

**IMPACT OF SPECIFIC FACTORS ON CAPITAL STRUCTURE
DECISIONS: A CASE OF PAKISTAN MOTOR VEHICLES,
TRAILER AND AUTO PARTS INDUSTRY (2004-2014)**

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ABSTRACT

The purpose of this paper is to identify specific factors of capital structure in the motor vehicle industry. Capital structure is the combination of debt and equity. Thus, the firms have to decide as what portion of equity and debt should be included in capital structure. This paper also argues that profitability, asset tangibility, financial and business risks have significant and negative impact on capital structure decisions. Nevertheless, liquidity and tax shield have positive impact and capital structure decisions.

Keywords: Factors, Capital Structure Decisions, Random Effect, Fixed Effect, Pooled OLS, Significant, Consideration

INTRODUCTION

Background of the Study: Capital structure is the combination of a debt and equity. What portion of equity and debt to be included in overall capital structure is very important decision for any firm? Each firm attempts to pay special attention to decide about capital structure mix. In capital structure decision, major emphasis is given on debt financing that's why capital structure decision and leverage decision are used interchangeably (Brigham, 2005). Capital structure is widely debated issue in the world of corporate financing.

Modern capital structure concept was introduced by Modgilani and Miller in 1958 which is also known as MM Proposition-I. Modgilani and Miller (1958) came up with the assumption of without taxes. They concluded firm's value remained same at any level of debt. But in 1963 they modified their assumption and came up with the assumption of taxes which is also known as MM proposition-II. Modgilani and Miller (1963) concluded firm's value reached at optimum when it used 100 percent debt in its capital structure. Though later on both MM proposition-I and MM proposition-II were heavily criticized and some other theories were developed. But contemporary financial experts still believe Modgilani and Miller is the pioneer of the modern capital structure.

Capital structure has remained a hot issue since its inception from 1958. It is still a question whether it is possible to achieve appropriate mix of debt and equity in reality or not. It is found through literature review that

capital structure factors vary from company to company and country to country. Titman & Wessels (1988), Bevan & Danbolt (2002) concluded large size firms of developed countries included major portion of debt in their capital structure. But Hall, Hutchinson and Michaelas (2004), Degryse, De Goeij & Kappert (2012) found same for small and medium size firms of developed countries. Gurcharan (2010), Afza & Hussain (2011) found small size and firms of developing held major portion of debt in their capital structure.

Research Questions: What are the specific factors of capital structure decision? How, do the firms' specific factors affect to decide about capital structure mix in motor vehicles, trailer and auto parts industry?

Problem Statement: Capital structure mix is an important decision for any firm. Firms strive to choose appropriate mix of debt and equity to bring their cost of capital at the lowest level. Financial managers always make efforts to raise the wealth of shareholders because it is their core responsibility. Importance of capital structure decision cannot be ignored. Appropriate decision making regarding financing mix can assist firms to lower their cost of capital which ultimately increases the value of firm. Capital structure decision is influenced by many factors. It is important to take careful consideration of those factors as best financing mix can be formulated. This study focuses to terrace out the specific factors of capital structure and their effect on financing mix especially on motor vehicles, trailer and auto parts industry.

SCOPE OF STUDY

This study is an attempt to scope of the study out those factors and their effects on capital structure decision. Eventually, this will help firms to ameliorate their financial performance and their contribution in GDP of Pakistan will also increase. This will be a better signal for society. Firms will be able to earn higher profits and this will attract most of the investors.

This study specifically focuses on motor vehicles, trailer and auto parts industry but general conclusion will be drawn for whole non-financial sector of Pakistan. It is expected this study will significant contribute to existing knowledge on capital structure. Firms operating in motor vehicles, trailer and auto parts industry will get certain directions from the findings of this study. Apart from motor vehicles, trailer and auto parts industry, firms operating in other manufacturing business will also be able to assess their financing decisions.

OBJECTIVES OF THE STUDY

This study mainly focuses to terrace out firms' specific factors of capital structure decisions for the listed firms of motor vehicles, trailer and auto parts industry. Apart from that, this study also attempts to find:

- Effect of Profitability on capital structure decisions,
- Effect of tangibility of asset upon deciding capital structure,
- Influence of size on capital structure decisions,
- Impact of growth on capital structure decisions,
- Influence of business and financial risk on capital structure decisions,
- Effect of on capital structure decisions, and
- Impact of tax shield on capital structure decisions.

