Impact of Capital Structure on Profitability: A Comparative Study of Cement &Automobile Sector of Pakistan

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Abstract

This study aims to find a relationship between the structure of capital & profitability. Various parameters namely Short-term & long-term Debts to Asset Ratio, Funded Capital Ratio, Funded Debt Ratio, Current Debt Ratio, Funded Asset Ratio & Sales Growth as an independent variable & Return on Assets of as dependent variable to find a relationship between Capital Structure & Profitability. 28 companies in Cement & Automobile sector of Pakistan Stock Exchange were chosen randomly as a sample. Secondary data for 7 years was collected from audited consolidated financial statements & analyzed through descriptive statistical techniques namely Correlation & Regression. Housman test was used for selection of model. Results display both positive &negative relationship between the variables in Cement & Automobile sector. The study contributes in the existing literature of finance especially in the context of emerging economies like Pakistan.

Keywords: Capital structure, Profitability, Performance analysis.

Introduction

A business organization is so called due to its economic objectives viz. earning profits. Capital structure can affect cost of capital & as a result financial performance. Cost of capital is the standard for the capital budgeting decisions; therefore the optimal level of debt &equity is necessary to perform well.

Some of the theories namely signaling theory, trade off theory, pecking order theory, and information asymmetry theory & agency

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theory also tell us about the relationship of capital structure with profitability. Beside these two professionals Modigliani & Miller (1958) concluded & irrelevance scheme on capital Structure.

Agency theory tells us about the debts &equity mix that how much portion is financed through debts &how much through equity for balancing the cost of debts against its benefit. The theory also states that debt financing have some advantages for the company like tax benefits. The important point which is discussed in the traditional theory of capital structure is "when WACC is minimized & the market value of assets is maximized an optimal structure of capital exists" (Kraus & Litzenberger, 1973). The asymmetry of information may enable the management as they have more information as compared to the investors in the market. Management intends to spread good news in the market to help maximize shareholder's value.

Signaling theory display managers' are holders of tools that help them clarify the difference between different firms as compared to their own. The best strategy is to use debts. It shows that the future performance of the company will be good because the managers having better expectations will use their best efforts. In short it sends good news &equally bad news about the firm performance.

According to Pecking order theory, company should prefer internal source of financing first &if it's inner source are not enough to meet its requirement i.e. in achieving the profitable projects than think about the external source of financing. According to this theory the company wants internal financing first than second priority should be debt &third equity financing. This Theory was also admired by Myers (1984) when he suggested that equity should be the last option for the managers, because the shareholders of the company will think that their part of ownership is reduced (Kraus & Litzenberger, 1973).

Research Objectives

i). To calculate a relationship of capital structure with profitability in indigenous cement &automobile sector.
ii). To find the variance in results between the aforementioned two sectors.
iii). To help management of cement &automobile sector in selecting optimal capital structure.
iv). To find out volatility in debts both long &short term in relationship with profitability of the selected firms.

Literature Review

Fu, (1997) found significant relationship between capital structure and profitability; He also found an inverse proportion to liability. Mesquita & Lara (2003**)** conducted a similar type of study &found that the rate of

return holds a positive correlation with short-term debt and equity. Whereas, it holds an inverse relationship with long term debt. Long term debts were not found beneficial for the company owing to shrinking profitability by payment of interest.

Likewise Amjad, (2007) found a positive &statistically significant correlation between profitability and debts. He also relates the static trade-off theory with his findings &argues that the total debts have no considerable relationship with financial performance because of hereditary difference characteristics of long term and short term debts. Contrarily, the capital structure of the firm holds a significantly negative impact on the financial performance of firm (Onaolapo, Kajola & Sunday, 2010). Similarly, Pratheep (2011) investigated capital structure &financial performance &found a negative relationship due to the cash outflows against interest payments.

Capital structure influences financial performance due to the methods of adjusted worth, market rate & book value. An optimal capital is the one which will minimize the cost of capital &maximize shareholder's wealth as noted by Gupta and Sharma, (2012). Congruently, Chou, (2010) found that there is a strong curvilinear relation between equity returns & debt to assets.

Khan, (2012) displayed a negative and inconsistent relationship between financial leverage &the performance of firm. He is also of the view that financial leverage has a significantly negative relationship with the performance of firm.

Ferati, (2012) found a positive correlation between short term debts & negative correlation between long term debts. Akhtar, Husnain & Ahsan, (2012) revealed that the spinning sector companies prefer internal financing as compared to external financing.

Another research conducted by Abbas et.al, (2012) concluded a significantly negative relationship between debts &financial performance & a significantly positive relationship between asset turnover, firm size, asset tangibility & growth opportunities with financial measures. The study also showed that by reducing debt ratio; management can improve the company's profitability &can also increase shareholder's wealth.

