

Financing Behavior of Textile Firms in Pakistan

Nadeem A. Sheikh and Zongjun Wang

Abstract—This study attempts to explore those factors that influence the capital structure choice of textile firms in Pakistan. The investigation is performed using panel data procedures for a sample of 75 firms listed on Karachi Stock Exchange during 2002-2007. The results suggest that leverage is negatively correlated with profitability, liquidity, and tangibility, and positively correlated with firm size and growth opportunities. In particular, the negative relationships of profitability and liquidity, and a positive relationship of growth opportunities with firm leverage confirm the predictions of pecking order hypothesis. A positive relationship of firm size with leverage confirms the predictions of trade-off theory. A negative relationship between tangibility and leverage is in contradiction with trade-off theory, however it seems to be consistent with the predictions of pecking order theory because of profound dependence of textile firms on short-term debt. Thus, these findings suggest that some of the insights from modern finance theory are portable to Pakistan in that certain firm specific factors that are relevant for explaining the capital structure in developed economies are also relevant in Pakistan.

Index Terms— Agency theory, Capital structure, Pecking order theory, Trade-off theory

I. INTRODUCTION

Capital structure represents the mix of the various debt and equity securities maintained by a firm. In general, a firm can choose among many alternative capital structures. For instance, it can either issue a large amount of debt or it can issue very little debt. However, the optimal capital structure is the set of proportions that maximizes the total value of the firm. Therefore, decisions concerning the proportion of debt and equity are quite challenging for the management of the firm because a wrong decision may lead to financial distress and eventually to bankruptcy.

A number of theories have been advanced in explaining the capital structure of firm. Despite the theoretical appeal of capital structure, academicians and researchers have not yet identified any specific method that corporate managers can use in order to attain an optimal debt level. This may be because of the fact that theories of optimal capital structure differ in their relative emphases, for example, the trade-off theory emphasizes taxes, the pecking order theory emphasizes differences in information, and the free cash flow theory emphasizes agency costs.

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Majority of the empirical research on capital structure is made by using data from developed economies that have many institutional similarities than from data from developing economies that have different institutional structures. Despite profound institutional differences that exist between developed and developing economies, however it is recognized that the choice between debt and equity depends on firm-specific characteristics. Which firm-specific characteristics (profitability, size, asset structure, growth opportunities and liquidity etc.) are most important in determining the capital structure of firms? Unfortunately, empirical evidences are still mixed and often difficult to interpret. Thus, lack of consensus among researchers about the factors that influence the capital structure choice and a little empirical work to understand the financing behavior of Pakistani firms necessitated the need for this research. It is expected that the outcome of this study will be of great use for corporate managers and other stakeholders to understand the impact of forces that influence the capital structure choice.

The rest of the paper is organized as follows. Section II summarizes the theories of capital structure. In section III the potential determinants of capital structure are summarized and theoretical and empirical evidence concerning these determinants is provided. Section IV explains the data and methodology. Section V is devoted to empirical results while Section VI explains the empirical findings. Finally section VII concludes.

II. REVIEW OF THEORIES OF CAPITAL STRUCTURE

The relationship between capital structure and firm value has been the subject of considerable debate. In their seminal study, Modigliani and Miller [20] proposed that in perfect capital markets (without taxes, transaction costs and information asymmetry) value of any firm is independent of its financing decisions. In a simplified context, the financial instruments issued by the firm do not affect the firm's productivity and thereby its value. Although, Modigliani and Miller's proof is based on those assumptions which do not hold in real world, but when these assumptions are relaxed the choice of capital structure becomes an important value determining factor. For instance, in a world with corporate taxes but no bankruptcy costs, Modigliani and Miller [21] proposed that firm value is an increasing function of leverage. Thus, firm should use as much debt as possible due to tax deductible interest payments and the value of levered firm exceeds that of unlevered firm by an amount equal to the present value of the tax savings that arise from the use of debt. Miller [19] presented an alternative theory by including three different tax rates - corporate tax rate, personal tax rate on equity income and the regular personal rate which applies to interest income - in his analysis. He proposed that the net tax

saving from corporate borrowings can be zero when personal as well as corporate taxes are considered. Other theories that have been advanced to explain the capital structure of firms include trade-off theory, pecking order theory, agency theory and theory of free cash flow.

