Revisiting Capital Structure of Non-financial Public Firms in Turkey

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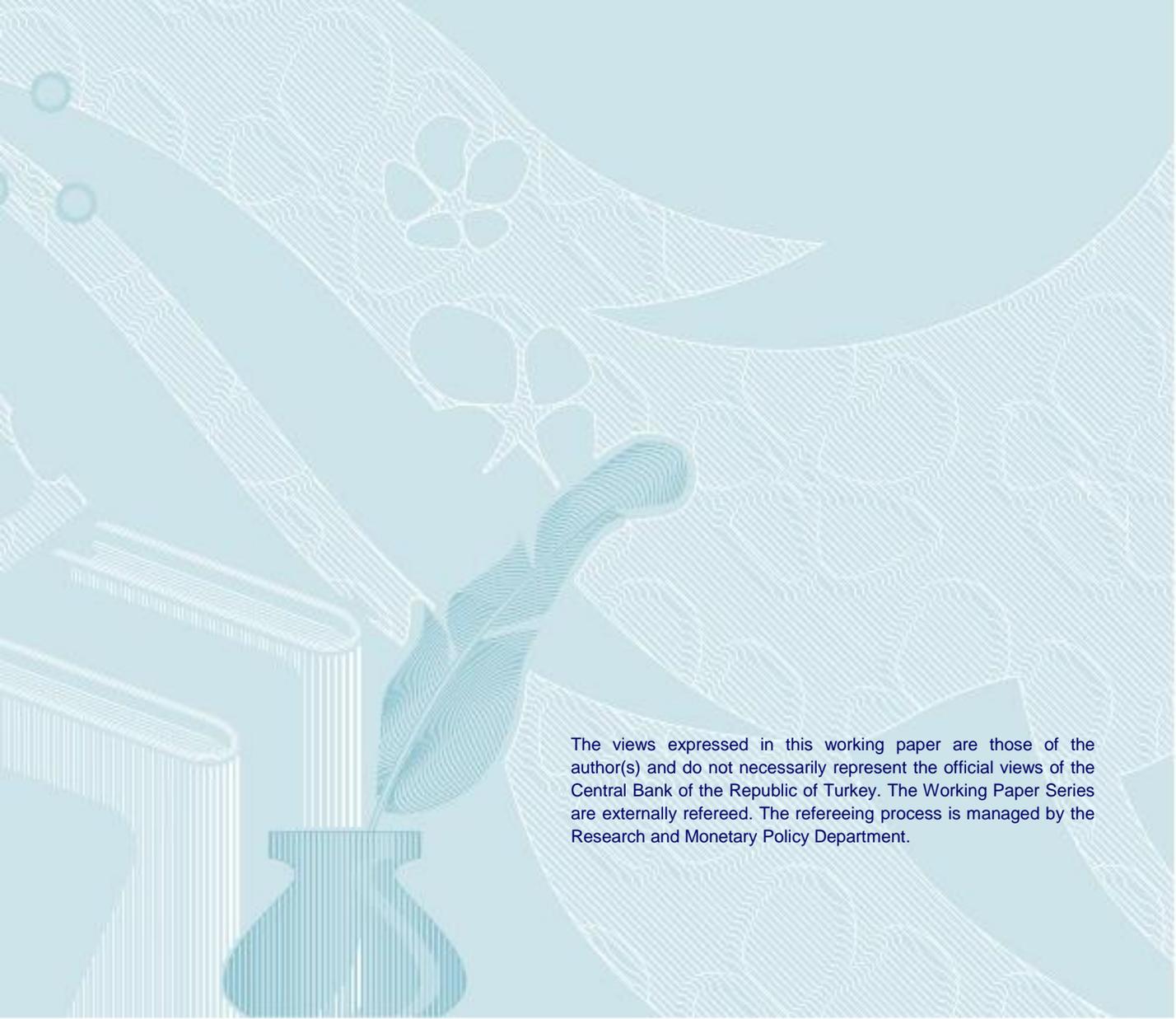
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Revisiting Capital Structure of Non-Financial Public Firms in Turkey[*]

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Abstract

This study investigates the determinants of capital structure of non-financial public firms quoted in Borsa Istanbul. We explore the effects of firm-specific, industry-specific and macroeconomic variables on book and market leverages by employing panel data. In addition, we study the effects of these variables on short-term and long-term leverage ratios. The results indicate that firm-specific factors have similar effects on both book and market leverage ratios except the effect of growth opportunity. The size of a firm is positively associated with its leverage ratio, particularly with long-term leverage ratio. Tangibility is negatively related to the short-term leverage ratio whereas it is positively related to the long-term leverage ratio. Profitability and liquidity have negative effects on leverage, particularly on short-term leverage ratio. It is also observed that the firms tend to follow their peers in their capital structure decisions. The effect of macroeconomic variables is somewhat more ambiguous. There seems to be positive association between inflation and leverage. On the other hand, firm leverage and economic growth are negatively related. Lastly, recursive panel regression methods show that the evolution of the parameter estimates are stable over time.

Keywords: Leverage, Capital structure, Nonfinancial firms

JEL Classification Numbers: G32, G30

1   Introduction

Capital structure has been one of the most prominent topics in finance literature and has drawn great attention especially in the aftermath of the global financial crisis of 2007-2008, since high leverage has been one of the main reasons for the crisis. High levels of debt and declining asset values have led to sharp increases in leverage ratios and have left corporate sector vulnerable to any negative shocks . Therefore, it is quite important to investigate whether there is excess leverage across firms in an economy. However, there is widespread dispersion in leverage ratios across industries and even across firms in the same industry. Thus it is important to figure out what causes significant variation in leverage among firms.

There are three main theoretical approaches trying to explain the determinants of capital structure of firms. Firstly, Modigliani and Miller (1958) suggested Irrelevance Theorem, which states that the value of a firm is independent of its capital structure under assumptions of no friction in financial markets (no tax or regulation), costless default and no asymmetric information between outside and inside investors. Although Modigliani and Miller provided a new framework to capital structure literature, their assumptions are strong.

When the assumptions of Modigliani and Miller are relaxed, it is observed that capital structure is expected to have significant impacts on firm value. Following Modigliani and Miller, Trade-off Theory and Pecking Order Theory have been developed to explain the capital structure decisions. Trade-off Theory claims that in the presence of corporate tax and financial distress costs, capital structure is expected to influence the value of firms. Pecking Order Theory states that firm value is affected by asymmetric information between outside and inside investors.

Many empirical studies have been implemented to test the above mentioned theories. Although these studies find supporting results for all of the theories, none of these theories is sufficient to fully explain the observed variation in capital structure possibly as each theory leans to different aspects of capital structure. In most empirical papers, the common technique applied is to pool all firms and to regress the leverage ratios on firm-specific factors such as size, tangibility and liquidity and macroeconomic variables such as GDP and inflation. There are also some empirical studies which hint to the existence of some industry effects and it is important to identify industry effects on leverage.

Based on similar techniques, there are some empirical studies about the determinants of capital structure in Turkey. In nearly all of these studies, the determinants of book leverage are investigated through regressing book leverage on firm-specific, industry-specific and macroeconomic variables using the data of public firms. There are also some studies which explore whether there is differentiation across public and private firms. All of these papers try to explain book leverage rather than market leverage. Although book

leverage is a good measure for capital structure, it uses balance sheet data, which does not reflect actual market values of assets. It can be argued that market leverage is not directly under control of managers since market value is determined in financial markets, nevertheless firm managers put more emphasis on market leverage since it provides a better measure of the actual riskiness of firms. Therefore, we believe that market measures of leverage would be considered in empirical studies on capital structure decisions instead of book leverage.

This study explores the determinants of both book and market leverages for nonfinancial public firms in Turkey by utilizing panel regressions. We consider only public firms since market values of private companies cannot be regularly obtained. Our contribution to the existing literature is threefold. Firstly, we investigate the determinants of market leverage besides determinants of book leverage and analyze whether they diverge from each other. In this respect, this is the first study investigating market leverage for Turkish nonfinancial firms. Secondly, we provide evolution of parameter estimates using recursive panel regressions. In this regard, we analyze whether the sensitivity of leverage to the firm-specific, industry-specific and macroeconomic variables has changed over time, especially after the global financial crisis of 2007-2008. Thirdly, this study focuses on industry effects using the industry classification of Capital Markets Board of Turkey. Although industry effects are also taken into account in a few previous papers, those papers employed broad industry classifications.

We provide evidence that book and market leverage ratios in general have been influenced similarly by size, liquidity, profitability, industry mean leverage and macroeconomic variables. Size, tangibility and industry mean leverage have positive effects whereas liquidity and profitability have negative effects on book and market leverages. Additionally, growth opportunities tend to be more relevant for market leverage whereas it does not have any significant effect on book leverage. It is also observed that industry dummies have significant effects on firm leverage, which confirms the heterogeneity across industries. There is variation in capital structures of different sub-industries within manufacturing industry. Lastly, time evolution of parameter estimates indicates that although there is variation across time, the parameter estimates seem to be stable. We observe no dramatic changes in determinants of capital structure after the global financial crisis.

The rest of the paper is organized as follows: Section 2 provides capital structure theories (Trade-Off Theory and Pecking Order Theory) and related empirical literature about the determinants of capital structure. Section 3 presents variable definitions and expected signs for the variables on leverage under these theories. Additionally descriptive statistics about the data and latest numbers for book and market leverage are also presented in this part together with methodology. The panel regression results under different specifications along with the recursive regression results are given in Section 4. Section 5 presents the robustness checks using different sub-samples and different

sub-periods. Section 6 concludes.

2 Theory and Empirical Literature

This section presents the theoretical explanations for capital structure and then provides the related literature.

