Does Capital Structure Effect Firm's Profitability: An Empirical Analysis of Listed Pharmaceutical Firms in Pakistan

Muhammad Zulqarnain Safdar

Lecturer, Department of Management Sciences, Abbottabad University of Science & Technology, Abbottabad, KPK, Pakistan.

Humaira Naz

Phd Scholar, Department of Business Administration Gomal University, Dera Ismail Khan, KPK, Pakistan.

Kiran Mustafa

Lecturer Department of Economics Abbottabad University of Science & Technology, Abbottabad, KPK, Pakistan

Muhammad Muddassar Khan

Lecturer, Department of Management Sciences, Abbottabad University of Science & Technology, Abbottabad, KPK, Pakistan

Muhammad Kamran

Lecturer, Department of Business Administration Gomal University, Dera Ismail Khan, KPK, Pakistan

Abstract

In every firm financial decision related to assets plays vital role in business. The optimum proportion of debt and equity is a challenge for the manager dealing with financial matters of the firm. This study aims to investigate the relationship between capital structure and profitability of listed pharmaceutical companies in Pakistan. The study spans over ten years by employing secondary data. The indicators of profitability in this study are return on assets (ROA) and return on equity (ROE) respectively. Simultaneously the indicators of capital structure are debt to equity ratio (DTE), long term debt to total asset (LDTA) and equity to fixed assets (ETFA) respectively. Furthermore the control variable is size of the firm (SZ). Results of the study show the relationship between profitability and capital structure is negatively significant suggesting established pecking order theory.

Key Words: Capital Structure, Firm's Performance, Return on Assets, Return on Equity, Capital Structure Ratios, Pharmaceutical Industry, Pakistan Stock Exchange

Introduction

Capital structure falls under financial structure, proportion of various sources of funds, and is deemed as a source for long term financing. The chief concern of capital structure is to make an array of sources of funds in a manner that is proper, in relative magnitude and in proportion. Debt and equity securities form aggregate capital structure. In other words capital structure is perpetual source of funds for the firm in the long-run represented by long-term debt, preferred stock and net worth. Capital structure therefore excludes short terms borrowings and denotes permanency to some extent (Trisha, 2016).

Chandra (2011) shows capital structure is about division of cash flows into fixed component (to meet debt obligations) and residual component (which belongs to equity shareholders). The capital market of developing countries as compared to developed countries is less efficient, incomplete and suffers from information asymmetries (Eldomiaty, 2007). The study of Gill et al., (2009) showed that decisions relevant to capital structure must be taken by corporations for reasons of their impact on firms' performance. Shubita and Alsawalhah (2012) show the importance of choice between capital structure and financial performance for reasons of its importance for the firms in the long-run. Furthermore the study shows that uncertainty increases for firm because of its ability related to debt servicing as and when they are due. Optimal capital structure is the maximum output with minimum cost incurred by the firms thus balancing the risk and return tradeoff; however financial managers have so far no tool and methodology to achieve optimal capital structure (Gitman and Zutter, 2010).

Capital structure has been explained by a number of theories. Researchers in financial management, despite theoretical appeal of capital structure, have failed to achieve capital structure that is optimal. However, prescriptions have been developed by academicians and practitioners to meet short-term goals of the firms. Therefore the study calls for investigation of relationship between capital structure and profitability of listed pharmaceutical firms operating in Pakistan. This study examines the relationship that exists between capital structure and profitability of listed pharmaceutical companies in Pakistan.

Literature Review

Capital structure is composed of long-term funds or that it is a mix of debt and equity securities. The mixture includes long-term debt, preferred stocks and equity. Debt may be nil in one company but it may be greater than firm's own capital. Fundamentally capital structure is a marketing problem (Brealey and Myers, 2003). Optimal capital structure maximizes market value of outstanding shares held by the firms (Weston and Brigham, 1992).

The seminal work of Modigliani and Miller (1958) developed theoretical framework of capital structure which provided a boost to this theoretical framework on the basis on which various theories were in expected in the future. They concluded to the well-known theory of 'capital structure irrelevance'. In this theory market value of firm is not impacted by financial leverage. Their theory however doesn't hold in real world because of its dependence on restrictive assumptions. The earlier position on capital structure however was reviewed by Modigliani and Miller (1963) by taking tax benefits as capital structure's determinant. It was proposed to the firms to use as much debt as possible so as to optimize their value.

