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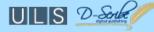
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Firm, Country and Macroeconomic Determinants of Capital Structure: Evidence from Turkish Banking Sector

Dr. Nuri Baltacı

Gümüşhane University | e-mail: nbaltaci@gumushane.edu.tr

Dr. Hasan Ayaydın

Gümüşhane University | e-mail: hayaydin61@gumushane.edu.tr

Abstract

This study explores the significance of firm-specific, country, and macroeconomic factors in explaining variation in leverage using a sample of banks from Turkish banking sector. The analysis is based on quarterly firm-level data from Turkish banking sector in 2002–2012. We aims to contribute to the empirical capital structure literature in the following ways. Our first contribution comes from assessing the importance of firm-specific factors, country-level factors and industrial factors for capital structure decisions in Turkish banking sector. Second, we employ appropriate and advanced dynamic panel data estimators, Blundell and Bond's (1998) generalized methods of moment's estimators (GMM System). We find that leverage is significantly and positively associated with average industry leverage, firm size and GDP growth. We find also that leverage is significantly and negatively associated with tangibility, profitability, inflation and financial risk. The regression results for leverage are both theoretically and empirically plausible for banks in Turkey. Moreover, tangibility, profitability and GDP growth are consistent with the predictions of the pecking order theory, while firm size is consistent with the predictions of the trade-off theory. Our findings suggest that the capital structures of financial and non-financial firms are ultimately determined by the same drivers.

Keywords: Capital structure, Turkish Banking sector, trade-off theory, pecking order theory, GMM System estimation

Firm, Country and Macroeconomic Determinants of Capital Structure: Evidence from Turkish Banking Sector

Dr. Nuri Baltacı

Dr. Hasan Ayaydın

1. INTRODUCTION

Capital structure decisions affect a firm in two ways. Firstly, firms of the same risk class could possibly have higher cost of capital with higher leverage. Secondly, capital structure may affect the valuation of the firm, with more leveraged firms, being riskier, being valued lower than less leveraged firms. Thus, capital structure is an important decision for it could lead to an optimal financing mix which could maximize the market price of the firm (Lim, 2012). Studies on capital structures of corporations have a long history, dating back to the nineteen fifties with the appearance of the works of Lintner (1956), Hirshleifer (1958) and Modigliani and Miller (1958). Theoretical and empirical studies that followed subsequently form an extremely large body of literature. Modigliani and Miller (1958) showed that in the perfect financial market, under certain assumptions, the value of a company is independent of its financing choice. Firm capital structure is irrelevant in efficient financial markets as shown by Modigliani and Miller (1958).

The issue of a given capital structure that may increase the shareholder value is one of the most important discussions in the finance field, both theoretically and empirically (Kayo and Kimura, 2011). Since Modigliani and Miller's (1958) "*capital structure irrelevance*" propositions, we have been witnessing the development of many theoretical points of view in this arena. Subsequent theoretical work has taken into account the imperfections of financial markets and has shown that firm capital structure emerges from firm-specific and macroeconomic factors. The preponderance of the studies on capital structure mainly focuses on the analysis of certain firm characteristics–e.g., profitability, tangibility, size, etc.–as determinants of leverage. For example, Frank and Goyal (2009), Lemmon et al. (2008) evaluate the contribution of firm-specific factors to leverage variation of U.S. firms. The empirical studies on the capital structure choices of firms that started appearing in the eighties (Marsh, 1982; Jalilavand and Harris, 1984; Titman and Wessels, 1988) and continued later are mostly based on data from developed countries. Bevan and Danbolt (2002) use data from the U.K. and Gaud et al. (2005) analyzed data from Swiss companies.

