EFFECT OF DEBT FINANCING ON CORPORATE FINANCIAL PERFORMANCE: EVIDENCE FROM TEXTILE FIRMS IN PAKISTAN

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Abstract

This study examines the effect of debt financing on firm's financial performance, measured as return on equity, using panel data of 95 textile companies in Pakistan from 2002-03 to 2007-08. Empirical results show a nonlinear relationship between return on equity and debt-to-asset ratio. As the debt-to-asset ratio increases, initially the return on equity increases until an optimal debt level is reached, after that it starts decreasing. The optimal debt-to-asset ratio for Pakistan's textile firms is estimated as 56 percent. We also find that firm's sales growth has positive and significant impact on return on equity whereas the firm size has no significant impact on it.

Keywords: Debt Financing, Panel Data, Return on Equity, Textile Firms, and Pakistan.

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Introduction

Firm's assets are typically financed with a combination of debt and equity, referred to as firm's capital structure. Capital structure decision is one of the most important financial decisions taken by a firm because it has an impact on the firm's financial performance.

A number of theoretical and empirical studies have been conducted to explore the impact of debt financing on the corporate financial performance. Majumdar & Chhibber (1999) and Mahakud & Misra (2009), studies conducted in India, found that corporate debt has a negative impact on the firm's financial performance because of high interest burden and agency costs. According to Majumdar (1997), the negative relationship between debt financing and the financial performance is due to the structure of Indian capital markets where lending institutions are mostly government-owned. Financial performance of the leveraged firms may decrease due to conflicts between shareholders and debt holders (Jensen & Meckling, 1976; Myers, 1977) and because highly leveraged firms lose substantial market share to their low leveraged competitors during industry downturns (Opler & Titman, 1994). Cheng (2009) found significant negative relationship between debt financing and the operating performance of listed companies in Taiwan. However, the operating performance of firms with high cash flows is not negatively affected by debt financing. Fama and French (1998) found that debt financing does not have a positive impact on the financial performance because there is no tax benefit of debt due to agency problems after controlling for earning, investment, research and development, and dividend.

Many research studies exist that support a positive relation between the use of debt and firm's profits. According to Baker (1973), the large amount of leverage implies greater risks and tends to raise industry profit rates. Heinkel (1982) pointed out that if capital suppliers are imperfectly informed or if the insiders have more information about the true value of firm then the debt financing and the firm value would have a positive relationship. A study by Ross (1977) found that the firms' financial structure signals information to market and higher leverage indicates good future prospects. Graham (1996) stated that due to the tax benefits of debt, the firms with high marginal tax rates are more likely to issue debt than the firms with low tax rates.

The literature on capital structure primarily focuses on the determinants of capital structure. Booth et al. (2001) examined the determinants of capital structure across ten developing countries and concluded that capital structure decisions of firms in developing economies are affected by the same variables which affect the capital structure decisions of firms in developed economies. Singh (2010) analyzed the firm-specific and country-specific determinants of capital structure for firms in four developing countries and concluded that capital structure decisions are affected by firm's own characteristics as well as the macroeconomic conditions of the country in which the firm operates.

Several studies have been conducted on capital structure in Pakistan including Shah and Hijazi (2004), Shah and Khan (2007), and Ilyas (2008).These studies have also focused on identifying the determinants of capital structure for the non-financial firms in Pakistan. However, these studies have not investigated how the capital structure affects the firm's financial performance. Since the firm has a choice of using debt or equity for financing its assets, there is a need to explore how the company's financing mix influences its financial performance.

In this study, we examine the effect of debt financing on textile companies' financial performance in Pakistan. We do not assume a monotonic relationship between debt financing and financial performance because the relationship may be different for different levels of leverage. We applied a quadratic functional form to estimate the relationship and found a nonlinear relationship between return on equity and debt-to-asset ratio. As the debt-to-asset ratio increases, initially the return on equity increases until an optimal debt level is reached, after that it starts decreasing.

