DETERMINANTS OF CAPITAL STRUCTURE – A CASE IN SRI LANKA

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Abstract

This paper features a cross- sectional regression analysis of the determinants of the company debt to total assets ratios of a sample of 74 Sri Lankan manufacturing companies for the period 1998-2002. The regression equations include a set of variables acting as proxies for likely determinants of debt ratios suggested in the empirical literature such as profitability, business risk, corporate size, growth rate and age. The study shows that profitability was significantly related to debt ratios of Sri Lankan companies. This finding confirms that more successful firms consistently fund their investment projects using retained earnings and have a lower debt ratio compared to their unsuccessful counterparts. Corporate size and growth rate were not significantly related to firms' debt ratios. The negative coefficient of asset structure and positive coefficient of business risk go against the theoretical predictions.

1. Introduction

The study of capital structure attempts to explain the mix of securities and financing sources used by corporations to finance real investment. An appropriate capital structure is a critical decision for any business organization. The decision is important not only because of the need to maximize returns to various organizational constituencies but also because of the impact such a decision has on an organization's ability to deal with its competitive environment. In the last three decades a number of theories have been proposed to explain the variation in the capital structure across firms. Increasingly, the profession is moving beyond an examination of the basic leverage choice to more detailed aspects of the financing decisions. There are three important explanations for capital structure choice in the literature: the trade-off theory, the agency theory and the pecking order theory.

The trade-off theory (Scott, 1976; Bradley, Jarrel and Kim, 1984) of financing is built around the concept of optimal capital structure that balances various costs and benefits of debt financing. In traditional trade-off models, the main benefit of debt financing is the tax advantage of interest deductibility. The primary cost of debt is those associated with financial distress. According to this theory, firms with safe, tangible assets and plenty of taxable income to shield prefer higher debt ratios.

Unprofitable companies with risky, intangible assets ought to rely primarily on equity financing.

The agency theory (Jensen and Meckling, 1976) emphasizes that optimal capital structure of a firm depends on the agency costs of equity and debt. The former will arise when interests of shareholders differ from those of the managers. Managers may act in their own economic self interest and they tend to waste free cash flows on perquisites. When such problems arise, outside equity holders need to monitor the activities of the managers. On the other hand, conflicts of interests between debt and equity investors arise because the latter have an incentive to expropriate wealth from debt holders. To restrict the transfer of value from creditors to shareholders, lenders typically insist on detail covenants in the contracts to facilitate monitoring of the firm's investments. According to the agency theory, an optimal capital structure is achieved by equating the marginal agency costs of debt and equity.

The pecking order theory (Myers, 1984; Myers and Majluf 1984) relies on the argument that firms prefer internally generated funds to external funds. Raising external funds is costly because managers have more information about the firm's prospects than outside investors. Investors are aware of this asymmetric information problem and they discount (under-priced) the firms' securities when new issues are announced. If a company issues under-priced shares, its wealth transfers from existing shareholders to new shareholders. To avoid this wealth transformation, managers avoid equity whenever possible. Therefore, managers prefer to use retained earnings because they are available without information cost. If external funds are required, firms prefer debt capital over equity capital. Issuing debt minimizes the information costs because it has prior claim on assets and earnings.

Empirical evidences on these theories are largely based on firms in the United States and other developed countries and it is not at all clear how these facts relate to the developing economy. It was therefore necessary to comprehensively test the adaptability of the theoretical foundations of capital structure developed mainly in US and other developed countries to the Sri Lankan context because our companies have a different institutional structure.

The rest of the paper is organized as follows. Section 2 discusses the potential determinants of companies' debt ratios used in the study. Section 3 deals with the data and methodology. The results of the

empirical tests are presented in Section 4 and the final Section summarizes key conclusions.