Recent and growing research has incorporated country-level characteristics into the traditional firm-level determinants to explain a firm's leverage. Several studies analyze the role of countries and industries on financing policies. These authors (Booth et al., 2001; Demirguc-Kunt and Maksimovic, 1999; Hanousek and Shamshur, 2011; Rajan and Zingales, 1995; Giannetti, 2003; Jõeveer, 2005; De Jong et al., 2008; Bancel and Mittoo, 2004; Antoniou et al., 2008; Beck et al., 2008; Psillaki and Daskalakis, 2009; Gropp and Heider, 2010; Gungoraydinoglu and Oztekin, 2011; Kayo and Kimura, 2011; Oztekin and Flannery, 2012; Joeveer, 2013 and Drobetz et al, 2013) suggest that, along with firm characteristics, country-specific factors may also influence firm capital structure. These studies compare the capital structure of firms from different countries, taking into account factors such as gross domestic product (GDP), inflation, development of stock markets, etc.

Country characteristics influence firms' costs and benefits in determining their capital structure. Countries differ in the quality of institutions that may potentially affect the trade-off among the bankruptcy costs and tax benefits, agency costs, and information asymmetry costs imposed on firms (Gungoraydinoglu and Oztekin, 2011). Subsequent to the departures from Modigliani and Miller (1958)'s irrelevance proposition, there is a long tradition in corporate finance to investigate the capital structure decisions of non-financial firms. It is easy to find studies that analyze firm characteristics as determinants of capital structure, but, the literature often neglects the role of industry and country in banking sector.

An early investigation of banks' capital structures using a corporate finance approach is Marcus (1983). He examines the decline in capital to asset ratios

of US banks in the 1970s. Barth et al. (2005), Berger et al. (2008) and Brewer et al. (2008) observe that the levels of bank capital are much higher than the regulatory minimum. Banks may be optimising their capital structure, possibly much like non-financial firms, which would relegate capital requirements to second order importance (Gropp and Heider, 2010:590). Flannery (1994), Myers and Rajan (1998), Diamond and Rajan (2000) and Allen et al. (2011) develop theories of optimal bank capital structure, in which capital requirements are not necessarily binding. But what determines banks' capital structures in Turkey? To answer the question, we analysis firm, industry, country and macroeconomic determinants of capital structure in Turkey. Turkish banks have become the focus of attention recently. Firm, country and macroeconomic determinants of capital structure is a subject of attention. This paper aims to contribute to the knowledge of capital structure by examining the determinants of capital structure across a large panel of banks and by focusing on both the characteristics of the bank and macroeconomic factors. In this article, we contribute to the empirical capital structure literature in the following ways. Our first contribution comes from assessing the importance of country-level factor for capital structure decisions and evaluating the relative importance of the country-specific factors in determining a firm's leverage compared with the firm-specific factors and industrial factors in Turkish banking sector. Second, we employ appropriate and advanced dynamic panel data estimators, Blundell and Bond's (1998) generalized methods of moment's estimators (System GMM, to estimate the determinants of capital structure.

The paper is organized as follows: In the next section we provide an overview of the related research and capital structure theories. In Section 3 we introduce the data and the estimation methodology. Section 4 contains the results, followed by a concluding section.

2. CAPITAL STRUCTURE THEORIES AND DETERMINANTS OF CAPITAL STRUCTURE

Concerning firm-level determinants of leverage, two main theoretical approaches are particularly important: *the trade-off theory* and *the pecking order theory*. These offer several predictions regarding to firm-specific and country-specific factors affecting firm leverage.

According to the trade-off theory, capital structure choices are determined by a trade-off between the benefits and costs of debt (Kraus and Litzenberger, 1973). Classic arguments for this trade-off are based on bankruptcy costs, tax benefits, and agency costs related to asset substitution (Myers, 1977), and overinvestment (Jensen, 1986; Stulz, 1990). Each firm has a value-maximizing target leverage ratio that it strives to reach (Gungoraydinoglu and Öztekin, 2011). As a result, although increased leverage mitigates the agency costs of equity, it exacerbates bondholder–shareholder conflicts (Drobetz et al, 2013).

