The Effect of Capital Structure on Profitability: Evidence from the United States

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The relationship between capital structure and profitability cannot be ignored because the improvement in the profitability is necessary for the long-term survivability of the firm. This paper seeks to extend Abor's (2005) findings regarding the effect of capital structure on profitability by examining the effect of capital structure on profitability of the American service and manufacturing firms. A sample of 272 American firms listed on New York Stock Exchange for a period of 3 years from 2005 – 2007 was selected. The correlations and regression analyses were used to estimate the functions relating to profitability (measured by return on equity) with measures of capital structure. Empirical results show a positive relationship between i) short-term debt to total assets and profitability and ii) total debt to total assets and profitability in the service industry. The findings of this paper show a positive relationship between i) short-term debt to total assets and profitability, ii) long-term debt to total assets and profitability, and iii) total debt to total assets and profitability in the manufacturing industry. This paper offers useful insights for the owners/operators, managers, and lending institutions based on empirical evidence.

Introduction

The capital structure decision is crucial for business organizations. The capital structure decision is important because of the need to maximize returns of the firms, and because of the impact, such a decision has on the firm's ability to deal with its competitive environment. The capital structure of a firm is a mixture of different securities. In general, firms can choose among many alternative capital structures. For example, firms can arrange lease financing, use warrants, issue convertible bonds, sign forward contracts or trade bond swaps. Firms can also issue dozens of distinct securities in countless combinations to maximize overall market value (Abor, 2005, p. 438).

A number of theories have been advanced in explaining the capital structure of firms. Despite the theoretical appeal of capital structure, researchers in financial management have not been able to find a model for an optimal capital structure. The best that academics and practitioners have been able to achieve are prescriptions that satisfy short-term goals (Abor, 2005, p. 438). The lack of a consensus about what would qualify as optimal capital structure in the service and manufacturing industries has motivated us to conduct this research. A better understanding of the issues at hand requires a look at the concept of capital structure and its effect on the firm's profitability.

Most other empirical studies on the capital structure of the firm and profitability have been conducted on industrial firms. There might be other factors that affect the profitability of service firms, which are not involved in manufacturing. In service industry, investment in machinery and equipment is very low. If service firms lease their facilities (buildings), then their total capital invested is mainly working capital (Gill, Biger, and Bhutani, 2009, p. 48). In order to examine whether these different investment patterns are also related to the capital structure of these firms, we chose to sample companies from both service industries and manufacturing.

This study examines the relationship between capital structure and profitability of the American service and manufacturing firms. The literature cites a number of variables that are potentially associated with the profitability of firms. In this study, the selection of exploratory variables is based on the alternative capital structure, profitability theories and previous empirical work. The choice can be limited, however, due to data limitations. As a result, the set of proxy variables includes six factors: three ratios of short-term debt to total assets, long-term debt to total assets, total debt to total assets and, in addition, sales growth, firm size, and profitability (measured by return on equity). The variables, together with theoretical predictions as to the direction of their influence on debt ratio and proxies, are summarized in Table 1.

Abor (2005) has tested variables by collecting data from Ghana Stock Exchange (GSE), Africa. This study extends Abor's study by analyzing data from publicly traded American service and manufacturing firms. The results can be generalized to service and manufacturing industries.

Capital Structure

The capital structure is defined as the mix of debt and equity that the firm uses in its operation. According to Brealey and Myers (2003), the choice of capital structure is fundamentally a marketing problem. The seminal work by Modigliani and Miller (1958) on capital structure provided a substantial boost in the development of the theoretical framework within which various theories were about to emerge in the future. Modigliani and Miller (1958) concluded to the broadly known theory of "capital structure irrelevance" where financial leverage does not affect the firm's market value. However, their theory was based on very restrictive assumptions that do not hold in the real world. These assumptions include perfect capital markets, homogenous expectations, no taxes, and no transaction costs. The presence of bankruptcy costs, financial distress and favorable tax treatment of interest payments lead to the notion of an "optimal" capital structure, which maximizes the value of the firm, or respectively minimizes its total cost of capital (Abor, 2005, P. 439).