Aburub, (2012) is of the view that the firm's capital structure had a positive & statistically significant impact on the firm's accounting & market performance measures. So far the studies reveal mixed findings &further analysis is required to form an indigenously objective view on the subject matter.

Hypotheses

H_1 = Long-term Debt to asset has a significant effect on profitability.

H_2= Short-term Debt to Total Asset has a significant effect on profitability.
H_3= Current Assets has a significant effect on profitability.
H_4= Funds Asset Ratio has a significant effect on profitability.

Methodology

Sample of the study is based on two sectors of Pakistan Stock exchange i.e. Cement & Automobile. Out of a total 36 listed companies in both sectors we chose 28 companies using simple random sampling technique. Hence, 12 automobile companies &16 cement companies comprises of our sample. Financial data was obtained from financial statements analysis of State Bank of Pakistan for a period of 7 years viz. 2005-11.

Variables

Variables	Description	Justification
ROA $= \frac{NP}{TA}$	This ratio shows that how efficiently the firm has utilized their assets i.e. current assets and fixed assets.	Abdul Ghafoor khan(2012), Irfan Ahmed (2010), Arbab khan (2011), Chao Chen (2010), Onaolapo (2010), Abbas (2012), Nour Abu-Rub (2012), Chin Ai Fu (1997)
SG = $\frac{CYs - Lys}{Lys}$	Means the total increase in the sales of the company over a specific period.	Arbab khan (2011), Onaolapo (2010), Chin Ai Fu (1997)
STDTA = $\frac{STD}{TA}$	This ratio shows that how much of total assets have been financed through short term loan.	José Marcos Carvalho de mesquita1, José Edson Lara (2003), Abdul Ghafoor Khan(2012), Arbab khan (2011), Nour Abu-Rub (2012), Chin Ai Fu (1997)
LTDTA = $\frac{LTD}{TA}$	This ratio shows that how much of total assets have been financed through long term debt	José Marcos Carvalho de mesquita1, José Edson Lara (2003), Abdul Ghafoor Khan(2012), Arbab khan (2011), Nour Abu-Rub (2012), Chin Ai Fu (1997)
FCR = $\frac{LTD + OE}{FA}$	The Funded Capital Ratio is computed by dividing the sum of Long-Term (funded) Debt and Stockholders' Equity by Fixed Assets.	Arbab khan (2011), Chin Ai Fu (1997)
FDR = $\frac{LTD}{OSC}$	A company's debt, such as bonds, long-term notes	Arbab Khan (2011), Onaolapo (2010), Chin Ai

	payables or debentures that will mature in more than one year or one business cycle. This type of debt is classified as funded debt because it is funded by interest payments made by the borrowing firm over the term of the loan.	Fu (1997)
CDR $=\frac{TCA}{SF}$	This ratio show that how much the owners have contributed to pay its short term liability.	Arbab Khan (2011), Chin Ai Fu (1997)
FAR $=\frac{TFA}{STD}$	A lower FAR will discourage short-term creditors from giving more short-term debt.	Arbab Khan (2011), Chin Ai Fu (1997)

ROA=Return on Assets, NP=Net Profit, TA=Total assets, SG=sales Growth, CYS=current year sales, Lys=last year sale, STDTA=Short term debts to total assets, STD=short term debts, LTDTA=long term debts to total assets, LTD=long term debts, FCR=Funded Capital Ratio, OE=owner's Equity, FA=fixed assets, FDR=Funded Debt Ratio, OSC=ordinary share capital, CDR=Current debts Ratio, TCA=total current assets, SF=Shareholder's funds, TFA=total Fixed assets, FAR=funded assets ratio.

Model of Regression Estimates

The below mentioned model is used to find correlation.

$$ROA = \alpha + \beta 1 + (STDTA) + \beta 2(LTDTA) + \beta 3(FCR) + \beta 4(FDR) + \beta 5 (CDR) + \beta 6(FAR) + \beta 7(Sales\ Growth) + \mu$$

Where, ROA= the return on Asset, STDTA= Short term debt to Asset Ratio, LTDTA= Long term debt to Asset Ratio, FCR= Funded Capital Ratio, FDR= Funded Debt Ratio, CDR= Current Debt Ratio, FAR= funded Asset Ratio & Sales Growth is the persistent increase in total Sales.

Fixed Effect model (panel regression) analysis was carried out with help of the equation given above. In this equation the variable ROA is the dependent variable representing profitability. "α" is the constant which shows that if all the independent variables have zero effect on dependent variable then there will be "α%" change in the dependent variable due to the constant. "β" denotes the percentage change in the dependent variable due to one unit change in the independent variable. "μ" is the error which represents the unknown factors. Sign with each independent variable its positive or negative impact on the dependent variable.