Trade-off theory asserts that firms determine their capital structure by weighing the costs and benefits that arise from an extra dollar of debt financing. Under trade-off theory framework, firms are supposed to choose a target capital structure that maximizes the firm value by minimizing the costs of prevailing market imperfections. However, target debt level may vary from firm to firm.

The Pecking order theory of Myers and Majluf [25] and Myers [23] is based on the notion of asymmetric information that corporate managers (insiders) know more about their company's prospects, risk and value than do outside investors. According to pecking order hypothesis, firms maximize their value by systematically choosing to finance new investments with cheapest available sources. More specifically, firms prefer to use internal financing when available and choose debt over equity when external finance is needed due to low information costs associated with debt.

Agency costs arise as a result of relationship between managers and shareholders and those between debt holders and equity investors. Conflicts between debt and equity investors only arise when there is a risk of default. If debt is totally free of default risk, debt holders have no interest in the income, value or risk of the firm. However, if there is a chance of default, then shareholders can gain at the expense of debt holders. Since equity is a residual claim, so shareholders gain when the value of existing debt falls, even when the value of the firm is constant, Myers [24]. According to Jensen and Meckling [15], the value of existing debt falls when managers could either invest funds in riskier assets or shift to riskier operating strategies. Debt holders might aware of these temptations and try to write the debt contracts correspondingly.

Another conditional theory of capital structure is the theory of free cash flow which postulates that high leverage leads to increase in firm value, despite the threat of financial distress, when a firm's operating cash flows exceeds its profitable investment opportunities, Myers [24]. Conflicts between managers and shareholders over payout policies are especially severe when a firm generates free cash flow. Jensen [14] proposed that 'debt' could be used as a controlling device to motivate managers to distribute free cash among shareholders instead of wasting it on inefficient activities. Another argument put forth by Grossman and Hart [11] is that 'debt' can create an incentive for managers to work harder, consume fewer perquisites and make better investment decisions etc., when bankruptcy is costly. Thus, a high debt ratio may be dangerous for a firm, but it can also add value by putting the firm on a diet.

Several empirical studies have examined the validity of these theories, but not yet consensus arrived among researchers regarding which theory best explains the capital structure choice. According to Myers [24], there is no universal theory of the debt-equity choice and no reason to expect one. However, there are several useful conditional theories, each of which helps to understand the financial structure that firms choose.

III. DETERMINANTS OF CAPITAL STRUCTURE

In this section we present a brief discussion of the attributes that different theories of capital structure suggest may affect the firm's capital structure choice. These attributes are profitability, size, tangibility (asset structure), growth opportunities and liquidity. The attributes, their relation to the capital structure models, and their observable indicators are discussed below:

A. Profitability

The trade-off and pecking order theories have opposite implications about the relationship between profitability and leverage. According to trade-off theory, high profitability promotes the use of debt finance and provides an incentive to firms to avail the benefit of tax shield on interest payment. So, this theory predicts a positive relationship between profitability and leverage. Pecking order theory states that firms prefer to finance new investment first with internal resources and then by issuing safest security that is debt, thereafter convertibles and finally with new equity. Firms follow this financing pattern due to costs that arise because of asymmetric information, or they can be transaction costs. Thus, this theory suggests a negative relationship between profitability and leverage. Several empirical studies that have shown a significant negative relationship between leverage and profitability include Baskin [2], Booth *et al.* [4], Eriotis *et al.* [7], Fama and French [9], Huang and song [13], Karadeniz *et al.* [16], Rajan and Zingales [26], Titman and Wessels [28], Wald [31] and Zou and Xiao [32]. We use the ratio of net profit before taxes over total assets as a measure of firm profitability.

