Determinants of Capital Structure: A case for the Pakistani Textile Composite Sector

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Abstract

The study analyzed the determinants of capital structure for the textile composite sector of Pakistan after Akbar, Ali, & Tariq (2009) followed by Rajan and Zingales (1995), Shah and Hijazi (2005) and Hijazi and Tariq (2006). The study took the same variables as used by Akbar, Ali, & Tariq (2009) and Rajan and Zingales (1995) i.e. Tangibility, Size, Growth and profitablity as independent variables while Leverage as Dependent variable. These variables were observed for 46 sampled firms out of 50 firms from the textile Composite sector of Pakistan for the period of five years (2005-2009) using Pooled OLS model. Data was taken from the State Bank of Pakistan Publication "Balance Sheet Analysis of Joint Stock Companies Listed on Karachi Stock Exchange, 2005-2009". The results are consistent with the previous studies. The results of the study showed that Profitability and Size is negatively related with leverage. Whereas tangibility and growh were found to be positively corrlated with leverage, but the realtion of growh was found to be highly insignificant.

Keywords: Capital Structure, Growth and Profitability, Leverage

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Capital structure is the option whether to go for Debt or equity or a mix of both. The goal of the firm's management is to increase the value of the firm. The shareholders can enjoy the fruits of Capital structure and they can benefit more if an optimal debt-equity ratio is worked out. A firm value is equal to the sum of both

debt and equity. This value increases or the pie gets bigger and bigger if and only if there is a change in capital structure. Capital structure decision maximizes the shareholder's wealth and minimizes the weighted cost of capital. As we know that different firms follow different mix of debt and equity which has given birth to different capital structure theories.

Modigliani and Miller (1958) were the first to describe capital structure. According to them capital structure is irrelevant to the value of the firm which is stated in their first proposition I. Then after it they gave proposition II but although these theories are based on some unrealistic assumptions. Later on, different researches were conducted to find out the determinants of capital structure and an optimal capital structure. Some of the theories on capital structure are Static Trade-off theory, Pecking order theory and Signaling theory.

The study on capital structure in Pakistan was first carried out by Shah and Hijazi (2004) over the firms listed on Karachi stock Exchange. The study found some of the determinants of capital structure which were analyzed in the light of capital structure theories. This research provided a base to the other researches because it was the first ever study over Pakistani listed firms on KSE. Later, different researches were carried out on different sectors. The study of Rafiq, Iqbal & Atiq (2008) found that capital structure is industry specific and it varies from industry to industry. So we cannot assign industry specific attributes on the whole industry as it is done by Shah and Hijazi (2004).

A study by Akbar, Ali & Tariq (2009) on determinants of capital structure for Textile sector of Pakistan was the first study in this sector. This study took all the firms in the entire textile sector of Pakistan. Broadly the textile sector is divided into three branches i.e. Textile Composite, Textile Spinning and Textile Weaving.

Capital structure decisions can be influenced by the industry specific variables for which Text Composite sector is taken as a case study. The aim of this study is to further refine or find the industry specific variables that can influence capital structure decision. By analyzing the Textile Composite sector individually can give better results. It may also address the shortcomings in the combine analysis.

Research Statement

"To determine the capital structure of listed firms in the textile composite sector of Pakistan"

Research Objectives

This study is conducted to find out the determinants of capital structure for the Textile Composite sector of Pakistan. Following below are some of the objectives that are aimed to be fulfilled;

- To examine the relationship of Tangibility of fixed assets with leverage.
- To find out the relationship of size and leverage of the firm.
- To find out the relationship of growth and leverage of the firm.
- To examine the relationship of profitability with leverage of the firm.

Literature Review

According to a research by Harris & Raviv (1991) on theory of capital structure, they stated that leverage is positively related with firm investment opportunities, size ,fixed assets, non-debt tax shield, and it has a negative relationship with uniqueness of the product, advertising expenditures, probability of bankruptcy, volatility and profitability.

The four variables, tangibility of asset, the market to book value ratio, firm size and profitability have proved to be more consistent as being correlated with leverage in the previous studies (see Bradley, Jarrel & kim (1984), Long & Malitz(1985), and Harris & Raviv(1991).

Similarly G.Rajan & Zingales (1995) in their research titled as what do we know about capital structure? Some evidence from international data investigated the determinants of capital structure choice of public firms in the major industrialized G-7 countries. They observed that the firms of the G-7 countries posses same leverage at aggregate level. They found that all the cross sections are affected by the same factors and this is also consistent with the past researches. They stated in USA leverage is affected by the same factors as it is in other countries. They concluded from the evidence that the theoretical foundations of the observed correlations are not still resolved.