All of the above mentioned tests were applied with the help of STATS 11.

Correlation Auto Mobile sector

	STDTA	LTDTA	FCR	FDR	CDR	FAR	SALGRW*
STDTA	1.0000						
LTDTA	0.8624	1.0000					
FCR	-0.2145	-0.1308	1.0000				
FDR	0.0153	0.1732	-0.3009	1.0000			
CDR	0.1001	-0.0499	-0.1990	0.6899	1.0000		
FAR	-0.2999	0.0607	-0.0183	0.2383	-0.1868	1.0000	
SALGRW*	0.0067	0.1328	0.0209	0.1939	0.0521	0.0176	1.0000

**Sales Growth*

The correlation table, short term debt to total asset (STDTA) is highly positive correlated with long-term debt to total asset (LTDTA) by amount of 0.8624. This shows that these variables may show significant relation with dependent variable. Similarly funded capital ratio is also positively correlated to Current debt ratio by 0.6899.

Hausman Test of Auto Mobile sector

	---- Coefficients ----			
	(b)	(B)	(b-B)	sqrt(diag (V_b-V_B))
	Fixed	Random	Difference	S.E.
STDTA	-.2174857	-.1977935	-.0196922	.
LTDTA	.8036423	.7460538	.0575886	.
FCR	-.048894	-.0119674	-.0369266	.
FDR	-.1252616	-.1353762	.0101146	.
CDR	.0222095	.0240797	-.0018703	.
FAR	-.1139595	-.06357	-.0503895	.
SALESGROWTH	-.0011051	-.007431	.0063258	.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)= 174.39
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

With the help of Hausman test we found that Prob >chi2 is 0.0000 which means that we should use fixed effect model for our data.

Regression of Auto Mobile sector

Fixed-effects (within) regression Number of obs = 84
Group variable: company Number of groups = 12
R-sq: within = 0.8128 Obs per group:
Between = 0.0586 Min = 7
Overall = 0.1945 Ag = 7.0

		Max = 7
		F(7,65) = 40.30
corr(u_i, Xb)	= -0.5174	Prob > F= 0.0000

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval
STDTA	-.2174857	.06525	-3.33	0.001	-.347799	-.0871725
LTDTA	.8036423	.116024	6.93	0.000	.5719265	1.035358
FCR	-.048894	.0117254	-4.17	0.000	-.0723113	-.0254767
FDR	-.1252616	.0571622	-2.19	0.032	-.2394223	-.0111008
CDR	.0222095	.010281	2.16	0.034	.0016769	.042742
FAR	-.1139595	.0218603	-5.21	0.000	-.1576176	-.0703014
SALGROW	-.0011051	.0086587	-0.13	0.899	-.0183978	.0161875
_CONS	.292083	.0513114	5.69	0.000	.1896071	.3945588
SIGMA_U	.15254925					
SIGMA_E	.05853919	(fraction of variance due to u_i)				
RHO	.87164497					

The regression equation obtained after the analyses of the data is as follows:

ROA= .292083+(-0.2174857)(STDTA) +0.8036423(LTDTA) +0.048894 (FCR)+0.1252)(FDR)+0.222095(CDR)+0.11395(FAR)+0.0011051(SALES Growth)+εi.

The regression results show that if all the independent variables are equal to zero there will still be an increase in the profitability of .292083 due to α. Further shows that there is a positive relation between LTDTA, CDR &profitability as one unit change in these variables increases the profitability by0.8036423 & 0.222095respectively. The result further shows that STDTA, FCR, FDR, FAR & SALES GROWTH of the firm negatively affects the profitability as each unit change in size of firm decreases profitability by -0.2174857,-0.048894, -0.1252616, -0.1139595 & -0.0011051 respectively.

The model is highly significant with a value of 40.30.Moreover, the coefficient table shows that STDTA, LTDTA, FCR, FDR, CDR & FAR are significant variables because there values are lesser then 0.05 i.e. 0.0001, 0.000, 0.032, 0.034 &0.000 respectively. Sales Growth is insignificant with 0.889. The value of R^2 is 0.8128 which means that it's a good fit. The value of R^2 tells that 81.28 percent changes in the profitability are brought by the selected independent variables.

Regression Estimation Cement Sector

The model use in finding the relationship between the above mentioned dependent &independent variables is as follows.