B. Size

According to trade-off theory, larger firms should borrow more because these firms tend to be more diversified and less prone to bankruptcy and smaller firms should operate with low leverage because these firms are more likely to be liquidated when facing financial distress. Moreover, larger firms have lower agency costs of debt i.e. relatively low monitoring costs because of less volatile cash flows and easy access to capital market. Thus, this theory predicts a positive relationship between size and leverage. Pecking order theory suggests a negative relationship between firm size and leverage as the problem of information asymmetry is less severe in large firms. Empirical evidence concerning the relationship between firm size and leverage is unclear. Chen [5] and Ezeoha [8] reported a significant negative relationship between firm size and leverage which is consistent with the predictions of pecking order theory which suggests that large firms should use more equity due to the relativity of the cost of equity financing owing to asymmetric information which is small for such firms. Wald [31] finds a significant positive relationship for firms in USA, UK and Japan, and insignificant negative/positive relationships for firms in Germany/France. Fama and French [9], Huang and Song [13], Marsh [17], Taub [27] and Zou and Xiao [32] have found a significant positive relationship between size and leverage which is consistent with the predictions of trade-off theory. We use natural logarithm of sales as a proxy of firm size.

C. Growth Opportunities

According to Myers [22], firms with high future growth opportunities should use more equity financing, because a highly leveraged company may forgo profitable investment opportunities when it expects by undertaking new project the value goes to firm's existing debt holders. Thus, this view suggests a negative relationship between leverage and growth opportunities. According to trade-off theory, firms holding future growth opportunities which are a form of intangible assets, tend to borrow less than firms holding more tangible assets because growth opportunities cannot be collateralized. So, this implication suggests a negative relationship between growth opportunities and leverage.

Empirical findings are still mixed, for instance, Baskin [2] and Viviani [30] have observed that leverage varies positively with past growth. Wald [31] find that USA is the only country where high growth is associated with lower debt/equity ratio which confirms the predictions of Myers's [22] model that ongoing growth opportunities imply a conflict between debt and equity interests and this conflict causes firm to refrain from undertaking net positive value projects. However, this explanation does not apply to other countries where fast growing firms use more debt. Chen [5] and Tong and Green [29] have found a significant positive relationship between growth opportunities and leverage for Chinese listed firms. We use the ratio of average market value per share over average book value per share (market-to-book ratio) as an indicator of growth opportunities. Average market value is found by taking the sum of high and low value per share during a year and divide it by 2 while average book value is found by taking the sum of opening and ending book value and divided it by 2.

D. Tangibility

Trade-off theory suggests a positive relationship between tangibility and leverage because tangible assets serve as collateral for debt financing. Moreover, greater collateral may alleviate the agency cost of debt. Pecking order theory suggests a negative relationship between leverage and asset structure because firms holding more tangible assets will be less prone to asymmetric information problems and hence less likely to issue debt. Most of the empirical studies have shown a positive relationship between tangibility and leverage include Booth *et al.* [4], Chen [5], Huang and Song [13], Rajan and Zingales [26], Titman and Wessels [28], Wald [31] and Zou and Xiao [32]. However, a few empirical studies have also shown a negative relationship between leverage and tangibility includes Bauer [3], Ferri and Jones [10], Karadeniz *et al.* [16] and Mazur [18]. We use the ratio of fixed assets over total assets as an indicator of tangibility.

E. Liquidity

Pecking order theory suggests a negative relationship between liquidity and leverage because firms with ample liquidity may use internally available fund to finance investment. On the other hand, trade-off theory suggests a positive relationship between leverage and liquidity because higher liquidity ratio can support a relatively higher debt ratio due to greater ability of a firm to satisfy short-term contractual obligations on time. A few studies have shown a

negative relationship between leverage and liquidity includes Deesomsak *et al.* [6], Mazur [18] and Viviani [30].