We have chosen the textile industry because it is the most important manufacturing industry in Pakistan. Textile industry accounts for 8 percent of Gross Domestic Product (GDP) and 60 percent of exports of Pakistan. Furthermore, it provides employment to 40 percent of industrial labor force (Government of Pakistan, 2013).The objective of this study is two fold: to explore the relationship between the corporate debt and financial performance of textile firms, and to find the optimal capital structure for these firms.

The rest of the paper is organized as follows. The next section describes the data and discusses the structure of textile firms in Pakistan, followed by a section on the model and estimation methods. Next, we present the empirical results. The final section draws conclusions.

Data and Structure of Textile Firms

This study uses the firm-level panel data for the listed companies from the textile industry of Pakistan for six years from 2002-03 to 2007-08, taken from State Bank of Pakistan (2009).The time period covered in this study represents the normal period and, therefore, does not account for the external shocks due to post 2008 global financial crisis impacts. In the year 2008, there were 182 textile companies listed on Karachi Stock Exchange. We did not include 72 firms with incomplete data and 15 firms with negative shareholders' equity for the covered period. Our final sample consists of six-year data for 95 textile firms of Pakistan with a total sample size of 570 observations.

The data show that all firms included in the sample are large-sized firms in terms of firms' total assets in fiscal year 2007-08 based on the size categories defined by SME bank in Pakistan (Government of Pakistan, 2008). According to these categories, a firm is defined as small if the total assets are at most Rs. 20 million, as medium if the total assets are between Rs. 20 million to Rs. 100 million, and as large firms if total assets are more than Rs. 100 million.

The data show that total debt of these firms include current debt, term finance certificates (debentures), loans from banks and non-bank financial institutions, and preferred equity. Over the study period, the long-term debt, on average, contributes to 26.5% to the total debt of the sample firms. The reason for lower proportion of long-term debt can be attributed to the under-developed public debt market in Pakistan. This is consistent with the findings of studies including Booth (2001) and Singh (2010) which observed that the firms operating in developing countries have substantially lower amounts of long-term debt.

Model and Estimation Methods

We use return on equity (*ROE*) as a measure of firm's financial performance. *ROE* is computed as net income (after-tax income) divided by total equity of the company and measures the percentage return that the stockholders earn on their investment. Debt-to-asset ratio (*DA*) is used as a measure of debt policy. *DA* is computed as total debt divided by total assets and measures the fraction of total asset base which is financed using debt. In addition to *DA*, other factors including firm size and sales growth also influence *ROE* of a company (Abor, 2007). To control for the effects of these factors, we include these two variables, firm size (*FS*) and sales growth (*SG*). *FS* is measured as log of total assets, and *SG* is calculated as a percentage change in sales.

The empirical model of this study is specified as follows:

$$ROE_{it} = \beta_0 + \beta_1 DA_{it} + \beta_2 DA_{it}^2 + \beta_3 FS_{it} + \beta_4 SG_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

where

ROE_{it} = Annual net income divided by year-end shareholders' equity for firm *i* in time *t*

DA_{it} = Year-end total debt divided by year-end total assets for firm *i* in time t

FS_{it} = Firm size (log of year-end total assets) for firm *i* in time *t*

$SG_{i,t}$ = Annual sales growth for firm *i* in time *t*

μ_i = unobservable firm specific effect

λ_t = unobservable time effect

ε_{it} = stochastic disturbance term

The squared term of debt-to-asset ratio, DA^2, is added to investigate whether the relationship between *ROE* and *DA* is monotonic for all levels of debt-to-asset ratio or this relationship varies for different debt-to-asset ratio levels. Similarly, we also explored the quadratic relationship by adding the squared term for *FS* and *SG*, however, they were not significant.

The panel data model specified above is a two-way error component regression model with firm specific effects and time specific effects. The firm specific effects account for the other variables that are time-invariant but vary from firm to firm (such as management quality). The time specific effects account for the other variables that vary from time to time (such as tax structure and inflation) but are common to all firms. Estimation of the model with firm specific effects and time specific effects corrects for the possible omitted variable bias. These effects, firm specific or time specific, may be fixed or random. In the case of fixed effects, the error components (μ_i or λ_t) are assumed as fixed parameters. In the case of random effects, the error components (μ_i or λ_t) are assumed to be random variables. As the data are available only for very short time period (six years), which do not represent a random sample across time, the fixed effects are used for time period as suggested in Baltagi (2008).For cross-section, the number of observations is 95. Assuming that the sample is representative, the unobservable cross-section effects may be fixed or random. We use the Hausman's specification test to check whether the cross-section effects are fixed or random (Baltagi, 2008).