The pecking order theory (also referred to as the information asymmetry theory), developed by Myers and Majluf (1984) and Myers (1984), argues that the adverse selection costs of issuing risky securities, because of either asymmetric information (Myers, 1984; Myers and Majluf, 1984) or managerial optimism (Heaton, 2002), lead to a preference ranking over financing sources by creating a wedge between internal and external financing costs and by increasing the difficulty of issuing securities. To minimize adverse selection costs, firms first issue internal funds, debt, and then equity (Gungoraydinoglu and Öztekin, 2011). There is no concept of target capital structure for a firm in the pecking order theory. The explanation provided by Myers for the pecking order theory is based on the assumption that firm insiders have more information than outsiders (Chakroborty, 2010). The pecking order theory ranks financing sources according to the degree they are affected by information asymmetry. As a result, firms use internal funds in the first place. If they need external funds, they prefer to issue debt over equity (Drobetz et al, 2013:4). In contrast with the trade-off theory, the pecking order theory does not predict that firms have well-defined target leverage (Dang, 2013).

These theories, in contrast to Modigliani and Miller's (1958) assumption of a perfect market, suggest that several factors may determine firm leverage, either firm-internal or firm-external. A particular factor might be positive or negative depending on the theoretical lens.

2.1. Firm-Level Determinants

Among the firm-level determinants of capital structure, we discuss profitability, size and tangibility.

2.1.1. Profitability

There is no consensus regarding the influence of profitability on capital structure. According to the pecking order theory, firms use internal sources of financing first and then go for external sources of financing. Firms with higher profitability will prefer internal financing to debt and hence a negative relationship is expected between profitability and leverage. Most empirical studies confirm the pecking order theory (Titman and Wessels, 1988; Rajan and Zingales, 1995; Booth et al., 2001; Fama and French, 2002; Chen, 2004; Delcoure, 2007; Daskalakis and Psillaki, 2008; Chakraborty, 2010; Gropp and Heider, 2010; Kayo and Kimura, 2011; Oztekin and Flannery, 2012; Joeveer, 2013; Chakraborty, 2013; Dang, 2013). While profitability is frequently treated as a capital structure determinant, Shyam-Sunder and Myers (1999) propose a more direct approach to test the pecking order, contrarily to the studies that show evidence that pecking order does not hold (Frank and Goyal, 2003; Leary and Roberts, 2010). According to the trade-off theory, more profitable firms are supposed to have more debt-serving capacity and more taxable income to shield. Therefore, according to this theory, when firms are profitable they are likely to prefer debt to other sources in order to benefit from the tax shield. (Chakraborty, 2010). The trade-off hypothesis states a positive relationship because low profitability may increase bankruptcy risk. Hence a positive relationship is expected between profitability and leverage (Kaya and Kimura, 2011). A positive relationship would confirm the trade-off theory and a negative relationship would confirm the pecking order theory.

2.1.2. Tangibility

Asset tangibility is a measure for the level of a firm's collateralizable value. From a trade-off perspective, one expects that firms with a higher ratio of fixed-to-total assets are subject to lower costs of financial distress, as tangible assets suffer from a smaller loss of value in case of bankruptcy. In addition, tangible assets are easier to value for outsiders, resulting in lower information asymmetry, less pronounced agency costs of debt, and a higher debt capacity. Therefore, the trade-off theory predicts a positive relationship between tangibility and leverage (Drobetz et al, 2013). However, the pecking order theory predicts that firms with less collateral face higher information costs and, thus, prefers debt to equity. In other words, collateral and target leverage are negatively related (Dang, 2013). Some studies report a significant positive relationship between tangibility and total debt (Titman and Wessels, 1988; Rajan and Zingales, 1995; Delcoure, 2007; Chakraborty, 2010; Gropp and Heider, 2010; Kayo and Kimura, 2011; Dang, 2013). Wiwattanakantang (1999) and Chen (2004) observes a positive relationship between tangibility and leverage respectively in Thailand and China but Booth et al. (2001) for ten developing countries and Huang and Song (2006), Joeveer (2013), Oztekin and Flannery (2012) and Chakraborty (2013) find a negative relationship. The pecking order theory recognizes a negative relationship between tangibility and leverage, whereas the trade-off theory defends a positive one.

