Forman Journal of Economic Studies
Vol. 11, 2015 (January–December) pp. 87-101

Determinants of Textile Firms' Profitability in Pakistan

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Abstract

Textile sector is the most important sector in the economy of Pakistan especially in terms of employment generation and exports. Any improvement in the growth and profitability of textile sector is likely to have significant impact on income generation, foreign exchange earnings, reducing poverty and improving the standard of living of people. The objective of the present study is to examine the profitability of the textile sector in Pakistan, concentrating mainly on the microeconomic factors. Several studies have undertaken the task of studying the relationship between firm's profitability and its determinants i.e. size, growth, liquidity, leverage etc. The analysis of present study is based on unbalanced panel data of 111 textile firm for the period of 2006 to 2011. The data pertain to short term, long term debts, total sales, earnings before interest and taxes, current assets, total assets, current liabilities, non-current liabilities etc. The present study shows that sales of the firm has positive and leverage has negative impact on the profitability of the firm. The private sector can engage itself on the basis of this study by concentrating on factors which have significant positive impact on its profitability. Any improvement in the growth of firms is likely to benefit many segments of society like traders and workers through more employment and income.

Keywords: Profitability, Textile, Translog, Growth, Size, Liquidity, Leverage

JEL classification: D21, M1, M2

1. Introduction

The societal welfare depends on the economic growth and profitability of the industry (Hermelo and Vassolo, 2007). Performance of firm plays significant role in the nation's economic gain (Gupta et al. 2013) and in the employment of the country (Hermelo and Vassolo, 2007; Arrighetti and Lasagni, 2013). The non-financial sector of Pakistan can be subdivided into 12 different sectors such as textile, food, chemicals, chemical products and pharmaceuticals, other manufacturing etc. (see table 1). Textile has a major share of 38.8 percent among

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these sectors. This sector plays an important role in the economy of the country. Pakistan holds 4th position in the production of cotton and having 3rd largest spinning capacity in Asia. This sector contributes significantly in the GDP, foreign exchange earnings and employment generation of the country. Textile sector contributes about 52 percent of total exports (Chhapra and Asim, 2012).

Table 1: Distribution of Companies by Economic Groups

Economic Groups	2011
Textile groups	155
Food	54
Chemicals, chemical products and pharmaceuticals	43
Other manufacturing N.E.S	30
Other non-metallic mineral products	28
Motor vehicles, trailers and auto parts	22
Fuel and energy	18
Information, communication and transport services	13
Coke and refined petroleum products	9
Paper, paperboard and products	9
Electrical machinery and apparatus	8
Other services activities	10

Source: www.sbp.org.pk

Growth in the textile sector can be improved through the participation of both public private stakeholders. Policy makers can be engaged to formulate policies by placing emphasis on those variables which have significant impact on the performance of textile firms. Textile firms in the private sector can engage themselves on the basis of this study by concentrating on factors which have significant positive impact on their growth and profitability. Any improvement in the growth of textile firms is likely to benefit many sections of society like traders and workers through generation of more employment and income. The objective of the present study is to examine the profitability of Textile Corporation and identify various determinants that affect the profitability of textile firms. In this connection, the data for 111 textile firms were obtained for the period of 2006 to 2011.

The major policy question of this study is to understand how the various factors affect textile firm's profitability in Pakistan and whether these factors have positive or negative impact. In this regard the hypotheses to be tested are as follows:

1. H_0: Asset turnover ratio has no impact on firm's profitability

   H_1: Asset turnover ratio has a positive impact on firm's profitability
2. H_0: Growth has no influence on the firm's profitability

   H_1: Growth has significant negative impact on the firm's profitability
3. H_0: Short term leverage has no effect on firm's profitability

   H_1: Short term leverage has a negative impact on firm's profitability
4. H_0: Long term leverage has no impact on firm's profitability

   H_1: Long term leverage has a negative impact on firm's profitability
5. H_0: The size of the firm has no effect on firm's profitability