The capital structure of firms presumably is affected by considerations of possible bankruptcy cost, agency costs, and even pecking order. Bankruptcy costs are the cost directly incurred when the perceived probability that the firm will default on financing is non zero. The potential costs of bankruptcy may be both direct and indirect. According to Titman (1984), the direct bankruptcy costs are the legal and administrative costs in the bankruptcy process, and the indirect bankruptcy costs are the loss in profits incurred by

the firm as a result of the unwillingness of stakeholders to do business with them.

The use of debt in capital structure of the firm leads to agency costs. Agency costs arise as a result of the relationships between shareholders and managers, and those between debt-holders and shareholders (Jensen and Meckling, 1976). The need to balance gains and costs of debt financing emerged from static trade-off theory developed by Myers (1984). The static trade-off theory values the company as the value of the firm if unlevered plus the present value of the tax shield minus the present value of bankruptcy and agency costs (Abor, 2005, p. 440).

Myers (1984) and Myers and Majluf (1984) developed the concept of optimal capital structure based on the notion of asymmetric information. The existence of information asymmetries between the firm and likely finance providers causes the relative costs of finance to vary between the different sources of finance. For example, an internal source of finance where the funds provider is the firm will have more information about the firm than new equity holders; thus, these new equity holders will expect a higher rate of return on their investments. It will cost the firm more to issue new equity shares than using internal funds. The same argument can be provided between internal finance and new debt holders. Thus, it can be concluded that there is a hierarchy of firm preferences with respect to the financing of their investments. This "pecking order" theory suggests that firms initially rely on internally generated funds (e.g., retained earnings) where there is no existence of information asymmetry. Firms then turn to debt if additional funds are required and finally they issue equity to cover any remaining capital requirements. The order of preferences reflects the relative costs of various financing options (Abor, 2005, p. 440).

The pecking order hypothesis suggests that firms are willing to sell equity when the market overvalues it (Myers, 1984; Chittenden *et al.,* 1996). This is based on the assumption that managers act in favor of the interest of existing shareholders. Consequently, they refuse to issue undervalued shares unless the value transfer from "old" to new shareholders is more than offset by the net present value of the growth opportunity. It can be concluded that new shares are only issued at a higher price than that imposed by the real market value of the firm. Therefore, investors interpret the issuance of equity by a firm as signal of overpricing. If external financing is unavoidable, the firm will opt for secured debt as opposed to risky debt and firms will only issue common stocks as a last resort (Abor, 2005, p. 440). Myers and Majluf (1984) maintain that firms would prefer internal sources to costly external finance. Thus, according to the pecking order hypothesis, firms that are profitable and generate high earnings are expected to use less debt capital than those that do not generate high earnings.

Capital Structure and profitability

The relationship between capital structure and profitability cannot be ignored because the improvement in the profitability is necessary for the long-term survivability of the firm. Because interest payment on debt is tax deductable, the addition of debt in the capital structure will improve the profitability of the firm. Therefore, it is important to

test the relationship between capital structure and the profitability of the firm to make sound capital structure decisions.

Roden and Lewellen (1995) collected data by using 107 leveraged buyout companies from the United States, related to corporate capital structure decisions. They used data for the ten-year period from 1981 through 1990. Through regression analysis, they found a positive relationship between profitability and total debt as a percentage of the total buyout-financing package in their study on leveraged buyout.

Wald (1999) used the 1993 Worldscope data set to collect data on firms from approximately forty countries. The total sample size was over 3,300 firms covered for the United States alone. Through regression analysis, Wald (1999) found a negative correlation between leverage and profitability.

Chiang, Chan, and Hui (2002) collected data related to 18 developers and the other 17 contractors from Hong Kong by using DataStream (an electronic financial database). Their empirical results found through regression analysis indicate that profitability and capital structure are interrelated.