2.1.3. Firm Size

The effect of firm size on leverage is ambiguous. Larger firms tend to be more diversified and, thus, less prone to bankruptcy. Also, larger firms have better access to credit markets compared to smaller firms. In addition, larger firms have more diluted ownership leading to less control over managerial decisions (Delcoure, 2007). Larger firms with less asymmetric information problems should tend to have more equity than debt and hence have lower leverage (Chakroborty, 2010). The larger firms face lower information costs and can raise equity capital more easily than the small firms. Therefore, in the presence of asymmetric information, firm size and target leverage may have a negative relation. Following the pecking order theory of capital structure, it is expected that the size of the firm will be negatively related to leverage. On the other hand, the trade-off theory suggests that large firms face lower financial distress and agency costs and, thus, are able to borrow more than small firms (Dang, 2013). The implication follows that firm size has a positive effect on target leverage. Some studies find positive relationship between firm sizes and leverage (Booth et al., 2001; Wiwattanakantang, 1999; Huang and Song, 2006; Delcoure, 2007; Daskalakis and Psillaki, 2008; Gropp and Heider, 2010; Kayo and Kimura, 2011; Lim, 2012;

Oztekin and Flannery, 2012; Joeveer, 2013; Dang, 2013), others observe that firm size is negatively related to leverage (Rajan and Zingales, 1995; Bevan and Danbolt, 2002; Titman and Wessels, 1988; Chakraborty, 2010; Gungoraydinoglu and Oztekin, 2011; Chakraborty, 2013). A positive relationship between firm Size and leverage would confirm the trade-off theory and a negative relationship would confirm the pecking order.

2.2. Country and Macroeconomic Determinants

A remaining question is whether capital structure is driven by underlying macroeconomic factors which influence firms' capital raising and induce them to choose different levels of leverage at different points (Erel et al., 2012). The business cycle can affect financing choices and leverage ratios. The demand-for-capital mechanism is based on changes in information asymmetry between firms and investors over the business cycle. If the adverse selection costs associated with information asymmetry are negatively related to the business cycle, poor macroeconomic conditions will induce firms to issue less information-sensitive securities. Therefore, they tend to use less equity and more debt (Drobetz et al, 2013). The conjecture that macroeconomic conditions affect firms' ability to raise capital seems particularly important for the banking industry that is affected by current financial crises around the world. Hence, we added model of the study country and macroeconomic determinants of capital structure. Following Ferson and Harvey (1994), De Jong et al (2008), we use inflation rate, GDP growth rate in order to control for the effects of countries economic conditions on capital structure.

2.2.1. GDP Growth Rate

Joeveer (2013) suggests that macroeconomic conditions may affect the leverage through the fact that they proxy the growth opportunities in the overall economy. Since equity financing is less common in Eastern Europe the investment opportunities will be mostly financed by debt and therefore they would expect GDP growth to be positively related to leverage (Joeveer, 2013) and GDP growth has been found to be positively related to leverage. Therefore, GDP growth rate indicates growth opportunities in the overall economy. That is, it is

can be evaluated that GDP growth contexts the pecking order theory and trade-off theory.

Firms with higher growth opportunities would need more fund. According to the pecking order theory, there will be stronger preference for external financing, especially for debt (Chakraborty, 2010). The pecking order hypothesis predicts that firms with higher growth opportunities indicate the greater demand of capital, thus external fund is preferred through debt financing (Lim, 2012). Rajan and Zingales (1995), Booth et al. (2001), Chen (2004), Delcoure (2007), Daskalakis and Psillaki (2008), Frank and Goyal (2009), Gropp and Heider (2010), Gungoraydinoglu and Öztekin (2011) and Drobetz et al (2013) find positive relationship between growth and leverage. On the other hand, According to the trade-off theory firms with high growth opportunities are likely to suffer from financial distress and the debt overhang problem (Myers, 1977). These firms have strong incentive to rely more on equity than on debt finance (Dang, 2013). In addition, Myers (1977) argued the negative relationship between growth and leverage from the perspective of agency costs. Firms with greater growth potential have more flexibility to have sub-optimal behaviors, thus transferring the wealth from debt holders to shareholders (Lim, 2012). The findings of Titman and Wessels (1988), Rajan and Zingales (1995), Kayo and Kimura (2011), Joeveer (2013) and Öztekin and Flannery (2012) confirmed trade-off theory. A negative relationship between GDP growth rate and leverage would confirm the trade-off theory and a positive relationship would confirm the pecking order.