2.1 Capital Structure Theories

Modigliani and Miller (1958) states that capital structure has no effect on firm value given that bankruptcy costs, transaction costs or taxes, and agency problems do not exist and there is no information asymmetry between outside and inside investors. In this framework, the cost of capital is independent of financing decisions. Although this theory has strong implications, capital structure changes have been observed to have an impact on firm values. It is found out that financing decisions tend to have significant effects on the value of firms when the assumptions of Modigliani and Miller are relaxed. Trade-off Theory and Pecking Order Theory have been developed to explain the variation in capital structure of firms. These theories focus on different aspects of capital structure.

Firstly, Trade-off Theory provided by Kraus and Litzenberger (1973) incorporates corporate taxes and financial distress costs into the capital structure problem. In the presence of corporate taxes, the government becomes the third party other than equity holder and debt holders on cash flows of a firm since it claims a proportion of the positive net income before taxes. Corporate taxes reduce cash flows accrued to shareholders. In the presence of corporate taxes, there is an incentive to increase leverage for managers since interest expenses can be deducted from net income before taxes. Therefore, the higher the corporate tax rate, the higher is the expected leverage keeping other factors constant. However, whether it is possible to deduct interest expenses depends on the availability of positive net income. If a firm does not have positive income before interest and tax expenses, benefits of leverage decline. Additionally, non-interest tax shields such as depreciation or deferred tax assets reduce incentives for increasing leverage.

In the context of Trade-off Theory, although debt provides tax shields, it also brings costs associated with bankruptcy and financial distress. These costs can be analyzed under two categories: direct and indirect costs. In case of bankruptcy, there are direct costs such as legal fees or expert fees, which reduce cash flows to debt holders and equity holders. Therefore, lenders might ask for an additional premium on the cost of debt, incorporating probability of bankruptcy. Additionally, high level of debt might deteriorate the functioning of operations since the greater the debt amount, the higher the probability of financial distress. As debt levels increase, the probability that cash flows from operations do not cover promised interest payments increases. Therefore,

suppliers might not be willing to provide materials in credit or customers might tend to switch to other firms due to possible loss of future benefits of the products such as warranties. These costs lead to loss of suppliers and market share, which accelerate the process to bankruptcy. Therefore, Trade-off Theory suggests that there should be some optimal point of leverage for firms considering benefits of tax shield and costs of financial distress.

Secondly, Pecking Order Theory developed by Myers and Majluf (1984) focuses on asymmetric information between outside investors and managers which acts in the interest of shareholders. It is assumed that managers have more information than outside investors on the true value of future investments. In the presence of asymmetric information, if managers issue equity to invest, outside investors regard this as a pessimistic signal about the true value of investment opportunity. Therefore outside investors require some premium on equity, which increases the cost of equity. The same mechanism is also valid for debt issuance. However, since the sensitivity of debt value to information is smaller than that of equity value, required premium for debt compared to equity is lower. Besides information asymmetry, the costs of issuing debt and equity such as underwriting fees contribute to the increase in costs. These transaction costs might be significant especially for small firms. Therefore, issuing equity is more expensive than issuing debt. By the same logic, issuing debt is more costly than using internal funds. This theory suggests a hierarchy in the use of funds from internally generated funds to debt and then equity. Another important point in presence of asymmetric information is to pass up positive NPV projects, which reduces the potential firm value. The theory suggests that the existence of financial slack or existence of a credit line limits the negative consequences of asymmetric information since firms might use these funds for future investment opportunities without issuing equity. Additionally, if firms have high level of assets in place, then they are more likely to suffer from asymmetric information.

2.2   Related Empirical Literature

There are numerous studies on determinants of firm level leverage, each employing different data, different time horizons and a variety of approaches which may result in non-overlapping conclusions. Nevertheless, the evolution of empirical studies has been definitely in the direction of considering industry-specific and macroeconomic dimensions rather than relying just on the firm-specific variables. In general, it is fair to conclude that firm leverage is determined by similar cross-firm determinants in different countries, although there are significant country-specific differences as stated by Kalemli-Özcan et al. (2012).

Bradley et al. (1984) state that there are strong industry influences on firm leverage ratios and earnings volatility is an inverse determinant of firm leverage. The intensity of

R&D and advertising expenditures are also inversely related to firm leverage according to their analysis.

Titman and Wessels (1988) find out that firms with specialized or unique products have lower leverage ratios and smaller firms have significantly higher leverage ratios. They also find some support for a negative association between profitability and leverage.

Rajan and Zingales (1995) study G7 countries and identify that firm leverage was more similar than previously thought. Their results reveal that firm size, tangibility, firm growth opportunities and profitability are relevant drivers of firm-level leverage. Moreover, they underline that theoretical underpinnings of these drivers were not crystal clear.

Faulkender and Petersen (2005) find that non-financial firms that have a debt rating, which can be considered as an indication of access to public bond markets, have significantly higher leverage levels even after controlling for firm characteristics.

Huang and Song (2006) study capital structure of listed firms in China. Their study reveals that firm leverage increases with size, fixed assets and industry leverage, but decreases with profitability, non-debt tax shields and growth opportunities. Another finding is that Chinese firms were working with lower levels of long-term debt.

In another study employing the data of 42 different countries, de Jong et al. (2008) conclude that firm-specific determinants of leverage vary across countries and country-specific effects not only directly influence capital structure of firms but also have indirect effects since they influence the roles of firm-specific determinants. However, in general tangibility and size are positively correlated with leverage whereas growth opportunities and profitability negatively affect firm leverage.

Frank and Goyal (2009) study capital structure of public American firms from 1950 to 2003. They state that median industry leverage, tangibility, log of assets and expected inflation positively affect market leverage. Profitability and market-to-book assets ratio negatively affect market leverage. When they consider book leverage, results are similar but the impact of firm size, market-to-book ratio and inflation become unreliable.

Brav (2009) studies a large UK data set of public and private firms. His results for public firms are similar to existing literature, suggesting that firm size and tangibility are positively and profitability and growth opportunities are negatively related to firm leverage. There are apparent differences between public and private firms regarding the sensitivity of leverage to its determinants. Private firms work with higher leverage as a result of private equity being more costly compared to public equity.

Güngöraydınoğlu and Öztekin (2011) study the determinants of capital structure by employing data on firms across 37 countries. Despite institutional arrangements matter, two-thirds of the variation in capital structure across countries is driven by firm-level variables. The most relevant firm-specific variables are liquidity, profitability, tangibility and size. Industry leverage is another important determinant.

Kühnhausen and Stieber (2014) use a large data set including firms from Japan, USA and European countries. Their analysis concludes that firm size, industry leverage, industry growth and tax shield positively affect leverage whereas profitability and liquidity have negative effects on leverage.

There is also a large body of literature focusing on Turkish firms. Durukan (1997) studies Turkish public firms for the period 1990-1995. Her findings reveal that business risk, profitability and non-debt tax shield are inversely related to leverage whereas firm size and tax rate are positively associated with leverage.

Sayılgan et al. (2006) analyze corporate capital structure decisions of listed Turkish manufacturing firms for the period between 1993 and 2002. According to their study, firm size and growth in total assets are positively associated with the leverage and profitability, tangibility, non-debt tax shields and growth in plant, property and equipment are inversely related to debt level.

Aydın et al. (2006) present a descriptive study of corporate sector financial structure using the Company Sector Accounts compiled by CBRT. The corporate sector is found to be excessively leveraged with a relatively low level of tangibility. Moreover, firms rely heavily on short term debt and foreign currency denominated debt.

Okuyan and Taşçı(2011) try to explain the determinants of capital structure for the largest 1000 industrial firms compiled by Istanbul Chamber of Industry. Their analysis employs only firm-specific variables and neither industry-specific nor macroeconomic variables are examined. They conclude that both profitability and asset size are negatively associated with firm leverage. On the other hand, value-added is positively associated with firm leverage.

Tomak (2013) studies the impact of overconfidence on capital structure for listed manufacturing firms in Turkey. The analysis reveals that firm size, tangibility, profitability and GDP growth have significant impact on leverage. On the other hand, there is no clear relationship between management confidence and firm leverage.

Köksal and Orman (2014) use a comprehensive firm-level data set which includes public and private firms in Turkey up to 2009. They provide evidence that firm size, potential debt tax shield, industry mean leverages and inflation are positively whereas profitability, business risk and GDP growth are negatively correlated to leverage. In their analysis, capital flows affect firm leverage positively, however this effect is not statistically significant for public firms.

3   Data and Methodology

This section is composed of three sub-sections. Firstly, we present definitions of the variables used in this study with their expected impact on leverage. Secondly, descriptive statistics are presented for the variables and lastly, we present the methodology used in

the study.

3.1 Variable Definition

The variables used to explain the determinants of capital structure can be classified as firm-specific, industry-specific and macroeconomic variables. Book and market leverages are used as dependent variables in this study. Detailed definitions are presented in Table 1.

3.1.1 Firm Specific Variables

Book Leverage: Most commonly used version of the book leverage is defined as the ratio of the book value of total interest bearing liabilities to the book value of total assets. The liabilities due to operations are not included in book leverage calculation. Since both variables in the definition are in book values, it is not affected by changes in the market value of equity directly. It is possible that book leverage might be greater than one due to negative earnings and erosion of the book value of equity. However, in the context of the paper we exclude observations with book leverage greater than one. Book leverage is also divided into two parts: long-term and short-term leverage. Short (long) term leverage is the ratio of short(long) term debt to total assets, where short-term debt refers to the debt with an original maturity less than 1 year.

Market Leverage: The second leverage measure used in this study is market leverage. It is defined as the ratio of book value of total interest bearing liabilities to the total of book value of debt and market cap of firms. Although it is more convenient to use the market value of debt rather than the book value of debt, the market value of debt is not available. Thus, market measure of leverage is commonly defined in this way. Market leverage cannot be greater than one since the market value of equity is the discounted value of expected cash flows and it cannot be negative. Since market leverage is based on market prices, it seems to be a more reliable measure for the riskiness of firms. Short-term and long-term market leverage are defined in the same way as we did in book leverage.