   H_1: The size of the firm has positive impact on firm's profitability
6. H_0: Liquidity of the firm has no impact on the firm's profitability

   H_1: Liquidity of the firm has a negative impact on the firm's profitability

2. Literature Review

Abbas et al. (2013) identified the impact of various financial measures such as leverage, growth, firm's size etc. on the profitability of firm. For this study they used panel data of different firms from 2005 to 2010 and applied linear regression model. Results of the study showed that leverage has negative while size of the firm has positive impact on firm's profitability. The growth and liquidity does not have any significant impact on the firm's profitability.

Chhapra and Asim (2012) investigated the determinants of capital structure that affect the growth of firm. They estimated linear regression model to see how fixed assets, size, taxes and profitability has an impact on the financial leverage of the firm by using data from 2005 to 2010 of 90 firms. The study concluded that all the variables such as fixed asset, sizes, taxes and net profit does not have any significant impact on financial leverage in the whole textile sector, spinning units and composite units. The authors draw conclusions that the size of firms has a negative impact on the leverage.

Hermelo and Vassolo (2007) analyzed different determinants of firm's growth. For this purpose, they collected the data from small and medium sized firms of Tucuman, Argentina. By using survey approach, they collected the information of growth, technology, financial capabilities, investment, geographical market and diversification of product. Information was obtained from 34 firms belonging to different sectors i.e. sugar, paper, textile, grain, meat, food and beverages, citrus processing, machinery manufacturing and dairy product processing. The authors used growth as a dependent variable measured in terms of sales growth from the period of 1994 to 1996. The determinants that they tested in the study were size, financial resources, investment in the new technology, diversification by products and sales in regional and national market (for some of the independent variables the authors used opening and closing inventory). The study applied linear regression model and used ordinary least square approach for the estimation. The results of the study showed that size (resources of a firm) has not significant while investment in the technology has significant negative impact on the firm's growth. The F value also shows that the model is not significant.

Glancey, (1998) examined the impact of different determinants on the small and large size firm's profitability and growth. For this study the author used linear model to estimate the impact of firm's size, age, location and inter industry differences on the growth and profitability of the firm. Author used survey data of 117 firms containing 751 observations for the year 1990 in Tayside region. They used different estimation methods to estimate this relationship as linear and 2SLS. The results of the study were not statistically significant by using ordinary least square regression model was used.

In the literature, authors mainly focused on the identification of different financial variables that might have an impact on the profitability but none of them was concerned about the specification of the model or testing a particular specification. Economic literature discussed various shortcomings of restricted functional form, as it has a large number of maintained hypotheses such as linear etc. The literature further concluded that wrong functional form could result in spurious estimation and results; while the flexible functional form has the least maintained hypothesis but this least maintained hypothesis comes at the cost of complicated estimation procedures. In the financial literature, the linear form is the most commonly used functional form (Glancey, 1998; Chhapra and Asim 2012; Abbas et al. 2013) but none of these studies tested various functional forms or used functional form specification test. Griffin et al. (1987) were of the view that the researcher is never in a position to know the true functional form and the

wrong functional form could result in the wrong results and implication. To avoid this problem, the researchers need to apply specification test for the selection of appropriate functional form. The authors were further of the view that the simpler functional forms are easy to estimate but these functional forms comes with the baggage of lot of maintained hypothesis; while the flexible functional form are difficult to estimate but the baggage of maintained hypothesis has been reduced significantly. To address the issue of inappropriate/wrong functional form, present study fills the literature gap by estimating a flexible functional form and apply a specification test in order to confirm whether the selected functional form is appropriate or not. Present study further uses the nested model test in order to confirm whether the nesting of a functional form in another functional form holds or not.

