

The Impact of Capital Structure on Profitability with Special Reference to IT Industry in India

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Firms can use either debt or equity capital to finance their assets. The best choice is a mix of debt and equity. The present study mainly analyses how far the capital structure (CS) affects the Profitability (P) of corporate firms in India. The study tries to establish the hypothesized relationship as to how far the CS affects the business revenue of firms and what the interrelationship is between CS and Profitability. This study is carried out after categorizing the selected firms into three categories based on two attributes, viz. business revenue and asset size. First, firms are grouped into low, medium and high based on business revenue. Second, firms are classified into small, medium and large based on asset size to establish the hypothesized relationship that CS has significant impact on Profitability of Information Technology (IT) firms in India. For the study, a sample of 102 IT firms was chosen by the Multi-Stage Sampling Technique. The data for a period of 8 years ranging from 1999–2000 to 2006–2007 have been collected and considered for analysis. Regression Analysis (to analyze the unique impact of CS on Profitability), in addition to descriptive statistics such as Mean, Standard Deviation, and Ratios has been used. The study proves that there has been a strong one-to-one relationship between CS variables and Profitability variables, Return on Assets (ROA) and Return on Capital Employed (ROCE) and the CS has significant influence on Profitability, and increase in use of debt fund in CS tends to minimize the net profit of the IT firms listed in Bombay Stock Exchange in India.

Key Words: capital structure, profitability, return on assets,
return on capital employed, debt, equity

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Introduction

In a wake of liberalization and globalization of economic policies across the world, investment opportunities have expanded and financing op-

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tions have widened, and above all dependence on capital markets has increased. A new business requires capital and still more capital is needed if the firm is to expand. The required funds can come from many different sources and by different forms. Firms can use either debt or equity capital to finance their assets. The best choice is a mix of debt and equity. One of the most perplexing issues facing financial managers is the relationship between capital structure (CS), which is the mix of debt and equity financing, and stock prices.

The debt is advantageous (relative to equity) if Debt Equity Ratio ($DER > 1$), otherwise it is harmful. The value of the firm is independent of its debt policy and is based on the critical assumption that corporate income taxes do not exist. In reality, corporate income taxes do exist, and interest paid to debt-holders is treated as a deductible expense. Thus, interest payable by firms saves taxes. This makes for debt financing advantages. The value of the firm will increase with debt due to the deductibility of interest charges for tax computation, and the value of the levered firm will be higher than that of the un-levered firm.

The determinants of CS considered by Modigliani and Miller (1958; 1963) in their seminal work on the subject, – whether interest was tax deductible or not – was pioneering. In the case where interest was not tax deductible, firms' owners would be indifferent as to whether they used debt or equity, and where interest was tax deductible, they would maximize the value of their firms by using 100% debt financing. In practice, despite interest being tax deductible, the use of debt varies widely, hence giving rise to the 'CS Puzzle' (Myers 1984). In recent years, there has been an increasing recognition that small enterprises are different from large ones and that these differences affect numerous aspects of small firms including their CS (Ang 1991; 1992). Hence, the higher the debt ratio, the greater the risk, and thus higher the interest rate will be. At the same time, rising interest rates overwhelm the tax advantages of debt. If the firm falls on hard times and if its operating income is insufficient to cover interest charges, then stockholders will have to make up the short fall, and if they can't, the firm may be forced into bankruptcy. Good times may be just around the corner. But too much debt can keep the company wipeout shareholders in the process. Several authors have pointed out that agency problems can be reduced or eliminated through the use of managerial incentive schemes and/or more complicated financial securities such as convertible debt (Barnea, Haugen and Senbet 1985; Brander and Poitevin 1988; Haugen and Senbet 1987).

A pecking order framework is intended to explain variations in *cs* (Myers 1984). The issue of external equity is seen as being the most expensive and also dangerous in terms of potential loss of control of the enterprise by the original owner-managers. The information advantage of the corporate managers will be minimized by issuing debt. Optimistic managers, who believe the shares of their firms are undervalued, will prefer immediately to issue debt and to avoid equity issue. Only pessimistic managers will want to issue equity, but who will buy it? Equity issues will occur only when debt is costly. If internally generated cash flow exceeds capital investment, the surplus is used to pay down debt rather than repurchasing and retiring equity. As the requirement for external financing will increase, the firm will work down the pecking order, from safe to riskier debt, perhaps to convertible securities or preferred stock and finally to equity as a last resort (Myers and Majluf 1984).