2. Determinants of a Firm's Capital Structure

By considering the above theoretical models of capital structure, the present study has used several company specific factors e.g., profitability, assets structure, business risk, etc., to analyze capital structure of the firms. However, it is difficult to distinguish among these variables according to the above theories because some variables that describe the pecking order theory are also relevant for the static trade-off model or agency theoretical framework. These factors have shown up most consistently as being correlated with leverage in previous studies.

Profitability

Neither theory nor empirical research has provided satisfactory evidence as to how profitability affects the capital structure of a firm. According to the static trade-off model, highly profitable firms prefer to use more debt because these can have higher tax savings, lower probability of bankruptcy, and potentially higher overinvestment (Booth, Aivazian and Demirguc-unt, 2001). The Pecking order theory suggests that changes in debt ratio are driven by the need for external funds, and not by any attempt to reach an optimal capital structure (Sunder and Myers, 1999). Accordingly, highly profitable firms are able to finance their investment proposals by using retained earnings. In contrast, less profitable firms are forced to resort to debt financing because of their poor internal retention. Hence, a negative relationship is expected between profitability and debt financing. In the present study the measurement of profitability is taken as the proportion of Earnings Before Interest and Taxes (EBIT) to Capital employed.

Assets Structure

Most capital structure theories argue that the type of assets owned by the firms, in some way, affects the choice between debt and equity. The tangibility of firm's assets can serve as proxy for financial distress in the static trade-off theory. It can also be used as proxy for agency and informational asymmetry costs in the pecking order theory and agency theoretical framework. These theories have advocated that a high proportion of hard tangible assets increase debt capacity because of the reduction in distress, agency and informational asymmetric costs. On the other hand, Titman and Wessels (1988) argue that issuing debt

secured by property (assets) with known value also avoids costs associated with issuing securities. Assets structure has been defined as the ratio of fixed to total assets.

Business Risk

Many authors suggest that a firm's optimal debt level is a decreasing function of the volatility of earnings. For example Baxter (1967) argued that

> "... the ability of business firm to "tolerate" leverage will depend on the variance of net operations earnings. Since businesses with relatively stable income streams (such as utilities) are less subject to the possibility of ruin, they may find it desirable to rely relatively heavily on debt financing. Firms with risky income streams, on the other hand, are less able to assume fixed charges in the form of debt interest and may well find that the average cost of capital begins to increase with leverage even when reliance on debt is moderate (p.402)."

These unstable earnings may be the result of either changes in volume of the sales or the inability of firms to maintain a satisfactory relationship between revenue and expenses. As for the volume, the problem may be in the industry as a whole or within an individual firm. Unstable earnings, whatever their cause, make the use of debt dangerous and less attractive to the lenders. In the present study the coefficient of variation of profitability has been used to measure business risk.

Growth Rate

Conventionally, it is expected that rapidly growing companies tend to have a higher debt ratio than those registering low growth. The main reason for this observation is that the financial requirements of the former are high and cannot be met fully by retained earnings. The 'agency theory' argument provides an alternative perspective. The theory suggests that the amount of debt issued by a firm is inversely related to the growth prospects consisting of future investment opportunities which would increase the value of the firm when undertaken. It is argued that firms financed with risky debt forego some of these valuable investment opportunities if benefits accrue to existing bondholders of the firm. Therefore, to minimise this underinvestment cost, firms with valuable growth opportunities must have relatively low debt ratio (Myers,

1977). In this study, compounded average assets growth rate has been taken as an indicator to measures the growth of a firm.

Corporate Size

The effect of corporate size on a firm's capital structure is more ambiguous. Generally, it is argued that large firms are able to utilize a higher volume of debt than small firms because of their stability, strength and reputation. Beside, it is also argued that relatively large firms tend to be more diversified and fail less often, so size may be an inverse proxy for the probability of bankruptcy (Rajan and Zingales, 1995).