3. Data

The analysis of present study is based on the panel data of textile firms operating in Pakistan. The data were obtained from the publications of State Bank of Pakistan and different annual reports of textile firms. The dataset of 111 textile firms operating in Pakistan for the period of 2006 to 2011 is used. The data pertains to short term debts, long term debts, total sales, earnings before taxes, taxes, fixed assets (non-current asset), current assets, total assets, current liabilities and non-current liabilities.

For this present study, net profit is considered as a dependent variable and it is measured in thousand rupees. Net profit is calculated by deducting all the taxes and interests from the profit. To see the impact of different financial variables on the profitability of the firm, size, asset turnover ratio, growth, leverage and liquidity is used. The firm size is measured as monetary value of total sales (thousand rupees). Similar measure has been used by Abbas et al. (2013) and Hermelo and Vassolo (2007). It is expected that firm size will have positive impact on the profitability of the textile firm. Asset turnover ratio is used as an independent variable. It is calculated by total sales divided by total assets. If the value of asset turnover ratio is higher, it indicates that the company is using sufficiently its assets to generate the revenue for the firm. Growth is measured as annual growth in the assets; similar measure has been used in the literature (Abbas et al. 2013; Glancey 1998). Leverage is measured as short term and long term leverage. Short term leverage is computed as total current liability divided by total asset, it indicates how quickly a company can pay off its debts if it needed by using current assets and it is expected that leverage has negative impact on the profitability of the firm and long term leverage is computed as total non-current

liabilities divided by total asset. Liquidity is defined as all those assets which can be easily realizable at the book value for example, cash, account receivables etc. (State bank of Pakistan 2011) and it is computed as current assets divided by current liabilities. Liquidity ratio shows a company's ability to pay back its short term debts.

The descriptive value of net profit shows that an average value of net profit of 111 textile firms is 221372.1 thousand rupees and total sales value is 4125147 thousand rupees. The average value of net profit in relation to total sales is about 5 percent, it means the rest of 95 percent of sales value goes in the cost and expenses. Asset turnover ratio is computed by using figures of total sales from income statement and total asset value can be found in the balance sheet of the firm.

Table 2: Definition of Variables and Descriptive Statistics

Variable	Definition	Mean	Standard Deviation
Netprofit	Net profit (Thousand rupee)	221372.1	515312.3
Size	Total Sales volume (Thousand rupee)	4125147	5048493
Assetratio	Asset Turnover Ratio	1.2030	0.5920
Growth	Annual growth rate	0.1380	0.2770
Lev1	Short term leverage	0.4622	0.1618
Lev2	Long term leverage	0.2041	0.1570
Liq	Liquidity	2.0403	19.5572

The mean value of asset turnover ratio shows that for every rupee spend on assets will generate the revenue of 1.2 rupee for the textile firms. It should be further noted as the asset gets older the asset turnover ratio will be different, as the book value of asset will go down with every passing year. The average value of annual growth rate of asset is 0.138, it shows that the total asset grow at the rate of 13.8 percent annually. The short term and long term leverage values are 0.4622 and 0.204 respectively, these values shows that textile firms have more short term

liabilities than long term liabilities. The average liquidity value is 2.04 (see table 2), which shows a satisfactory level of textile firms to pay back its short term debts.

4. Methods

The economic literature suggests that different financial variables have significant impact on the profit of the firm (Abbas et al. 2013; Chhapra and Asim 2012). They suggest net profit of a firm depends on different financial variables such as sales, asset turnover ratio, asset growth, debts (short term and long term debt) and liquidity. The relationship can be specified as follows

Net profit = f(size, assettratio, growth, lev1, lev2, liq)

