STRATEGIC DEBT WITH DIVERSE MATURITY IN DEVELOPING COUNTRIES

Industry-Level Evidence from the Turkish Manufacturing

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Abstract

A joint hypothesis of the capital structure or more focused strategic debt theory is that leverage decisions are the extensions of output market strategies and that debt in return has consequences for industry competition. It is however highly controversial how these consequences depend on the maturity structure, nor has the role of maturity directly been tested. We test this joint hypothesis of strategic debt separately for the short-term and long-term debt in the Turkish manufacturing within the framework of a modified capital structure equation. Such a distinction is crucial in developing countries including Turkey where the leverage is predominantly short-term. The panel estimations at two-digit industry level point to significant behavioral differences attributable to the maturity structure. First, the decision to take on the long-term debt is found to be strategic and inducing a quantity-based (Cournot) competition. The short-term debt is in contrast found to have no strategic content but rather be a liquidity-constrained finance, increasing (decreasing) with unanticipated rises in costs (revenues).

Keywords: Strategic debt, maturity structure, industry competition, developing countries, Turkey

JEL Classification: G32, L13

1. Introduction

This paper aims at providing empirical evidence on the so-called 'theory of strategic debt' in developing countries. The theory postulates that strategic considerations in the output market induce higher debt to gain strategic advantage, and thus establishes a link between debt and industry competition. The theory is an extension to oligopoly and imperfect capital market theories, and owes much to, among others, Brander and Lewis (1986), Maksimovic (1988), Glazer (1994), Showalter (1995, 1999), Dasgupta and Titman (1998). Subject to limited liability and bankruptcy effects, debt is found to shape industry competition as it determines the patterns of collusion. Basically, debt is shown to lead to tougher competition (higher output and lower price) both in the uncertain demand (Brander and Lewis) and in the stationary demand (Maksimovic). Showalter verifies this by noting that it is specific to the case of demand uncertainty and may not hold in cost uncertainty. Glazer, by distinguishing between short-term and long-term debt, shows that the above results are specific to the case of short-term debt and argues that long-term debt leads to softer competition.

Studies directly testing the influence of strategic considerations in the output market on corporate borrowing are extremely scarce. Phillips (1995) and Showalter (1999) involve tests on the US manufacturing industries[1]. Both studies are general in that they do not distinguish between the short-term and long-term debt. Showalter however directly tests the effects of strategic considerations on debt by explicitly incorporating the demand and cost uncertainties in a capital structure equation. His main finding is that the demand uncertainty in output market leads to higher debt while the cost uncertainty leads to lower debt. In the theory of strategic debt this is interpreted as a price-based (Bertrand) competition induced by debt.

[1] Studies that involve indirect testing are Gertler and Gilchrist (1994), Opler and Titman (1994), Hendel (1996), Chevalier and Scharfstein (1996), Nickell and Nicolitsas (1999).

We directly test whether demand and cost conditions (both certain and uncertain) lead to higher debt, and particularly, whether the short-term or long-term debt in a developing country. Implications for the type of competitive behavior motivated by each debt use will also be derived from these tests. We explicitly distinguish between the short-term and long-term debt to see if the results vary with maturity, a point of both theoretical and comparative concern. This distinction is necessary in order to consistently compare the results from the developed and developing economies. Divergent results may simply be due to the fact that corporate debt in most advanced countries is predominantly long-termed while it is predominantly short-termed in most developing countries[2].

The Turkish manufacturing sector that we have chosen as the case study is an interesting benchmark regarding the debt structure. The total debt to asset ratio is high and comparable to those found in most developed countries while it is dominated by the short maturity as in most developing countries. Our case study is based on the 15 manufacturing industries at two-digit level over 1990-2000, and therefore panel data methodology is employed.

The panel estimation of the modified capital structure equation yields two basic evidences. First, unexpected rises in cost are matched by the higher short-term debt while the long-term debt is more strategic and cut down. The responses to the temporary increases in sales are to cut down the short-term debt but increase the long-term debt. These are the evidences that the long-term debt use has a strategic nature while the short-term debt is basically a liquidity-constrained finance. The strategic response of the long-term to the temporary components of demand and cost is recurrent for their stationary components as well. The responses of the short-term debt to the temporary and stationary components of demand and cost are generally different.