However, firm size can also be considered as a proxy for the degree of informational asymmetry between insiders and outside investors. Accordingly, large firms are better placed than small organizations in raising equity funds from the capital market directly because informational asymmetry costs are lower for the former entities. Gupta (1969) argued that

> "In view of very high cost of outside equity funds for the smaller-sized corporations, and the various psychological factors associated with their management which account for a reluctance to take in new equity owners, the smaller-sized cooperation tend to rely heavily on debt (p.526)." If so, size should have a negative impact on the supply of debt.

In the present study, the volume of total sales has been used to measure the size.

Age of the Firm

The age of the firm influences its capital structure mainly through reserves. Accordingly, the older companies are likely to have higher reserves compared to younger companies, because they have more time to build up its internal resources from profitable earnings. Age of the firm can also be considered as a proxy for the degree of informational asymmetry. Helwege and Liang (1996) suggest that older firms, which have low asymmetric information costs are less likely to issue public bonds. Hence, an inverse relationship is expected between age and firms' debt levels. Age has been defined in this study as the number of years from the date of incorporation of the company to the year in which the study was conducted.

3. Data and Methodology

The present study used secondary information to find out the impact of various factors on a firm's capital structure. This data was collected from the Hand Book of Listed Companies in the Colombo Stock Exchange. 74 listed manufacturing companies with no missing values for relevant variables during the period of 1998-2002 are included in the final sample. These companies belonged to beverage, food and tobacco, chemicals and pharmaceuticals, footwear and textiles and motor and general manufacturing industries. These organizations represent large corporations in Sri Lanka since a majority of the firms have annual sales more than SL Rs. 500 million.

Existing empirical studies have used different measures of debt ratios to measure a firm's capital structure (e.g., Titman and Wesssels 1988; Jalilvand and Harris 1984; Chung, 1993). These studies have also observed varying implications. Therefore, two different debt ratios have been specified as the dependent variable in the regression analysis. Accordingly, the dependent variable in one set of regression (Model 1) is the ratio of long-term debt to total assets. The dependent variable in the second set of regression (Model 2) is the ratio of the total debt to total assets.

Model I

$$LTDR = \alpha_{M1} + \beta_{1M1}\, PB + \beta_{2M1}\, AS + \beta_{3M1}\, BR + \beta_{4M1}\, GR + \beta_{5M1}\, CS + \beta_{6M1}\, AG + \mu$$

Model II

$$TDR = \alpha_{M2} + \beta_{1M2}\, PB + \beta_{2M2}\, AS + \beta_{3M2}\, BR + \beta_{4M2}\, GR + \beta_{5M2}\, CS + \beta_{6M2}\, AG + \mu$$

Where, LTDR = Long-term debt ratio, TDR = Total debt ratio, PB = Profitability, AS = Assets Structure, BR = Business Risk, GR = Growth Rate, CS = Corporate Size, AG = Age of the firm, μ = Error term,

4. Empirical Results

The results of diagnostics tests and outcomes of the estimated regression models are presented in Tables 1 and 2 respectively.

Table 1
Test of Multicollinearity

	Variables	Pairwise Correlation Matrix						Co-linearity Statistics	
		PB	AS	BR	GR	ER	AG	Tolerance	VIF
PB	Profitability	1.000	--	--	--	--	--	0.887	1.127
AS	Assets Structure	0.182	1.000					0.894	1.118
BR	Business Risk	-0.209	0.157	1.000				0.656	1.524
GR	Growth Rate	-0.126	0..198	0.303	1.000			0.896	1.164
CG	corporate size	0.020	-0.159	-0.515	-0.232	1.000		0.712	1.405
AG	Age of the firm	-0.034	-0.056	-0..070	-0.111	-0.022	1.000	0.976	1.025

Average VIF = 1.227

Diagnosis tests found that regression outcome is free form multicollinearity and correlation between error terms (residuals). The multicollinearity was examined by the construction of pair wise correlation matrix, and calculating Variance Inflation Factor (VIF) and tolerance statistics. The pair wise correlation matrix of independent variables indicates that the correlations between independent variables are not very substantial. In addition to this, VIF values are all well below 10 and the tolerance statistics are all well above 0.2. These statistics imply that there is no multicorllinearity within these data.