For this present study, Translog functional form is used as this functional form has fewer maintained hypothesis than some other functional forms such as Cobb Douglas, Linear, etc. The Translog functional form can be specified as follows

$$
\begin{aligned}
Lnnetprofi\ t_{jt} &= \beta_0 + \beta_1 Lnassettra\ tio_{jt} + \beta_2 Lngrowth_{jt} + \beta_3 Ln;lev1_{jt} \\
&+ \beta_4 Lnlev2_{jt} + \beta_5 Lnsize_{jt} + \beta_6 Lnliq_{jt} + \frac{1}{2}(\beta_{11} Lnassettra\ tio^2{}_{jt} + \\
&\beta_{22} Lngrowth^2{}_{jt} + \beta_{33} Lnlev1^2{}_{jt} + \beta_{44} Lnlev2^2{}_{jt} + \beta_{55} Lnsize^2{}_{jt} + \beta_{66} Lnliq^2{}_{jt}) \\
&+ \beta_{12} Lnassettra\ tio_{jt} Lngrowth_{jt} + \beta_{13} Lnassettra\ tio_{jt} Lnlev1_{jt} + \\
&\beta_{14} Lnassettra\ tio_{jt} Lnlev2_{jt} + \beta_{15} Lnassettra\ tio_{jt} Lnsize_{jt} + \\
&\beta_{16} Lnassettra\ tio_{jt} Lnliq_{jt} + \beta_{23} Lngrowth_{jt} Lnlev1_{jt} + \beta_{24} Lngrowth_{jt} Lnlev2_{jt} \\
&+ \beta_{25} Lngrowth_{jt} Lnsales_{jt} + \beta_{26} Lngrowth_{jt} Lnliq_{jt} + \beta_{34} Lnlev1_{jt} Lnlev2_{jt} \\
&+ \beta_{35} Lnlev1_{jt} Lnsize_{jt} + \beta_{36} Lnlev1_{jt} Lnliq_{jt} + \beta_{45} Lnlev2_{jt} Lnsize_{jt} + \\
&\beta_{46} Lnlev2_{jt} Lnliq_{jt} + \beta_{56} Lnsize_{jt} Lnliq_{jt} + \mu_{jt}
\end{aligned}
$$

Where net $profit_{jt}$ is net profit of jth textile firm in year t, similarly all the right hand side financial variables are used for jth firm at t year, βs are the parameters of different financial variables and μ_{jt} is the random error term.

The elasticity of output with respect to each financial variable i.e. growth, leverage, size, liquidity and asset turnover ratio would be calculated by using

$$\varepsilon_i = \frac{\partial LnNetprofit}{\partial LnX_i}$$

Where Xi = 1, 2, 3, 4, 5, 6. So the elasticity of each financial variable[2] can be written as

$$\frac{\partial LnNetprofit}{\partial LnX_i} = \beta_i + \sum_{j=1}^{7} \beta_{ij} \overline{LnX_j}$$

5. Estimation and Results' Discussion

For estimation purpose, we used Translog functional form and applied different econometric tests for the robustness of the model such as likelihood ratio (LR) test, Hausman test, Ramsey RESET test, heteroscedasticity and auto correlation tests.

Likelihood ratio test is used to compare the restricted (Cobb Douglas) and unrestricted (Translog) model. Different restrictions were applied to determine whether the restrictions hold or not. The value of LR test is 84.59, which is significant at 10 percent level of significance as shown in table 3. It shows that Translog (unrestricted) model performs better than the Cobb Douglas (restricted) model.

We also applied Hausman test in order to select between fixed and random effect model. The test statistic used in Hausman is given as under

$$\left(\hat{\beta}_{FE} - \hat{\beta}_{RE}\right)^T \left[Var(\hat{\beta}_{FE}) - Var(\hat{\beta}_{RE})\right]^{-1} \left(\hat{\beta}_{FE} - \hat{\beta}_{RE}\right) \sim \chi_{k-1}^2$$

The value of Hausman test is 33.60 and the coefficient is not significant at 10 percent level of significance (see table 3). The test statistic showed that random effect model performs better than fixed effect model.