Profitability: Profitability is defined as the ratio of operating income to the book value of total assets. Since operating income does not cover expenses due to capital structure and it is related to operations, it is thought to be a good measure of profitability. Pecking Order Theory suggests that profitable firms are able to create cash flows to finance their future investment expenditures so that they are expected to have less debt. According to Trade-off Theory, profitable firms are expected to have higher leverage to reduce tax expenses. Although the theories provide different views for the effect of profitability on leverage, most of the empirical evidence shows a negative relation between profitability and leverage, which supports the predictions of Pecking Order Theory.

Size: Size is defined as the natural logarithm of total assets. Another commonly used

measure for size is the natural logarithm of sales. However, we prefer to use the first definition since sales might be quite high for some industries with low sales turnover and it might be misleading to compare them to the ones with relatively high sales turnover. Trade-off Theory predicts that larger firms have opportunity to diversify their investment and they might have stable cash flows. Therefore, default probability for these firms is expected to be lower than small firms, which reduces financial distress costs. Additionally, large firms have better bargaining power over their creditors and they can benefit from economies of scale. Therefore, Trade-off Theory suggests a positive relation between size and leverage. In contrast to Trade-off Theory, Pecking Order Theory predicts a negative relation between size and leverage since smaller firms are more likely to suffer from asymmetric information. However, most empirical studies show a positive relation between size and leverage, which supports Trade-off Theory.

Liquidity: The ratio of cash and cash equivalents to total assets is used as the measure of liquidity. Pecking Order Theory suggests that the existence of financial slack reduces the costs of information asymmetry, therefore liquidity is expected to influence leverage ratio in a negative way. In other words, internally generated cash flows should be the first choice in financing decisions. Trade-off Theory suggests a positive relation between liquidity and leverage ratio since higher levels of liquidity reduce the financial distress costs and higher levels of debt can be achieved. Empirical studies indicate a negative relation between liquidity and leverage ratio, supportive of Pecking-Order Theory.

Tangibility: Tangibility is defined as the ratio of the book value of net fixed assets to the book value of total assets, which is consistent with the definitions in the literature. Trade-off Theory suggests that expected relation between leverage and tangibility is positive due to the collateral value of net fixed assets. The collateral value of net fixed assets reduces lenders' risk hence the cost of financial distress. Even if these assets are not used as collateral, these assets are likely to lead to higher recovery rates in case of default. Pecking Order Theory also implies positive relation between tangibility and leverage since assets in place increases the costs of asymmetric information and firms tend to use more debt. Empirical studies also show a positive relation between tangibility and leverage ratio.

Growth Opportunity: There are two main measures for growth opportunity. One of them is the growth in sales whereas the second is the price-to-book ratio. The first indicator gives more information about past growth trends whereas the second one refers to possible growth opportunities in the future. In this regard, it is believed that book-to price ratio of equity seems a more reasonable variable to reflect growth opportunities. Pecking Order Theory suggests a positive relation between growth opportunities and leverage since growth firms are more likely to suffer from asymmetric information. On the other hand, Trade-off Theory predicts a negative relation since growth firms are likely to have greater financial distress costs. Empirical evidence is ambiguous.

Business Risk: There are two common measures used to reflect business risk. The first one is the standard deviation of free cash flows to total assets ratio whereas the second one is the standard deviation of operating income to total assets. In our study, the second ratio is used to measure the business risk. Both Trade-off and Pecking Order Theories suggest a negative relation since it is a measure for financial distress and firms with high level of business risk are likely to suffer more from information asymmetry. Empirical evidence on the relation between business risk and leverage ratio generally indicates a negative association.

3.1.2 Industry-Specific Variables

Industry Average Leverage: The tendency of an industry is an important factor for the capital structure decisions of firms in that industry. Trade-off Theory suggests a positive relation between industry average leverage and firm leverage. Pecking Order Theory does not provide a clear hint on the issue. The measure for industry average leverage used in this study is the asset size weighted average of firm leverage in that industry. It is also calculated for short-term and long-term debt separately.

3.1.3 Macroeconomic Variables

Besides firm-specific and industry-specific factors, macroeconomic conditions are likely to influence leverage ratios. The most common macroeconomic variables used in the previous studies are inflation, GDP growth and corporate income tax rate. In addition to these variables, we also include capital flows as an additional explanatory variable following Köksal and Orman (2014).

Inflation: The percentage change in the Consumer Price Index is used as the measure of inflation. Inflation might influence leverage from several points. According to Trade-off Theory, an increase in inflation might induce firms towards leverage due to deductibility of interest expenses. In that sense, the higher the inflation, the more incentive to raise debt in order to deduct more interest expenses. However, if interest rates increase more than inflation, then the benefits decline. Additionally, keeping other factors constant, an increase in inflation is expected to increase total asset size due to higher net income; through this channel, leverage ratio might decline. Pecking Order Theory has no prediction for the effects of inflation on leverage.

GDP Growth: GDP growth at constant prices is used as the measure of economic activity. Based on Pecking Order Theory, an increase in economic activity is likely to increase investment opportunities relatively more than internal funding and firms use more of external resources, which translates into a positive relation. On the other hand, Trade-off Theory suggests a negative relationship due to the insufficiency of tangible assets to investment opportunities.

Capital Flows: The ratio of net financial flows to nominal GDP is used as the measure of capital flows. Capital flows are expected to increase leverage through the ease in lending conditions. However, capital flows might also have secondary effects such as the increase in asset prices and this channel is likely to reduce the leverage, especially the market leverage. Besides, if firms have foreign debt in their balance sheet, appreciation of domestic currency together with the increase in capital flows is likely to reduce domestic value of foreign debt so that leverage ratio might further decline. Considering all of these, the effect of capital flows on leverage seems to be ambiguous.

Corporate Tax Rate: According to Trade-off Theory, corporate tax rate is expected to influence leverage positively since it allows more tax deduction. However, the magnitude of this effect depends on other factors such as personal income tax, non-interest tax shields and potential debt tax shields. Pecking Order Theory has no clear implications for the effects of corporate tax on leverage.

3.2 Descriptive Statistics

Our data includes nonfinancial firms listed in Borsa Istanbul (BIST) from 1994 to 2014.[1] We consider only public firms for a variety of reasons. Firstly, market leverage might be a better measure for riskiness of a firm and managers tend to respond to changes in market leverage rather than book leverage. Since market leverage is not observable for most of private companies, we only consider public firms. Additionally, the quality of data for public firms is more reliable than that of private firms since financial statements of public firms are regularly audited and controlled. Therefore, we use only the data on public firms to investigate the determinants of firm-specific, industry-specific and macroeconomic variables. However, it should be kept in mind that there might be some differences between public and private firms.

Financial companies including banks, insurance companies, financial leasing and factoring firms are excluded from our data since high leverage is the norm for these firms and financial statements of financial and nonfinancial firms are not comparable. Firms in agricultural sector are also disregarded. In addition to that, we exclude observations with negative book value of equity. Lastly, variables used as explanatory variables are winsorized at each tail at 1 percent to remove outliers in the data set.

Descriptive statistics for each variable used in the study are displayed in Table 2. It presents mean, median, standard deviation, first and third quantile, and extremum values for each variable used in the study. Descriptive statistics show that the book leverage (market leverage) for the whole sample is on average 20 percent (23 percent). Additionally, short-term leverages are higher than long-term leverages.

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[1] Data source for firm and industry specific variables is Bloomberg. Macroeconomic variables are obtained from CBRT.

Correlation matrices presented in Table 3 and Table 4 show that firm-specific factors have low correlations with each other whereas macroeconomic variables tend to have relatively higher correlations with each other. We observe variation in distribution of each firm-specific variable. For this reason, we also present histogram figures for each firm-specific variable for the year 2014 in Figure 1. [2]

Although leverage measures seem to be low on average, dispersion of them across firms is also an important concern for financial stability. The histogram of book leverage shows that there are some firms operating with leverage ratio more than 50 percent. However, significant number of firms have book leverage ratios between 0 and 10 percent.

We classify firms under different industries rather than categorizing into manufacturing and non-manufacturing as in previous studies. We used the classification criteria of Capital Markets Board of Turkey. There are 14 different industries: weaving industry, electricity, gas and water industry, food, beverages and tobacco industry, holding companies, services industry, paper and paper products industry, chemistry products industry, mining industry, basic metal industry, metal equipment industry, forest products industry, stone and sand products industry, technology industry, and construction industry. Figure 2 and Figure 3 show the evolution of asset weighted book and market leverages for these industries over time. As one can easily observe, there is a strong heterogeneity across industries. Electricity, gas and water industry has the highest level of book and market leverage whereas mining industry has the lowest level of book and market leverage. Additionally, figures show that leverage ratios show significant variation over time. During the 2008 global financial crisis, a decrease in leverage ratios is observed in almost all industries. However, changes in leverage tend to differ across industries since the crisis. For instance, while we observe an increase in weaving industry and paper & paper products industry leverage ratios, there is a decline in leverage for construction and mining industries. Looking at the overall book and market leverage, it is observed that during times of crisis (1999, 2001 and 2008) the leverage ratios tend to decline and in post-crisis periods we observe increase in leverage ratios to some extent.

3.3 Methodology

We follow the previous research and regress firm leverage on relevant firm-specific, industry-specific and macroeconomic variables. We employ the following three models respectively.

Pooled OLS:

$$L_{i,t} = \alpha + \beta X_{i,t-1} + \gamma Y_{i,t-1} + \rho Z_t + \epsilon_{i,t} \tag{1}$$

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[2]Distribution of market leverage across firms is very similar to that of book leverage. Thus we only present the histogram of book leverage.