Abor (2005) took a sample of 22 firms listed on Ghana Stock Exchange over a five-year period (1998-2002). He found i) a positive relationship between the ratio of short-term debt to total assets and return on equity, ii) a negative relationship between the ratio of long-term debt to total assets and return on equity, and iii) a positive association between the ratio of total debt to total assets and return on equity. In addition, he found a positive relationship between i) firm size and profitability, and ii) sales growth and profitability. Mendell, Sydor, and Mishra (2006) conducted a cross sectional study by using a sample of 20 forest industry firms traded on a US stock exchange for the years 1994-2003. Through regression analysis, they found a negative relationship between profitability and debt.

In summary, based on limited availability of literature on the relationship between capital structure and the profitability of the firm, it has been found that capital structure impacts the profitability of the firm. The present study investigates the effect of capital structure on profitability of American service and manufacturing firms.

Table 1 below summarizes the definitions and theoretical predicted signs.

Table 1: Proxy variables definition and predicted relationship

Proxy Variables	Definitions	Predicted sign
Short-Term Debt (SDA)	Short-term debt divided by the total assets	+/-
Long-Term Debt (LDA)	Long-term debt divided by the total assets	+/-
Total Debt (DA)	Total debt divided by the total assets	+/-
Firm Size (SIZE)	Natural Logarithm of Firm's Sales, lagged one year period	+/-
Sales Growth (SG)	Current year's Sales minus previous year's sales divided by previous year's sales	+/-
Industry	Firm is assigned value one if firm is a manufacturing firm and zero otherwise	+/-

Methods

Measurement

To remain consistent with previous studies, measures pertaining to capital structure and profitability were taken from Abor's (2005, p. 442) study. The study applied co-relational and non-experimental research design. The process of measurement is central to quantitative research because it provides the fundamental connection between empirical observation and mathematical expression of quantitative relationships.

To measure profitability dependent variable, we used earnings before interest, tax, and extraordinary income scaled by total owners' equity, denoted as ROE, as a proxy for the firm's profitability.

Capital structure independent variable was measured as debt ratios (short-term debt to total assets, long-term debt to total assets, and total debt to total assets).

Three control variables (firm size, sales growth, and industry) were also included as standard determinants of corporate profitability.

Natural logarithm of sales (SIZE) was used as proxy for the firm size.

Sales growth (SG) was measured as current year's sales minus previous year's sales divided by previous year's sales.

Firm is assigned value one if firm is a manufacturing firm and zero otherwise.

The relationship between debt and profitability is estimated in the following regression models:

$$\text{Profitability}_{i,t} = b_0 + b_1*\text{SDA} + b_2*\text{SIZE} + b_3*\text{SG} + \mu_{i,t}$$

$$\text{Profitability}_{i,t} = b_0 + b_1*\text{LDA} + b_2*\text{SIZE} + b_3*\text{SG} + \mu_{i,t}$$

$$\text{Profitability}_{i,t} = b_0 + b_1*\text{DA} + b_2*\text{SIZE} + b_3*\text{SG} + \mu_{i,t}$$

where b_0 = constant of the regression equation

b_1, b_2, and b_3 = coefficient of SDA, SIZE, and SG.

b_1, b_2, and b_3 = coefficient of LDA, SIZE, and SG.

b_1, b_2, and b_3 = coefficient of DA, SIZE, and SG.

Note that all variables were calculated using book value.

$\text{Profitability}_{i,t}$ - profitability for firm i between 2005-2007 measured by ROE.

$\text{SDA}_{i,t}$ - short-term debt/total assets for firm i in time t.

$\text{LDA}_{i,t}$ - long-term debt/total assets for firm i in time t.

$\text{DA}_{i,t}$ - total debt/total assets for firm i in time t.