Other theories explaining firms' capital structure are bankruptcy cost, agency theory and pecking order theory. Bankruptcy costs are the directly incurred costs as and when the probability, perceived as that the firm will default, is greater than zero on financing. The probability of debt increases with the level of debt and that the company is left apprehensive and fearful of failing to meet its obligations of interest and loans. Bankruptcy cost may be direct (for instance, legal and administrative costs incurred in the process of bankruptcy) or indirect (for instance, incurrence of losses by firms which in turn forces investors or stakeholders to not invest further in that firm) (Titman, 1984). The use of debt by firms in capital structure gives birth to agency cost. Jensen and Meckling (1976) argued that the

relationship between debt holder and shareholder and that between shareholder and manager results in agency cost. The theory static trade-off theory by Myer (1984) was the result of achieving a balance between gains and cost of debt financing. On the basis of asymmetric information Myers (1984) and Myers and Majluf (1984) explains optimal capital structure. Myers and Majluf (1984) indicate that in the theories of asymmetric information firm preferences are hierarchal in relation to financing of their investments. So far pecking order theory is concerned Myers (1984) argues that in financing their businesses a particular preference is followed by firms for using capital. Firms in the pecking order theory initially depend on undistributed profits which if and when are not substantial for meeting the needs of the business will resort to debt financing and that they may turn to issuance of equity to cover any additional capital requirements. The investigation of taxes, financing decisions and firms' value in a study by Fama and French (1998) suggest that tax benefits are not conceded by debt. Despite differences in financial markets variables impacting companies' capital structure are similar and same (Booth et al., 2001).

The debt rate in bigger as well as profitable companies usually is lower (Graham, 2000). In case of long-term financing rate of return and debt are negatively related, however short-term financing and equity are positively related (Mesquita and Lara, 2003). Debt financing is prioritized because of its expected higher rate of return (Hadlock and James, 2002). The coefficients of four measures of profitability against debt ratio in these measures are positively significant (Taub, 1975). The same association is identified in a study by Peterson and Rajan in case of industries. The study of Zertun and Tian (2007) on investigating the impact of capital structure on performance of the firms concludes that the impact of capital structure on performance of the firms is negatively significant. On examining the impact of capital structure on performance of firms in Sri Lanka the findings of Pratheepkanth (2011) shows that the impact is negatively significant.

On investigating the relationship between profitability and capital structure in the U.S from the period 1981-1990 suggests the relationship is positive (Roden and Lewellen, 1995). The analogous results of Champion (1999), Nag et al. (2000), Handlock and James (2002) conclude that debt levels for highly profitable firms are higher. Leverage and performance of the firms are positively related (Margaritis and Psillaki, 2010). The study of Rajan and Zingales (1995) indicate negative relationship between profitability of the firms and level of debt. The study of Gleason, Lynette and Ike (2000) indicate reduction in performance of the firms when the level of debt is higher. The findings are supported by study of Fama and French (2002) indicating negative relationship between capital structure and performance of the firms. Similarly the relationship between capital structure and performance of the firms is negative in both developing and developed economies. When the performance of the firms is measured by ROA, ROE and EPS the relationship is negative between capital structure and performance of the firms, however the relationship of Tobin's Q with STD and LTD are positively significant (Salim and Yadav, 2012). The findings are supported by the study of Zeitun and Tian (2007) when investigating the companies operating in Jordan over the period 1989-2003. The relationship between capital structure and performance of firms in Ghana is mixed (Abor, 2005). The relationship between short-term debt and performance of the firms is positive however the relationship of long-term debt with performance of the firms is

negative (Appiadjei, 2014). The study by Simlerly and Li (2000) indicate negative relationship between capital structure and performance of the firms.

Research Methodology

The study takes into account nine listed pharmaceutical companies operating in Pakistan for the analysis purpose by employing secondary data obtained from annual reports published by pharmaceutical companies, country's central bank's, State Bank of Pakistan, website and from Pakistan Stock Exchange (PSE). The study spans over ten years from 2005-2014.

SPSS and software Version 22.0 has been used as statistical tool for the finding the relationship between capital structure and profitability of pharmaceutical firms. To investigate the relationship reliability analysis, descriptive statistics, multiple regression analysis and test of significance have been employed.