[2] This is documented in Singh et al (1992) and Demirguc-Kunt et al. (1999).

The observed strategy of long-term debt use is thus expected to lead to a quantity (Cournot) competition in the manufacturing sector. The observed strategy of the short-term debt is at variance with the predictions of the theory and does not support any specific competition. This is particularly true in the case of unanticipated changes in the output market conditions. We emphasize the difference between our finding and that of Showalter's on the US manufacturing, that is, a quantity versus price competition induced by the long-term debt.

2. Hypotheses on strategic debt with different maturity

The theory of strategic debt predicts a positive relationship between demand uncertainty and debt ratio under both quantity (Cournot) and price (Bertrand) competition. If demand uncertainty increases, firms will increase leverage ratio to improve their strategic position. Firms with higher leverage make strategic gains and thus raise their expected profits as they can commit to larger output and force a reduction in rival firms' output. The enforced tradeoff between the outputs of leveraged and rival firms represents the typical case of quantity competition. Instead, if competition is based on price then leveraged firms obtain strategic gains and higher expected profits by enforcing a certain pricing behavior.

However, cost uncertainty is hypothesized to induce different debt use depending on quantity or price competition. Firms faced with cost uncertainty are expected to increase leverage in quantity competition to commit to a higher output. Quite the opposite, in price competition, firms are expected to reduce leverage through which they can commit to higher prices. Therefore, a positive relationship between debt ratio and cost uncertainty is expected if competition is based on quantity, and a negative relationship if competition is based on price.

These relationships might be modified or even reversed if the same strategic considerations motivate a specific maturity. For instance, Glazer analytically shows that under uncertain demand firms with long-term leverage are more collusive in quantity competition

but more competitive in price competition. However, there is no consensus on the maturity-competition relationship in the theoretical capital structure literature, and nor has the role of maturity directly been tested[3]. Stohs and Mauer (1996) find an inverse relationship between the length of maturity and unexpected increase in earnings. More recently, Emery (2001) argues that firms would prefer short-term debt because it permits them to match production and sales more closely to changes in demand, resulting in higher output and profit.

The preference for a specific maturity might be an important signal on the ultimate aim of strategic debt use and therefore is currently of key interest. We now provide some preliminary evidence that the short-and long-term debt responds differently to the same strategic variables. Figure 1 displays the simple directional relations between the two different debt ratios and the demand and cost conditions in the Turkish manufacturing. Every variable is measured as the cross-sectional mean of the 15 industries over 1990-2000. The legends used have the following meanings:

DEBTS: Short-term debt (to total assets in book-value) ratio,

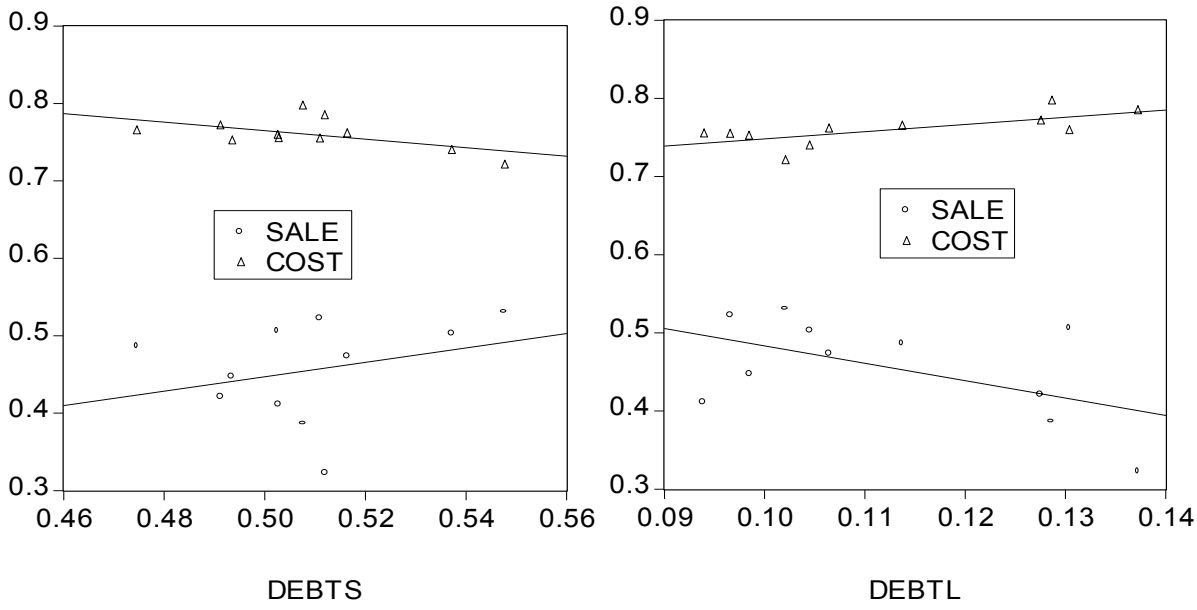
DEBTL: Long-term debt (to total assets in book value) ratio,