$\text{SIZE}_{i,t}$ - Natural logarithm of firm's sales, lagged one year period.

$\text{SG}_{i,t}$ - Current year's sales minus previous year's sales divided by previous year's sales.

$\mu_{i,t}$ = the error term.

Data Collection

A database was built from a selection of approximately 500 financial-reports that were made public by publicly traded companies between January 1, 2005 and December 31, 2007. The selection was drawn from Mergent Online [http://www.mergentonline.com/compsearch.asp] to collect a random sample of service and manufacturing companies. Out of approximately 500 financial-reports announced by public companies between January 1, 2005 and December 31, 2007, only 272 financial reports were usable. We used cross sectional yearly data in this study. Thus, 158 financial reports resulted in 474 total observations for the service industry and 114 financial reports resulted to 342 observations for the manufacturing industry. Since random sampling method was used to select companies, we consider the sample as a representative sample.

Descriptive Statistics

Table 2 provides descriptive statistics of the collected variables. All variables were calculated using balance sheet (book) values. The book value was used because the companies did not provide any market value related to the variables that we used in this study. In addition, the measurement of profitability could only be based on income statement values, not on so-called market values. The explanatory variables are all firm specific quantities and there is no way to measure these variables in terms of their 'market value.' Furthermore, when market values are considered in such studies there is always a rather legitimate question of the date for which the 'market values' refer to. This is rather arbitrary. Hence, we relied on 'book values' as of the date of the financial reports.

Table 2: Descriptive Statistics of Independent, Dependent, and Control Variables (2005-2007)

Service Industry (N = 474)				
Variables	Minimum	Maximum	Mean	Std. Deviation
SDA	0.001	0.761	0.233	0.153
LDA	0.002	0.954	0.322	0.217
DA	0.065	1.163	0.554	0.190
SG	0.003	1.149	0.142	0.142
SIZE	10.000	21.350	14.954	1.904
ROE	0.017	3.065	0.265	0.293
Manufacturing Industry (N = 342)				
Variables	Minimum	Maximum	Mean	Std. Deviation
SDA	0.041	0.483	0.210	0.091
LDA	0.012	0.733	0.281	0.154
DA	0.136	0.992	0.491	0.165
SG	0.001	0.645	0.155	0.125
SIZE	8.920	20.470	14.870	2.144
ROE	0.058	0.866	0.259	0.150

All variables were calculated using book value
SDA - Short-term debt divided by the total assets
LDA - Long-term debt divided by the total assets
DA - Total debt divided by the total assets
SIZE - Natural Logarithm of Firm's Sales, lagged one year period
SG - Current year's sales minus previous year's sales divided by previous year's sales
ROE - Earnings before interest, tax, and extraordinary income scaled by total owners' equity

Total observations come to 158 x 3 = 474 for the service industry. The average indicators of variables computed from the financial statements. The average short-term debt to total assets ratio is 23.3%, the average long-term debt to total assets ratio is 32.2%, and the average total debt to total assets ratio is 55.4%. The average sales growth is 14.20% and the average profitability (measured by earnings before interest, tax, and extraordinary income scaled by total owners' equity) is 26.50%. The average firm size measured by logarithm of sales, lagged by one-year period, came to 14.954 million (see Table 2).

Total observations come to 114 x 3 = 342 for the manufacturing industry. The average indicators of variables computed from the financial statements. The average short-term debt to total assets ratio is 21%, the average long-term debt to total assets ratio is 28.1%, and the average total debt to total assets ratio is 49.1%. The average sales growth is 15.50% and the average profitability (measured by earnings before interest, tax, and extraordinary income scaled by total owners' equity) is 25.90%. The average firm size measured by logarithm of sales, lagged by one-year period, came to 14.870 million (see Table 2).