The modern theory of *cs* began with the paper of Modigliani and Miller (1958). They (MM) pointed out the direction that such theories must take by showing under what conditions the *cs* is irrelevant. Since then, many economists have followed the path they mapped. Now, some 50 years later, it seems appropriate to take stock of where this research stands and where it is going. Some other recent surveys include Taggart (1977), Masulis (1983), Miller (1988), Ravid (1988) and Allen (1991) and comments on Miller (1977) by Bhattacharya (1979), Modigliani (1982), Ross (1977), and Stiglitz (1974) and Masulis (1980), which are general surveys. Allen (1991) focuses on security design, and Ravid (1988) concentrates on interactions between *cs* and product market.

Research in this area was initiated by Jensen and Meckling (1976) building on earlier work of Fama and Miller (1972). Empirically, profitability of firms in concentrated industries differs from that of firms in more competitive industries in terms of level and persistence. Firms in concentrated industries have relatively higher profits (Mackay and Philips 2005). In addition to higher levels of profits, there is evidence that firms in concentrated industries behave differently in preserving profit margins when compared to competitive industries. Mark ups are countercyclical in concentrated durable goods industries. For the non-durable goods sector, mark-ups are relatively more pro cyclical in concentrated industries than those in competitive industries (Ian, Hubbard and Bruce 1988). The influence of persistence in profitability on the leverage-profitability relationship has been addressed by Raymar (1991), Sarkar and Zapatero (2003), and Leland (1994) with varying predictions.

In Raymar's (1991) model, firms optimally recapitalize at the end of each period, leading to a positive relationship between leverage and profitability.

Statement of the Problem, Significance and Scope

The present study mainly analyses how far the CS affects the profitability of corporate firms in India. Asset size and business revenue would appear to be the important factors in determining the profitability of corporate firms. In India, few studies have analyzed the relationship between asset size and business revenues on the impact of CS and Profitability.

This study is carried out after categorizing the selected firms into three categories based on two attributes. First, firms are grouped into low, medium and high based on business revenue (total income). Second, firms are classified into small, medium and large based on asset size to establish the hypothesized relationship that CS has significant impact on Profitability of IT firms in India.

Though many research studies have been undertaken in the field of CS, only very few studies have been undertaken to analyze the association between CS and Profitability. Therefore, this study is a maiden attempt to analyze the

- profitability of the firms.
- significant relationship among different sized firms in terms of CS and Profitability.

The study constitutes an attempt to provide an empirical support to the hypothesized relationship between CS and Profitability. Is there any significant difference in the impact of CS on Profitability of IT firms in India? How far does the CS affect the business revenue of firms, and what is the interrelationship between CS and Profitability?

Objectives and Hypotheses of the Study

The present study is intended

- to study the factors influencing CS of select firms based on asset size and business revenue.
- to analyze the interrelationship between CS and Profitability based on asset size and business revenue.

H_0^1 *There is no significant relationship between selected CS variables and Return on Asset (ROA) of Low Income IT firms, Medium Income IT firms, and High Income IT firms.*

- H₀² *There is no significant relationship between selected CS variables and ROA of Small Size IT firms, Medium Size IT firms, and Large Size IT firms.*
- H₀³ *There is no significant relationship between selected CS variables and Return on Capital Employed (ROCE) of Low Income IT firms, Medium Income IT firms, and High Income IT firms.*
- H₀⁴ *There is no significant relationship between selected CS variables and ROCE of Small Size IT firms, Medium Size IT firms, and Large Size IT firms.*
- H₀⁵ *There is no significant relationship between selected CS variables and ROA of Overall IT firms.*
- H₀⁶ *There is no significant relationship between selected CS variables and ROCE of Overall IT firms.*

Review of Literature

The value of corporate debt and capital structure (CS) are interlinked variables. Debt values (and therefore yield spreads) cannot be determined without knowing the firm's CS, which affects the potential for default and bankruptcy, but CS cannot be optimized without knowing the effort of leverage on debt value. Both theoretical and empirical CS studies have generated many results that attempt to explain the determinants of CS. Modigliani and Miller (1958) state that interest tax shields create strong incentives for firms to increase leverage. But also the size of non-debt corporate tax shields, like tax deductions for depreciation and investment tax credits, may affect leverage. Titman and Wessels (1988) extend the theories that have different empirical implications; measures of short-term, long term, and convertible debt rather than an aggregate measure of total debt. Barton and Gordon (1988) suggest that a managerial choice perspective may help to explain CS choice at the firm level of analysis.