SALE: Sales growth,

COST: Costs to sales ratio.

[3] The general literature on debt maturity is however vast. See, among others, Barclay and Clifford (1995), Stohs and Mauer (1996), and Barclay, Marx and Clifford (2001), and their references.

Figure 1: Alternative debt ratios versus strategic variables



The short-term and long-term debt ratios are separately plotted against the ordinary sale and cost variables (not their deviations or trends). These preliminary statistics show that the short-term and long-term debt ratios have diverse interactions with the same strategic variables. The more interesting temporary versus stationary distinction will be explicitly considered in the formal empirical analysis below.

3. The formal empirical methodology

The empirical methodology is designed to determine both the presence of strategic debt use and the type of competition motivated by this use. Basically, a capital structure equation familiar from the empirical finance literature is adopted to explain the debt use[4]. The capital structure equation is modified to include the product market conditions as represented by demand and cost variables. The equation applied by Showalter includes only the stochastic parts of demand and cost. However, some theoretical studies (those following Maksimovic (1988)) also consider the stationary part of the demand in explaining the strategic debt use.

[4] See for example Rajan and Zingales (1995), and Booth et al. (2001)

We will therefore include both the stochastic and stationary product market variables to see if debt use and competition change with the nature of these variables concerned.

The general estimating equation written as a fixed-effects regression model has the form,

$$\frac{D_{i;t}}{A_{i,t}} = (\alpha_i + \alpha_t) + \sum_{j=1}^{n} \beta_j X_{i,j,t} + \varepsilon_{i,t} , \qquad (1)$$

where $X_{i,j,t}$ is the *j*th explanatory variables for the *i*th industry at time *t*, $\varepsilon_{i,t}$ is the random error term for industry at time *t*, $D_{i,t} / A_{i,t}$ is one of the two debt ratios for the *i*th industry at time *t*, and α_i s represent the industry-specific intercepts. The fixed-effects model allows the regression intercept $(\alpha_i + \alpha_t)$ to vary across industries, which are restricted to a single α_t in the alternative pooling model. The β_j s however do not vary across industries both in the fixed-effects and pooled models. The fixed-effects model, by allowing different industry intercepts, serves as a remedy for the known flaw of the capital structure model, which is being not fully specified.

The set of explanatory variables X_j includes mainly:

- Profitability,
- Tangibility of assets,
- Volatility of return or business risk,
- Non-debt tax shield,
- Demand conditions (stochastic and stationary parts),
- Cost conditions (stochastic and stationary parts),
- Other eclectic variables (time trend, business cycle dummies, lagged variables, etc.).

The first four variables are standard in the capital structure literature, and other variables representing the firm size (proxied by sale) and firm value (proxied by market to book debt ratio) are also added for firm level studies[5]. These two variables lose their relevance at industry level studies when especially some of the firms are not quoted, which is the case in the present study.

We do not attempt a detailed discussion on the rationale for the choice of these variables. We contend with a brief explanation for the expected influence of them on debt use. Profitability represents the possibility of internal finance and therefore is expected to reduce the leverage. Operating income, ebit or reported pre-tax profits are the alternative measures of profitability. Fixed assets are collateral for borrowing and can induce debt financing by reducing its cost. The sum of property (gross or net), plant and equipment is widely used measure of fixed assets, and sometimes inventory is also included. Business risk or the volatility of earnings affects the terms of borrowing and therefore debt finance by signaling the probability of bankruptcy. Business risk is however endogenous to debt as the latter increases the former by leading to deviations from the optimal output and price, a point of concern in the empirical research. The standard deviation of profitability is the mostly used measure of risk. Non-debt tax deductions on depreciation and investment reduce the tax advantage of leverage and therefore its use.