Table 3 provides the Pearson correlation for the variables that we used in the regression model. Pearson's correlation analysis is used for data to find the relationship between capital structure and profitability. We found that the firm's profitability (measured by return on equity) is positively correlated with the short-term debt and total debt in both the service and manufacturing industries. The positive correlations explain that short-term debt and total debt in the capital structure improve the profitability of the firm in the service and manufacturing industries because interest payments are tax deductable.

Table 3: Pearson Bivariate Correlation Analysis

Service Industry (N =454)						
	ROE	SDA	LDA	DA	SG	SIZE
ROE	1	0.212**	0.062	0.254**	0.010	-0.053
SDA		1	-0.518**	0.212**	0.013	0.036
LDA			1	0.726**	0.052	0.063
DA				1	0.070	0.101
SG					1	-0.124
SIZE						1
Manufacturing Industry (N = 342)						
	ROE	SDA	LDA	DA	SG	SIZE
ROE	1	0.431**	0.179	0.407**	-0.143	0.096
SDA		1	-0.170	0.391**	-0.077	0.105
LDA			1	0.841**	-0.180	-0.140
DA				1	-0.213*	-0.073
SG					1	-0.063
SIZE						1

** Correlation is significant at the 0.01 level (2-tailed)

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

Analysis and Results

In this section, we present the empirical findings on the relationship between capital structure and profitability of the American firms. In addition, we provide discussion on the relationship between capital structure and profitability.

A positive relationship between short-term debt to total assets and profitability (see Table 4) in both the service and manufacturing industries was found. The findings of this paper are consistent with prior empirical studies that short-term debt to total assets is positively correlated with profitability (e.g., Abor, 2005). This suggests that short-term debt tends to be less expensive, and therefore increasing short-term debt with a relatively low interest rate will lead to an increase in profit levels.

Non-significant relationships between i) sales growth and profitability and ii) firm size and profitability were found in both the service and manufacturing industries (see Table 4).

Table 4: OLS Regression estimates on factors affecting profitability [a, b, c]

Service Industry: Short-Term Debt to Total Assets

[R^2 = 0.050; SEE = 0.306; F = 2.212]

Regression Equation (A): ROE = 0.378 + 0.428 SDA - 0.021 SG - 0.013 SIZE

	Unstandardized Coefficients		Standardized Coefficients c	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.378	0.225		1.678	0.096		
SDA	0.428	0.175	0.213	2.451	0.016	0.995	1.005
SG	-0.021	0.192	-0.010	-0.109	0.914	0.982	1.018
SIZE	-0.013	0.014	-0.081	-0.923	0.358	0.982	1.018

Manufacturing Industry: Short-Term Debt to Total Assets

[R^2 = 0.162; SEE = 0.142; F = 5.303]

Regression Equation (A1): ROE = 0.110 + 0.620 SDA - 0.124 SG + 0.003 SIZE

	Unstandardized Coefficients		Standardized Coefficients c	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.110	0.116		0.948	0.346		
SDA	0.620	0.170	0.372	3.651	0.000	0.984	1.016
SG	-0.124	0.122	-0.104	-1.020	0.311	0.987	1.013
SIZE	0.003	0.007	0.048	0.473	0.638	0.989	1.011

[a] Dependent Variable: ROE

[b] Independent Variables: SDA, SG, and SIZE

[c] Linear Regression through the Origin

SEE = Standard Error of the Estimate

Note that only 5.00% ($R^2 = 0.050$) of the variance in the degree of profitability can be explained by the degree of SIZE, SDA, and SG in the service industry (see Table 4). In the manufacturing industry, 16.20% ($R^2 = 0.162$) of the variance in the degree of profitability can be explained by the degree of SIZE, SDA, and SG.

We found a positive relationship between the ratio of long-term debt to total assets and profitability (see Table 5) in the manufacturing industry. The findings of this paper contradict with prior empirical studies that long-term debt is negatively correlated with profitability (Abor, 2005). This may be because of the economic downturn in United States and the low interest rates on the long-term debt.

