Determinants of Capital Structure: A Study of Listed Manufacturing Companies of Colombo Stock Exchange (CSE), Sri Lanka

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ABSTRACT

This study examines the determinants of capital structure decisions of firms, specifically for manufacturing companies. The survey data were gathered from listed companies from stock exchange in Sri Lanka. The capital structure is the composition of debt and equity capital that comprises a firm's financing its assets. In this study an attempt has been made to examine what factors determine the capital structure of the listed manufacturing companies in Sri Lanka. For this purpose 5 years data from 2005 to 2009 have been gathered from the Colombo Stock Exchange (CSE). The capital structure was represented by the leverage and the profitability, tangibility and the asset turnover have been selected as the determinant factors of Capital Structure. The data were analyzed using descriptive and inferential statistics. Finding of this study revealed that there is low relationship between the factors of leverage and profitability. Based on this study, tangibility and asset turnover has negative relationship related with leverage. And it showed the impact of profitability, tangibility and asset turnover on leverage was only 10%, 2% and 1% respectively and profitability has the most impact on Leverage than other factors of tangibility and asset turnover. The factors other than profitability, tangibility and asset turnover mostly influence on capital structure.

Key words: Capital structure, Profitability, Tangibility, Colombo Stock Exchange (CSE) and Leverage

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1 Introduction.

Capital structure is an important topic in corporate finance for practitioners and academic researchers. A number of capital structure theories have been proposed in the recent years to explain the variation in debt ratios across firms. Capital structure theory suggests that firms determine what is often referred to as a target debt ratio; which is based on various trade-off between the costs and benefits of debt versus equity. The modern theory of capital structure was established by Modigliani and Miller (1958). Following on from this pioneering work of Modigliani and Miller on the capital structure, three conflicting theories of capital structure have been developed. They are namely: static trade-off theory (Bradley et al., 1984), pecking order theory (Myers and Majluf, 1984), and agency cost theory (Jensen and Meckling, 1976).

The capital structure is how a firm finances its overall operations and growth by using different sources of funds. The capital structure decision is one of the most important decisions made by the Financial Management. It is center of many other decisions in the area of corporate finance. Capital structure is one of the effective tools of management to manage the cost of capital. In this study, we examine the factors that determine the capital structure of the listed manufacturing companies in Sri Lanka during the period of 2005 - 2009. This study attempts to investigate the determinants of capital structure for the manufacturing Companies in Sri Lanka, listed by the Colombo Stock Exchange over the period of 2005-2009.

2 Research Question

Our purpose is to solve the research questions stated below, which is formulated on the basis of the problem discussion. It concerns the practical matter of deciding the appropriate capital

structure and the possibility of improvements. The problem statement to be analyzed in this study is:

"What are the determinants of capital structure of listed manufacturing firms in Sri Lanka?"

3 Objectives of the study

The main objective of the study is to identify the important determinant factors of capital structure of the Listed Manufacturing Companies in Sri Lanka. In addition to that to understand the nature of determinants analyzed that what extent they influence on capital structure of the firm.

4 Hypothesis

From the research question the following hypothesis are developed to test and conclude the remarks. .

H_1: There is a positive relationship between the profitability, tangibility and asset turnover and the Leverage.

H_2: The Profitability, tangibility and asset turnover has an impact on Capital Structure.

5 Literature review

Quite a large strand of theoretical and empirical research has focused on the area of determinants of capital structure. Titman et al (1988) investigated that the determinants of capital structure choice using data from United States from 1974 to 1982. They reported that debt levels are negatively related to the "uniqueness" of a firm's line of business. They found out that firms can potentially impose high costs on their customers, workers, and suppliers in the event of liquidation have lower debt ratios. They conclude that transaction costs may be an important determinant of capital structure choice.

Gau et al, (1990) in their study investigated were amongst the first to apply the theory of capital structure directly to real estate investment decisions at the project level. Based on a sample of 1,423 apartment and commercial property transactions in Vancouver between 1971 and 1985, they observed that the level of debt employed in a property acquisition is directly related to the cost of the investment and inversely to the size of its depreciation tax shield, expected costs of financial distress and market interest rates.

Yuanxin Liu and Jing Ren, (2009) examined An Empirical Analysis on Capital Structure of Chinese Listed IT Companies In their study; they analyzed the determinants of the capital structure for a panel of 92 IT companies listed in the China stock exchange. Six traditional explanatory variables are adopted in the study, including size, profitability, and tangibility, liquidity, and profit growth rate and growth opportunity. It is found that the size of companies is positively related to leverage, while growth and profitability, liquidity, profit growth rate and growth opportunity are negatively associated with leverage. The sign of these relations suggest that both the pecking order theory and trade off hypothesis are at work in explaining the capital structure of IT companies.