The variables representing the demand and cost conditions are specific to the model of strategic debt. As discussed earlier, mostly the stochastic components of them are considered but the stationary components are also found relevant in some theoretical studies. The stationary and stochastic components are measured respectively by the trends and deviations from the trends. The empirical capital structure equation will separately be estimated for both the short-and long-term uses to see if they respond differently to the same set of variables.

[5] See the studies in footnote 4 for a detailed discussion.

4. Evidence on strategic debt use in the Turkish manufacturing

4.1. Data on capital structure and strategic variables

Continuous and integrated data on capital structure and real activities at industry level is extremely scarce in Turkey. The output market data is collected mainly by the State Institute of Statistics while the financial market data is collected by the Turkish Central Bank. The output market and financial markets data were not properly integrated. Only recently the Turkish Central Bank has taken the task and consolidated the real and financial data at industry level in its Sectoral Balance Sheets (SBSs) data set. This data set is mainly at two-digit level and annual covering 1990-2000, and only few industries are available at three-digit level. We use the SBSs data set, the most disaggregated source on the integrated financial-real activities.

Some of the two-digit industries are dominated by the government firms and therefore are excluded because their capital structure as well as output market decisions will not probably be based on profit maximization. Our sample extracted from the SBSs data set thus includes 15 two-digit private manufacturing industries with annual frequency over 1990-2000. The industry level data is preferred to an alternative firm-level data based on limited number of quoted firms. Indeed, the total number of the listed manufacturing firms is 129 while it is 3792 in the SBSs data set[6]. In addition, the publicly traded firms, usually the largest and highest graded, have much easier access to the capital markets, sometimes directly through their subsidiaries.

[6] Of these 3792 firs 381 are the largest, holding the 46.6 percent of employment, 70.2 percent of net sales, 66.8 percent of assets and 72 percent of networth. See the Sectoral Analyses accompanying the SBSs by 2000 for the distribution of firms among the industries.

Basic data on capital structure and key strategic variables are given in Table 1. The first point to note is the predominant share of short-term debt in total debt. It ranges between 33-62 percent at the individual industries, and has a mean of 51 percent for the total 15 private manufacturing industries over 1990-2000. The share of long-term debt to total assets ratio in the total 62 percent is only 11 percent. The average fixed assets and depreciations to total assets ratios are respectively 28 and 26 percent for the whole manufacturing sector. The average annual growth in nominal sales is about 45 percent, but it has a much higher standard deviation compared to that of the cost to sales ratio, a sign of much volatile demand rather than cost.

(Here)

(Table 1: Descriptive statistics on debt use and output market conditions)

Inspecting the simple correlations among the potential variables of the strategic debt equation we have seen only a moderate substitution between the two types of leverages (-0.22). Two explanatory variables, tangibility and profitability, are negatively correlated (-0.51), indicating that larger capacity industries have lower profit margin. Tangibility has opposite correlations with the trends of sales and costs (-0.61 and 0.63) but positive correlations with their deviations (0.07 and 0.26), may be an indication that capacity decisions are driven by expectations[7]. Non-debt shield moves inversely with the sales deviation but parallel with the costs deviation (-0.50 and 0.81), while it is not strongly correlated with their trends, meaning that it is basically set in motion for unexpected changes. The sales trend is strongly correlated with its cost counterpart (-0.89), but less significantly correlated with its own and cost deviations (0.14 and -0.18). The extremely high correlation between the trend variables show the mutual dependence over the long term, for instance, a persistence rise in

[7] The trends and devaitions, as explained later, are drived from the Hodrick-Prescott filter.

costs lead to a persistence fall in sales probably because of the reduced profit margin, and vice versa. Though reversely signed, the cost trend has similarly low correlations with both its own deviation (0.23) and the sales deviation (-0.18). The costs deviation and the sales deviation are moderately negatively correlated (-0.43), signifying that one uncertainty reduces the other uncertainty. Finally, the cost and sales deviations have opposite correlations with profit margin (-0.51 and 0.40 respectively).