For companies in the service industry, we found no significant relationships between i) the ratio of long-term debt to total assets and profitability, ii) sales growth and profitability, and iii) firm size and profitability (see Table 5). The lack of significant relationship between the ratio of long-term debt to total assets ratio and profitability may be due to the high gearing ratio for the long-term debt. For example, average long-term debt to total assets ratio in the service industry is 32.2% compared to 28.10% in the manufacturing industry. That is, the high gearing ratio starts eroding the profitability of the firms and tax benefits start to disappear.

No significant relationships between i) sales growth and profitability and ii) firm size and profitability were found in the manufacturing industry (see Table 5).

Table 5: OLS Regression estimates on factors affecting profitability [a, b, c]

Service Industry: Long-Term Debt to Total Assets

[$R^2 = 0.011$; SEE = 0.312; F = 0.448]

Regression Equation (B): ROE = 0.418 + 0.114 LDA - 0.001 SG - 0.012 SIZE

	Unstandardized Coefficients		Standardized Coefficients c	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.418	0.230		1.817	.072		
LDA	0.114	0.133	0.076	0.858	.392	0.998	1.002
SG	-0.001	0.196	0.000	-0.005	.996	0.984	1.016
SIZE	-0.012	0.015	-0.072	-0.801	.425	0.984	1.016

Manufacturing Industry: Long-Term Debt to Total Assets

[$R^2 = 0.077$; SEE = 0.149; F = 2.282]

Regression Equation (B1): ROE = 0.113 + 0.226 LDA - 0.116 SG + 0.008 SIZE

	Unstandardized Coefficients		Standardized Coefficients c	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.113	0.127		0.884	0.379		
LDA	0.226	0.106	0.231	2.122	0.037	0.951	1.051
SG	-0.116	0.129	-0.097	-0.899	0.371	0.965	1.036
SIZE	0.008	0.008	0.112	1.042	0.301	0.973	1.027

[a] Dependent Variable: ROE [b] Independent Variables: LDA, SG, and SIZE
[c] Linear Regression through the Origin

Note that 1.10% ($R^2 = 0.011$) of the variance in the degree of profitability can be explained by the degree of SIZE, LDA, and SG in the service industry (see Table 5).

Also note that 7.70% ($R^2 = 0.077$) of the variance in the degree of profitability can be explained by the degree of SIZE, SG, and LDA in the manufacturing industry (see Table 5).

Positive relationships between the ratio of total debt to total assets and profitability were found in both the service and manufacturing industries (see Table 6). These findings imply that an increase in debt position is associated with an increase in profitability; thus, the higher the debt, the higher the profitability of the firm (this is similar to the findings reported by Abor, 2005, p. 443).

No significant relationships between i) sales growth and profitability and ii) firm size and profitability were found in both the service and the manufacturing industries (see Table 6).

Table 6: OLS Regression estimates on factors affecting profitability [a, b, c]

Service Industry: Total Debt to Total Assets

[$R^2 = 0.081$; SEE = 0.301; F = 3.689]

Regression Equation (C): ROE = 0.249 + 0.486 DA - 0.044 SG - 0.016 SIZE

	Unstandardized Coefficients		Standardized Coefficients c	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.249	0.228		1.091	0.278		
DA	0.486	0.150	0.277	3.227	0.002	0.987	1.013
SG	-0.044	0.190	-0.020	-0.230	0.818	0.979	1.021
SIZE	-0.016	0.014	-0.094	-1.090	0.278	0.977	1.024

Manufacturing Industry: Total Debt to Total Capital Ratio

[$R^2 = 0.203$; SEE = 0.138; F = 6.942]

Regression Equation (C1): ROE = -0.038 + 0.397 DA - 0.054 SG + 0.008 SIZE

	Unstandardized Coefficients		Standardized Coefficients c	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-0.038	0.125		-0.301	0.764		
DA	0.397	0.093	0.431	4.256	0.000	0.948	1.055
SG	-0.054	0.121	-0.045	-0.447	0.656	0.950	1.053
SIZE	0.008	0.007	0.119	1.195	0.236	0.986	1.014

[a] Dependent Variable: ROE

[b] Independent Variables: DA, SG, and SIZE

[c] Linear Regression through the Origin

Note that 8.10% ($R^2 = 0.081$) of the variance in the degree of profitability can be explained by the degree of SIZE, DA, and SG in the service industry (see Table 6).