Deesomsak, Paudyal and Pescetto (2004) also investigated the determinants of capital structure of firms operating in the Asian Pacific region, in four countries (namely Thailand, Malaysia, Singapore and Australia) with different legal, financial and institutional environments. They found that capital structure decisions of firms are influenced by the environment in which they operate as well as firm specific factors identified in existing literature.

Jean J. Chen, (2004) developed a preliminary study to explore the determinants of capital structure of Chinese-listed companies using firm-level panel data. The findings reflect the transitional nature of the Chinese corporate environment. They suggest that some of the insights from modern finance theory of capital structure are portable to China in that certain firm-specific factors that are relevant for explaining capital structure in developed economies are also relevant in China. However, neither the trade-off model nor the Pecking order hypothesis derived from the Western settings provides convincing explanations for the capital choices of the Chinese firms. The capital choice decision of Chinese firms seems to follow a ‘‘new Pecking order’’—retained profit, equity, and long-term debt. These significant institutional differences and

financial constraints in the banking sector in China are the factors influencing firms' leverage decision and they are at least as important as the firm-specific factors.

Rataporn Deesomsak, Krishna Paudyal, Gioia Pescetto (2004) investigated the determinants of capital Structure of firms operating in the Asia Pacific region, in four countries with different legal, financial and institutional environments, namely Thailand, Malaysia, Singapore and Australia. The results suggest that the capital structure decision of firms is influenced by the environment in which they operate, as well as firm-specific factors identified in the extant literature. The financial crisis of 1997 is also found to have had a significant but diverse impact on firm's capital structure decision across the region.

Samuel G. H. Huang and Frank M. Song examined a new database, which contains the market and accounting data from more than 1000 Chinese listed companies up to the year 2000, to document the characteristics of these firms in terms of capital structure. As in other countries, leverage in Chinese firms increases with firm size, non-debt tax shields and fixed assets, and decreases with profitability and correlates with industries. They find that ownership structure affects leverage. Different from those in other countries, leverage in Chinese firms increases with volatility and firms tend to have much lower long-term debt.

Boopen Seetanah, Kesseven Padachi, and Rishi Ronoowah attemped to supplement the existing literature by bringing new evidences on the determinants of capital structure for the case of companies listed on the Stock Exchange of the small island developing state (SIDS) of Mauritius. Results from the study reveal that certain firm specific factors which explain capital structure in developed countries are also relevant in a small island economy like Mauritius. Using panel estimations techniques for the case 38 firms of the stock exchange of Mauritius (SEM) for the period 1994-2004, the regression results show that the most important firm specific factors that influence capital structure choice in Mauritius are profitability, size, tangibility and liquidity. Other factors like business risk, Non Debt Tax Shield effects and growth opportunities do not appear to affect capital structure.

5 Methodology

5.1 Sample

Three different types of firms which are electronic, plastic and rubber and the aluminum from the manufacturing sector are selected to the study during the period of 2005-2009. The capital structure is represented the firms' leverage and the profitability expressed by ROC of these firms are compared among these different types of firms.

5.2 Scope

The scope of the study is listed manufacturing companies on Colombo Stock Exchange (CSE), Sri Lanka. Thirteen companies are listed under the manufacturing sectors under the headings of Plastic & rubber, Aluminum and Electronics. ACL Plastic, Central Industries Ltd., Kelani Cables Ltd., Kelani tyres and Samson International are included under the Plastics & rubber manufacturing, Aluminium includes ACME Printing and packaging, Alufab Ltd., Lanka aluminium and Parquant Ltd., and Abans Ltd., ACL Cables, Sierra Ltd., and Regnis Ltd., are included under the Electronic Manufacturing sector.

5.3 Data Sources

The secondary data was used for the present study during the five years of 2005-2009. The data were collected from the hand books of listed companies published by Colombo Stock Exchange (CSE), annual reports of the companies, journals and books etc.,

5.4 Mode of Analysis

According to the research objectives and research questions, this study has set the variables used in this study and their measurement are largely adopted from existing literature. The following capital structure which is dependant variable and the other ratios which are the independent variables taken into accounts as follows:

Table-1: Calculations of Capital Structure and Other Ratios

Variables	
Dependent Variables	**Leverage Ratio (Capital Structure)**
Overall leverage	Ratio of book value of Total Debt(long term debt + short term debt) to Total Assets(TDTA)
Long term Leverage	Ratio of book value of Long term debt to Total Assets(LTLR)
Independent Variables	**Profit and Asset ratios:**
Profitability	Ratio of earnings before interest, tax and depreciation to Owners Equity or Shareholder Equity (ROE)
Asset Structure(Tangibility)	Fixed Assets to Total Assets (TA)
Asset turnover ratio	Sales to Average Total Assets (AT)

Data were analyzed using descriptive and inferential statistics. Also regression analysis was performed to investigate the impact of dependent variable on independent variable which the model used for the study is given below.