HYPOTHESES OF THE STUDY

- H₁:** Profitability has negative and significant impact on capital structure decisions.
- H₂:** Asset tangibility influences capital structure decisions significantly.
- H₃:** Size has positive influence on capital structure decisions.
- H₄:** Growth affects capital structure decisions favourably.
- H₅:** Financial risk influences on capital structure decisions inversely.
- H₆:** Business risk affects capital structure decisions inversely.
- H₇:** Liquidity affects capital structure decisions positively.
- H₈:** Tax Shield has favourable effect on capital structure decisions.

LIMITATIONS OF THE STUDY

This study examines the factors of capital structure of listed firms operating in motor vehicles, trailer and auto parts industry. These factors are financial in nature, any effect is observed purely based on available financial data. This study does not incorporate any non-factor such as law and order situation, electricity problems, other human motivational factors. Analysis is based on financial data and findings are drawn by keeping financial aspects only. The specific focus is only motor vehicles, trailer and auto parts industry but results are generalized for other manufacturing industries of Pakistan which is known as non-financial corporate sector of Pakistan.

LITERATURE REVIEW

There are several factors of capital structure decisions used in lot of the national and international studies. These factors are profitability, asset tangibility, size, growth, financial risk, business risk, liquidity and tax shield.

First factor is profitability; return on assets has been used as a proxy of profitability. Shah & Hijazi (2004) used return on assets as a proxy of profitability. They supported it was appropriate proxy because capital structure consisted on both debt and equity and return on assets showed collective return of both financing modes. Myers & Majluf (1984) concluded profitability significantly influenced on capital structure decisions.

Second factor is asset tangibility; it is measured by the proportion of gross fixed assets in the total assets of the company (Shah & Hijazi, 2004).

Awan (2011), Sabir & Malik (2012), Hijazi & Tariq (2006), Ali (2011) and Shah & Khan (2007) conducted their studies on Pakistani firms and found positive impact of asset tangibility on capital structure decisions. There are a few studies which found negative impact of asset tangibility on capital structure decisions such as Afza & Hussain (2011), Sheikh & Wang (2011) conducted their studies on electrical goods sector of Pakistan and manufacturing sector of Pakistan respectively.

Third factor is size; it is measured by taking natural log of assets (Shah & Hijazi, 2004; and Titman & Wessels, 1988). There are also mixed findings for this factor. Ahmed (2010), Rafiq (2008), Sabir & Malik (2012), Saeed (2007), Sheikh & Wang (2011), Shah & Hijazi (2007), Ali (2011) found size positively affected capital structure decisions. Their studies were based on Pakistani firms. On the other hand similar effect was found by Titman & Wessels (1988) and Sayilgan (2006) in international setting.

Fourth factor is growth; it is measured as change in total assets divided by base year total assets (Shah & Hijazi, 2004). There are mixed finding on this factor. Shah & Hijazi (2004) conducted their study on Pakistani firms and found growth negatively influences on capital structure decisions. Similar results were also observed in international setting such as Jensen & Meckling (1976), Titman & Wessels (1988), Opler & Titman (1994), Barclay, Smith & Watts (1995), Rajan & Zingales (1995), Ozkan (2000), and Sayilgan (2006) found negative impact of growth on capital structure decisions.

Fifth factor is financial risk; it is measured by earnings before interest and tax divided by earning before tax (Pindado, Requejo, & Torre, 2008). Castanias (1983), Shleifer & Vishny (1992), Handa & Linn (1993), Hughes & Liu (2007), Pindado *et.al.*, (2008), and Dragota (2009) found inverse effect of financial risk on capital structure decisions. They further added shareholders got reluctant with high level of debt and demand for high returns. It is because debt increases cost of borrowing; and financial risk also increases.

