.006371	155.2200	0.0000
ROE	-0.006005	0.001984	-3.027627	0.0031
LNTAX	0.000391	0.000865	0.451702	0.6524
CL	-0.942545	0.020886	-45.12737	0.0000
DIV	0.001577	0.001137	1.387195	0.1683

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.966153	Mean dependent var	0.892288
Adjusted R-squared	0.962248	S.D. dependent var	0.019764
S.E. of regression	0.003840	Akaike info criterion	-8.182155
Sum squared resid	0.001534	Schwarz criterion	-7.875247
Log likelihood	491.6561	Hannan-Quinn criter.	-8.057554
F-statistic	247.3912	Durbin-Watson stat	1.917054
Prob(F-statistic)	0.000000		

Appendix C: The Regression Output

Dependent Variable: LEV
Method: Panel Least Squares
Date: 11/29/17   Time: 23:26
Sample: 2004 2016
Periods included: 13
Cross-sections included: 9
Total panel (balanced) observations: 117

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROE	-0.005218	0.002084	-2.503435	0.0141
TAX	4.24E-06	0.002396	0.001767	0.9986
CL	-0.932282	0.022628	-41.20022	0.0000
DIV	0.002583	0.001249	2.067798	0.0415
C	0.989650	0.015683	63.10203	0.0000

Effects Specification

Cross-section fixed (dummy variables)
c

R-squared	0.970818	Mean dependent var	0.892288
Adjusted R-squared	0.963205	S.D. dependent var	0.019764
S.E. of regression	0.003791	Akaike info criterion	-8.125312
Sum squared resid	0.001322	Schwarz criterion	-7.535104
Log likelihood	500.3307	Hannan-Quinn criter.	-7.885694
F-statistic	127.5262	Durbin-Watson stat	1.942350
Prob(F-statistic)	0.000000		