The indicators of profitability in this study are return on assets (ROA) and return on equity (ROE) respectively. Simultaneously the indicators of capital structure are debt to equity ratio (DTE), long term debt to total asset (LDTA) and equity to fixed assets (ETFA) respectively. Furthermore the control variable is size of the firm (SZ). The following econometric technique has been employed to test causal linkage between capital structure and profitability of the sampled pharmaceutical companies of the country:

$$ROAnt=\beta o+\beta 1DTEnt+\beta 2LDTAnt+\beta 3ETFAnt+\beta 4SZnt+u\ldots.. (1)$$

$$ROEnt=\beta o+\beta 1DTEnt+\beta 2LDTAnt+\beta 3ETFAAnt+\beta 4SZnt +u\ldots.. (2)$$

Where,

ROAnt: Return on assets of pharmaceutical companies n (n = 1, 2, 3,…, 9 companies) at time t (t = 1, 2,…, 10 years)

ROEnt: Return on equity of pharmaceutical companies n (n = 1, 2, 3,…, 9 companies) at time t (t = 1, 2,…, 10 years)

βo = The intercept of equation, β1, β2, β3, β4 = Slope coefficient or regression coefficient, u = Unexplained variable or error term, DTEnt: Debt to Equity (Debt: Long Term Debt), LDTAnt: Long term debt to total assets, ETFAnt: Equity to fixed assets and SZnt: Size (log of total assets) of pharmaceutical companies n (n = 1, 2, 3,…, 9 companies) at time t (t = 1, 2,…, 10 years).

Analysis and Results

Reliability Analysis: The degree to which measures are free from error and consisted results are yielded is theoretically defined as reliability (Peter, 1979). The internal model of consistency is Cronbach's alpha which is based on average inter-item correlation. The data should be reliable and have Cronbach's alpha $\alpha > 0.7$ (Nunnally, 1978; Churchill, 1979).

Table 1: Reliability Analysis

S. No.	Variables	Cronbach's Alpha	N of Items
1	DTE	0.750	10
2	LDTA	0.810	10
3	ETFA	0.730	10
4	SZ	0.795	10
5	ROA	0.822	10
6	ROE	0.854	10

Source: Author's Computations (SPSS, 21.0 Version)

The variables of capital structure and profitability mentioned in the above table are reliable and consistent with recommendations of Nunnally (1978) for reason of Cronbach's alpha greater than 0.7.

Descriptive Statistics: In present study, the basic features of a data are portrayed through the utilization of descriptive statistics. The descriptive statistic regarding capital structure ratios showed in Table 2 indicates that the mean value of Debt to Equity is 0.29 with minimum 0.10 and maximum 0.53 which means that company utilizes long-term debt equal to 29% of equity as source of long term finance. The average value of long term debt to total assets is 0.51 which indicate that 51% of company's total assets are financed by long term debt or creditors.

Table 2: Descriptive Statistics

S. No.	Variables	Mean	Maximum	Minimum	SD
1	DTE	0.29	0.5322	0.1026	0.2892
2	LDTA	0.51	0.7532	0.1521	0.4574
3	ETFA	0.47	0.8455	0.2045	0.2842
4	SZ	20.41	24.2688	15.5474	1.4854
5	ROA	0.43	3.0014	-2.1414	0.4694
6	ROE	0.31	2.2547	-1.6347	0.4328

Source: Author's Computations (SPSS, 21.0 Version)

Equity to fixed assets ratio shows a mean of 0.47 with minimum value 0.20 and maximum value 0.84. It means that on average stockholders financed 47% of company's fixed assets. Similarly, the descriptive statistic regarding profitability ratios showed in Table 2 indicates that the mean value of return on assets is 0.43 with minimum -2.14 and maximum 3.0 which means that on average 43% profitability is generated by company through the utilization of its assets. The mean value of return on equity is 0.31 with lowest of -1.63 and highest of 2.25. It indicates that company's stockholder on average are getting a return of 31% on their invested funds.

Regression Analysis

Table 3: Regression Analysis

Variables	Model 1					Model 2				
	B	**SE**	**B**	**T**	**P value**	**B**	**SE**	**β**	**t**	**P value**
(Constant)	15.3555	3.210		4.783	0.000	4.267	0.831		5.132	
DTE	-0.651	0.101	- 0.401	- 6.423	0.000	- 0.584	0.149	- 0.390	- 3.919	0.000
LDTA	-0.385	0.075	- 0.375	- 5.132	0.000	- 0.812	0.201	- 0.858	- 4.032	0.000
ETFA	-0.484	0.127	- 0.293	- 3.815	0.000	- 0.554	0.143	- 0.363	- 3.853	0.000
SZ	0.098	0.020	0.310	4.677	0.000	0.085	0.033	0.295	2.551	0.036
	Dependent Variable: Return on Assets R Square: 0.751 Adjusted R Square: 0.602 Df1: 4 Df2: 4 F Statistics: 26.858 Prob.(F): 0.000 Durbin Watson: 1.931					**Dependent Variable:** Return on Equity R Square: 0.846 Adjusted R Square: 0.692 Df1: 4 Df2: 4 F Statistics: 45.594 Prob.(F): 0.000 Durbin Watson: 1.880				