IV. DATA AND METHODOLOGY

In order to investigate the determinants of capital structure of textile firms listed on Karachi Stock Exchange (KSE) during 2002-2007 the data is taken from the publication of State Bank of Pakistan entitled "Balance Sheet Analysis of Joint Stock Companies". The data concerning market value of shares is obtained from the "Annual Diary" published by the Karachi Stock Exchange over a period of six years during 2002-2007. Each diary contains data of high and low value per share in a year for companies listed during the year.

Initially all the firms in the textile sector were selected for analysis purpose, however many firms were found with incomplete data. Thus, firms with any missing observations for any variable included in our model during the study period dropped from the sample. Consequently, the final sample set consists of a balanced panel of 75 firms over a period of 6 years.

The variables used in this study and their measurement are largely adopted from existing literature. This will allow us to compare our findings with prior empirical studies in developed and developing economies. Our dependent variable is the debt ratio (dr_{it}) which is defined as the ratio of total debt over total assets. Total debt contains both long-term debt and short-term debt. Although, the strict notion of capital structure refers exclusively to long-term debt, however short-term debt is also included mainly because of its significant representation (72 percent) in total debt ratio. Since bond market in Pakistan is not very much developed and commercial banks are also hesitant in providing long-term finance on favorable term. Therefore, firms turn to short-term financing even when financing their long-term investments.

On the basis of available data, this study employs five explanatory variables - profitability (pro_{it}), size (sz_{it}), growth opportunities (gro_{it}), tangibility (tag_{it}) and liquidity (liq_{it}). The book value is used for the calculations of variables wherever applicable except the variable of growth opportunities.

In this empirical study we use panel data procedures because the sample contains data across firms and over time. In order to estimate the effects of explanatory variables on debt ratio (a measure of leverage) we use three estimation models, namely, pooled ordinary least square (OLS), fixed effects and random effects. Under the hypothesis that there is no group or individual effects among the firms, we estimate the pooled OLS model. As panel data contains observation on the same cross-sectional units over several time periods there might be cross-sectional effects on each firm or on a set of group of firms. Different techniques are available to deal with this type of problem, however, two estimation techniques, namely, fixed effects and random effects are very prominent.

Fixed effects technique take into account the individuality of each firm or cross-sectional unit included in the sample by letting the intercept vary for each firm but still assumes that

the slope coefficients are constant across firms. Random effects model estimates the coefficients under the assumption that the individual or group effects are uncorrelated with other explanatory variables and can be formulated. This study also employs the Hausman [12] specification test to determine which one estimation model, either fixed effects or random effects, best explain our estimations. The null hypothesis underlying the Hausman specification test is that fixed and random effects model's estimators do not differ substantially.

Regression models - pooled OLS, fixed effects and random effects – are specified as follows.

$$dr_{it} = \beta_0 + \beta_1 pro_{it} + \beta_2 sz_{it} + \beta_3 gro_{it} + \beta_4 tag_{it} + \beta_5 liq_{it} + \varepsilon_{it}$$

$$dr_{it} = \beta_{0i} + \beta_1 pro_{it} + \beta_2 sz_{it} + \beta_3 gro_{it} + \beta_4 tag_{it} + \beta_5 liq_{it} + \mu_{it}$$

$$dr_{it} = \beta_0 + \beta_1 pro_{it} + \beta_2 sz_{it} + \beta_3 gro_{it} + \beta_4 tag_{it} + \beta_5 liq_{it} + \varepsilon_i + \mu_{it}$$

dr_{it} = debt ratio of firm i at time t

β_0 = common y -intercept

$\beta_1 - \beta_5$ = coefficients of independent variables

β_{0i} = y -intercept of each cross-sectional unit

ε_{it} = error term for firm i at time t

ε_i = cross-sectional error component

μ_{it} = error term for firm i at time t

pro_{it} = profitability of firm i at time t

sz_{it} = size of firm i at time t

gro_{it} = growth opportunities of firm i at time t

tag_{it} = tangibility of firm i at time t

liq_{it} = liquidity of firm i at time t

V. EMPIRICAL RESULTS

The summary statistics of dependent and independent variables are reported in Table I. As shown in the table, the average debt ratio among Pakistani firms stands at 64.95 percent. This ratio, in comparison with firms in G-7 countries as shown by Rajan and Zingales [26], indicates that Pakistani firms seems to be more leveraged than those in Canada, UK and USA and less leveraged than those in France, Germany Italy and Japan.