Pooled OLS with Industry Dummies:

$$L_{i,t} = \alpha + \beta X_{i,t-1} + \gamma Y_{i,t-1} + \phi IND_{i,t} + \rho Z_t + \epsilon_{i,t} \tag{2}$$

Firm Fixed Effects:

$$L_{i,t} = \alpha + \beta X_{i,t-1} + \gamma Y_{i,t-1} + \rho Z_t + \mu_i + \epsilon_{i,t} \tag{3}$$

Here, i, t denote firm and time respectively. L is the leverage ratio of the firm and we use total, short-term and long-term leverages. X, Y, Z stand for the vectors of firm-specific, industry-specific and macroeconomic variables. IND is the industry dummy and μ_i is the firm fixed effect. We lag firm-specific and industry-specific variables to reduce endogeneity issues.

Pooled OLS regression ignores firm heterogeneity, but serves as a starting point. In order to capture the impacts of industry, we employ industry dummies. However, since these dummies create collinearity with firm-fixed effect, we study industry effect with pooled OLS regression. Lastly, to take into account firm heterogeneity, we do fixed effects regression.

We estimate the equations with heteroscedasticity and serial correlation robust standard errors, which are calculated using the Newey-West methodology (Newey and West, 1987).

4 Empirical Results

Tables from Table 5 to Table 10 demonstrate the empirical results based on model specifications. Table 11 compares our results with theoretical predictions. We list the findings on each variable below.

Profitability: Profitability is statistically significant in all specifications when the dependent variable is total leverage. We see that it is negatively associated with both book and market leverages of firms. It is consistent with previous empirical studies on capital structure of Turkish non-financial firms. When we use short and long-term leverage ratios as dependent variables, it is observed that the impact of profitability on short-term leverage is more pronounced. It can be interpreted that firms with higher profitability tend to use their internal funds firstly, which is in line with Pecking Order Theory.

Size: Firm size is positively related with both book and market leverages of firms in line with previous studies. The impact is statistically significant in all specifications except when the dependent variable is short-term leverage and we employ pooled OLS. The results indicate that larger firms tend to use external funds more, particularly long-term borrowing. This finding is consistent with Trade-off Theory.

Liquidity: Similar to profitability, liquidity has negative effects on total book and market leverages. This impact is statistically significant under all specifications. We also observe that short-term leverage seems to be much more sensitive to liquidity than long-term leverage.

Tangibility: We observe that the impact of tangibility on total leverage is statistically significant and it is positively related to leverage in most of the specifications. However, tangibility loses its statistical significance in fixed effects specification. This finding is consistent with both Trade-off and Pecking Order Theories. More importantly, the effect of tangibility differs for short and long-term leverages. Although it affects the long-term leverage positively, it is negatively associated with the short-term leverage.

Growth Opportunity: The effect of growth opportunity on leverage ratios is not clear. When we use book leverage as dependent variable, it is statistically insignificant under all specifications. However, it becomes statistically significant and negatively correlated with total and short-term leverage when we work with market leverage and pooled regressions.

Business Risk: We could not detect a definite impact of business risk on leverage. It is statistically insignificant under all specifications.

Industry Average Leverage: Industry average leverage seems to be positively associated with firm leverage. This becomes more pronounced and statistically significant when we employ pooled regression and obviously it tends to lose statistical significance when we control for industry and firm effects. This might also stem from our approach of detailed industry definition rather than imposing broad industry definitions as in previous studies. However, this finding is much more robust when we use book leverage as dependent variable. In general, the results are consistent with Trade-off Theory.

Inflation: Inflation influences book and market leverage positively and it is statistically significant in all specifications except when we employ pooled regression with industry dummies, market leverage being the dependent variable. This finding on the effect of inflation is consistent with previous findings. It indicates that firm leverage tends to increase when inflation increases, which is in line with Trade-off Theory.

GDP Growth: GDP growth is negatively associated with leverage, in line with Trade-off Theory. However, when the dependent variable is market leverage, it is only statistically significant when we employ pooled regression with industry dummies. Thus, its impact on book leverage is more pronounced.

Capital Flows: Results regarding the effect of capital flows on leverage are mixed. When we use book leverage, its effect is positive and statistically significant in all specifications. However, in case of market leverage, capital flows are statistically significant only in fixed effects regression and its impact is negative. Although capital flows tend to decrease the domestic value of foreign currency debt, the effect of capital flows on book leverage is still positive. Thus, it can be inferred that firms tend to increase their

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borrowing in times of increasing capital flows. However, increasing capital flows are also associated with increase in share prices; therefore they lead to a rise in the market value of equity, which in turn reduces market leverage. The results indicate that the effect of capital flows through valuation channel must be seriously considered while analyzing market leverage.

Corporate Tax Rate: The effect of corporate tax rate on firm leverage is ambiguous. In half of the specifications, the impact of corporate tax rate on total leverage is statistically insignificant and the sign of the coefficient differs depending on model specification. When we control for firm fixed effects, we observe that it is positively correlated to the total and short-term leverage and negatively associated with the long-term leverage.

Industry Dummies: The results from pooled regression with industry dummies show that there exists a strong heterogeneity among industries even after controlling firm specific and macroeconomic factors. Industry effects are more pronounced for market leverage. However, industry dummies for holding companies, services, chemistry products, mining, basic metal, stone and stone products, and technology are statistically significant in both book and market leverage.

The regression results indicate that all firm specific variables except growth opportunities have the same sign for both market and book leverage. On the other hand, the effect of macroeconomic variables, in particular capital flows, tends to show differences for market and book leverages. Another important finding is that while studying firm leverage, it may not be sufficient to use general industrial categorizations. Rather, it is reasonable to use more specific sub-industry categorizations. Overall, our results provide supporting evidence for both Trade-off Theory and Pecking Order Theory. Nevertheless, similar to Köksal and Orman (2014) our results favor Trade-off Theory.

Since Turkey is a highly dynamic emerging market, it is possible that considering different time frames could produce different results. Thus, we run recursive regressions to see the evolution and stability of the parameter estimates, starting with the initial period of 1994 to 1999 using firm fixed effects specification.[3] Nevertheless, as it can be seen in Figures 4 and 5, the coefficient estimates are fairly stable for the period after 2002.[4] The parameter estimates are statistically significant for all sub-periods after 2002, which shows the robustness of our estimations in general. It can be said that the global financial crisis did not leave a dramatic mark on capital structure decisions of Turkish nonfinancial public firms.

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[3]Equation 3 in Methodology section.

[4]Stability may be defined in many ways. Here we use rather a crude approach. What we mean by stability is that estimated coefficients stay statistically significant and close to the estimated coefficient for the whole period.

5 Robustness Checks

We perform several robustness checks in order to see the stability of our results. In this respect, firstly we employ current levels of firm specific and industry specific variables rather than lagged values although there might be endogeneity problems under this alternative specification. We do not report the results for this alternative specification but the parameter estimates do not differ substantially.

Secondly, we add time dummies to our model specifications for considering time fixed effects. However, since for a given year the values of macroeconomic variables do not show any variation across firms, this creates a collinearity problem. Dropping out macroeconomic variables and including time fixed effects do not alter our results for firm-specific and industry-specific variables.

Lastly, we control for possible bias due to the exit or entrance of some firms to the sample. To this end, we run regressions for the firms having data for a period of more than different thresholds, such as 5, 10 and 15 years. Our results show that the coefficients are robust against different data availability.

6 Conclusion

Our results indicate that firm-specific factors have similar effects on book and market leverage except growth opportunity. Besides, it is observed that some of firm-specific factors have different impacts on short and long-term leverage ratios. Size is more related to long-term leverage and its effect on short-term leverage is smaller. Additionally, the effect of tangibility changes for short and long-term leverage ratios. The other firm-specific factors have similar effects on firm leverage. It can be interpreted that fundamental variables like size and tangibility have more effect on long-term firm leverage whereas the effects of profitability and liquidity are more pronounced in short-term leverage ratios. It is observed that firms tend to follow their peers in their capital structure decisions. Lastly, most of the industry dummies are found to be statistically significant, indicating a difference in leverage decisions across industries.

The effect of macroeconomic variables is somewhat ambiguous. There seems to be a positive association between inflation and leverage. It may imply that keeping inflation low and stable also contributes to macro financial stability. On the other hand, the effect of GDP growth on firm leverage is negative. Lastly, the results on capital flows show that capital flows are negatively associated with market leverage whereas it is positively related to book leverage. Even though the value of foreign currency denominated debt decreases during times of rapid capital inflows due to the appreciation of Turkish Lira, book leverage tends to increase, which might be interpreted that firms tend to increase their debt level during rapid capital inflows. While rapid capital flows result in increase

in asset values, at the same time it rises the market value of assets and reduces market leverage.

Lastly, recursive regression results indicate that time evolution of parameters is fairly stable and they are found to be statistically significant for all sub-periods after 2002. However, it is observed that the estimates of some variables, in particular macroeconomic variables, seem to change over time.