2.2.2. Inflation Rate

Inflation is one of the main indicators of a country's stability. An increase in inflation rate brings about uncertainty in economic situation. This uncertainty causes firms' inability to repay their debts. Higher inflation decreases the benefits of leverage because of higher bankruptcy costs of debt imposed on firms (Gungoraydinoglu and Öztekin, 2011). In this case, lenders demand a higher return for the risk they undertake. Higher interest rate increases firm's cost of debt expected, firms reduce debt ratios. In addition, in periods with higher inflation, firms use currently weak dollars to repay debt and lower their leverage ratios (Drobetz et al, 2013). Therefore, inflation has a negative effect on leverage. Joeveer (2012) maintains that expected inflation is predicted to be positively related to

leverage due to higher real value of tax deductions on debt. Demirguc-Kunt and Maksimoviç (1999), Gungoraydinoglu and Öztekin (2011), Öztekin and Flannery (2012), Drobetz et al (2013) and Joeveer (2013) find negative relationship between inflation and leverage.

2.2.3. Financial Risk

The overall aim of the financial risk rating is to provide a means of assessing a country's ability to pay its way. In essence, this requires a system of measuring a country's ability to finance its official, commercial, and trade debt obligations. According to ICRG Methodology, the financial risk includes following: foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of exports of goods and services, net international liquidity as months of import cover, exchange rate stability (ICRG, 2013). Hence, we added also financial risk index the model. Joeveer (2013) find negative relationship between country credit rating and leverage. To our knowledge, there are no studies on capital structure that consider financial risk as a determinant of leverage and this aspect is, we believe, one of the relevant contributions of our paper. Lastly, we analyze the influence of financial risk on firm leverage using the financial risk index from ICRG.

2.2.4. Average industry leverage

Studies on capital structure often employ dummy variables to control the effect of industry on leverage. It would be reasonable to suppose that specific characteristics of a given industry could also influence the firm capital structure. Therefore, following Joeveer (2013) and Frank and Goyal (2009), we analyze the influence of industry on firm leverage using the average industry leverage. Since the firm takes into account firms' capital structure and leverage in the industry, average industry leverage is expected to be positively related to leverage. Frank and Goyal (2009), Oztekin and Flannery (2012) and Joeveer (2013) find positive relationship between average industry leverage and leverage.

3. METHODOLOGY AND DATA

Prior research has examined the factors that determine leverage (Flannery and Rangan, 2006; Frank and Goyal, 2005, 2009; Hovakimian et al., 2001, 2011). We follow the existing literature on the selection of the firm-specific factors affecting leverage but also incorporate country-specific macroeconomic factors that are theoretically important in a firm's determination of leverage (Cook and Tang, 2010; Frank and Goyal, 2009; Korajczyk and Levy, 2003). The lack of country-specific variability in their study, however, means that they are unable to measure macroeconomic factors, which is the focus of the present paper.

The dynamic panel model in Eq. (1), (2), (3) and (4) requires instruments for the endogenous transformed lagged dependent variable (Baltagi, 2001) and other potentially endogenous explanatory variables. We use Blundell and Bond's (1998) generalized methods of moments estimators (System GMM) methodology to estimate Eq. (1), (2), (3) and (4). The choice of our econometric model is essentially based on the following set of concerns: (i) the potential endogeneity of domestic savings; (ii) the dynamic relationship between domestic savings and investment as both are impacted by the prior values of each other; and (iii) unobserved country-specific effects. We estimate the following two transformed models:

Model 1a:

$$LEV1_{it} = \gamma LEV1_{it1} + \beta_1 IND1_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 INF_{it} + \beta_5 TANGY_{it} + \beta_6 ROA_{it} + v_{it} \qquad Eq.\ (1)$$

Model 1b:

$$LEV1_{it} = \gamma LEV1_{it1} + \beta_1 IND1_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 INF_{it} + \beta_5 TANGY_{it} + \beta_6 ROA_{it} + \beta_7 FINRISK_{it} + v_{it} \qquad Eq.\ (2)$$