Empirical Results

The descriptive statistics on return on equity (*ROE*), debt-to-asset ratio (*DA*), firm size (*FS*) measured by total assets and annual sales growth (*SG*) of sample textile firms are presented in Table 1. The average *ROE* for the sample firms over the six year period is 3.6%. Statistics on *ROE* show that there is a lot of change in the average *ROE* over the six year period. It dropped from 8.8% in the fiscal year 2002-03 to 6 5.3% in the fiscal year 2007-08. The average *DA* for the sample firms is highest (68.7%) in 2007-08 and lowest (59.9%) in the year 2002-03. Over the six year period, 64% of the total assets of the sample firms, on average, are financed by total debt. The average total assets for the sample companies are Rs. 1.74 billion in 2002-03 and Rs. 3.92 billion in 2007-08, which shows a rapid growth of 17.6% per year in the asset base of the sample companies during the period of study. The average *SG* for the sample firms over the six year period is 15%. Although the size of the firm, on average, has increased in all six years, *ROE* has declined for three years from 2005-06 to 2007-08. The decline in *ROE* was mainly due to the decline in exports owing to

global financial crisis and domestic energy shortages (Government of Pakistan, 2009).

Panel data regression analysis was carried out to examine the relationship between the textile firms' debt financing and financial performance. The model was estimated using E views version 6.As the data are available only for very short time period (six years), which do not represent a random sample across time, the fixed effects are used for time period (Baltagi, 2008).For cross-section, the number of observations is 95. Assuming that the sample is representative, the unobservable cross-section effects may be fixed or random. Table 2 compares coefficient estimates with cross-section fixed effects and random effects. The table reports the p-values of t-test for testing the significance of the differences between the coefficient estimates with cross-section fixed effects and random effects. To check whether the cross-section effects are fixed or random, we use Hausman's specification test. Table 3presents the results of Hausman's specification test. As the p-value of the chi-square statistic is less than 0.05, the test rejects the null hypothesis of random effects for cross-section. Therefore, the test supports the fixed effects for cross-section.

Results on panel data model with fixed effects for both the cross-section and time period are presented in Table 4. The results show that R^2 of the regression is 0.38, which indicates that all independent variables together explain 38% of the variation in the dependent variable. Note that the model is overall significant as the p-value of F-statistic is much less than 0.05.

The results in Table 4 show that the estimated coefficient estimates are 1.92 on *DA*and 61.71 on *DA²*. These coefficient estimates are statistically significant since the p-value for each coefficient is less than 0.05.The results show a quadratic relationship between the predicted *ROE* and *DA*, illustrated in Figure 1. When the *ROE* is maximized with respect to *DA* in regression model given in Equation (1), the optimal *DA* ratio is $DA^* = -\frac{\beta_1}{2\beta_2}$, where β_1 is the coefficient on *DA* and β_2 is the coefficient on *DA²*. Based on the coefficient estimates, the optimal *DA* is estimated as 56 percent. These results show that as the debt-to-asset ratio increases, initially the return on equity increases

until an optimal debt level is reached, where the return on equity is maximum. Beyond the optimal debt level, the return on equity starts decreasing. These findings are consistent with the trade-off theory of capital structure which suggests that a firm's optimal capital structure is found by trading off the tax benefits of debt against the bankruptcy and financial distress costs (Baxter, 1967; Leland, 1994; Leland & Toft, 1996).

The coefficient estimate on firm size (*FS*) is not significant. This means that firm size has no impact on the firm's financial performance. The coefficient on sales growth (*SG*) is statistically significant with a *p*-value less than 0.05. The results indicate that the sales growth has a positive impact on the financial performance of textile firms.