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Tables and Figures

Table 1: Variable Definitions

Firm Specific Variables	
Book Leverage	Short and Long Term Borrowings / Total Assets (%)
Short Term Book Leverage	Short Term Borrowings / Total Assets (%)
Long Term Book Leverage	Long Term Borrowings / Total Assets (%)
Market Leverage	Short and Long Term Borrowings / (Debt + Market Cap) (%)
Short Term Market Leverage	Short Term Borrowings / (Debt + Market Cap) (%)
Long Term Market Leverage	Long Term Borrowings / (Debt + Market Cap) (%)
Profitability	Operating Income / Total Assets (%)
Size	Natural Logarithm of Total Assets
Liquidity	Cash and Cash Equivalence / Total Assets (%)
Tangibility	Net Fixed Assets / Total Assets (%)
Growth	Price to Book Ratio of Equity
Business Risk	Standard Deviation of Profitability (Last Three Years)
Industry Specific Variables	
Industry Leverage	Book (Market) Leverage for the Industry (weighted by total assets / market value of total assets)
Short Term Industry Leverage	Short Term Book/Market Leverage for the Industry (weighted by total assets / market value of total assets)
Long Term Industry Leverage	Long Term Book/Market Leverage for the Industry (weighted by total assets / market value of total assets)
Macroeconomic Variables	
Inflation	Annual CPI Inflation (%)
GDP	Annual Growth of Real GDP (%)
Capital Flows	(FDI + Portfolio Flows + Other Investment) / GDP (%)
Corporate Tax Rate	Corporate Tax Rate

Table 2: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Min	Max	First Quartile	Median	Third Quartile
Short Term Book Leverage	2810	12.442	13.256	0	79.665	1.754	8.351	18.954
Long Term Book Leverage	2810	7.805	11.073	0	62.623	0	2.439	12.145
Book Leverage	2810	20.247	18.171	0	84.907	3.856	17.007	32.029
Short Term Market Leverage	2848	14.248	15.551	0	92.474	1.502	8.95	22.333
Long Term Market Leverage	2844	8.805	12.84	0	74.154	0	2.697	13.222
Market Leverage	2853	23	21.663	0	96.741	3.417	17.649	37.426
Size	2810	5.493	1.576	2.127	10.997	4.387	5.298	6.381
Profitability	2810	8.199	10.693	-18.008	48.81	1.052	6.356	13.656
Tangibility	2810	33.276	20.18	0	87.793	17.587	31.958	47.763
Growth	2810	1.489	1.847	0.031	20.427	0.548	1.024	1.76
Business Risk	2810	5.444	4.615	0.204	26.65	2.071	3.922	7.689
Liquidity	2810	8.312	9.708	0.013	54.1	1.203	4.598	12.366
Short Term Industry Book Leverage	2810	11.624	7.12	0	42.265	7.366	9.44	14.791
Long Term Industry Book Leverage	2810	11.432	7.749	0.017	53.378	5.566	9.824	15.826
Industry Book Leverage	2810	22.969	11.184	0.198	64.025	14.682	22.111	30.116
Short Term Industry Market Leverage	2931	11.615	9.108	0	54.343	5.751	8.347	14.833
Long Term Industry Market Leverage	2931	11.049	8.293	0	62.046	4.859	9.02	15.745
Industry Market Leverage	2931	22.516	14.382	0	76.178	12.429	19.667	29.106
Inflation	21	37.486	35.465	6.25	106.3	8.6	10.44	64.9
GDP	21	3.849	4.918	-5.697	9.363	2.127	5.265	7.191
Capital Flows	21	4.172	3.443	-2.997	8.754	2.347	3.656	7.191
Corporate Tax Rate	21	0.247	0.047	0.2	0.33	0.2	0.25	0.3

Table 3: Correlation Matrix with Book Leverage Measure

	Lev.	ST Lev.	LT Lev.	Prof.	Size	Liq.	Tang.	Growth	B. Risk	Ind. Lev.	ST Ind.	LT Ind.	Inf.	GDP	Cap. Flows	Cor. Tax
Lev.	1															
ST Lev.	0.796	1														
LT Lev.	0.689	0.109	1													
Prof.	-0.119	-0.07	-0.112	1												
Size	0.148	-0.038	0.287	-0.035	1											
Liq.	-0.241	-0.251	-0.095	0.089	0.183	1										
Tang.	0.138	-0.01	0.237	-0.134	-0.002	-0.201	1									
Growth	0.021	-0.012	0.049	-0.064	0.076	0.088	-0.039	1								
B. Risk	-0.057	0.015	-0.111	0.163	-0.312	-0.012	0.04	-0.055	1							
Ind. Lev.	0.404	0.33	0.268	-0.106	0.03	-0.137	0.038	-0.026	-0.086	1						
ST Ind. Lev.	0.343	0.4	0.084	-0.044	-0.083	-0.167	0.028	-0.078	0.003	0.787	1					
LT Ind. Lev.	0.28	0.084	0.359	-0.112	0.129	-0.033	0.068	0.009	-0.113	0.67	0.241	1				
Inf.	0.024	0.088	-0.065	0.464	-0.279	-0.126	-0.004	-0.293	0.263	0.066	0.191	-0.132	1			
GDP	-0.104	-0.122	-0.025	0.002	0.023	-0.003	0.041	0.018	0.045	-0.2	-0.225	-0.034	-0.094	1		
Cap. Flows	-0.026	-0.096	0.073	-0.275	0.236	0.08	-0.064	0.2	-0.31	-0.033	-0.154	0.142	-0.632	0.541	1	
Cor. Tax	-0.039	0.044	-0.116	0.166	-0.255	-0.083	0.127	-0.128	0.4	-0.066	0.076	-0.196	0.457	0.089	-0.525	1

Table 4: Correlation Matrix with Market Leverage Measure

|	Lev.	ST Lev.	LT Lev.	Prof.	Size	Liq.	Tang.	Growth	B. Risk	Ind. Lev.	ST Ind.	LT Ind.	Inf.	GDP	Cap. Flows	Cor. Tax
Lev.	1															
ST Lev.	0.811	1														
LT Lev.	0.705	0.156	1													
Prof.	-0.214	-0.159	-0.168	1												
Size	0.203	0.03	0.306	-0.043	1											
Liq.	-0.234	-0.236	-0.11	0.098	0.176	1										
Tang.	0.117	-0.025	0.226	-0.134	0.003	-0.199	1									
Growth	-0.142	-0.151	-0.057	-0.068	0.079	0.085	-0.039	1								
B. Risk	-0.118	-0.046	-0.144	0.159	-0.309	-0.012	0.04	-0.053	1							
Ind. Lev.	0.364	0.275	0.281	-0.215	0.217	-0.011	-0.009	-0.059	-0.185	1						
ST Ind.	0.322	0.326	0.148	-0.152	0.102	-0.048	-0.031	-0.116	-0.104	0.842	1					
LT Ind.	0.28	0.123	0.323	-0.207	0.263	0.035	0.019	0.024	-0.206	0.81	0.366	1				
Inf.	-0.102	-0.028	-0.138	0.467	-0.283	-0.119	-0.005	-0.294	0.261	-0.245	-0.114	-0.305	1			
GDP	-0.078	-0.093	-0.019	0.004	0.023	-0.001	0.04	0.016	0.043	-0.074	-0.076	-0.046	-0.09	1		
Cap.l Flows	0.038	-0.034	0.106	-0.277	0.239	0.075	-0.064	0.201	-0.311	0.134	0.007	0.228	-0.631	0.539	1	
Cor.Tax	-0.104	-0.021	-0.15	0.168	-0.257	-0.079	0.128	-0.129	0.4	-0.256	-0.098	-0.345	0.457	0.088	-0.525	1