In another research by Correa, Basso & Nakamura (2007) who analysed some determinants of capital structure for the largest Brazilian firms using Panel data model for the period ranging from 1999 to 2004 by taking up a sample of 389 firms out of 500 largest companies.The result showed a negative relationship of leverage with tangibility of assets, profitability and business industry, while a positive relation exits between risk and capital origin.

According to a research by Shah & Hijazi (2004) on the determinants of capital structure for non financial listed firms on Karachi Stock Exchange for five years period(1997-2001) using

pooled regression model. They observed a negative relation of growth and profitability with leverage and a positive realtion of tangibility of asset and size with leverage.However the relationship of tangibility and leverage was found to be statistically insignificant.

In another study by Hijazi & Tariq (2006) who analysed the determinants of capital structure for Cement sector of Pakistan by using pooled reggression model for 16 firms out of 22 in the Cement sector. The result showed that tangibility of asset and growth is positively related to leverage whereas size and profitability is negatively related to leverage.

Similarly in another study conducted by Shah & Khan (2007) found the deteminants of capital structure of KSE listed non financial firms using fixed effect dummy variable regression by taking 286 firms from financial sector of Pakistan. The results demonstrated that tangibility and size is positively related to leverage whereas growth, non debt tax shield and profitability is negatively related to the leverage. Tangibility, growth and profitability were found to be statistically significant while size and non debt tax shield were statistically insignificant. Earning volatility has no relation with leverage.

Furthermore Rafiq *et al.* (2008) found the determinants of capital structure of the chemical industry of Pakistan using Pooled reggression model by taking 26 firms out of 39 firms from chemical sector of Pakistan for the period ranging from 1993-2004. They found that profitability is negatively related to leverage while non-debt tax shield, tangibility of asset, income variation and growth is positively related to leverage.

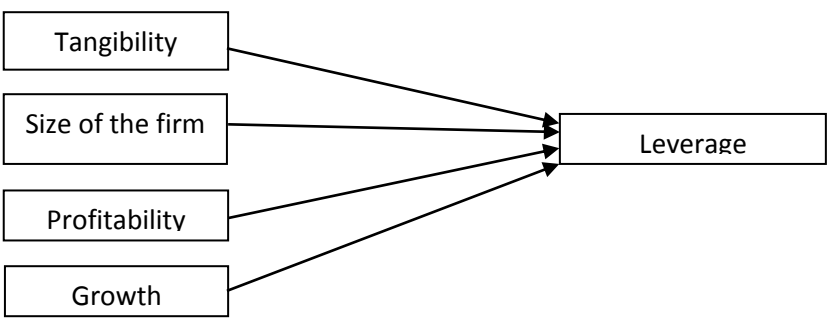
According to Sheikh & Wang (2011) who conducted a research on the determinants of capital structure for firms in the manufacturing industry of pakistan. The study analyzed 160 firms which are listed in Karachi stock exchange for a period of five years (2003-2007) using panel data techniques.The result

suggested that profitability, earning volatility, liquidity and tangibility are negatively related to leverage. Whereas size is positively related to leverage. Non-debt tax sheild and growth opportunities are not significantly related to leverage.

Similarly Akbar, Ali & Tariq (2009) conducted a research on the determinants of capital structure in textile sector of pakistan. They took four variables named as tangibility of assets, Growth, firm size and profitability following Rajan & Zingales (1995). They analyzed 155 listed firms from KSE out of total 167 firms for a period of five years(1999-224) using Pooled reggression analysis. They found their results consistent with the previous studies. The research proved a positive relationship of profitability, tangibility and size.whereas the relationship of growth with leverage was found to be negative.

Theoretical Framework

Independent varaibles include Tangibility of assets, Size, Profitability and Growth while Dependant varaible includes Leverage.



Operational Definitions

Firm specific variables are used namely, Size, Growth, Tangibility of assets and Profitability. These variables were also used by previous studies of Rajan and Zingles (1995), Shah and Hijazi (2005) and Hijazi and Tariq (2006).This study has used the

same variables which were used by Akbar, Ali and Tariq (2009) in Textile sector. These variables are described below.

Leverage

It is the percentage of total assets financed through debt. Leverage has been used in this research as the ratio of total liabilities divided by total assets.

Leverage = Total Liabilities / Total assets

Tangibility of Assets

This study has used Tangibility as the ratio of net fixed assets divided by total assets.

Tangibility = Net Fixed assets / Total assets

Size

This Research has used size as the natural log of total assets.

Size = Ln (Total assets)

Growth

For this study growth has been defined as the percentage change in total assets.