Capital structure = f (ROE, TA, AT)

It is important to note that the capital structure depend upon Profitability (ROE); Tangibility (TA); Asset turnover (AT). The following models are formulated to measure the impact of Profitability, Tangibility and Asset turnover ratio on capital structure.

TDTA = ßO+ß1(NI/OE)+ ß2 (FA/TA) + ß3 (S/TA) + e …….....(1)

LTLR = ßO+ß1(NI/OE)+ ß2 (FA/TA) + ß2 (S/TA) + e ……..(2)

Where

NI/OE : NetIncome / Owners Equity

FA/TA : Fixed Assets / Total Assets

S/TA : Sales / Average total assets

e : error term

Based on the above regression model TDTA, LTLR are considered as the dependent variables where as NI/OE, FA/TA and S/TA are the independent variables. The detail analysis is carried out with the help of above indicators.

6 Results and Discussions

To find out the rank that which factor has more influence on capital structure the descriptive statistics analysis has been made as follows:

Table-2: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Rank
ATOR	13	.80	4.55	2.4897	1.05992	2
ROE	13	5.03	17.44	10.9342	3.99195	1
TANG	13	.13	.83	.3630	.20420	3

Source: Survey results

From the above results the mean value of Asset Turnover, Return on Equity and Tangibility is 2.4897, 10.9342 and .3630 respectively. ROE is ranked as 1st impact on Capital structure and Asset turnover has the 2nd impact and Tangibility is the 3rd. So we can conclude the profitability (ROE) has more impact on Capital structure than others.

The correlation analysis was carried out to findout the relationship between capital structure and profitability and asset structure.

Table – 3: Correlation between Long-term liability, Total liability and Asset turnover, Profitability and Tangibility

Variables	LTLR	TDTA	ATOR	ROE	TANG
LTLR	1	.282	.263	.114	.201
TDTA		1	-.091	.306	-.122
ATOR			1	.241	.575(*)
ROE				1	-.385
TANG					1

* Correlation is significant at the 0.05 level (2-tailed).

Source: Survey results

From the above table the Long term liability has low relationship with Profitability (ROE), Asset Turnover (ATOR) and Tangibility (TANG) revealed .263, .114 and .201 respectively. The total debt to Total assets has the negative relationship with Asset turnover and Tangibility of -.091 and -.122 respectively. But the relationship between Total debt to Profitability (ROE) has the low relationship as .306. The hypothesis 1 ($H_{1)}$ could not be accepted because the Leverage and profitability has low relationship and Leverage and tangibility and turnover has negative relationship.

Table-4: Regression Analysis for Long term Leverage and Profitability, Tangibility and Asset turnover

Dependent Variable: Leverage (LTLR)

a Predictors: (Constant)	R	R Square
ROE	.114(a)	.013
TANG	.201(a)	.041
ATOR	.263(a)	.069

Source: Survey results

Table-5: Regression Analysis for Total Leverage and Profitability, Tangibility and Asset turnover

Dependent Variable: Leverage (TDTA)

a Predictors: (Constant)	R	R Square
ROE	.306(a)	.093
TANG	.122(a)	.015
ATOR	.091(a)	.008

Source: Survey results

From the above table the Profitability (ROE) has an impact on capital structure which is 10% and 90% is influenced by other factors. Tangibility and Asset Turnover has low impact on capital structure which is 2% and 1% respectively.

Table-6: Regression Analysis for Long – term Leverage and Profitability, Tangibility and Asset turnover

Dependent Variable: Leverage (LTLR)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.297(a)	.088	-.216	.25144

a Predictors: (Constant), TANG, ROE, ATOR

Source: Survey results

Based on the regression model the above table illustrates that the impact of profitability (ROCE) and Tangibility and Asset turnover on capital structure (TD/TA) is very low that is only 0.297, and 9% depends on these factors other 91% determined by other factors not mentioned in the regression model.

Table-7: Regression Analysis for Total Leverage and Profitability, Tangibility and Asset turnover

Dependent Variable: Leverage (TDTA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.395(a)	.156	-.126	.31770

a Predictors: (Constant), TANG, ROE, ATOR

Source: Survey results

From the above table the impact of profitability (ROCE), Tangibility and Asset turnover on Capital structure (LTLR) has .395 as low which is only 15% determined by these factors and other 85% is determined by other factors not mentioned in the model.

From the results the hypothesis 2 has been accepted. The impact of Profitability, tangibility and asset turnover on leverage is very low and other factors such as environment, economic condition, firm size influence on capital structure.

7 Conclusions:

This paper examined capital structure and the factors which profitability, Tangibility and Asset turnover influence on the capital structure of listed manufacturing companies in Sri Lanka. The analysis shows that these factors have low impact on capital structure and it concluded profitability has an impact on capital structure other than Tangibility and Asset turnover. Further it can be concluded according to previous research the environment, economic conditions, firm's size and financial crisis etc., have more impact on capital structure.

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