Figure 1: Distribution of Key Variables in 2014
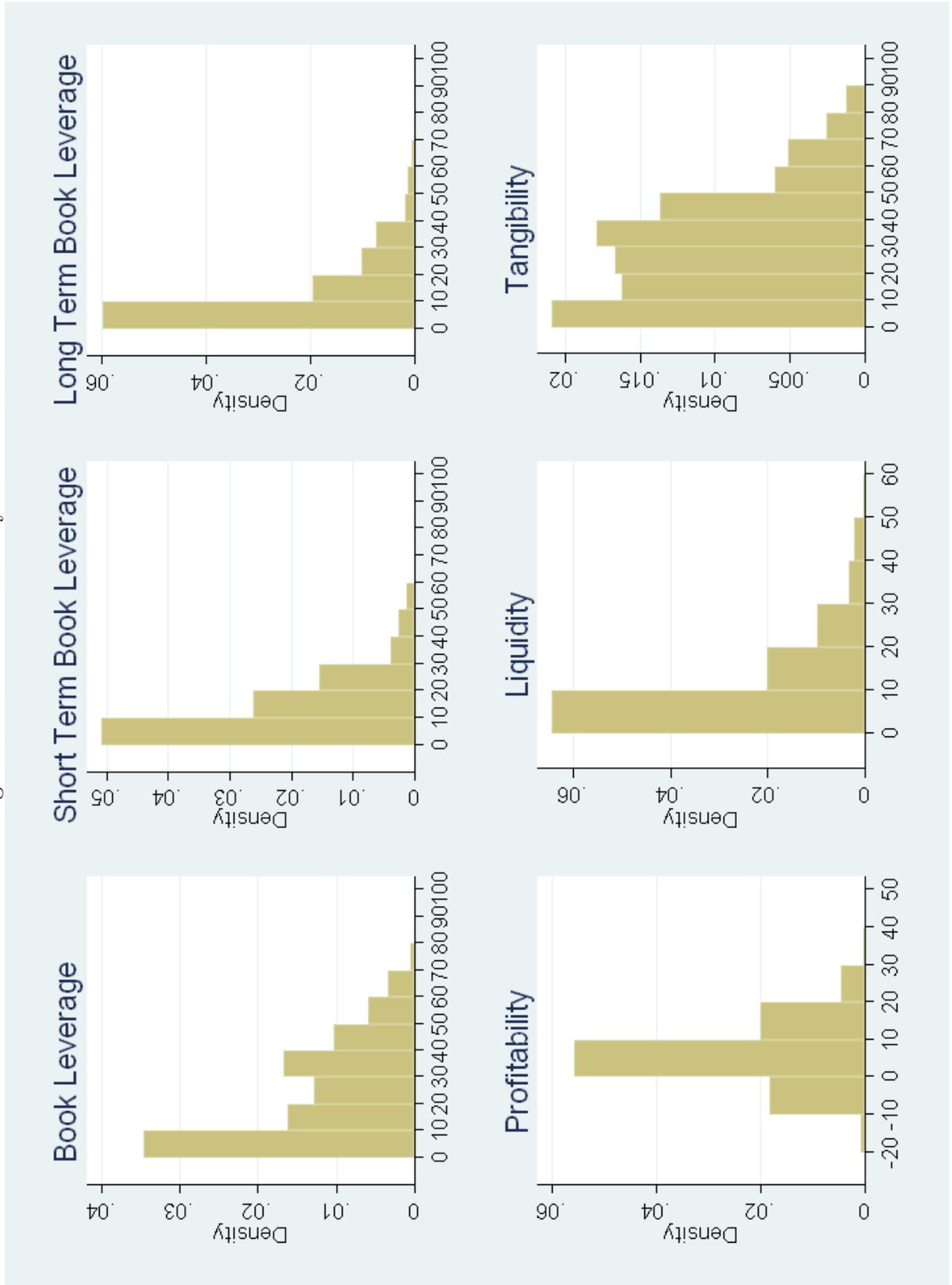
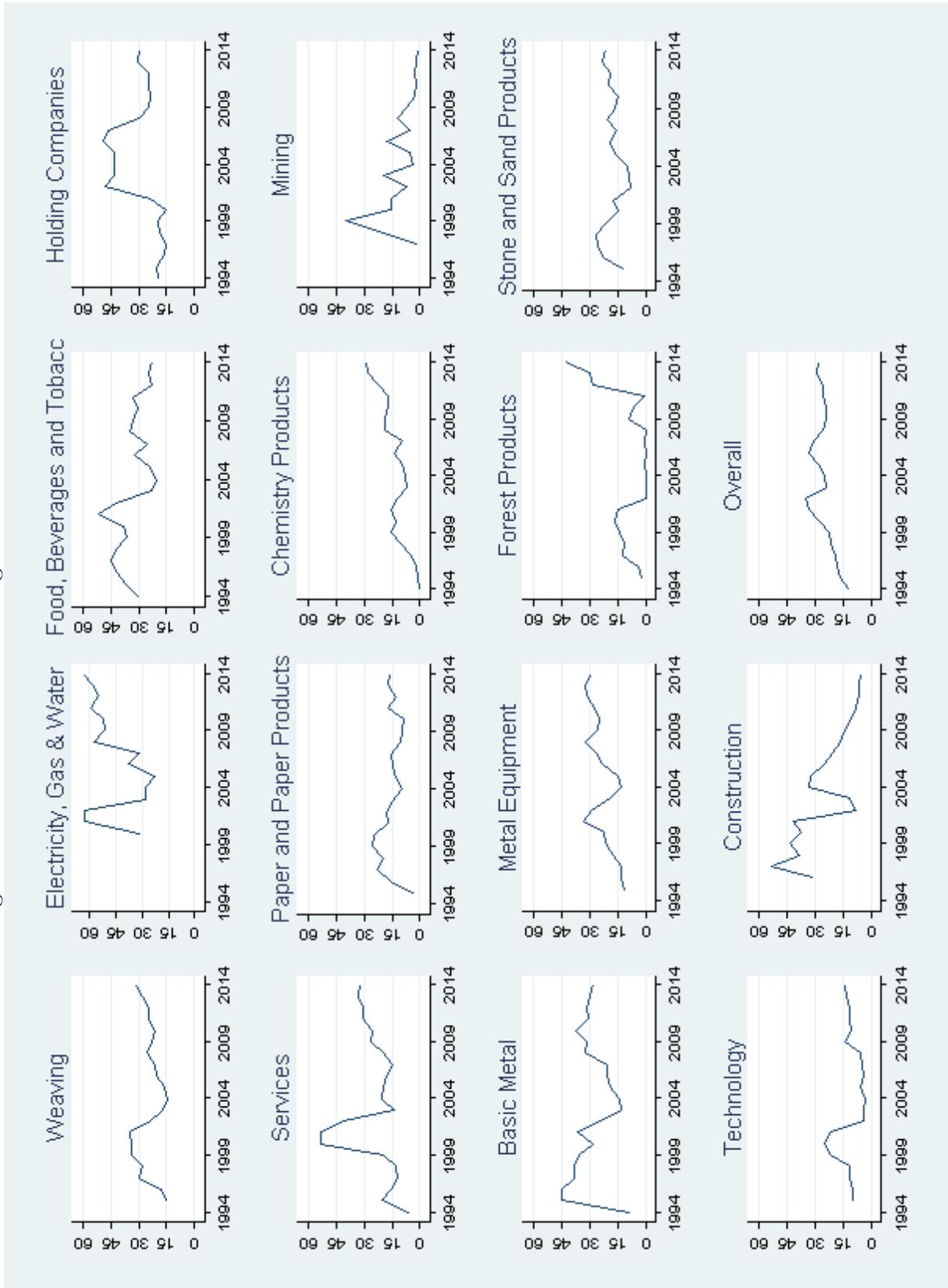Figure 2: Trends in Book Leverage across Industries

Figure 3: Trends in Market Leverage across Industries
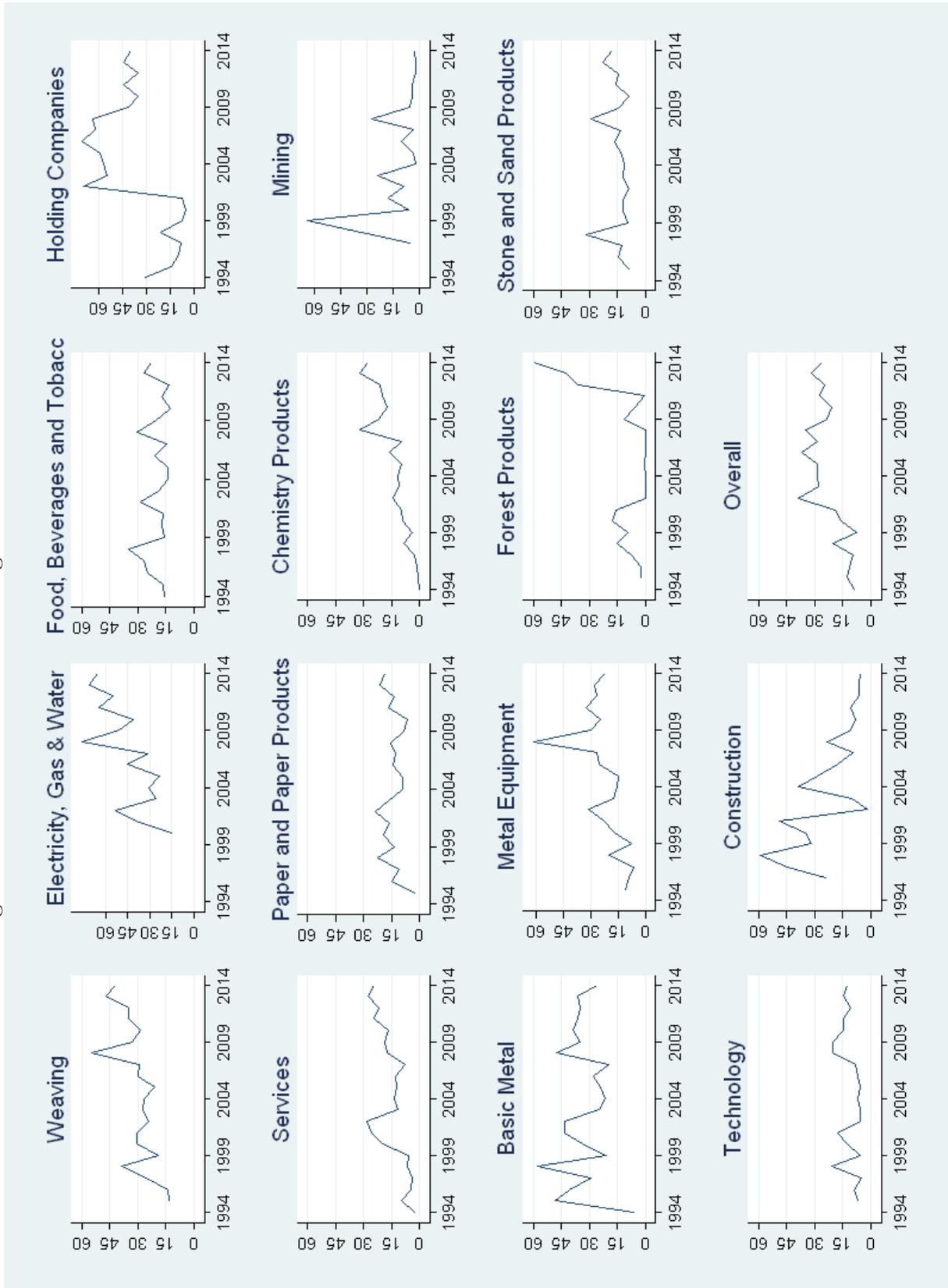
Table 5: Pooled OLS Results

Dependent Variable: Book Leverage

	Total Leverage	Short Term Leverage	Long Term Leverage
Profitability	-0.117***	-0.06*	-0.058**
	(0.041)	(0.032)	(0.023)
Size	2.107***	0.158	1.908***
	(0.361)	(0.251)	(0.229)
Liquidity	-0.407***	-0.316***	-0.087***
	(0.044)	(0.032)	(0.026)
Tangibility	0.066**	-0.039**	0.111***
	(0.03)	(0.02)	(0.018)
Growth	0.109	-0.011	0.138
	(0.202)	(0.102)	(0.13)
Business Risk	0.162*	0.055	0.085
	(0.096)	(0.073)	(0.053)
Industry Average	0.377***		
	(0.05)		
Short Term Industry Average		0.414***	
		(0.066)	
Long Term Industry Average			0.267***
			(0.049)
Inflation	0.121***	0.056***	0.061***
	(0.025)	(0.018)	(0.015)
GDP	-0.493***	-0.367***	-0.123**
	(0.102)	(0.081)	(0.06)
Capital Flows	0.658***	0.311**	0.316***
	(0.188)	(0.14)	(0.117)
Tax Rate	-6.037	2.177	-14.437**
	(11.477)	(8.546)	(6.595)
Constant	-1.519	9.031***	-7.779***
	(4.075)	(3.086)	(2.35)
Number of Observations	2648	2627	2573
Adjusted R-Square	0.178	0.146	0.182

Newey-West (HAC) standard errors are presented in parentheses.
*, **, *** denote for statistical significance at 1%,5% and 10% respectively.