Sixth factor is business risk; it is measured by degree of operating leverage that is gross profit margin divided by earnings before interest and tax (Taggart, 1977). Taggart (1977), Marsh (1982) found business risk negatively influenced on capital structure decision. These were early studies that incorporated this factor. Later on, Johnson (1997), Piotroski (2000), Campbell & Hilscher (2006) supported early studies and found same results.

Seventh factor is liquidity; it is measured by current ratio that is current assets divided by current liabilities (Anderson 2002). Anderson (2002), Mazur (2007), and Lipson and Mortal (2009) found liquidity had inverse effect on capital structure decisions. On the other hand, Barclay, Morellec & Smith (2001), Green and Hollifield (2003), Butler, Grullon & Weston

(2005), and Sibilkov (2009) found liquidity had positive effect on capital structure decisions.

Eighth factor is tax shield; which is measured interest expense into corporate tax rate (MacKie-Mason 1990). Kraus & Litzenberger (1973), Jensen & Meckling (1976), Miller (1977), Kim (1978), Grossman & Hart (1982), Bradley, *et.al.*, (1984), Jensen (1986), Harris & Raviv (1990), Stulz (1990) and Chang (1999) found tax shield positively influenced to decide about leverage level.

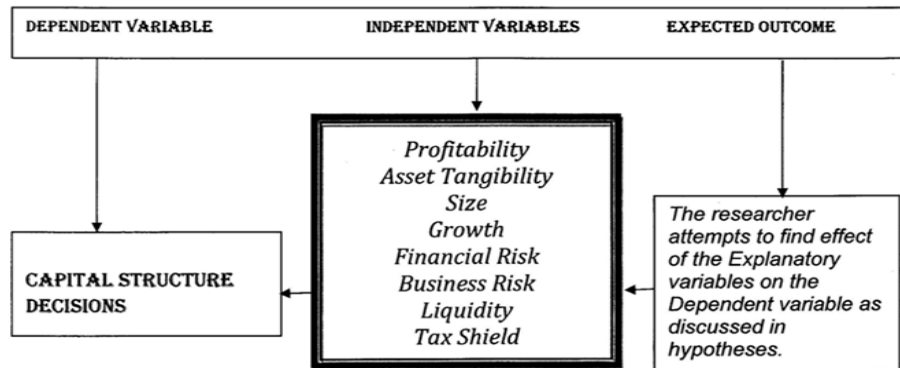
RESEARCH MODEL AND THEORETICAL FRAMEWORK

This study examines the effect of specific factors on capital structure decisions on listed firms operating in motor vehicles, trailer and auto parts industry of Pakistan. The stochastic model has been developed:

$$CS = \alpha - \beta_1 P \pm \beta_2 T + \beta_3 S + \beta_4 G - \beta_5 FR - \beta_6 BR + \beta_7 L + \beta_8 TS \pm \varepsilon \text{ (Equation: 1)}$$

Whereas:

CS=Capital Structure Decisions	FR=Financial Risk
P=Profitability	BR=Business Risk
T=Tangibility of Assets	L=Liquidity
S=Size	TS=Tax Shield
G=Growth	
And theoretical framework is as follows:	



METHODOLOGY

Research Design: This research is quantitative and descriptive in nature. It includes numerical data which have been collected from the financial statement analysis. This study investigates impact of specific factors profitability, asset tangibility, size, growth, financial risk, business risk, liquidity and tax shield on capital structure decisions. It requires multiple-regression to be applied to run the data. Regression technique is run

to test the impact of independent variable(s) on dependent variable. This study uses panel data because data has both time series and cross sectional characteristics. There are three panel models pooled OLS, fixed effect model, and random effect model. The selection of the best model among these three models is made by using some econometrics tools. First Hausman test is applied to choose better model from fixed and random effect models. The decision is made on probability value of Hausman test, selection of random effect model does not require any further investigation but selection of fixed effect model further requires to be compared with pooled OLS. Wald test is applied to choose better model from fixed and pooled OLS models.

Sampling Design: Annual data of seventeen listed firms from motor vehicles, trailer and auto parts industry of Pakistan have been collected from State Bank of Pakistan through systematic sampling. There are twenty two companies in motor vehicles, trailer and auto parts industry of Pakistan but data of eleven years (2004 to 2014) is available only of seventeen companies. Data of each company has been collected from “Financial Statement analysis of Non-financial sector of Pakistan” published by State Bank of Pakistan (SBP website). Any further requirement associated with data has also been confirmed from particular website of that firm.