Sheel (1994) showed that all leverage determinants studied, excepting firm size, are significant in explaining leverage variations in debt behaviour. Vogt (1994) analyzed a set of simultaneous equations for external financing and investment spending that tests the pecking order hypothesis (Myers 1984) against a partial stock adjustment model (Jalilvand and Harris 1984 and Taggart 1977). Consistent with a partial adjustment model, firms appear to adjust slowly to long-run financial targets. However, additional financing needs follow a pecking order. And sup-

port work by Fazzari, Hubbard and Petersen (1988). Rajan and Zingales (1995) found that factors identified by previous studies as correlated in the cross-section with firm leverage in the US are similarly correlated in other countries as well. Shyam Sunder and Myers (1999) argued that mere reversion of leverage ratios can be observed even if the pecking order theory is true. Gleason, Mathur and Mathur (2000) accepted that variables other than CS also influence corporate performance. A negative relationship between CS and performance suggests that agency issues may lead to use of a higher than appropriate level of debt in the CS, thereby leading to a lower performance.

Graham (2000) estimated the tax advantage to debt. Stein (2001) found that a firm has the option to increase future debt levels; tax advantages to debt increase significantly. Booth et al. (2001) state that debt ratios in developing countries seem to be affected in the same way and by the same type of variables that are significant in developed countries. However, there are systematic differences in the way these ratios are affected by country factors, such as GDP growth rates, inflation rates, and development of capital markets. Um (2001) stated that the static trade-off theory of CS is obtained, where the net tax advantage of debt financing balances leverage related costs such as bankruptcy, and suggests that a high profit level gives rise to a higher debt capacity and accompanying tax shield. Hence it is expected that a positive relationship should exist between profitability and financial leverage. Antoniou, Guney and Paudyal (2002) found that CS decisions of firms are not only affected by its own characteristics but also by its surrounding environments for different reasons, such as the deterioration or the improvement in the state of economy, the existence of a stock market and/or the size of the bank sector.

Berger, A. N. (2002) findings are consistent with the agency cost hypothesis-higher leverage, or a lower equity capital ratio is associated with higher profit efficiency, all else being equal. The relationship between performance and leverage may be reversed when leverage is very high due to the agency cost of outside debt. Profit efficiency is responsible to ownership structure of the firm consistent with agency theory and their argument that profit efficiency embeds agency costs. Hung (2002) found that high gearing reflects more of low equity base than high level of debts, which indicates that capital gearing is positively related with asset but negatively with profit margins. Pandey's (2002) findings vindicated the saucer-shaped relationship between CS and Profitability because of

the interplay of agency costs, costs of external financing and interest tax-shield, and proved that the size and tangibility have a positive influence and growth, risk and ownership have a negative influence on cs.

Bhaduri (2002) stated that the optimal cs choice can be influenced by factors such as growth, cash flow, size and product and industry characteristics, and confirmed the existence of restructuring costs in attaining an optimal cs. Voulgaris, Asteriou and Mirigianakis (2002) found that the growth of asset utilization, gross as well as net profitability, and total assets have a significant effect on the cs. Ronny and Clarirette (2003) supported the pecking order theory and rejected the trade-off theory of cs. Further, the small role played by the Mauritian capital market as a source of long-term finance is evident from the results with respect to a number of explanatory variables including age, growth, risk and profitability. The strong and positive results for the size variable are consistent with the findings of other studies and with the trade-off theory. Sarkar and Zapatero (2003) suggested that the speed of reversion differs by competitive environment, and the time-series applications support the notion that the profitability is decreasing with the speed of reversion in profitability.

Strebulaev (2003) argued that even though a positive relation between profitability and the optimal leverage ratio can be expected, there is a negative relation between profitability and the actual leverage ratio. Because of transaction costs, firms do not rebalance their leverage ratios constantly; instead, they allow them to move within a range surrounding the optimal leverage ratios. Mesquita and Lara (2003) stated that the choice between the ideal proportion of debt and equity can affect the value of the company, as much as the return rates can. The results indicate that the return rates present a positive correlation with short-term debt and equity, and an inverse correlation with long-term debt. Azhagiah and Premgeetha (2004) suggested that the rapid ability to acquire and dispose of debt provides the desired financial flexibility of firms with a goal for growth. The non-debt tax shield and growth rate are statistically significant, which means that these variables are the major determinants of the cs of Pharmaceutical Companies in India.

Hennessy and Whited (2005) argued that the dynamic tax considerations can also cause a negative relation between profitability and leverage ratios. Therefore, these firms are more likely to face internal fund-debt financing decisions. On the other hand, less profitable firms, due to lack of internal funds, are more likely to face the debt-equity financing de-

decisions, and show that debt financing is relatively less attractive in the debt-equity financing decision because of different tax rates. Therefore, a negative relation between profitability and leverage ratio can be induced when firms facing internal fund-debt and debt-equity decisions are mixed together. Pandey (2004) predicted that there will be a non-linear relationship between CS and profitability. Firms at a lower level of profitability would employ more internal funds, as external funds are expensive and on debt tax shield (such as depreciation) may be more than enough to take advantage of tax benefits. Firms have more profit to shield from taxes as well, as they are able to generate more output by employing asset effectively.