Also note that 20.30% ($R^2 = 0.203$) of the variance in the degree of profitability can be explained by the degree of SIZE, SG, and DA in the manufacturing industry (see Table 6).

Test for multi-colinearity: All the VIF coefficients are less than 2 and tolerance coefficients are greater than 0.5.

Discussion

Although the financial leverage provides tax benefits to the corporations, it increases default risk for the lending institutions such as banks, credit unions, and other private lenders. Default risk is defined as the uncertainty surrounding a firm's ability to service its debts and obligations within specified time periods (e.g., less than one year for current liabilities, more than one year for long-term liabilities). As shown in table 2, the average long-term debt to total assets ratio is 32.2% in the service industry and 28.10% in the manufacturing industry. The average total debt to total assets ratio is 55.4% in the service industry and the average total debt to total assets ratio is 49.1% in the manufacturing industry. That is, the high gearing ratio starts eroding the profitability of the firms and tax benefits start to disappear.

Although default is a deceptively rare event, the typical firm has a default probability of around 2% in any year. However, there is considerable variation in default probabilities across firms (Crosbie and Bohn, 2002, p. 4). According to Baribeau (1989), as leverage increases, not only does potential return increase, but a firm's ability to service its debt usually erodes, and the risk of credit default rises. The debt also increases the danger of corporate illiquidity when the economy next experiences a recession (Hale, 1988). To improve the efficiency, it is important for the lending institutions to understand default risk of a firm in different industries such as service and manufacturing.

The nature of service and manufacturing industries is different. For example, investment in machinery and equipment is almost non-existent in the service industry. If service firms lease their facilities (buildings), then their total capital invested is mainly working capital (Gill, Biger, and Bhutani, 2009, p. 48). Thus, lending institutions may not have enough assets to pledge to recover losses in the case of bankruptcy. This may be one of the reasons for the bank failures in the USA. Another factor that is important to understand for the lending institutions is the capacity of the firm to service debt (measured by debt service coverage ratio). Once gearing ratio goes up, the cost of debt also goes up because of the high default risk, which in turn, increases the liability payments of the firm. During the economic downturn, sales level tends to go down which cause cash inflow problems for the corporations. Consequently, firms start defaulting liability payments. Therefore, it is important for lenders to understand and review i) cash flows, ii) the level of assets and liabilities, iii) market value and volatility of the company assets, iv) liquidity of assets, etc., on a yearly basis to control the companies. This, in turn, will reduce the default risk and will minimize losses for the lending institutions.

Conclusions

Based on the findings of this paper, it can be concluded that the capital structure of the firm impacts profitability. It is because interest on debt is tax deductable in United States. The results suggest that profitable firms depend more on debt as their main financing option. Although interest on debt is tax deductable, a higher level of debt increases default risk, which in turn, increases the chance of bankruptcy for the firm. Therefore, the firm must consider using an optimal capital structure. The optimal capital structure includes some debt, but not 100% debt. In other words, it is a "best" debt/equity ratio for the firm, which in turn, will minimize the cost of capital, i.e., the cost of financing the company's operations. In addition, it will reduce the chances of bankruptcy.

This study is limited to the sample of American service and manufacturing industry firms. The findings of this study could only be generalized to service and manufacturing firms similar to those that were included in this research. Future research should investigate generalizations of the findings beyond the American service and manufacturing sectors. Important control variables such as industry sectors from different countries, etc., should be used to determine other factors that influence the relationship between capital structure and profitability of the firm.

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