4.2. Panel estimation results

We have applied the modified capital structure equation (1) to the two-digit industry level data of the Turkish manufacturing. The sample includes 15 private industries over 1990-2000, and has a dimension of 15x11 (165 observations). The estimation method is the weighted OLS (wLS). The wLS, based the estimated variances from the first stage of regression, is considered as a feasible GLS methods as it allows for cross-sectional heteroskedasticity. Basically, the so called fixed-effects regression was adopted to allow different industry intercepts. Since they are not directly estimated the industry intercepts do not have the test statistics. An alternative way is to estimate them as industry dummies. However, with a large number of cross-sectional units included, this may result in less efficient estimates[8]. As alternative to the main fixed-effects regression, more restrictive pooled and pooled differenced regressions were undertaken to pin on the slopes of regressors that are assumed the same across industries. Standard errors are the White's heteroskedastic consistent within each cross-section as they were corrected using the computed covariance matrix.

[8] Fixed-effects estimation is said to have some practical advantages over the alternative SUR and random-effects estimations (see Hasio (1986)). The SUR estimation, for instance, is not appropriate for small samples while the random estimation treats intercepts as random.

The three alternative estimation results are presented in Tables 2-4. The fixed-effect estimation in Table 2 yields the following: Two of the standard variables of the capital structure equation, namely, non-tax shield and profitability, have the same negative effect on each debt ration. The use of reported before-tax profits for profitability may be questioned but the effect is invariant to the use of alternative measures such as the operational profit or ebit. The latter gross profit measures are not preferred because of their high correlations with the cost ratio. The other standard variable, the assets tangibility, has different effects on each debt ratio. It reduces the short-term debt but increases the long-term debt use. This is an interesting difference in the capital structure whereby the capacity expansion is financed by the long-term debt but not the short-term debt.

Regarding the strategic output market variables, several observations from this first estimation should be stressed. First, the unanticipated changes in demand tend to have no significant effect on the both types of debt uses. Second, the unanticipated changes in cost boost the short-term finance but discourage the long-debt. Third, the stationary components of the output market variables tend to have quite divergent effects on each debt ratios, and especially a sustained increase in demand encourages the use of long-term.

(Here)

(Table 2: Fixed-effects panel estimation on strategic debt use in Turkey)

The results from the alternative pooled regression presented in Table 3 augment the result on the effect of anticipated changes in cost. That is, unexpected changes in cost have a strong positive effect on short-term debt but a negative effect on long- term debt.

(Here)

(Table 3: Pooled panel estimation on strategic debt use in Turkey)

We now discuss the results from the third alternative estimation based on the difference form. The difference form has potential advantages of eliminating some possible stationarity problems in the data and focusing on the short-term dynamics, particularly in the output market. The difference form of the model naturally eliminates the trend components of the output market variables and focuses on their deviations[9]. It is an equivalent to the estimation in deviation form and but allows intercept terms in the regression. The difference form can therefore be estimated both by the fixed-effect or the pooled regression. We have estimated the both regressions but the results from the former are not reported because they are less efficient as expected. The results from the pooled regression of the capital structure equation in difference form are presented in Table 4. The difference form estimation strengthens the previous findings on the temporary output market conditions. That is, unexpected changes in both cost and demand have the opposite effects on each debt ratio. The unexpected increase in cost is financed by short-term debt while it discourages the long-term debt taking. Similarly, the unexpected rise in sales revenue reduces the need for short-term finance while it boosts the long-term finance possibly because of improved expectations.

(Here)

(Table 4: Pooled panel estimation on strategic debt use in Turkey)

(in difference form and without trend variables)

[9] Simple correlations related to the trend (stationary) components of sales and costs indicate significant dependence between themselves and between these variables and other standard variables of the capital structure equations. Possible estimation problems due to these high correlations will thus be avoided in the difference form estimation excluding the trends of sales and costs.

We have also done estimations based on the deviation form of the capital structure equation and a variety of additional variables. For the estimation in deviation form every variable is redefined by subtracting from its mean. As noted before, this is equivalent to the fixed-effects regression wherein the industry specific constant terms are eliminated. This estimation produces almost identical results obtained in the difference form estimation but makes no efficiency improvement and therefore is not reported.