Data Analysis Techniques: It has already been discussed the best one among three panel models would be selected through Hausman and Wald tests. Attempt has been made to well regard the assumptions underlying each model. It has also been attempted to develop such model which is useful for estimation. In order to achieve this purpose, following econometrics techniques have been applied:

- Augmented Dicky-Fuller Test to check stationary of data.
- Variance Inflating Factor (VIF) and Tolerance to check multi-co-linearity among explanatory variables.
- Analysis of Variance (ANOVA) to test the usefulness of the model.
- Akaike info criterion (AIC), Schwarz criterion (SC), Hannan-Quinn criterion (HQC) to check the validity of the model.
- Durbon Watson to test the autocorrelation between residual and its lag.
- Actual and Fitted Graph to check goodness of the fit of the model.

DATA ANALYSIS

Findings and Discussion

	Augmented Dicky-Fuller-Data Stationary Test		
	Test Critical Values		
	1% Level	5% Level	10% Level
	-3.465780	-2.877012	-2.575097
Variables	t-Statistic		Probability
Capital Structure Decisions	-5.033018		0.0000
Profitability	-12.35583		0.0000
Asset Tangibility	-4.572398		0.0002
Size	-6.581646		0.0000
Growth	-10.31420		0.0000
Financial Risk	-5.361933		0.0000
Business Risk	-4.923688		0.0001
Liquidity	-5.343717		0.0000
Tax Shield (Log)	-4.873875		0.0001

Above table summarizes the results of ADF-Test to check whether data is stationary or non-stationary. These results have been compiled at level. Both t-statistic and Probability suggest data is stationary at 1 percent, 5 percent and 10 percent.

Hausman Test-Comparison of Fixed and Random Effect Models			
Test Summary	Chi Square Statistic	Chi Square d.f.	Probability
Cross Section Random	19.107107	8	0.0143

Hausman Test results suggest fixed effect model is appropriate on this data. When fixed effect model is selected, it further requires to be compared with pooled OLS. For this purpose dummy variables are introduced and tested in Wald Test.

Wald Test-Comparison of Fixed and Pooled OLS Models			
Test Statistic	Value	Df	Probability
F-statistic	4.151518	(16, 162)	0.0000

Wald Test results suggest fixed effect model is appropriate on this data. It does not required further investigation. Following results have been compiled by using fixed effect model which is found appropriate by using Hausman and Wald tests.

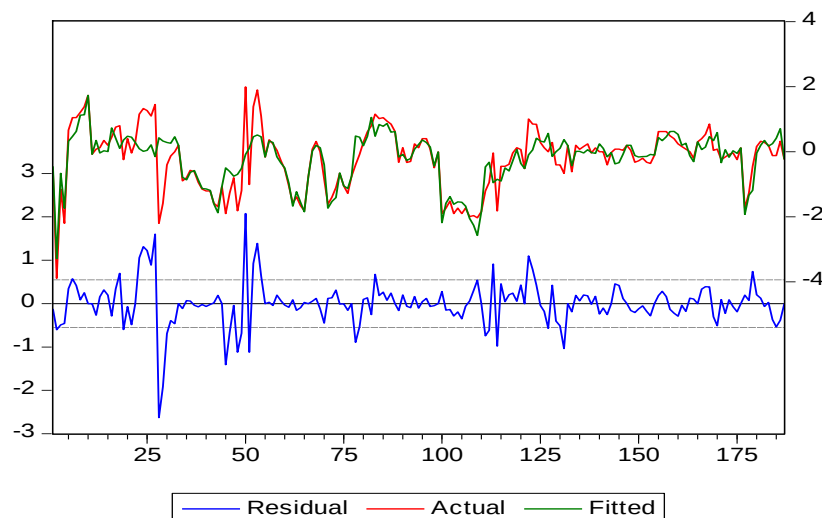
Dependent Variable:- Capital Structure Decisions: Hypotheses Testing						
Variables	Coefficient	Std. Error	t-statistic	Prob.	Tolerance	VIF
Profitability	-0.004790	0.000459	-10.43572	0.0003	.942	1.062
Asset Tangibility	-0.378300	0.126403	-2.992807	0.0032	.794	1.259
Size	0.173836	0.063825	2.723634	0.0072	.917	1.090
Growth	0.015258	0.048779	0.312802	0.7548	.916	1.092
Financial Risk	-1.874764	0.959608	-1.953676	0.0525	.494	2.023
Business Risk	-1.102192	0.116345	-9.473469	0.0000	.814	1.228
Liquidity	0.461370	0.067687	6.816227	0.0065	.967	1.034
Tax Shield	0.161663	0.050014	3.232317	0.0015	.504	1.982