Growth = Y2-Y1 / Y1 × 100

Profitability

This study measures profitability as net profit before taxes are divided by the total assets.

Profitability = Net profit before taxes / total assets

Hypothesis

- Hypothesis 1: A firm with higher percentage of fixed assets will have a higher Debt ratio.
- Hypothesis 2: There is a negative relationship between size and leverage of the firm.
- Hypothesis 3: Firm with higher growth rate will have higher leverage.
- Hypothesis 4: Firm with higher profitability will have lesser leverage.

Research Methodology

Population

The study targeted all the firms of the textile composite sector of Pakistan which is the main sub sector in the overall textile industry. So the phenomenon under study was the whole textile composite sector of Pakistan. The total number of firms were 50 in this sector which presented them for the analysis.

Sample

The study started with analyzing all the firms in the textile composite sector of Pakistan. Out of 50 firms, 46 firms were selected for the analysis while 4 firms were excluded due to the non availability of sufficient data. The data was analyzed for a period of five years (2005-2009). There were 230 firm-years which were analyzed during the sample period.

Data Collection

The study used secondary type of data in the overall analysis. The data which was necessary for calculation purpose was taken from the publication of State bank of Pakistan named as "Balance Sheet Analysis of Joint Stock Companies Listed on the Karachi Stock Exchange 2005-2009". The financial data was taken from the same document for the period ranging from 2005-2009.

Annual reports of the selected firms were also used for data collection.

Table 1. List of Sampled Firms

S/no	Name of Firm	S/no	Name of Firm
1	Sarhad textile mills limited	24	Sapphire Fibres Ltd.
2	Azgard Nine limited(Legler-nafees denim mills ltd.)	25	Sapphire Textile Mills Ltd.
3	Blessed textile Ltd.	26	Shams Textile Mills Ltd.
4	Colony Mills Ltd.(Colony textile mills Ltd)	27	Suraj Cotton Mills Ltd.
5	Faisal spinning mills Ltd.	28	Taj Textile Mills Ltd.
6	Fateh Textile Mills Ltd.	29	Towellers Ltd.
7	Ghazi Fabrics International Ltd	30	Usman Textile Mills Ltd.
8	Gul Ahmad Textile mills Ltd	31	Zahur Cotton Mills Ltd.
9	Husein Industries Ltd	32	(Colony) Thal Textile Mills Ltd.
10	Ishaq Textile Mills Ltd	33	Ahmed Hassan Textile Mills Ltd.
11	Jubilee Spinning & Weaving Mills Ltd	34	Artistic Denim Mills Ltd.
12	Kohinoor Industries Ltd.	35	Chenab Ltd.
13	Mahmood Textile Mills Ltd.	36	Dawood Lawrencepur Tex.Ltd. (Dawod Coton Mills)
14	Masood Textile Mills Ltd.	37	Fateh Sports Wear Ltd.
15	Mian Textile Industries Ltd.	38	Hala Enterprises Ltd.
16	Mohammad Farooq Textile Mills Ltd.	39	Hamid Textile Mills Ltd.
17	Mubarak Textile Mills Ltd.	40	International Knitwear Ltd.
18	Nina Industries Ltd.	41	Khyber Textile Mills Ltd.
19	Nishat (Chunian) Ltd.	42	Safa Textiles Ltd.
20	Paramount Spinning Mills Ltd.	43	Nishat Mills Ltd.
21	Quetta Textile Mills Ltd.	44	Aruj Garment Accessories Ltd.
22	Redco Textiles Ltd.	45	Kohinoor Textile Mills Ltd.
23	Reliance Weaving Mills Ltd.	46	The Crescent Textile Mills Ltd.

The Regression Model

The study used pooled regression model for analysis. Pooled regression is used in this study just because it accompanies both cross sectional and time series data. The model can also be called as constant co-efficient model. This is called constant-coefficient because in this model both slopes and intercepts are assumed to be constant. The assumption of this model is that there is no significant cross section or time effects.

The equation for our regression model is given below (Balance Sheet Analysis of Joint Stock Companies Listed on the Karachi Stock Exchange, 2005-2009, State Bank of Pakistan.)

$$LG = \beta o + \beta 1(TG) + \beta 2(SZ) + \beta 3(GT) + \beta 4(PF) + \epsilon$$

Where

LG = Leverage

TG = Tangibility

SZ = Size

GT = Growth

PF = Profitability

ϵ = error term

Data Analysis & Results

This section contains the results of the descriptive statistics and regression analysis. Table 1 shows the summary of the descriptive statistics for the variable values in the sample.