Model 2a:

$$LEV2_{it} = \gamma LEV2_{it1} + \beta_1 IND2_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 INF_{it} + \beta_5 TANGY_{it} + \beta_6 ROA_{it} + v_{it} \qquad Eq.\ (3)$$

Model 2b:

$$LEV2_{it} = \gamma LEV2_{it1} + \beta_1 IND2_{it} + \beta_2 SIZE_{it} + \beta_3 GROWTH_{it} + \beta_4 INF_{it} + \beta_5 TANGY_{it} + \beta_6 ROA_{it} + \beta_7 FINRISK_{it} + v_{it} \qquad Eq.\ (4)$$

Where subscripts *i* and *t* indicate bank and time period, respectively. β_0 that is common to all recipient banks. *IND* represents average industry leverage. We use two average industry leverage measures: *IND1* and *IND2*. *IND1* is defined as average deposits plus liabilities to total equities, while *IND2* is defined as average deposits plus liabilities to total book assets, *SIZE* is natural logarithm of assets as a proxy for the firm size, *GROWTH* is growth rate defined as the rate of change in the gross domestic product, *INF* is inflation rate measured by rate of change in the consumer price index, *TANGY* is tangibility by the ratio of fixed assets to total assets, *ROA* is profitability defined as the ratio of net profit to total assets, FINRISK is financial risk index from ICRG.

Our sample consists of 39 banks covered in the Turkish banking sector during the period between 2002 and 2012. There are several different leverage measures used in capital structure studies (see the discussion of leverage definitions in Rajan and Zingales, 1995). Banks' capital structure fundamentally differs from the one of non-financial firms since it includes deposits etc., a source of financing generally not available to firms. Different rates in the banking sector are used to determine capital structure decisions. Fallowing studies (Nacour and Goaied, 2001; Bashir, 2003; Pratomo and İsmail, 2006), we use two leverage measures: LEV1 and LEV2. The two leverage measures used in this study differ from each other. LEV1 is defined as deposits plus liabilities to total equities, while LEV2 is defined as deposits plus liabilities to total book assets. The all data are on quarterly basis. The all firm-specific data used in this paper are taken from Banks Association of Turkey (BAT). The country and macroeconomic variables are obtained from a variety of sources. GDP growth is obtained Turkey Statistical Institute (TSI). Inflation is taken from CBRT electronic data delivery system general statistics. Financial risk index data is taken from International Country Risk Guide (ICRG).

Table 1 provides descriptive statistics of all variables. The two measures of leverage differ sharply during the entire period 2002–2012. During the entire period 2002–2012, LEV1 is 0.492 whereas LEV2 is 0.586. As can be seen from Table 1; we get similar pictures for the industry leverage from the two alternative measures. Size variable is a value between "0.7 "and

"8.2". Financial risk index value is changed "27.5" and "36.5" and the average value of its is "32.4".

Table 1: Descriptive statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
LEV1$_{t-1}$	560	.4923	.8549	.8549	7.6026
LEV2$_{t-1}$	560	5867	3045	3045	.9392
INDS1	560	6507	0022	6474	6536
INDS2	560	5847	0006	5837	5860
SIZE	560	.5728	.7425	7009	.2306
GROWTH	560	.3875	.5005	14.7	2.6
INF	560	46.66	3.7394	6	07.5
TANGY	560	0213	0272	0002	3547
ROA	560	0110	0449	.6323	3221
FINRISK	560	2.4500	.8336	7.5	6.5

Table 2 reports the correlation coefficients between the variables. The two alternative measures of leverage are highly correlated, as the correlation coefficient is 0.639.