Some relevant variables such as the inflation rate, the inventory to sales ratio and the interest payments (or plus the lagged short-term debt) to sales ratio are included in the alternative regression models. Surprisingly, the inflation rate and financial pressure (interest payments to sales) ratio do not have any statistically significant effect on the debt ratios. The inventory to sales ratio tends to have a significant positive effect on the short-term debt use but an insignificantly negative effect on the long-term debt use. Finally, the anticipated (trend and therefore unanticipated) components of cost and demand variables are estimated in two alternative ways, and all produces the similar results. In addition to the Hodrick-Prescott filtering actually used, we directly estimated the trends from the linear non-linear trend equations (as in Showalter (1999)) and from the autoregressive equations. The regression results involving the trend variables in Tables 2 and 3 are not notably sensitive to the trend estimation techniques.

5. Summary and concluding remarks

We have tested the strategic debt hypothesis separately for the short-term and long-term debt use within the framework of the capital structure theory. The fundamental and commonly agreed implication of the theory is that debt can shape the industry competition. However, whether debt would lead to a softer or tougher competition depends critically on the maturity structure, and this is a point of important controversy in the theoretical literature. Moreover,

there has been no direct test of whether different maturities lead to different competitive outcomes even in advanced countries. A distinction according to the maturity structure is particularly important in developing countries where the corporate debt is predominantly short-term in contrast to the long-term maturity found in most advanced countries.

The standard empirical capital structure equation is modified to incorporate the output market conditions, both anticipated and unanticipated. The impacts of the strategic demand and cost variables, as well as those of the standard variables, on each debt ratio have been investigated. This study therefore contains a joint test of capital structure with diverse maturity and its strategic extensions. The strategic extensions in turn have direct consequences for the type of competition in the output market under the debt structure thus determined. The present study is to our knowledge the first direct application of the strategic debt theory in developing countries, as well as the first one distinguishing between the short-term and long-term debt.

The Turkish manufacturing sector investigated is an interesting benchmark as it shares with the debt structures in both advanced and developing countries. The total debt to assets ratio is as high as in advanced countries (62%) but dominated by the short-term debt (51%) as in most developing countries. Both the determination of and the implications (for competition) from the debt use with such a diverse maturity structure could be very different. Our empirical findings do indeed point to important behavioral differences attributable to the maturity structure. The decision to take on long-term debt is strongly of a strategic nature. It increases with rising demand (both temporary and permanent) but decreases with rising cost (both temporary and permanent).

The short-term debt decision is basically not driven by the strategic considerations. Instead it is circumscribed or spontaneous. Our estimations yield an undisturbed positive relationship between the unanticipated cost increases and short-term debt rising cost. That is,

temporary cost increases are matched by higher short-term debt. The statistically acceptable relationship between the unexpected increases in sales and short-term debt is a negative one. A negative coefficient on the unanticipated increases in sales together with a positive coefficient on the unanticipated cost does not fit to the theories of strategic debt. These estimates can better be interpreted within the framework of liquidity-constrained finance, a familiar issue in many developing countries. The trend increases in cost and demand influence the short-term debt in the same direction, albeit with changing signs and significance in alternative estimations.

In short, the use of long-term debt in the Turkish manufacturing is found to induce a quantity-based (Cournot) competition while the short-term debt is found to have little if any strategic content. The manufacturing industries are in contrast a sort of captive users of the short-term debt in response to unanticipated cost increases, which is immediately reversed with unanticipated increases in revenue. Finally, all the three standard variables of the capital structure equation included have significant explanatory power in each debt use. An interesting detail is that tangibility increases the long-term debt use while it reduces the short-term debt use.