Chen (2004) suggested that some of the insights from the modern finance theory of CS are transferable to China in that certain firm-specific factors that are relevant for explaining CS in a developed economy are also relevant in China. The significant institutional differences of financial constraints in the banking sector in China are the factors influencing firms' leverage decision. Chen and Zhao (2004) suggested that dynamic tax considerations are unlikely to be the main reason for the negative relation between profitability and leverage either. Deesomsak (2004) suggested that the CS decision of firms is influenced by the environment in which they operate, and finds a significant but diverse impact on firms' CS decision. Loof (2004) found the ideas that the more unique a firm's asset, is the thinner the market is for such assets. Hence one may expect that uniqueness be negatively related to leverage.

Voulgoaris, Asteriou and Mirigianakis (2004) found that the profitability is one of the major determinants of CS for both SMES and LSES size groups. However, efficient assets management and assets growth are found essential for the debt structure of LSES as opposed to efficiency of current assets (CAS), size, sales growth and high fixed assets, which were found to affect substantially the credibility of SMES. Joshua (2005) revealed a significantly positive relationship between the ratio of short term debt to total assets and ROE. Song (2005) indicated that most of the determinants of CS suggested by CS theories appear to be relevant for Swedish firms. But one also finds significant differences in the determinants of long and short term forms of debt.

Harrington (2005) supported the theories of CS, which indicates that profitability is an important determinant of leverage. The results suggest that manufacturing firms in concentrated industries have a slower rate of mean reversion in profitability when compared to firms operating in a

more competitive environment. A slower rate of mean reversion in profitability leads to a greater response of leverage to profitability. Huang and Song (2006) found that, as in other countries, leverage in Chinese firms increases with firm size and fixed assets, and decreases with profitability, non-debt tax shield, growth opportunity, managerial shareholdings correlate with industries, and found that the ownership or institutional ownership has no significant impact on cs. Tang (2007) found that fixed assets, growth opportunities, and the joint effect of these two variables are the significant long-term debt determinants of the lodging industry, and suggests that fixed assets and growth opportunities affect each other's relationship with long-term debt usage. Raheman, Zulfiqar and Mustafa (2007) indicated that the cs of the non-financial firms listed on Islamabad Stock Exchange has a significant effect on the profitability of these firms. Dragota and Semenescu (2008) proved that the pecking order theory seemed to be more appropriate for the Romanian capital market, but the signalling theory was not entirely rejected.

Though many research studies have been undertaken in the field of cs and Profitability, very few studies have been undertaken to find the impact of cs on Profitability. Therefore, to fill this gap in the literature and shed light, the present study attempts to analyze the impact of cs on Profitability with special reference to the selected IT firms in India.

Methodology

SOURCES OF DATA

Secondary data were used for the study. The required data were collected from CMIE (Centre for Monitoring Indian Economy) Prowess Package. The public Ltd firms with Low Income, Medium Income and High Income groups based on the level of income from business, i. e., firms with Income < Rs.25 crore as Low, Income between Rs.25 crore and Rs.100 crore as Medium, and firms with business Income > Rs.100 crore is categorized as High income group. Firms with Total Assets (TAS) worth below Rs.25 crore are termed as 'Small Size Firms,' firms with TAS worth Rs.25 crore and above, but below Rs.100 crore are considered as 'Medium Size Firms,' and firms with TAS worth Rs.100 crore and above are classified as 'Large Size Firms.'

SAMPLING DESIGN

As on 31 March 2007, the total number of firms listed in Bombay Stock Exchange (BSE) was 4916, out of which 835 firms were listed under

IT Sector; 736 were Software firms, and firms doing other than software business were 99. Out of 736 software firms, only 727 firms were listed continuously, which were considered for selection. Considering the availability of data and firms listed continuously for all the 8 years (1999–2000 to 2006–2007), 116 firms were selected as a sample (out of 116 firms removing the outliers of 14 firms i. e., the firms with extreme values are removed). Finally a sample of 102 IT firms (116 – 14) was chosen by the Multi-Stage Sampling Technique.