Present study also applied Ramsey Reset test for the specification of functional form. For this purpose, an auxiliary regression is formulated by adding different power terms of predicted dependent variables in the model. If the test fails to reject hypothesis then it shows that the model is not properly specified and

[2] This formulation of elasticity shows that it is evaluated at sample mean of each financial variable such as growth, leverage, size, liquidity and asset turnover ratio.

there could be a problem of specification of the model and if the test rejects the hypothesis then it means the model is properly specified (Thomas, 1999).

Table 3: Estimates of Textile Firms using Translog Function

Variables	Textile Firms (n=111)
Constant	-11.3062 (17.1058)
Lnassettraio	6.8913 (2.6981)*
Lngrowth	-0.7773 (1.1817)
Lnlev1	-10.7812 (4.9517) *
Lnlev2	-2.1208 (1.8017)
Lnsize	0.6134 (2.1084)
Lnliq	-8.6348 (4.9999) **
$Lnassettraio^2$	0.2282 (0.2021)
$Lngrowth^{2'8}$	-0.1142 (0.0404) *
$Lnlev1^2$	-1.9663 (0.5730) *
$Lnlev2^2$	-0.1716 (0.1110)
$Lnsize^2$	0.0282 (0.0673)
$Lnliq^2$	-0.8807 (0.4435) *
LnassettraioLngrowth	0.2614 (0.1193) *
LnassettraioLnlev1	2.3080 (0.4009) *
LnassettraioLnlev2	0.3816 (0.1963) **
LnassettraioLnsize	-0.2355 (0.1686)
LnassettraioLnliq	1.5203 (0.5297) *
LngrowthLnlev1	-0.0789 (0.2160)
LngrowthLnlev2	-0.2337 (0.0854) *
LngrowthLnsize	-0.0181 (0.0708)
LngrowthLnliq	-0.0292 (0.2194)
Lnlev1Lnlev2	-0.5460 (0.4232)
Lnlev1Lnsize	0.2975 (0.2773)
Lnlev1Lnliq	-2.1282 (0.7706) *
Lnlev2Lnsize	-0.0095 (0.0975)
Lnlev2Lnliq	-0.0156 (0.3690)

LnsizeLnliq	0.4401 (0.3018)
Coefficient of Determination	0.709
LR test	84.59*
RESET test	0.13
Hausman Test	33.60
Wooldridge Test for Auto Correlation	4.367**

Standard error of the Coefficient is given in the prentices and Estimates obtained by using FGLS procedure. * and ** represents statistical significance at 5 % and 10 % level of significance respectively

The results of the Ramsey Reset test shows that the test statistic is 0.13 and the value is not significant at 10 percent level of significance as shown in table 3. It shows that the Translog model is properly specified.

Presence of heteroscedasticity results in unbiased but inefficient estimates of the parameters (Gujarati, 2007). For this purpose, we used White test and it shows that there is a problem of heteroskedasticity in the textile data. Presence of serial correlation biases the standard error and makes the results inefficient. For the present study, we used Wooldridge serial correlation test. Drukker (2003) was of the view that Wooldridge serial correlation test requires relatively less assumptions. The Wooldridge serial correlation statistic is 4.367 and the statistic is significant at 10 percent level of significance. It shows that there is a problem of first order autocorrelation in the textile data.

To fix the issues of heteroscedasticity and autocorrelation, present study uses Feasible Generalized Least Square (FGLS) procedure. The results of the estimated Translog functional form are presented in the table 3. The coefficient of determination value is 0.709; it shows that about 70.9 percent variation in the net profit is due to asset turnover ratio, growth, short term leverage, long term leverage, size and liquidity. We also computed elasticity of net profit with respect to each financial variable as reported in the Table 4.

The elasticity estimates of asset turnover ratio is positive, it shows that as the asset turnover ratio goes up, it has a positive impact on the net profit; this relation further indicates that textile companies are using sufficiently its assets to generate the revenue. The value of elasticity indicates that if the asset turnover ratio increases by 1 percent then it will result in an increase in the net profit by 0.12 percent.