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Table 1: Descriptive statistics on debt use and output market conditions								
Industries	DEBTS	DEBTL	TANGIB	NSHIELD	SALE	SDSALE	COST	SDCOST
Food	0.565	0.101	0.272	0.246	0.450	0.096	0.812	0.022
Tobacco	0.624	0.070	0.293	0.132	0.463	0.148	0.759	0.062
Textile	0.469	0.132	0.358	0.337	0.436	0.103	0.809	0.035
Apparel	0.636	0.082	0.197	0.151	0.439	0.094	0.797	0.023
Leather	0.615	0.075	0.140	0.135	0.443	0.098	0.819	0.029
Lumber	0.544	0.076	0.309	0.313	0.452	0.087	0.828	0.021
Paper/printing	0.369	0.165	0.412	0.301	0.465	0.080	0.683	0.045
Chemicals	0.517	0.114	0.274	0.281	0.449	0.069	0.676	0.020
Rubber	0.409	0.092	0.389	0.379	0.450	0.082	0.744	0.026
Stone/clay	0.334	0.160	0.387	0.416	0.439	0.080	0.662	0.042
Primary metals	0.498	0.131	0.287	0.270	0.446	0.097	0.838	0.016
Machinery	0.491	0.175	0.199	0.239	0.437	0.067	0.713	0.019
Electricals/opticals	0.569	0.123	0.197	0.207	0.445	0.060	0.712	0.037
Transportation	0.460	0.110	0.286	0.333	0.459	0.128	0.795	0.027
Furniture and others	0.583	0.084	0.231	0.208	0.508	0.088	0.744	0.036
Panel averages	0.509	0.113	0.282	0.263	0.455	0.065	0.759	0.021

Explanations: Figures are the averages over 1990-2000 of the following variables:
DEBTS: Short-term debt to total assets ratio in book value.
DEBTL: Long-term debt to total assets ratio in book value.
TANGIB: Tangible assets to total assets ratio.
NSHIELD: Depreciation to total assets ratio as a measure of non-tax shield.
SALE: Rate of change in net sales
SDSALE: Standard deviation of SALE.
COST: Cost of the goods sold to SALE ratio.
SDCOST: Standard deviation of COST.

Table 2: Fixed-effects panel estimation on strategic debt use in Turkey		
	Coefficients	
Variables	Short-term debt use	Long-term debt use
TANGIB	-0.323*	0.168*
	(2.603)	(2.918)
NSHIELD	-0.208*	-0.130*
	(2.610)	(3.165)
PROFIT	-0.139*	-0.182*
	(2.092)	(4.748)
SALEDEV	0.013	0.008
	(0.263)	(0.197)
COSTDEV	0.334**	-0.162**
	(1.767)	(1.855)
SALETR	-0.074	0.108*
	(0.921)	(3.507)
COSTTR	-0.170	-0.043
	(1.394)	(0.450)
Dummy94	0.028	-0.011*
	(2.403)	(2.295)
Lagged dep. var.	0.148**	0.486*
	(1.896)	(8.796)
Fixed-effects[a]		
Food	0.798	0.063
Tobacco	0.832	0.018
Textile	0.758	0.071
Apparel	0.815	0.051
Leather	0.775	0.047
Lumber	0.807	0.047
Paper/printing	0.668	0.081
Chemicals	0.734	0.079
Rubber	0.723	0.066
Stone/clay	0.654	0.107
Primary metals	0.751	0.077
Machinery	0.701	0.123
Electricals/opticals	0.759	0.083
Transportation	0.741	0.098
Furniture and others	0.786	0.054
Weighted statistics		
R^{-2}	0.952	0.918
F	315.3*	239.2*
SER	0.045	0.023
SSR	0.252	0.069
DW	1.776	2.107
Observations (period)	150 (1991-2000)	150 (1991-2000)

Notes: Estimation method is weighted Least Squares, wLS, and dependent variables are the ratios of short-term and long-term debt to total assets in book values.
t-statistics in parentheses are White's Heteroskedatic-consistent.
Coefficients superseded with a single star (*) and double stars (**) are significant respectively at 1 to 5 % and 6 to 10 % levels.
[a] Fixed-effects (i.e., industry specific intercepts do not have t-statistics or standard errors.
Variable definitions:
DEBTS: Short-term debt to total assets ratio in book value.
DEBTL: Long-term debt to total assets ratio in book value.

TANGIB: Tangible assets to total assets ratio.
NSHIELD: Depreciation to total assets ratio as a measure of non-tax shield.
PROFIT: Before-tax profits to total assets ratio.
SALETR: Trend of sales rate, obtained through Hodrick-Prescott filter.
COSTTR: Trend of cost (to sale) ratio, obtained through Hodrick-Prescott filter.
SALEDEV: Deviation of sales rate from its trend (SALE-SALETR).
COSTDEV: Deviation of cost (to sales) ration from its trend (COST-COSTTR).