Table 2
Results of Regression Models

Independent variables	LTDR	TDR
1. Profitability	-0.0619 (1.871*)	-0.153 (2.809)**
2. Assets structure	-0.0937 (1.151)	-0.232 (1.746)*
3. Business Risk	0.0162 (0.513)	0.298 (1.799)*
4. Growth Rate	-0.0534 (0.851)	0.101 (0.343)
5. Corporate Size	-0.0167 (0.114)	-0.018 (0.075)
6. Age of the firm	-0.0977 (0.122)	0.239 (1.816)*
R^2	0.17	0.36
FV	1.216	4.12**
DW	2.116	1.959

Figures in parentheses are t - values

Sample size = 74,   * Significant at 10 percent, ** Significant at 5

It can be seen in Table 2 that some of the regression coefficients of independent variables have predicted signs. However, other estimated coefficients are fairly small in magnitude and are statistically insignificant. In particular, the regression coefficients for model I (except the coefficient of profitability) are statistically insignificant. However, some of the regression coefficients for model II are marginally significant.

As far as explanatory power of the regression models is concerned, the values of R2 and F-ratio of the regression models reveal a number of issues for consideration. It is important to note that over 80 percent of cross sectional variation in long-term debt ratio is left unexplained since in long-term debt equation coefficient of multiple determinations is less than 20 percent. Further, low F-Value (1.216) holds the coefficient of multiple determinations to be insignificant. However, the coefficient of

multiple determinations, R2, is 36 percent for long-term debt equation. It implies that 36 percent of variation in total debt is explained by variables used in the regression model. The computed F-value for all variables is 4.12 which is significant at 5 percent level and supports the reliability of the explanatory power of the model.

The effect of profitability on debt ratio, as indicated by its regression coefficients, is found to be negative in both the equations, and it is statistically significant at 5 percent level in model II. However, in model I the effect of profitability is significant at 10 percent level.

The negative relationship between profitability and debt ratios suggests that the companies experiencing a high earning rate would tend to have lower debt. Thus, this result supports the view that highly profitable companies are able to accumulate sufficient amount of earnings as internal funds. This is consistent with the pecking order theory which suggests that debt will only be used by the firms which do not have sufficient funds from internally generated profits. However, the pecking order is not the only possible interpretation of the relationship, as a negative relationship is expected between earnings rate and leverage as past profitability can be viewed as proxy for future growth opportunities.

The coefficients of assets structure are found to be negative in both the equations indicating that the firms with a lower proportion of fixed assets tend to use more debt. Accordingly, this result is inconsistent with the static trade-off model in terms of distress costs. It is also inconsistent with the pecking order theory and agency theoretic framework from the point of view of agency and informational symmetric costs. However, this result supports the idea that the firms' borrowing will be inversely related to the non debt-tax shields. Since the fixed assets usually provide more depreciation tax shields than the current assets do, an inverse relationship between the fixed assets and the long-term debt ratio can be expected. On the other hand, Berger and Udell (1994) show that companies with close relationships with creditors need to provide less collateral, arguing that the relationships and the better informed monitoring by creditors substitute for physical collateral. If so, one can expect that tangibility matters less in companies that have a close relationship with creditors.

The empirical result indicates that the level of borrowing is positively related to the firm's business risk. This result tends to refute traditional thinking that firms with a higher business risk have less

capacity to sustain high financial risk, and thus, will use less debt. However, it is not impossible to find reasons for a positive relationship between business risk and leverage. Bankruptcy costs for a respondent companies do not seem to be large because these large sized firms have a good relationship with the bank system of the country. Often the companies in financial distress are helped by banks. Therefore, firms with high business risk   are not always less attractive to lenders. Moreover, this positive relationship between firms' debt level and business risk would also support the argument that firms with larger business risk may have lower agency costs of debt and thus optimally borrow more. This agency cost of debt has been explained by Myres (1977) as follows.