Tools Used for Analysis

The Statistical Techniques used for analysis are Pearson's Coefficient of Correlation (to analyze the relationship between CS and Profitability), Regression Analysis (OLS Model to analyze the unique impact of CS on Profitability) in addition to descriptive statistics such as Mean, Standard Deviation, and Ratio.

Two dependent variables, Return on Assets (ROA) and Return on Capital Employed (ROCE) are considered as profitability variables (business revenue) for the study. The independent variables of Total Debt to Total Assets (TD_TA) and Debt-Equity Ratio (DER) have been used as proxy for CS. The controlled variables, Expenses Ratios (EXP_INC) and Current Ratios (CA) are also used.

Independent and Dependent variables of the selected sample firms for the period of study:

1. Dependent Variables (Profitability Variable)
 - Return on Assets (ROA)
 - Return on Capital Employed (ROCE)
2. Independent Variables (Capital Structure Variables)
 - Total Debt to Total Asset (TD_TA)
 - Expense to Income Ratio (EXP_INC)
 - Debt Equity Ratio (DER)
 - Current Ratio (CR)
3. Controlled Variable
 - Expense Income Ratio (EXP_INC)

Correlation analysis is carried out to find out the existence of multi-collinearity among independent variables in order to decide what variables can be used in regression model, or how the regression model with all independent variables can be used.

Multiple Regression Equation Model

$$Y_e = a + b_1 \text{EXP_INC} + b_2 \text{TD_DA} + b_3 \text{CR} + b_4 \text{DER} + e,$$

where Y_e = Profitability variables (ROA & ROCE), EXP_INC = Expenses – Income, TD_TA = Total Debt – Total Asset, CR = Current Ratio, a = Intercept, $b_1 \dots b_4$ = Estimated Coefficient, and e = Residual Error.

Period of the Study

The data for a period of 8 years ranging from 1999–2000 to 2006–2007 have been collected and considered for analysis. Not all the IT firms were continuously listed, and the availability of data for the years together for the IT firms is 8 years.

Limitations and Scope for Further Study

- Analysis of the study is based on finance data collected from the CMIE Prowess Package. The quality of the study depends purely upon the accuracy, reliability and quality of secondary data.
- A detailed trend covering a lengthy period could not be done due to lack of resources.
- For the availability of data and analysis, the size of sample is also restricted to 102, out of 116 software firms. The analysis is based on business revenue (low income below Rs.25 crore, medium income between Rs.25 to Rs.100 crore and high income – above Rs.100 crore); based on assets size (small size below Rs.25 crore, medium size between Rs.25 to Rs.100 crore and large size above Rs.100 crore) to make the sample distribution somewhat normal, removing firms with unrealistic value (outliers); 102 firms were ultimately selected.
- Today, no firm is involved exclusively in hardware or software. IT hardware firms being switched over to software and also outsourcing (mutual funds and stock market) lose their identity as hardware. So it is difficult to classify the firms exclusively for software and exclusively for hardware.
- Due to the influence of some extraneous variables the intercept is very high in a few regression model analyses. Hence, for future studies, it is better to include those independent variables to find the true impact of those variables on the financial decision in respect of CS and Profitability.

TABLE 1 Results of Regression Analysis for Return on Assets (ROA) of low Income, medium income, and high income IT Firms

Variable	Coefficient for Low Income Firms	Coefficient for Medium Income Firms	Coefficient for High Income Firms
Intercept	16.7369***	101.2607***	126.4997***
EXP_INC	-0.1037***	-0.8993***	-1.1508***
TD_TA	-0.0258	-0.2309***	0.0010
CR	-0.0241	-0.2829***	-0.0610
DER	-0.0536	-1.5052***	-11.6766***
R ²	0.2270	0.7728	0.5792
Adjusted R ²	0.2183	0.7669	0.5734
F Statistic	26.07***	131.78***	100.15***
P Value (F Statistic)	0.000	0.0000	0.0000

NOTES *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level

The study is based only on IT firms. Therefore, the inferences and results will be of much use for further analysis by covering firms in other sectors also.

- Studies could be carried out covering other firms, and varying inferences could be ascertained.
- Studies could be carried out to find out whether there is any significant relationship between sizes of corporate firms other than IT firms in respect of CS and Profitability.
- Studies could also be carried out in order to find out whether there is any significant relationship between fixed assets, assets structure, investment, and volatility, advertising expenditure, the probability of bankruptcy, and uniqueness of the product, earnings volatility of corporate firms etc., in respect of CS and Profitability.

Industry Analysis and Major Findings

From the analysis of data pertaining to CS and Profitability, the major findings are presented in table 1.