Table 2: Correlation coefficients between variables

	LEV1	LEV2	INDS1	INDS2	SIZE	GROWTH	INF	TANGY	ROA	FINRISK
LEV1	1.000									
LEV2	0.639	1.000								
INDS1	-0.091	-0.068	1.000							
INDS2	-0.089	-0.070	0.928	1.000						
SIZE	0.270	0.252	0.639	0.559	1.000					
GROWTH	0.068	0.044	-0.338	-0.178	-0.203	1.000				
INF	-0.087	-0.069	0.963	0.988	0.615	-0.230	1.000			
TANGY	-0.093	0.044	-0.342	-0.321	-0.326	0.081	-0.339	1.000		
ROA	-0.055	-0.006	0.075	0.035	0.160	-0.079	0.049	-0.125	1.000	
FINRISK	-0.036	-0.005	0.072	0.147	0.121	0.427	0.126	-0.062	0.018	1.000

Among the explanatory variables, INF and SIZE are highly correlated with INDS 1, 2 (correlation coefficients are 0.9632 and 0.988, 0.639 and 0.559). Moreover, SIZE is highly correlated with two alternative measures of leverage, LEV1 and LEV2 (correlation coefficients are 0.270 and 0.252). A bank's leverage correlates positively with SIZE, GROWTH and negatively with INDS, INF, TANGY, ROA and FINRISK variables.

4.   EMPIRICAL RESULTS AND DISCUSSION

Table 3 reports the empirical results from our estimations of target leverage, modeled by Equation 2, 3. All coefficients on firm-specific variables have expected signs. The results of all the model (Model 1a, b and Model 2a, b) are parallel to a large extent. Firm size variable is not statistically significant in Model 1a, b, while financial risk variable is not statistically significant in Model 2a, b.

Table 3: Empirical results from estimations of target leverage the models.

Independent Variables	Model 1a	Model 1b	Model 2a	Model 2b
LEV1$_{t-1}$	0.603*** (0.0522)	0.595*** (0.049)		
LEV2$_{t-1}$			0.236** (0.114)	0.232** (0.113)
INDS1	1.334*** (0.410)	2.133*** (0.604)		
INDS2			0.991*** (0.222)	0.980*** (0.220)
SIZE	0.291 (0.099)	0.049 (0.095)	0.008* (0.004)	0.007* (0.004)
GROWTH	0.034*** (0.008)	0.053*** (0.013)	0.001*** (0.0004)	0.001*** (0.0004)
INF	-0.019*** (0.006)	-0.019*** (0.006)	-0.001*** (0.0003)	-0.001*** (0.0003)
TANGY	-47.477*** (18.019)	48.247** (18.262)	-2.087** (0.939)	-2.104** (0.941)
ROA	-3.661** (1.749)	-3.428** (1.620)	-0.466** (0.212)	-0.475** (0.216)
FINRISK		-0.113*** (0.035)		0.0003 (0.001)
AR(2)	0.7236	0.7402	0.2540	0.2532
Wald chi2	2116.03	2283.61	352.07	472.09
F Prob.	0.0000	0.0000	0.0000	0.0000
Observations	1521	1521	1521	1521
Banks	39	39	39	39
Instruments	785	786	785	786

Robust SEs of coefficients is reported in parentheses.
*, ** and *** indicate the coefficient significant at the 10, 5 and 1% levels, respectively.

The coefficient on average industry leverage is positive and statistically significant meaning that specific characteristics of a given industry influence the firm capital structure. This finding is consistent with the previous empirical evidence (e.g. Frank and Goyal, 2009; Oztekin and Flannery, 2012 and Joeveer, 2013).

The results for Turkey banks show that leverage is significantly and positively associated with firm size. This finding is consistent with the trade-off theory that large firms face lower financial distress and agency costs and, thus, are able to borrow more than small firms. Empirically, this finding is consistent with the previous empirical evidence (e.g. Booth et al., 2001; Wiwattanakantang, 1999; Huang and Song, 2006; Delcoure, 2007; Antoniou et al., 2008; Daskalakis and Psillaki, 2008; Gropp and Heider, 2010; Kayo and Kimura, 2011; Lim, 2012; Oztekin and Flannery, 2012; Joeveer, 2013; Dang, 2013),

Tangibility enters with negative and significant signs in the LEV1 and LEV2 regression. The negative influence of tangibility suggests that the collateral aspect of fixed assets is an important leverage driver for the countries in our sample. This finding is consistent with

the pecking order theory view that firms with less collateral face higher information costs and, thus, prefers debt to equity. Empirically, our finding is consistent with previous empirical evidence (e.g. Rajan and Zingales, 1995; Brooth et al., 2001; Huang and Song, 2006; Antoniou et al., 2008; De Jong et al., 2008, Joeveer, 2013; Oztekin and Flannery, 2012; and Chakraborty, 2013).