> "We have an interesting, perhaps surprising conclusion. The impact of risk of debt on the market value of the firm is less for firms holding investment options on assets that are risky relative to the firms present assets. In this sense we may observe risky firms borrowing more than safe ones" (p.167).

However, there is no strong tendency for business risk to have a positive linear effect on long term debt ratio since the regression coefficient of the business risk variable is too small and is statistically insignificant.

It is evident from the regression results that growth rate has no significant influence on a firm's debt ratios. However, the negative coefficient of growth rate indicates that a company with a higher growth rate would have a relatively low long-term borrowing in its capital structure. This is inconsistent with the conventional argument that rapidly growing industries would tend to have greater use of debt in their capital structure because demand for investment funds exceeds their internally generated funds. Nevertheless, the negative relationship between long-term debt ratio and growth rate is consistent with the agency theoretic framework that suggests that agency costs of debt are higher for firms in growing industries.

On the other hand, empirical results indicate that growth corporations tend to have a higher total debt in its capital structure. This indicates that growing firms may substitute short-term financing for long-term investments.

Firm size is found to be in inverse relationship with both LTDR and TDR. One possible explanation for this opposite direction is that

informational asymmetries between insiders in a firm and the capital markets are lower for large firms. So large firms should be more capable of issuing informationally sensitive securities like equity, and should have lower debt level. However, this result is inconsistent with the view that large firms might be more diversified and fails less often, so they are able to utilize a higher volume of debt in their capital structure than small companies. Although the value of the regression coefficient is negative, there is no systematic tendency for large companies to use less debt than smaller sized companies as the regression coefficients in both the equations are fairly small and are statistically insignificant. Therefore, it can be concluded that corporate size may not be a major determinant of a firm's capital structure.

The older the firm, the lower the long-term debt ratio and higher the total debt ratio, indicating that older firms tend to rely less on long-term debt and more on short-term borrowing than younger firms. One possible reason for the negative relationship between the age of the firm and long-term debt ratio is that the older companies would have larger retained earnings compared to younger ones, because they have more time to build its internal resources from profitable trading. This is consistent with the pecking order theory which suggests that firms obtain external financing only when internal funds are not sufficient to finance investment projects. An alternative argument for this relationship is that young firms are often viewed as having a high default risk, so they are less likely to have a higher proportion of debt in their capital structure.

However, empirical results indicate that the age of the firm is positively related to the firm's total debt level. Older firms may have easier access to short-term borrowing at cheaper costs than younger firms because of their long history of repaying its debts. However, the regression coefficient of age in long-term debt equation is not statistically significant but the coefficient of age in total debt equation is significant at 10 percent level. These results indicate that age may not be a key determinant of long-term debt but it may be a determinant of short-term debt.

5. Concluding Remarks

This paper has investigated the determinants of corporate capital structure in Sri Lanka as discussed in the literature. The results were found to be fairly different from the findings of empirical studies carried out in the developed countries. However, a few are consistent with those

of the earlier studies. Accordingly, the study found that profitability was significantly related to debt ratios of Sri Lankan companies. The negative sign for the profitability is consistent with the pecking order hypothesis which explains that the companies experiencing high earning rate would tend to have lower debt. Though the study found the anticipated sign for corporate size, and growth rate as described in the literature, the regression coefficients are fairly small in magnitude and are statistically insignificant. This indicates that corporate size and growth rate were not significantly related to firms' debt ratios. Further, there is no evidence to support the theory which states that assets structure and business risk are related to firms' debt levels. The negative coefficient of fixed assets to total assets ratio and the positive coefficient of business risk measure go against the theoretical predictions. Overall, this indicates that the influence of the theoretical variables on Sri Lankan company capital structure is not clear-cut at all.

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