Prior to estimating the coefficients of the model the sample data is also tested for multicollinearity. Results shown in Table II indicates that most cross-correlation terms for the independent variables are fairly small, thus, giving little cause for concern about the problem of multicollinearity among the independent variables.

The results of pooled OLS estimation model are presented in Table III. Under OLS estimation model, profitability, size, tangibility and liquidity proved to be significant in confidence level of 1%. Growth opportunity is the only independent variable which proved highly insignificant. The OLS regression has high R^2 and appears to be able to explain most of the cross-sectional variation in leverage. Moreover, F -statistic proves the significance of the model.

The results of fixed effects and random effects estimation

models are also reported in Table III. All the variables proved to be significant in confidence level of 1% under both of the estimation models. However, the adjusted R^2 for the fixed effects estimation model is higher than for simple pooling model, indicating the existence of omitted variables. The Hausman specification test is also employed to choose which one estimation model either fixed effects or random effects best explain our estimations. Results of Hausman specification test are reported in Table IV. The test is asymptotically χ^2 distributed with five degrees of freedom. The test statistic for debt ratio equation is 39.76 and that the associated probability is zero which indicates that the null hypothesis is rejected and we may be better off by using the estimations of fixed effects model.

Table I: Summary Statistics

Variables	Obs.	Mean	Std. Dev.	Minimum	Maximum
dr_{it}	450	0.64950	0.12739	0.21502	0.89129
pro_{it}	450	0.02561	0.12294	-1.87493	0.77612
sz_{it}	450	7.37690	1.06410	1.43510	9.95810
gro_{it}	450	0.68240	0.5044	0.06430	3.38780
tag_{it}	450	0.54628	0.14260	0.18632	0.88516
liq_{it}	450	1.01750	0.41050	0.28220	3.76430

Table II: Pearson Correlation

	dr_{it}	pro_{it}	sz_{it}	gro_{it}	tag_{it}	liq_{it}
dr_{it}	1.000					
pro_{it}	0.004	1.000				
sz_{it}	0.101	0.257	1.000			
gro_{it}	0.026	0.160	0.320	1.000		
tag_{it}	-0.147	-0.035	-0.322	0.006	1.000	
liq_{it}	-0.434	-0.025	0.343	0.063	-0.561	1.000

VI. DISCUSSION ON EMPIRICAL RESULTS

According to the results of empirical analysis, profitability, liquidity and tangibility have a negative and significant relationship with debt ratio while firm size has a positive and significant relationship with debt ratio. Contrasting results are found concerning the variable of growth opportunities. The fixed effects model accepts this variable but OLS model does not.

Negative relationships of profitability and liquidity with leverage confirm the implications of pecking order hypothesis which suggest that highly liquid and profitable firms prefer to finance new investment with internally available funds than through debt finance. A significant positive relationship of firm size with leverage is consistent with the theoretical underpinnings of trade-off capital structure model which suggest that large firms should operate at high debt level due to their ability to diversify risk and to

take the benefit of tax savings on interest payment. A positive relationship between growth opportunities and leverage indicates that high-growth firms in Pakistan use more debt than equity to finance new investment. Although this relationship is in contradiction with the predictions of trade-off theory, however it is consistent with pecking order hypothesis which suggest that high-growth firms with lower operating cash flows should have high debt ratios and companies with few investment opportunities and substantial free cash flow should have low debt ratios, Barclay and Smith [1]. Thus, this implication indicate that the need for operating cash flow among high growth Pakistani firms is so huge that might not be met with internal resources, consequently firms turn to debt finance.