ROA = 0.3341+0.3922(STDTA)+ (0.1384) (LTDTA) +0.2269 (FCR) +0.0110325(FDR) +(-0.015425(CDR) +0.0235703(FAR)+(-0.0006)(SALES Growth)+μ

Correlation of Cement Sector

	STDTA	LTDTA	FCR	FDR	CDR	FAR	SALGRW*
STDTA	1.0000						
LTDTA	0.2845	1.0000					
FCR	-0.1420	0.1553	1.0000				
FDR	-0.1946	0.3350	-0.2313	1.000			
CDR	0.1151	-0.0182	-0.2898	0.6833	1.000		
FAR	-0.6057	0.2114	-0.0552	0.2457	-0.223	1.0000	
SALGRW*	0.0488	-0.1578	0.1610	-0.1722	0.123	-0.3893	1.0000

**Sales Growth*

Funded debt ratio (FDR) is highly positively correlated with current debt ratio (CDR) by amount of 0.6833. Similarly short term debt to total assets (STDTA) is also negatively correlated to funded asset ratio (FAR) by 0.6899, &funded asset ratio (FAR) is also negatively correlated with sales growth.

Hausman Cement Sector

In case of Cement Sector Husman test suggests Random model for the data the value ofProb>chi2 is 0.4464.

	Coefficients			
	(b)	(B)	(b-B)	sqrt(diag (V_b- V_B))
	Fixed	Random	Difference	S.E.
STDTA	.3922061	.3435574	.0486487	.
LTDTA	.1384485	-.1422753	.0038268	.
FCR	.2268155	.2164581	.0103574	.
FDR	.0110325	.0043177	.0067148	.
CDR	-.015425	-.0083058	-.0071193	.
FAR	.0235703	.0263237	-.0027535	.
SALESGROWTH	.0006196	.0182466	-.017627	.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 6.83
Prob>chi2 = 0.4464

Regression Cement Sector

Random-effects GLS regression — Number of obs = 112
Group variable: company — Number of groups = 16
R-sq: within = 0.5274 — Obs per group:
Between = 0.3634 — Min = 7

Overall = 0.4724 Avg = 7.0
Max = 7
Wald Chi2(7) = 108.22
corr(u_i, X) = 0 (assumed) Prob > Chi2 = 0.0000

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval
STDTA	.3435574	.0786734	4.37	0.000	.1893603	.4977545
LTDTA	-.1422753	.0304896	-4.67	0.000	-.2020339	-.0825167
FCR	.2164581	.0242476	8.93	0.000	.1689337	.2639826
FDR	.0043177	.0112791	0.38	0.702	-.0177889	.0264243
CDR	-.0083058	. 0139265	-0.60	0.551	-.0356012	.0189897
FAR	.0263237	.0061138	4.31	0.000	.0143409	.0383065
SALGROW	.0182466	.0155128	1.18	0.240	-.0121578	.0486511
_CONS	-.4323066	.1163681	-3.71	0.000	-.6603839	-.2042294
SIGMA_U	.03761518				(fraction of variance due to u_i)	
SIGMA_E	.05536992					
RHO	.31577481					

The regression equation obtained after the analyses of the data is as follows:

The results shows that if all the independent variables are equal to zero there will still be increase in the profitability of 0.3341251 due to . This table further shows that there is a positive relation between STDTA, FCR, FDR, FAR, Sales Growth & profitability as one unit change in these variables increases the profitability by $0.3922061, 0.2268155, 0.0110325, 0.0235703 \& -0.0006196$ respectively. The result further show that LTDTA, CDR**,** of the firm negatively affects the profitability as each unit change in size of firm decreases profitability by $-0.1384485 \& -0.0006196$ respectively. The results further show that Value of f-test is 14.67 which is greater than 4. Therefore, it is concluded that the model as a whole is significant.

More over the result shows that STDTA, LTDTA, FCR & FAR are significant variables because there value is lesser then 0.05. Which are 0.000, 0.000, 0.000 & 0.019 respectively. While FDR, CDR &Sales Growth is insignificant the value is 0.0.379, 0.307 & 0.019.Value of R^2 is 0.5357 which means that it's a good fit. The value of R^2 tells that 53.57 percent changes in the profitability are brought by the independent variables discussed in this research.

Conclusion

This research made an effort to determine the effect of structure of capital on the profitability of automobile &cement sector of Pakistan during 2005-2011. Analysis is carried out by panel data using fixed effect t& random effect model. Hypothesis tests were aimed to find out the (positive or negative) relationship between the chosen variables.

The results reveal that there is both positive &negative effect of the independent variables on the dependent variable in automobile sector as all the other variables except CDR of firm has a negative impact on the profitability. Whereas, in cement sector LTDTA, CDR have negative effect on the profitability while STDTA, FCR, FDR, FAR and Sales Growth has a positive effect on the profitability.

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