Table 1:
Descriptive Statistics for Return on Equity, Debt-to-Asset Ratio, Firm Size and Annual Sales Growth of Sample Textile Firms

Fiscal year	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Average (2002-03 to 2007-08)
Average return on equity	0.088	0.066	0.072	0.046	-0.004	-0.053	0.036
ratio (ROE)	(0.339)	(0.376)	(0.104)	(0.092)	(0.185)	(0.209)	
Average debt-to-asset	0.599	0.624	0.635	0.647	0.657	0.687	0.641
ratio (DA)	(0.158)	(0.167)	(0.159)	(0.153)	(0.158)	(0.141)	
Average firm size (total	1.734	2.182	2.765	3.092	3.522	3.919	2.869
assets in billions Rs.)	(2.254)	(2.961)	(3.576)	(4.200)	(5.102)	(5.301)	
Average sales growth	0.234	0.252	-0.167	0.400	0.116	0.065	0.150
rate (SG)	(0.362)	(0.260)	(0.247)	(0.346)	(0.460)	(0.296)	

Note: Standard deviations are given in parentheses

Table 2:

Comparison of Coefficient Estimates with Cross-Section Random Effects and Fixed Effects

Independent Variable	Fixed Effect $\hat{\beta}_{FE}$)	Random Effect ($\hat{\beta}_{RE}$)	($\hat{\beta}_{FE}$–$\hat{\beta}_{RE}$)	Variance ($\hat{\beta}_{FE}$–$\hat{\beta}_{RE}$)	p-value
DA	1.921	1.241	0.680	0.111	0.041
DA^2	-1.711	-1.203	-0.508	0.072	0.058
FS	-0.037	0.049	-0.086	0.010	0.389
SG	0.071	0.086	-0.015	0.001	0.100

Table 3:

*Hausman's Specification Test for Cross-Section Random Effects versus Fixed Effects*

	Chi-Square Statistic	Degree of Freedom	p-value
Cross-Section Random	10.395	4	0.0343

Table 4:

Regression Results with Cross-Section Fixed Effects and Time Fixed Effects (Dependent Variable ROE)

Independent Variable	Coefficient Estimate	Standard Error	t-Statistic	p-value
Constant	-0.344	0.342	-1.007	0.315
DA	1.921	0.495	3.880	0.000
DA^2	-1.711	0.413	-4.138	0.000
FS	-0.037	0.103	-0.355	0.723
SG	0.071	0.030	2.368	0.018

$R^2 = 0.376$; *F*-statistic = 2.723 (*p*-value = 0.0000)

Figure 1:

Effect of Debt-to-Asset Ratio on Predicted Return on Equity
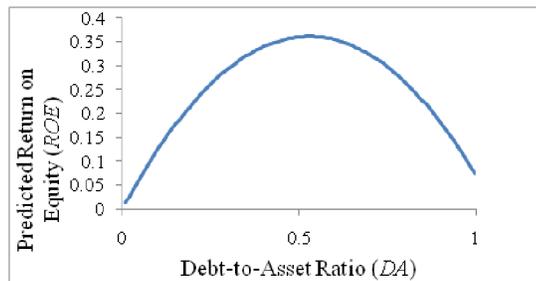
Conclusion

This study examines the impact of debt financing on the financial performance, as measured by return on equity, of textile firms in Pakistan using the panel data of 95 textile firms for a six-year period from 2002-03 to 2007-08. Empirical results show a nonlinear relationship between return on equity and debt-to-asset ratio. As the debt-to-asset ratio increases, initially the return on equity increases until an optimal debt level is reached, after which it starts decreasing. The optimal debt-to-asset ratio for Pakistan's textile firms is estimated as 56 percent. These results imply that the textile firms which are heavily trapped in debt have to bear huge interest costs which take a big portion out of the operating incomes of these firms, leaving little portion in the net income which belongs to the owners. We also find that firm's sales growth has positive and significant effect whereas the firm size has no significant impact on its return on equity.

Further research can be done to explore the effect of financial leverage on the performance of textile firms as measured through the stock returns of the firms. Macro-economic variables can be incorporated to see their effects on financial leverage of firms. Similar studies can also be done for other industrial sectors of Pakistan.

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