Negative relationship between tangibility and leverage does not sit well with trade-off hypothesis which suggest that companies with relatively safe, tangible assets tend to borrow more than companies with risky, intangible assets. However, this finding seems to be consistent with the predictions of pecking order theory which predicts a negative relationship between short-term debt and asset structure. Since Pakistani firms heavily depend on bank debt due to small and undeveloped bond market. Moreover, privatized commercial banks offer short-term loans on favorable terms than risky long-term loans. Therefore, firms turn to short-term borrowing even when financing their long-term investments. Thus, negative relationship between tangibility and debt ratio may because of heavy proportion of short-term debt in total debt employed by textile firms.

VII. CONCLUSION

This empirical study investigates the determinants of capital structure of textile firms listed on Karachi Stock Exchange during 2002-2007. Based on data availability, five potential determinants of capital structure were analyzed in this paper – profitability, size, growth opportunities, tangibility and liquidity.

The results suggest that leverage is negatively correlated with profitability and liquidity which is consistent with pecking order hypothesis. Leverage is positively correlated with firm size which is consistent with the implications of trade-off theory. This result also supports the view of size as an inverse proxy for the probability of bankruptcy. A positive relationship between leverage and growth opportunities is in contradiction with trade-off theory but consistent with the predictions of pecking order theory which suggest that high-growth companies with low operating cash flow should operate at high debt ratios. A negative relationship between tangibility and leverage is in contradiction with trade-off theory which suggests that companies with relatively safe, tangible assets tend to borrow more than companies with risky, intangible assets. However, this finding seems to be consistent with the predictions of pecking order theory which suggest a negative association between short-term debt and tangibility. Since firms in Pakistan heavily rely on bank debt due to small and undeveloped bond market. Moreover, majority of privatized commercial banks prefer to extend short-term loans on conventional terms compared to long-term loans. Owing to these reasons, firms turn to short-term financing even when financing long-term

investment.

In summary, the heavy reliance of Pakistani firms on short-term debt might limit the explanatory power of the capital structure models that derived from the Western settings. However, empirical findings of this study confirm that some of the insights from modern finance theory are portable to Pakistan in that certain firm-specific factors that are relevant for explaining capital structure in developed countries are also relevant in Pakistan.

Table III: Dependent Variable Debt Ratio (dr_{it})

Variables	Pooled OLS	Fixed effects	Radom effects
C	0.966681*** (20.64585)	0.568749*** (6.747361)	0.839042*** (14.46226)
pro_{it}	-0.101089*** (-2.662560)	-0.131426 *** (-3.977660)	-0.099308 *** (-3.217405)
SZ_{it}	0.027055*** (5.475133)	0.059767*** (5.997410)	0.031112*** (4.927027)
gro_{it}	0.006085 (0.644707)	0.058982*** (4.867093)	0.033719*** (3.314185)
tag_{it}	-0.477620*** (-12.38660)	-0.394083 *** (-7.348888)	-0.418813*** (-9.672771)
liq_{it}	-0.252980*** (-18.73335)	-0.178617*** (-12.90746)	-0.207101*** (-16.40324)
R^2	0.455539	0.758143	0.394429
Adj R^2	0.449408	0.706503	0.387609
F-statistic	74.29708	14.68140	57.83835
Prob.> F	0.000000	0.000000	0.000000

(t -statistic given in parenthesis)

*significant at 10% level

**significant at 5% level

***significant at 1% level

Table IV: Correlated Random Effects – Hausman Test

Variables	Fixed effects	Radom effects	Var(Diff.)	Prob.
pro_{it}	-0.131426	-0.099308	0.000139	0.0064
SZ_{it}	0.059767	0.031112	0.000059	0.0002
gro_{it}	0.058982	0.033719	0.000043	0.0001
tag_{it}	-0.394083	-0.418813	0.001001	0.4344
liq_{it}	-0.178617	-0.207101	0.000032	0.0000
Wald χ^2	39.764415			
Prob.> χ^2	0.0000000			

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