Source: Author's Computations (SPSS, 21.0 Version)

To find out the strength of the association or relationship between capital structure and profitability of pharmaceutical firms, multiple regression analysis is used. Table 3 shows that overall Model 1 and 2 are statistically significant at 1% as observed from F-statistics values which are 26.858 and 45.594 respectively with prob. (F) = 0.000. In both models the values of beta and t indicate that all the measures relating to the capital structure i.e., debt to equity, long term debt to total assets and equity to fixed assets have negative relationship with profitability measures of pharmaceutical firm. This suggests that if there is increase in debt to equity, long term debt to total assets, and equity to fixed assets, the profitability of pharmaceuticals firms decreases and vice versa. This negative relationship between capital structure and profitability is due to high cost of long term debt and equity because financing company through long term debt and equity is very expensive and risky so creditors and owners demand high rate of return to compensate themselves from the risk. While a positive relationship is observed between control variable size and profitability of pharmaceutical firms in both models, meaning that if the firm's size increases then its profitability increase and vice versa. From the above table the values of Durbin Watson d statistics for Model 1 and Model 2 are 1.931 and 1.880 respectively. As these values are near to 2 so there is no serial correlation or autocorrelation amongst variables.

The results of above two models indicate that there is a significant and negative relationship between capital structure and profitability of pharmaceutical firms. The findings of the current research work are in line with previous researches like Miller (1977), Myers (1984), Titman and Wessels (1988), Fama and French (1998), Rajan and Zingales (1995), Harris and Ravive (1991), Graham (2000), Gleason et al. (2000), Booth et al. (2001), Yas et al. (2001), Lara and Meskoeeta (2003), Chen (2004), Hang and Sung (2006), Zeitun and Tian (2007), Abor (2007), Karadeniz et al. (2009), Chakraborty (2010), Anup and Suman (2010),

Ali and Iman (2011), Saeedi & Mahmoodi (2011), Manawaduge et al. (2011), Salim and Yadav (2012) and Nor and Fatihah (2012) who found a significant negative relationship between capital structure and firm's performance**.**

Conclusion

In every firm financial decision related to assets plays vital role in business. The optimum proportion of debt and equity is a challenge for the manager dealing with financial matters of the firm. This study aims to investigate the relationship between capital structure and profitability of listed pharmaceutical companies in Pakistan. The indicators of profitability in this study are return on assets and return on equity respectively. Simultaneously the indicators of capital structure are debt to equity ratio, long term debt to total asset and equity to fixed assets respectively. Furthermore the control variable is size of the firm. Results of the study show that there exists significant and negative relationship between profitability and capital structure which suggests established pecking order theory. The findings of the current research work are in line with previous researches who found that if there is increase in leverage it will cause decrease in firms' profitability because long term debt and equity are more expensive as compared to internal financing and short term debt. It is suggested that firm use first internally generated funds i.e., retained earnings also called undistributed profit, then short term funds, long term funds and finally from issuance of equity in order to meet its capital requirement. As in case of pharmaceutical firms long term debt and equity negatively affect the profitability. So it is also suggested to firms that if there is need for external financing, then short term debt is best option in order to maintain the profitability.

References

Abor, J. (2005). The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. Journal of Risk Finance, 6(5), 438–447. http://dx.doi.org/10.1108/15265940510633505

Appiadjei, E. A. (2014). Capital Structure and Firm Performance: Evidence from Ghana Stock Exchange. Research Journal of Finance and Accounting, 5(16), 37-43.

Booth, L., Aivazian, V., Demirguc-Kunt, A.E. and Maksimovic, V. (2001), "Capital structure in developing countries", Journal of Finance, Vol. 56 No. 1, pp. 87-130.

Brealey, R.A. and Myers, S.C. (2003), Principles of Corporate Finance, international ed., McGraw-Hill, Boston, MA.

Chandra, P. (2011). *Financial management*. Tata McGraw-Hill Education

Eldomiaty, T. I. (2008). Determinants of corporate capital structure: evidence from an emerging economy. International Journal of Commerce and Management, 17(1/2), 25-43.