Table 6: Pooled OLS with Industry Dummies
Dependent Variable: Book Leverage

	Total Leverage	Short Term Leverage	Long Term Leverage
Profitability	-0.093**	-0.058*	-0.034
	(0.041)	(0.032)	(0.023)
Size	2.386***	0.303	1.997***
	(0.38)	(0.273)	(0.232)
Liquidity	-0.376***	-0.282***	-0.092***
	(0.043)	(0.031)	(0.026)
Tangibility	0.073**	-0.047**	0.122***
	(0.032)	(0.023)	(0.018)
Growth	0.142	0.01	0.137
	(0.207)	(0.104)	(0.134)
Business Risk	0.125	0.004	0.109**
	(0.098)	(0.072)	(0.055)
Industry Average	0.246***		
	(0.056)		
Short Term Industry Average		0.264***	
		(0.07)	
Long Term Industry Average			0.167***
			(0.048)
Inflation	0.126***	0.057***	0.063***
	(0.025)	(0.018)	(0.015)
GDP	-0.526***	-0.383***	-0.146**
	(0.1)	(0.081)	(0.058)
Capital Flows	0.658***	0.305**	0.327***
	(0.184)	(0.139)	(0.114)
Tax Rate	-4.615	6.613	-16.523***
	(11.273)	(8.361)	(6.432)
Electricity, Gas, Water	5.754	-4.606*	12.482***
	(5.108)	(2.669)	(3.349)
Food, Beverages, Tobacco	0.655	1.362	-0.499
	(3.057)	(2.463)	(1.443)
Holding Companies	-7.345***	-6.572***	-0.373
	(2.649)	(2.16)	(1.567)
Services	-6.324***	-4.578**	-0.845
	(2.384)	(1.987)	(1.405)
Paper, Paper Products	-4.579	-4.721**	0.082
	(3.275)	(2.256)	(1.92)
Chemistry Products	-6.734***	-3.86**	-2.671**
	(2.356)	(1.96)	(1.289)
Mining	-13.296***	-9.057***	-4.556***
	(2.53)	(2.21)	(1.309)
Basic Metal	-5.181**	-0.181	-4.114***
	(2.591)	(2.443)	(1.317)
Metal Equipment	-3.548	-3.99**	1.128
	(2.349)	(1.841)	(1.404)
Forest Products	-3.931	-3.927	-0.115
	(5.136)	(3.728)	(2.414)
Stone and Sand Products	-11.665***	-7.966***	-3.183***
	(2.218)	(1.928)	(1.206)
Technology	-5.359**	-5.513***	-0.069
	(2.627)	(2.092)	(1.562)
Construction	-0.779	-4.721	4.373
	(6.6)	(3.346)	(4.208)
Constant	4.243	13.223***	-6.588***
	(4.49)	(3.519)	(2.436)
Number of Observations	2648	2627	2573
Adjusted R-Square	0.217	0.182	0.232

Newey-West (HAC) standard errors are presented in parentheses.
*, **, *** denote for statistical significance at 1%,5% and 10% respectively.

Table 7: Panel Regression with Firm Fixed Effects

Dependent Variable: Book Leverage

	Total Leverage	Short Term Leverage	Long Term Leverage
Profitability	-0.158***	-0.112***	-0.045**
	(0.038)	(0.031)	(0.023)
Size	6.455***	2.827***	3.655***
	(0.664)	(0.496)	(0.45)
Liquidity	-0.174***	-0.131***	-0.046*
	(0.035)	(0.023)	(0.024)
Tangibility	0.018	-0.05**	0.065**
	(0.03)	(0.022)	(0.021)
Growth	0.175	0.014	0.157
	(0.14)	(0.097)	(0.095)
Business Risk	-0.015	-0.022	0.003
	(0.076)	(0.061)	(0.048)
Industry Average	0.192***		
	(0.042)		
Short Term Industry Average		0.24***	
		(0.052)	
Long Term Industry Average			0.14***
			(0.041)
Inflation	0.162***	0.087***	0.072***
	(0.02)	(0.015)	(0.013)
GDP	-0.303***	-0.272***	-0.024
	(0.08)	(0.067)	(0.052)
Capital Flows	0.245*	0.109	0.119
	(0.145)	(0.119)	(0.096)
Tax Rate	21.288**	20.415***	-1.347
	(8.364)	(6.469)	(5.698)
Constant	-38.842***	-11.366***	-26.241***
	(5.21)	(4.009)	(3.526)
Number of Observations	2648	2627	2573
Number of Firms	224	224	224
Adjusted R-Square	0.6349	0.543	0.57

Newey-West (HAC) standard errors are presented in parentheses.
*, **, *** denote for statistical significance at 1%,5% and 10% respectively.

Table 8: Pooled OLS Results

Dependent Variable: Market Leverage

	Total Leverage	Short Term Leverage	Long Term Leverage
Profitability	-0.208***	-0.119***	-0.087***
	(0.047)	(0.036)	(0.025)
Size	2.495***	0.313	2.172***
	(0.43)	(0.289)	(0.265)
Liquidity	-0.513***	-0.387***	-0.123***
	(0.052)	(0.038)	(0.029)
Tangibility	0.04	-0.076***	0.119***
	(0.036)	(0.023)	(0.022)
Growth	-0.459***	-0.394***	-0.055
	(0.176)	(0.094)	(0.113)
Business Risk	0.023	-0.021	0.038
	(0.106)	(0.082)	(0.062)
Industry Average	0.27***		
	(0.048)		
Short Term Industry Average		0.31***	
		(0.06)	
Long Term Industry Average			0.234***
			(0.053)
Inflation	0.06**	0.021	0.041***
	(0.028)	(0.02)	(0.015)
GDP	-0.15	-0.108	-0.03
	(0.118)	(0.091)	(0.066)
Capital Flows	0.134	-0.049	0.195
	(0.228)	(0.166)	(0.138)
Tax Rate	-22.946*	-4.171	-20.098***
	(13.204)	(9.759)	(7.556)
Constant	13.158***	17.922***	-4.726*
	(4.728)	(3.507)	(2.633)
Number of Observations	2579	2574	2571
Adjusted R-Square	0.159	0.126	0.1753

Newey-West (HAC) standard errors are presented in parentheses.

*, **, *** denote for statistical significance at 1%,5% and 10% respectively.

Table 9: Pooled OLS with Industry Dummies

Dependent Variable: Market Leverage

	Total Leverage	Short Term Leverage	Long Term Leverage
Profitability	-0.159***	-0.101***	-0.055**
	(0.046)	(0.035)	(0.024)
Size	2.702***	0.397	2.25***
	(0.467)	(0.319)	(0.273)
Liquidity	-0.473***	-0.345***	-0.127***
	(0.05)	(0.037)	(0.028)
Tangibility	0.071*	-0.065**	0.135***
	(0.038)	(0.025)	(0.022)
Growth	-0.42**	-0.338***	-0.078
	(0.18)	(0.092)	(0.118)
Business Risk	0.007	-0.074	0.076
	(0.11)	(0.08)	(0.064)
Industry Average	0.064		
	(0.054)		
Short Term Industry Average		0.115*	
		(0.068)	
Long Term Industry Average			0.089*
			(0.052)
Inflation	0.033	0.005	0.033**
	(0.029)	(0.02)	(0.016)
GDP	-0.276**	-0.168*	-0.08
	(0.117)	(0.092)	(0.064)
Capital Flows	0.056	-0.105	0.179
	(0.221)	(0.162)	(0.134)
Tax Rate	-26.119**	-1.941	-24.469***
	(12.975)	(9.472)	(7.4)
Electricity, Gas, Water	1.52	-10.903***	12.734***
	(5.974)	(3.314)	(3.839)
Food, Beverages, Tobacco	-8.454**	-5.265*	-2.528
	(3.566)	(2.809)	(1.757)
Holding Companies	-8.736**	-8.75***	-0.142
	(3.487)	(2.796)	(2.023)
Services	-12.778***	-10.35***	-1.458
	(3.06)	(2.602)	(1.733)
Paper, Paper Products	-13.854***	-11.266***	-1.716
	(3.712)	(2.666)	(2.246)
Chemistry Products	-14.789***	-9.187***	-4.722***
	(3.016)	(2.567)	(1.659)
Mining	-22.245***	-15.216***	-6.058***
	(3.287)	(2.855)	(1.817)
Basic Metal	-8.402***	-3.352	-4.88***
	(3.234)	(3.087)	(1.732)
Metal Equipment	-10.431***	-9.506***	-0.393
	(2.881)	(2.381)	(1.664)
Forest Products	-13.369**	-11.054***	-1.616
	(6.193)	(4.18)	(3.142)
Stone and Sand Products	-21.333***	-15.026***	-5.392***
	(2.856)	(2.462)	(1.572)
Technology	-11.281***	-8.584***	-1.808
	(3.605)	(2.951)	(1.994)
Construction	-5.434	-8.894**	4.264
	(7.405)	(4.016)	(4.886)
Constant	28.644***	28.311***	-1.087
	(5.579)	(4.389)	(2.939)
Number of Observations	2579	2574	2571
Adjusted R-Square	0.211	0.177	0.222

Newey-West (HAC) standard errors are presented in parentheses.
*, **, *** denote for statistical significance at 1%,5% and 10% respectively.