The use of debt fund in CS and ROA of low income IT firms ($\beta = -0.1037$, $t = -10.00$, $p < 0.01$); ($R^2 = 0.227$, $F = 26.07$, $p < 0.01$); (22.7 per cent of the variation in ROA) is not significant (see table 1). Hence, H_0 'There is no significant relationship between selected CS variables and ROA of low income IT firms' is accepted. However, in respect of medium income IT firms 'There is a significant relationship between CS variables

and ROA. Profitability has a significant but inverse relationship with CS ($R^2 = 0.7728$, $F = 131.78$, $p < 0.01$). Hence, H_0^1 in respect of medium income IT firms is rejected.

The use of debt fund in CS has a significant negative impact on profitability generated through use of assets in the case of High income IT firms ($R^2 = 0.5792$, $t = 100.15$, $p < 0.01$); coefficient of expenses ratio (EXP_INC) $\beta = -1.1508$, $t = -18.71$, $p < 0.01$; and DER ($\beta = -11.6766$, $t = -3.01$, $p < 0.01$) is statistically significant. So, H_0^1 in respect of High income IT firms is rejected.

In respect of the relationship between CS and Profitability of the small size IT firms, the correlation of EXP_INC with ROA, and that of TD_TA with ROA is negatively significant; and that of TD_TA with ROA. Among the individual β coefficients, only the coefficient of expense ratio ($\beta = -0.2018$, $t = -10.44$, $p < 0.01$) and coefficient of TD_TA ($\beta = -0.1940$, $t = -4.05$, $p < 0.01$); ($R^2 = 0.3426$, $F = 30.62$, $p < 0.01$) is negatively significant (see table 2). Hence, H_0^2 : 'There is no significant relationship between selected CS variables and RAO of Small Size IT firms' is rejected.

Profitability of medium size IT firms is inversely affected by the use of debt fund in CS, the β coefficients with negative sign, (-0.0978) for EXP_INC ($t = -6.37$, $p < 0.01$), ($\beta = -0.0574$) for TD_TA ($t = -2.50$, $p < 0.01$), ($\beta = -0.2043$) for CR ($t = -3.03$, $p < 0.01$) and ($\beta = -2.2249$) for DER ($t = -2.31$, $p < 0.01$) are significant. Hence, H_0^2 : in respect of Medium Size IT firms is rejected. The increase in use of debt fund in CS tends to reduce the net profit scaled by TAS for large size IT firms. The ROA is negatively significant, correlated with DER; TD_TA; DER; EXP_INC ($\beta = -0.9763$, $t = -16.66$, $p < 0.01$); DER ($\beta = -8.7959$, $t = -2.38$, $p < 0.01$). Hence, H_0^2 in respect of Large Size IT firms also is rejected.

The relationship between CS and Profitability for all selected IT firms [ROA with EXP_INC, TD_TA; CR is negatively significant. Profitability measured as a net profit relative to TAS tends to decline with increase in TD proportionate to TAS when there has been an increase in ER, and CR. The β coefficients, (-0.1789) for EXP_INC ($\beta = -0.1789$, $t = -13.83$, $p < 0.01$); ($\beta = -0.0954$) for TD_TA ($t = -4.68$, $p < 0.01$), and $\beta = -0.1542$, $t = -2.80$, $p < 0.01$ for CR are negatively significant (see table 2). Hence, H_0^5 : 'There is no significant relationship between selected CS variables and RAO of Overall IT firms' is rejected.

There is no significant relationship between selected CS variables and ROCE of low income IT firms. EXP_INC ($\beta = -0.0797$, $t = -9.56$, $p <$

TABLE 2 Results of Regression Analysis for Return on Asset (ROA) of small size, medium size, large size and overall IT Firms

Variable	Coefficient for Small Size Firms	Coefficient for Medium Size Firms	Coefficient for Large Size Firms	Coefficient for Overall Firms
Intercept	28.4528***	24.4195***	110.3241***	34.7189***
EXP_INC	-0.2018***	-0.0978***	-0.9763***	-0.1789***
TD_TA	-0.1940***	-0.0571**	-0.0272	-0.0954***
CR	0.0308	-0.2043***	0.2050	-0.1542***
DER	-0.0417	-2.2249**	-8.7959**	-0.2660
R ²	0.3426	0.1853	0.5783	0.2282
Adjusted R ²	0.3315	0.1744	0.5720	0.2244
F Statistic	30.62***	17.00***	91.55***	59.94***
P Value (F Statistic)	0.0000	0.0000	0.0000	0.0000

NOTES *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level

0.01); DER ($\beta = 0.1149$, $t = 1$, $p < 0.01$). Profitability by capital employed is inversely and significantly influenced by expenditure and independent of the CS of low income IT firms (see table 3). Hence, H_0^3 'There is no significant relationship between selected CS variables and ROCE of low income IT firms' is accepted. The fit of regression is good ($F = 24.12$ at 1% level), however the R^2 value is very low (0.2137), which gives support for accepting the H_0^3 .