Fama, E. F., & French, K. R. (2002). Testing trade-off and pecking order prediction, about dividends and debt. Review of Financial Studies, 15(1), 1–33. http://dx.doi.org/10.1093/rfs/15.1.1

Fama, E.F. and French, K.R. (1998), "Taxes, financing decisions, and firm value", Journal of Finance, Vol. 53, pp. 819-43.

Gill, A., Biger, N., Pai, C., & Bhutani, S. (2009). The determinants of capital structure in the service industry: evidence from United States. *The Open Business Journal*, *2*, 48-53.

Gitman, L. J., & Zutter, C. J. (2010). Principles of managerial finance (13th ed.). New York: Prentice Hall.

Gleason, K. C., Lynette, K M., & Ike, M. (2000). The Interrelationship between culture, capital structure, and performance: Evidence from European retailers. Journal of Business Research, 50(2), 185–191. http://dx.doi.org/10.1016/S0148-2963(99)00031-4

Graham, J.R. (2000), "How big are the tax benefits of debt?" Journal of Finance, Vol. 55, pp. 1901-41.

Hadlock, C.J. and James, C.M. (2002), "Do banks provide financial slack?", Journal of Finance, Vol. 57, pp. 1383-420.

Jensen, M. and Meckling, W. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", Journal of Financial Economics, Vol. 3, pp. 305-60.

Margaritis, D., & Psillaki, M. (2010). Capital structure, equity ownership and firm performance. Journal of Banking & Finance, 34(3), 621–632. http://dx.doi.org/10.1016/j.jbankfin.2009.08.023

Mesquita, J.M.C. and Lara, J.E. (2003), "Capital structure and profitability: the Brazilian case", Academy of Business and Administration Sciences Conference, Vancouver, July 11-13.

Modigliani, F. and Miller, M. (1958), "The cost of capital, corporate finance and the theory of investment", American Economic Review, Vol. 48, pp. 261-97.

Modigliani, F. and Miller, M. (1963), "Corporate income taxes and the cost of capital: a correction", American Economic Review, Vol. 53, pp. 443-53.

Myers, S.C. (1984), "The capital structure puzzle", Journal of Finance, Vol. 39, pp. 575-92.

Myers, S.C. and Majluf, N.S. (1984), "Corporate financing and investment decisions when firms have information that investors do not have", Journal of Financial Economics, Vol. 12, pp. 187-221.

Petersen, M.A. and Rajan, R.G. (1994), "The benefits of lending relationships: evidence from small business data", Journal of Finance, Vol. 49, pp. 3-37.

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. Journal of Finance, 50(5), 1421–1460. http://dx.doi.org/10.1111/j.1540-6261.1995.tb05184.x

Roden, D. M., & Lewellen, W. G. (1995). Corporate capital structure decisions: evidence from leveraged buyouts. *Financial Management*, 76-87.

Roden, D., & Lewellen, W. (1995). Corporate capital structure decisions: Evidence from leveraged buyouts. Financial Management, 24(2), 76–87. http://dx.doi.org/10.2307/3665536

Salim, M., & Yadev, R. (2012). Capital structure and firm performance: Evidence from Malaysian listed companies. Social and Behavioral Sciences, 65, 156–166.

Shubita, M. F., & Alsawalhah, J. M. (2012). The relationship between capital structure and profitability. *International Journal of Business and Social Science*, *3*(16).

Simerly, R. L., & Li, M. (2000). Environmental dynamism, capital structure and performance: A theoretical integration and an empirical test. Strategic Management Journal, 21, 31-50. http://dx.doi.org/10.1002/(SICI)1097-0266(200001)

Taub, A.J. (1975), "Determinants of the firm's capital structure", Review of Economics and Statistics, Vol. 57, pp. 410-16.

Tianyu, H. (2013). The comparison of impact from capital structure to corporate performance between Chinese and European listed firms. Master's thesis of Jonkoping University. Retrieved from http://urn.kb.se/resolve?urn=urn:nbn:se:hj:diva-21994

Titman, S. (1984), "The effect of capital structure on a firm's liquidation decisions", Journal of Financial Economics, Vol. 13, pp. 137-51.

Trisha. (2016). Capital Structure: Concept, Definition and Importance. Retrieved August 10, 2016 from http://www.yourarticlelibrary.com/financial-management/capital-structure/capital-structure-concept-definition-and-importance/44063/

Weston, J.F. and Brigham, E.F. (1992), Essentials of Managerial Finance, The Dryden Press, Hinsdale, IL.

Zeitun, R. and G. Tian, 2007. "Capital structure and corporate performance: evidence from Jordan", Australasian Accounting Business and Finance Journal, 1: 40-53.