Table 10: Panel Regression with Firm Fixed Effects

Dependent Variable: Market Leverage

	Total Leverage	Short Term Leverage	Long Term Leverage
Profitability	-0.18***	-0.138***	-0.04
	(0.043)	(0.034)	(0.025)
Size	8.549***	3.758***	4.747***
	(0.845)	(0.612)	(0.553)
Liquidity	-0.203***	-0.146***	-0.057**
	(0.04)	(0.026)	(0.028)
Tangibility	0.029	-0.048*	0.07***
	(0.036)	(0.026)	(0.026)
Growth	-0.032	-0.104	0.079
	(0.099)	(0.085)	(0.076)
Business Risk	-0.018	-0.02	-0.001
	(0.088)	(0.071)	(0.053)
Industry Average	-0.003		
	(0.036)		
Short Term Industry Average		0.1**	
		(0.044)	
Long Term Industry Average			0.028
			(0.041)
Inflation	0.074***	0.046***	0.037***
	(0.022)	(0.017)	(0.014)
GDP	-0.011	-0.023	0.062
	(0.094)	(0.076)	(0.057)
Capital Flows	-0.555***	-0.395***	-0.133
	(0.172)	(0.14)	(0.109)
Tax Rate	7.255	13.81*	-6.739
	(9.793)	(7.67)	(6.266)
Constant	-28.602***	-4.748	-25.042***
	(7.205)	(5.117)	(4.285)
Number of Observations	2579	2574	2571
Number of Firms	224	224	224
Adjusted R-Square	0.621	0.538	0.568

Newey-West (HAC) standard errors are presented in parentheses.
*, **, *** denote for statistical significance at 1%,5% and 10% respectively.

Table 11: Capital Structure Theories and Our Results

	Trade-off Theory	Pecking Order Theory	Our Results
Profitability	+	-	-
Size	+	-	+
Liquidity	?	?	-
Tangibility	+	+	+
Growth	-	+	?
Business Risk	-	-	?
Industry Average	+	?	+
Inflation	+	?	+
GDP	-	+	-
Capital Flows	?	?	?
Corporate Tax	+	?	?

+/- denote for positive and negative association with leverage respectively, whereas ? stands for inconclusiveness or unavailability.

Figure 4: Recursive Fixed Effects Estimates for Book Leverage
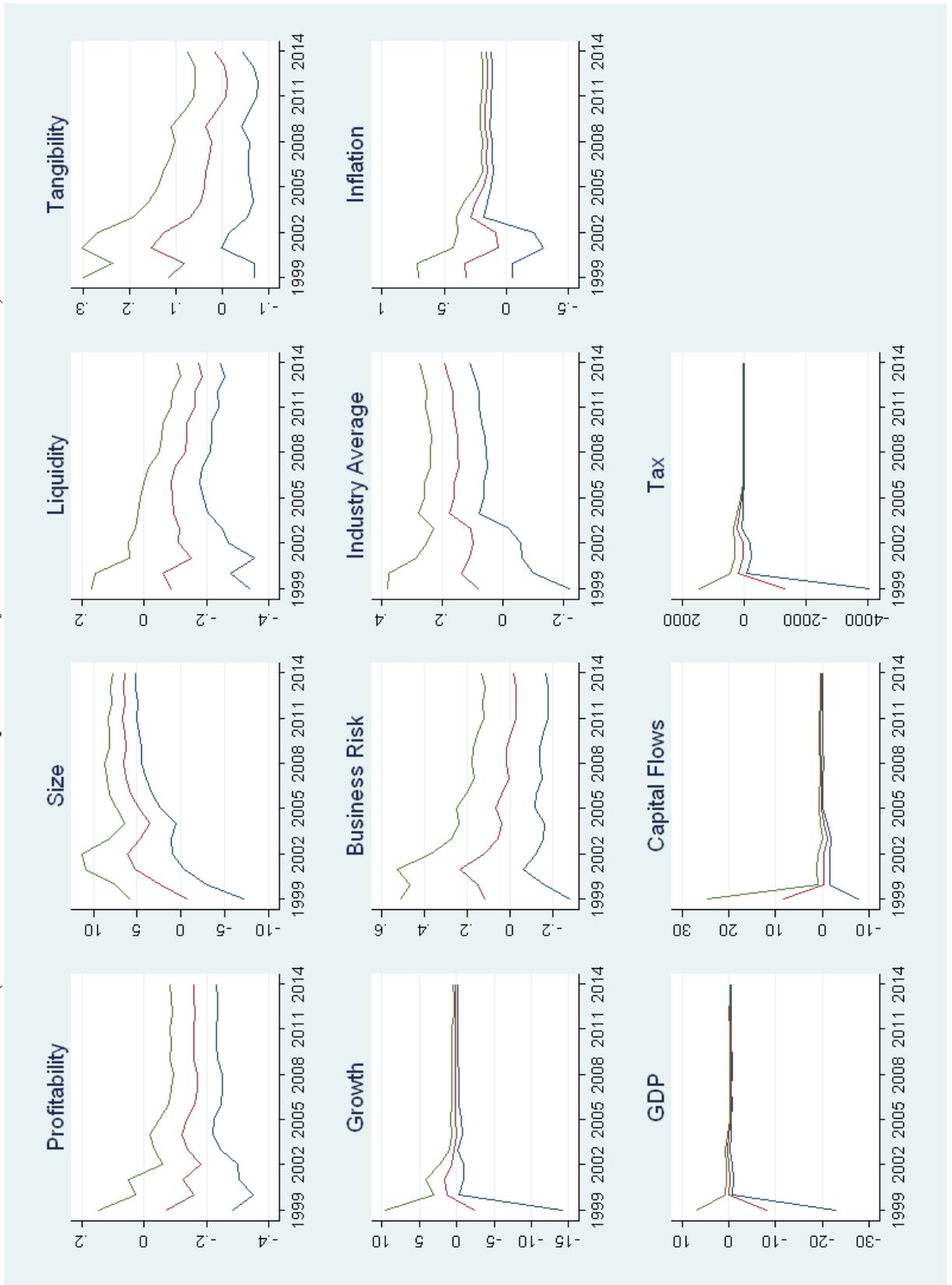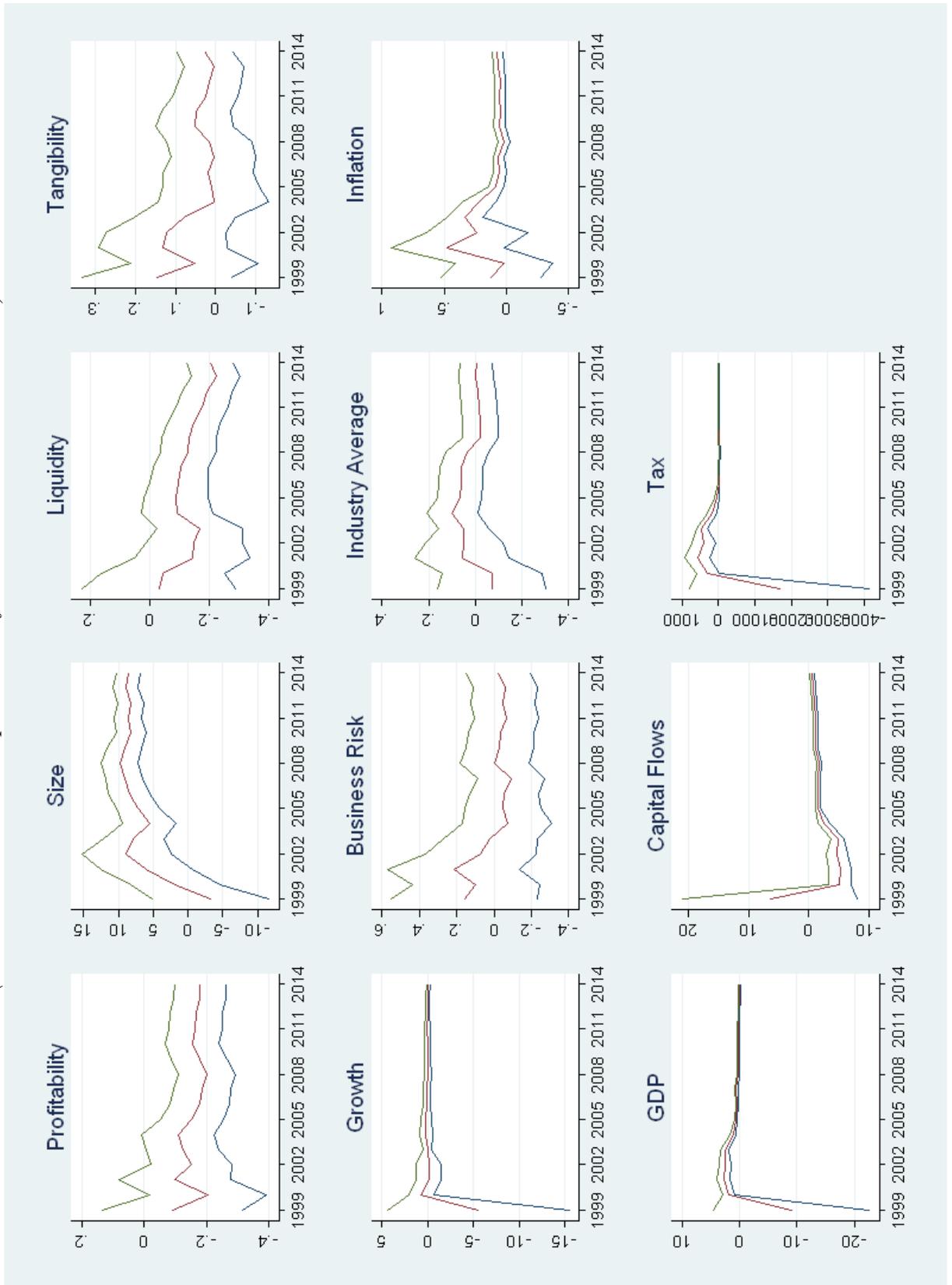(Green and blue lines represent confidence intervals at 95% level.)

Figure 5: Recursive Fixed Effects Estimates for Market Leverage
(*Green and blue lines represent confidence intervals at 95% level.*)

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