Table 1. Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Dev.
Leverage	230	0.109253	1.86468	0.742359	0.293211
Tangibility	230	0.000000	0.908824	0.500628	0.202613
Size	230	3.52342	10.5810	7.46554	1.65824
Growth	230	-74.1503	44097.3	201.789	2907.15
Profitability	230	-0.718831	1.73689	0.0153348	0.148278

To check the presence of multicollinearity among predictor variables, we checked the Correlation matrix which is given below in Table 2.

Table 2: Correlation Coefficients

Variables	TG	SZ	GT	PF
TG	1			
SZ	-0.1304	1		
GW	-0.0005	0.0882	1	
PF	-0.1418	0.0211	-0.0004	1

From table 2 it can be seen that the highest coefficient is -0.14 between two variables which indicates that there is no multicollinearity problem among the independent variables. We used correlation matrix for the identification of multicollinearity. A coefficient of correlation in excess of 0.8 is considered to pose serious problems for statistical inference.

Table 3. Regression model summary

R Square	Adjusted R Square	P-value (F)
0.250399	0.237073	2.42e-13

Table 3 represents the value of R-square (R^2= .25 or 25%) which indicates that independent variables such as Tangibility of assets, size, growth and profitability explains on 25% of variation in dependent variable i.e. Leverage. The overall model is

significant at 1% level of significance as indicated by the value of F-statistics.

Table 4: Regression Coefficients & their significance

	Coefficient	Std. Error	t-ratio	p-value
Const	1.02691	0.0943933	10.8791	<0.00001
TG	0.347054	0.0850955	4.0784	0.00006
SZ	-0.0607019	0.0103349	-5.8735	<0.00001
GR	3.99317e-06	5.84469e-06	0.6832	0.49517
PF	-0.386736	0.115303	-3.3541	0.00093

Table 4 reports the estimated coefficients of the variables. Tangibility of assets and leverage is positively related to each other in textile composite sector of Pakistan, which is shown by the value ($\beta 1 = 0.347$) and the corresponding t-statistic value indicates that the regression coefficient is significant. This supports our first hypothesis that tangibility and leverage are positively related to each other. Hijazi and Tariq (2006) also found the same relationship for cement sector while the same positive relation was found by Akbar, Ali, & Tariq (2009) in the whole textile sector of pakistan.This finding confirms the static tradeoff theory according to which Leverage should increase with the increase in tangible assets of firm.

Size is negatively correlated ($\beta 2 =$ -0.0607) with leverage and is found statistically significant by the value of P. This supports our hypothesis that size and leverage of the firm in the textile composite sector of Pakistan have inverse relationship. This relation was also observed by Hijazi and Tariq (2006) and by Akbar, Ali, & Tariq (2009). A possible explanation can be that large firms in the textile composite sector of pakistan are in a better position to raise equity capital at comparable low costs.

The amount of capital required by large firms is sufficient to warrant economies in the cost of raising equity capital. However this finding contradicts the findings of Rajan & Zingle (1995) and Shah & Hijazi (2005) who reported a positive relationship between size and leverage.

Growth was found to be positively correlated ($\beta 3 = 5.84469e-06$) but the regression coefficient is not statistically significant. This finding contradicts Shah and Hijazi (2005) who evidenced negative relationship. Meanwhile Hijazi and Tariq (2006) found a positive relationship between growth and Leverage in the cement industry of Pakistan. Akbar, Ali, & Tariq (2009) found a negative relationship which was statistically significant. Hence we reject our third hypothesis that growth and leverage are positively correlated.

Leverage and profitability of the firm in the textile composite sector of pakistan are negatively correlated ($\beta 4 = -0.386$) which shows that equity is used as a source of finance by profitable firms in the textile composite sector of Pakistan. This finding is in accordance with the pecking order theory. The same results were observed by Shah and Hijazi (2005) and Hijazi and Tariq (2006). A negative realtion was also found by Akbar, Ali, & Tariq (2009) hence we accept our fourth hypothesis that profitability and leverage are inversely related.

Conclusion

The study analyzed 46 sample firms in the textile Composite sector of Pakistan using Pooled OLS model in order to find out the determinants of capital structure of the firms in the textile Composite sector of Pakistan.

All the variables including Tangibility, size, growth and profitability exhibited the same relationship with leverage as expected but the relationship of growth with leverage was found to be statistically insignificant. The positive relation of Tangibility with leverage supports the Static Trade Off theory but contradicts the Pecking Order Theory. The negative relationship of size with leverage contradicts both the Static Trade off Theory and the Pecking Order Theory. The positive relation of growth with leverage also contradicts both the theories but this relation was

found to be statistically insignificant. Finally, the negative relationship of profitability with leverage confirms the Pecking order Theory, however, contradicts the Static Trade off Theory.

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