The elasticity magnitude of size also indicates positive relationship, it shows as the total sales of the textile firm goes up then it has a positive impact on net profit. These results are consistent with the findings of Krishnan and Moyer (1997); Zeitun and Tian (2007) and Onaolapo and Kajola (2010). The value of elasticity indicates that as the total sales of the textile firms goes up by 1 percent then the net profit will go up by 0.797 percent as shown in table 4.

The growth variable has a negative impact on the net profit. It shows that when the growth of total asset goes up, it decreases the net profit. Dobson and Gerrard (1989) and Zeitun and Tian (2007) found the similar behavior. The elasticity coefficient of growth is significant at 5 percent level of significance. The coefficient indicates that as the total asset goes up by 1 percent, it decreases the net profit of 0.28 percent.

Table 4: Elasticities as Estimated by Various Studies

Variable	Elasticity
Assetratio	0.121*
Growth	-0.276*
Lev1	-3.301*
Lev2	-0.950*
Size	0.797*
Liq	-0.124*

* represents statistical significance at 5 % level of significance

The short term and long term leverage coefficient indicates negative relationship with net profit. Similar relationship has been found by Krisnan and Moyer (1997); Zeitun and Tian (2007); Onaolapo and kajola (2010); Memon et al. (2010); Chhapra and Asim (2012) and Abbas et al. (2013). The magnitude of short term leverage is higher than long term leverage, it shows that net profitability of textile firms is more responsive to the short term leverage than long term leverage. The magnitude shows that if the short term leverage increases by 1 percent, it will result in a decrease in the profitability of 3.3 percent. However an increase in the long term leverage will cause a decrease of net

profitability of 0.95 percent and these values are significant at 5 percent level of significance. The elasticity coefficient of liquidity shows that if there is an increase of liquidity by 1 percent, it will result in a decrease of net profitability by 0.12 percent. It means if a textile firm has more assets (those can be realized easily at the book value) it has a significant negative impact on profitability. The results of the present study are consistent with the findings of Abbas et al. (2013). It shows that the textile firms should reduce these assets (i.e. cash, receiveables, etc.) and invest in the business in order to increase the profitability.

6. Conclusion

Financial variables play an important role in any business to grow and growth of this business benefits the society in several ways such as an improvement in the products' quality, an increase in competition, an enhancement in the exports, reduction in unemployment, economic development and foreign exchange earnings. To understand the impact of different financial variables on the profitability of textile sector in Pakistan, the objective of the present study is to see which of the financial variables have significant impact on the profitability of textile sector.

For this purpose the data were obtained from 111 textile firms operating in Pakistan for the period of 2006 to 2011. In the literature, different studies have used linear model (having a lot of maintained hypothesis) and they did not test the specification of the functional form. Present study fills this gap by estimating a flexible functional form (Translog) and applies the functional form specification test, nested model test, heteroskedasticity and autocorrelation test. The results of the model also showed that Translog functional form is the best representation of the textile data.

The results of the present study are as per our expectations and confirm the hypothesis that we have proposed by reviewing the literature. The elasticity estimates showed that asset turnover ratio and the size of the firm have positive impact on the net profitability; while growth, short term and long term leverage, liquidity have negative impact on the net profitability. The results of the present study are consistent with the findings of the literature. These results imply that the textile firms are using their existing assets in an efficient manner, the short term and long term leverage shows that companies should try to reduce the level of these leverages in order to increase the profitability. The elasticity of liquidity coefficient implies that textile firms should reduce the assets that can be easily releasable in order to increase the profitability of the textile firm; rather the textile

firms should invest in these assets back to the business so that the profit can be increased by using these investments.

The present study uses the data from textile sector and analyzed the impact of various financial variables on the firm's profitability. Similar approach can be used on other sectors such as sugar, food processing industry etc. to examine the determinants of various financial variables on the profitability. Due to non-availability of longer time period data, present study estimated model by using data from 2006 to 2011. Other researchers can apply similar approach for the extended period of time for various sub-sectors of industry.

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