However, there is a significant relationship between CS variables and ROCE for medium income IT firms ($R^2 = 0.5650$, $F = 50.34$, $p < 0.01$). The negative sign for TD_TA and DER indicates that the proportion of debt in CS plays a vital role in net earnings and increase in use of debt fund in CS, which tends to significantly reduce the net earnings of this group of firms. Hence, H_0^3 in respect of medium income IT firms is rejected. There is a significant relationship between use of debt fund in CS and ROCE of High income IT firms ($R^2 = 0.1588$, $F = 13.74$, $p < 0.01$). Hence, H_0^3 in respect of High income IT firms is also rejected.

The profitability of small size IT firms is inversely affected by the use of debt fund in CS. ROCE is significant with R^2 value of 0.3641 and with F value of 33.63 ($p < 0.01$); (EXP_INC) ($\beta = -0.1747$, $t = -8.92$, $p < 0.01$); and there is an increase in TD proportionate to TAS ($\beta = -0.3761$, $t = -7.75$, $p < 0.01$). The profitability measured by ROCE is negatively signif-

TABLE 3 Results of regression analysis for return on capital employed (ROCE) of low income, medium income, and high income IT Firms

Variable	Coefficient for Low Income Firms	Coefficient for Medium Income Firms	Coefficient for High Income Firms
Intercept	12.4991***	78.9195***	53.4934***
EXP_INC	-0.0797***	-0.5890***	-0.3290***
TD_TA	-0.0192	-0.4669***	-0.1745***
CR	-0.0133	-0.4984***	-0.7391***
DER	0.1149	-3.2573***	5.0630
R ²	0.2137	0.5650	0.1588
Adjusted R ²	0.2048	0.5538	0.1473
F Statistic	24.12***	50.34***	13.74***
P Value (F Statistic)	0.0000	0.0000	0.0000

NOTES *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level

TABLE 4 Correlation matrix analysis results for all selected IT firms

Variables	ROA	ROCE	EXP_INC	TD_TA	CR	DER
ROA	1.0000					
ROCE	0.7282***	1.0000				
EXP_INC	-0.4461***	-0.3763***	1.0000			
TD_TA	-0.1646***	-0.1886***	0.0536	1.0000		
CR	-0.1177***	-0.1349***	0.1041***	-0.0906***	1.0000	
DER	-0.0461	-0.0259	-0.0189	0.0803**	-0.0248	1.0000

NOTES **Significant at 5% level; ***Significant at 1% level

icant, affected by the use of debt fund in CS for small size IT firms (see table 5). Hence, H₀⁴: There is no significant relationship between selected CS variables and ROCE of Small Size IT firms is rejected.

The increase in use of debt fund in CS tends to reduce the net earnings significantly for medium size IT firms. The results of regression on ROCE with expense, liquidity and CS ratios for medium size IT firms (EXP_INC) ($\beta = -0.0663, t = -4.69, p < 0.01$); CR ($\beta = -0.2103, t = -3.38, p < 0.01$); and DER ($\beta = -2.8458, t = -3.20, p < 0.01$) is negatively significant at 1 per cent level, and that of TD_TA ($\beta = -0.0492, t = -2.33, p < 0.01$). Hence, H₀⁴ in respect of Medium Size IT firms is rejected.

The use of debt fund in CS of large size IT firms is less profitable.

TABLE 5 Results of regression analysis for return on capital employed (ROCE) of small size, medium size, large size, and overall IT Firms

Variable	Coefficient for Small Size Firms	Coefficient for Medium Size Firms	Coefficient for Large Size Firms	Coefficient for Overall Firms
Intercept	28.2070***	21.0961***	64.1875***	26.5529***
EXP_INC	-0.1747***	-0.0663***	-0.4916***	-0.1240***
TD_TA	-0.3761***	-0.0492**	-0.1636***	-0.0979***
CR	-0.0243	-0.2103***	-0.5859***	-0.1700***
DER	0.1762	-2.8458***	5.8751*	-0.1059
R ²	0.3641	0.1535	0.3173	0.1833
Adjusted R ²	0.3532	0.1422	0.3070	0.1792
F Statistic	33.63***	13.56***	31.02***	45.49***
P Value (F Statistic)	0.0000	0.0000	0.0000	0.0000

NOTES *Significant at 10% level; **Significant at 5% level; ***Significant at 1% level

The results of regression for ROCE with selected explanatory variables for large size IT firms ($R^2 = 0.3173$, $F = 31.02$, $p < 0.01$) are negatively significant. The large size IT firms with use of more debt fund in CS are less profitable during the study period. Therefore, H_0^4 in respect of Large Size IT firms is rejected.