The coefficient on profitability is negative and statistically significant meaning that the more profitable firms are likely to have less debt. This finding appears to be most consistent with the pecking order theory's prediction that firms with large profits and sufficient retained earnings are less likely to rely on debt financing. Empirically, our results are in line with the well-documented international evidence on the relation between leverage and profitability (e.g. Titman and Wessels, 1988; Rajan and Zingales, 1995; Booth et al., 2001; Fama and French, 2002; Chen, 2004; Delcoure, 2007; Daskalakis and Psillaki, 2008; Frank and Goyal, 2009; Chakraborty, 2010; Gropp and Heider, 2010; Kayo and Kimura, 2011; Oztekin and Flannery, 2012; Joeveer, 2013; Chakraborty, 2013; Dang, 2013).

GDP growth has positive signs in both leverage regressions. This finding appears to be consistent with the pecking order theory's prediction that firms with higher growth opportunities would need more fund and that firms with higher growth opportunities indicate the greater demand of capital, thus external fund is preferred through debt financing. Our finding is consistent with previous empirical evidence (e.g. Rajan and Zingales, 1995; Booth et al., 2001; Chen, 2004; Delcoure, 2007; Daskalakis and Psillaki, 2008; Frank and Goyal, 2009; Gropp and Heider, 2010; Gungoraydinoglu and Öztekin, 2011 and Drobetz et al, 2013)

The inflation and financial risk index have negative signs in both leverage regressions confirming the predictions. The negative influence of inflation suggests that an increase in inflation rate brings about uncertainty in economic situation. This uncertainty causes firms' inability to repay their debts. Higher inflation decreases the benefits of leverage because of higher bankruptcy costs of debt imposed on firms. Lenders demand a higher return for the risk they undertake. Higher interest rate increases firm's cost of debt expected, firms reduce debt ratios. Our results are in line with the international evidence on the relation

between leverage and inflation (Demirguc-Kunt and Maksimoviç, 1999; Gungoraydinoglu and Öztekin, 2011; Öztekin and Flannery, 2012; Drobetz et al, 2013; and Joeveer, 2013).

In sum, the regression results for leverage are both theoretically and empirically plausible for banks in Turkey. Moreover, tangibility, profitability and GDP growth are consistent with the predictions of the pecking order theory, while firm size is consistent with the predictions of the trade-off theory.

5. CONCLUSIONS

In this paper we study the importance of firm-specific, country and macroeconomic factors for determining the capital structure of banks. The analysis is based on firm-level data from Turkish banking sector in 2002–2012. We use two measures of leverage in this paper.

This paper aims to contribute to the knowledge of capital structure by examining the determinants of capital structure across a large panel of banks and by focusing on both the characteristics of the bank and macroeconomic factors. In this article, we contribute to the empirical capital structure literature in the following ways. Our first contribution comes from assessing the importance of country-level factor for capital structure decisions and evaluating the relative importance of the country-specific factors in determining a firm's leverage compared with the firm-specific factors and industrial factors in Turkish banking sector. Second, we employ appropriate and advanced dynamic panel data estimators, Blundell and Bond's (1998) generalized methods of moment's estimators (System GMM), to estimate the determinants of capital structure.

We find that leverage is significantly and positively associated with average industry leverage, firm size and GDP growth. We find also that leverage is significantly and negatively associated with tangibility, profitability, inflation and financial risk. Empirically, our results are in line with the well-documented international evidence on the relation between leverage and determinants. The regression results for leverage are both theoretically and empirically plausible for banks in Turkey. Moreover, tangibility, profitability and GDP growth are consistent with the predictions of the pecking order theory, while firm size is consistent with the predictions of the trade-off theory.

Our findings suggest that the capital structures of financial and non-financial firms are ultimately determined by the same drivers. In addition, our results have important managerial implications: they show that bank's managers should focus a significant part of their attention on firm characteristics and cannot ignore the importance of external environments (e.g., industry, country, macroeconomics) when making financing decisions.

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