Above table summarizes results of fixed effect model. The coefficient of profitability factor is negative and the probability value of profitability factor indicates null hypothesis is rejected it means profitability has negative and significant impact on capital structure decisions. The coefficient of asset tangibility factor is negative and the probability value of asset tangibility factor indicates null hypothesis is rejected it means asset tangibility influences capital structure decisions significantly and this impact is negative. The coefficient of size factor is positive and the probability value of size factor indicates null hypothesis is rejected it means size has positive influence on capital structure decisions. The coefficient of growth factor is positive and the probability value of growth factor indicates null hypothesis is not rejected it means growth does not affect capital structure decisions favourably.

The coefficient of financial risk factor is negative and the probability value of financial risk factor indicates null hypothesis is rejected it means financial risk influences on capital structure decisions inversely. The coefficient of business risk factor is negative and the probability value of business risk factor indicates null hypothesis is rejected it means business risk affects capital structure decisions inversely. The coefficient of liquidity factor is positive and the probability value of liquidity factor indicates null hypothesis is rejected it means developed liquidity affects capital structure decisions positively. The coefficient of tax shield factor is positive and the probability value of tax shield factor indicates null hypothesis is rejected it means tax shield has favourable effect on capital structure decisions. Variance Inflating Factor (VIF) and Tolerance indicate absence of multi-collinearity among explanatory variables which is desirable:

Model Summary			
Cross-Section fixed (Dummy Variables)			
R-squared	0.699449	Mean dependent var	-0.226190
Adjusted R-squared	0.654923	S.D. dependent var	0.934574
S.E. of regression	0.548999	Akaike info criterion	1.762429
Sum squared resid	48.82686	Schwarz criterion	2.194395
Log likelihood	-139.7871	Hannan-Quinn criter.	1.937462
F-statistic	15.70872	Durbin-Watson stat	1.576684
Prob(F-statistic)	0.000000		

Other results related to the model have been summarized in above table. R-squared value is 70 percent that indicates explanatory variables explain dependent variable by 70 percent. F-statistic and Prob (F-statistic) also indicate model is useful for prediction. AIC, SC, and HQC are also lower and closer to each other that is also a good sign for estimated model. Durbin Watson stat indicates there is very weak autocorrelation between residual and its lag but it is acceptable.



This graph also shows goodness of the fit of the model. Forecasted model is well fitted on actual data. All indicators of best fit regression have been observed in this model.

CONCLUSION AND RECOMMENDATIONS

There are eight specific factors which affect capital structure decisions. This study has critically evaluated those factors and findings have been drawn from the data of motor vehicles, trailer and auto parts industry of Pakistan. It has found these factors have key importance upon deciding capital structure level. All factors except growth have found significant. Some factors have negative impact and some have positive impact on capital structure decisions. The factors such as profitability, asset tangibility, size, financial risk, business risk, liquidity and tax shield have significant impact on capital structure decision. Profitability, asset tangibility, financial risk and business risk have significant and negative impact on capital structure decisions. On the other hand, size, liquidity and tax shield have significant and positive impact on capital structure decisions. Growth is the only factor which is found insignificant; it has no significant impact on capital structure decisions. On the basis of findings, it is recommended firms operating in motor vehicles, trailer and auto parts industry of Pakistan must take careful consideration of these factors while deciding about capital structure level. Apart from that, other firms operating in manufacturing business can also review their capital structure decision in the light of these factors.

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