Table 3: Pooled panel estimation on strategic debt use in Turkey		
	Coefficients	
Variables	Short-term debt use	Long-term debt use
TANGIB	-0.299*	0.080*
	(5.002)	(2.266)
NSHIELD	-0.184*	-0.066*
	(2.768)	(2.245)
PROFIT	-0.174*	-0.101*
	(2.389)	(2.780)
SALEDEV	-0.050	0.040
	(0.950)	(0.821)
COSTDEV	0.112*	-0.089
	(2.530)	(1.003)
SALETR	0.161**	0.042*
	(1.773)	(4.752)
COSTTR	0.262*	-0.102
	(3.889)	(2.612)
Dummy94	0.018	-0.009**
	(1.371)	(1.696)
Lagged dep. var.	0.462*	0.755*
	(4.691)	(15.474)
Constant	0.147*	0.099*
	(2.001)	(2.832)
Weighted statistics		
R^{-2}	0.926	0.885
F	209.1*	128.3*
SER	0.049	0.025
SSR	0.337	0.091
DW	1.807	2.01
Observation (period)	150 (1991-2000)	150 (1991-2000)

Notes: Estimation method is weighted Least Squares, wLS, and dependent variables are the ratios of short-term and long-term debt to total assets in book values.
t-statistics in parentheses are White's Heteroskedatic-consistent.
Coefficients superseded with a single star (*) and double stars (**) are significant respectively at 1 to 5 % and 6 to 10 % levels.
Variable definitions:
DEBTS: Short-term debt to total assets ratio in book value.
DEBTL: Long-term debt to total assets ratio in book value.
TANGIB: Tangible assets to total assets ratio.
NSHIELD: Depreciation to total assets ratio as a measure of non-tax shield.
PROFIT: Before-tax profits to total assets ratio.
SALETR: Trend of sales rate, obtained through Hodrick-Prescott filter.
COSTTR: Trend of cost (to sale) ratio, obtained through Hodrick-Prescott filter.
SALEDEV: Deviation of sales rate from its trend (SALE-SALETR).
COSTDEV: Deviation of cost (to sales) ration from its trend (COST-COSTTR).

Table 4: Pooled panel estimation on strategic debt use in Turkey (in difference form and without trend variables)		
	Coefficients	
Variables	Short-term debt use	Long-term debt use
TANGIB	-0.349*	0.156*
	(2.217)	(2.303)
NSHIELD	-0.224*	-0.039
	(1.994)	(0.783)
PROFIT	-0.018	-0.036
	(0.171)	(0.944)
SALEDEV	-0.171*	0.117*
	(4.697)	(2.157)
COSTDEV	0.399*	-0.106*
	(2.819)	(2.130)
Dummy94	0.028*	-0.005
	(2.932)	(0.816)
Constant	0.005*	0.003*
	(2.493)	(2.183)
Weighted statistics		
R^{-2}	0.262	0.125
F	8.47*	4.54*
SER	0.064	0.026
SSR	0.589	0.098
DW	2.294	2.159
Observation (period)	150 (1991-2000)	150 (1991-2000)

Notes: Estimation method is weighted Least Squares, Wls, and dependent variables are the ratios of short-term and long-term debt to total assets in book values. All variables included are first-differenced.
t-statistics in parentheses are White's Heteroskedatic-consistent.
Coefficients superseded with a single star (*) and double stars (**) are significant respectively at 1 to 5 % and 6 to 10 % levels.
Variable definitions (all variables except the 1994 dummy entered in the first difference form).
DEBTS: Short-term debt to total assets ratio in book value.
DEBTL: Long-term debt to total assets ratio in book value.
TANGIB: Tangible assets to total assets ratio.
NSHIELD: Depreciation to total assets ratio as a measure of non-tax shield.
PROFIT: Before-tax profits to total assets ratio.
SALEDEV: Deviation of sales rate from its trend (SALE-SALETR).
COSTDEV: Deviation of cost (to sales) ration from its trend (COST-COSTTR).