The net profit against capital employed tends to decline with the increase in TE, TD, CAS, and CLS, and the β coefficients for all explanatory variables, except for DER are negatively significant. ROCE with EXP_INC ($r = -0.3763$, $p < 0.01$), TD_TA, CR, and ROA. The β coefficients, (-0.1240) for EXP_INC, $t = -11.11$, $p < 0.01$); ($\beta = -0.0979$) for TD_TA ($t = -5.56$, $p < 0.01$), and $\beta = -0.1700$, $t = -3.57$, $p < 0.01$ for CR are negatively significant (see table 4). It is inferred that CS has a significant impact on profitability of IT firms in India. Hence, H_0^6 : There is no significant relationship between selected CS variables and ROCE of Overall IT firms, is rejected.

Concluding Remarks

Two variables, viz., Return on Assets (ROA) and Return on Capital Employed (ROCE) are considered as profitability control variables for the study. The Total Debt to Total Assets (TD_TA) and Debt-Equity Ratio (DER) have been used as proxy for CS. For empirical evaluation of the

effect of CS on Profitability, the statistical techniques, viz., Pearson's coefficient of correlation and regression analysis in addition to descriptive statistics such as mean, standard deviation have been used. Analysis is carried out after categorizing the selected firms into three categories based on two attributes, viz., asset size; and business revenue. First, the selected firms are segmented into three groups as low, medium and high based on business revenue (total income). Second, the firms are categorized into small, medium and large based on asset size. Appropriate statistical tools are applied across all groups of firms. The selected firms are segmented into three groups based on the size of the assets used in the business. The profitability and portion of debt in CS as well as the relationship between profitability and CS and impact of CS on profitability are analyzed across size classes.

Based on the business revenue, the study proves that low income IT firms with low expenses are highly profitable, but profitability of these groups of firms is independent of the level of debt fund in their CS. Therefore, profitability by capital employed is inversely and significantly influenced by expenditure and is independent of the CS of low income IT firms. The medium income IT firms have performed well by generating substantial income with less debt. The CS of IT firms with medium income from business has a significant impact on profitability. The proportion of debt in CS plays a vital role in net earnings, and the increase in use of debt fund in CS tend to significantly reduce the net earnings of this group of firms. IT firms belonging to the high business revenue group have shown better performance in managing CS but most of the revenue has been expended. Hence the use of debt fund in CS has a significant negative impact on profitability generated through application of assets in the case of High income IT firms. On the whole, it is inferred that the increase in $\frac{TD}{TA}$ proportionate to $\frac{TA}{CS}$ tends to decrease the net earnings relative to capital employed when there has been an increase in total expenses and increase in use of CAS for IT firms belonging to the high business revenue group.

Based on the size of business, it is inferred that the small size IT firms have not performed well in generating revenue. Profitability is inversely affected by the increase in total expenses and increase in $\frac{TD}{TA}$ proportionate to $\frac{TA}{CS}$. CS has a significant unique impact on profitability when there has been a remarkable negative influence of total expenses on profitability for small size IT firms. On the whole, it is found from the regression results that profitability measured by ROCE is significantly negatively af-

affected by use of debt fund in CS for small size IT firms. In respect of IT firms belonging to the medium size group, the study proves that the net earnings have stood at 10 per cent to their TAS and capital employed, and debt in CS is lesser for medium size IT firms. Therefore, the profitability of medium size IT firms is inversely affected by the use of debt fund in CS, and the increase in the use of debt fund in CS tends to decrease the net income significantly. The increase in the use of debt fund in CS tends to reduce the net earnings significantly for medium size IT firms. As far as the large size IT firms are concerned, the study reveals that the large size IT firms have never relied on debt fund in their CS. They have yielded better net profit by use of less debt fund. Further, the increase in the use of debt fund in CS tends to reduce the net profit scaled by TAS for large size IT firms in India, and they, by use of more debt fund in CS, are less profitable during the study period.

The relationship between CS and Profitability, as well as the unique impact of CS on Profitability across the classes by income and assets, reveals that the profitability of selected IT firms listed in BSE decreases significantly with decrease in either spending out of business revenue (EXP_INC) or decrease in total debt proportionate to TAS or decrease in CR. CS has a significant impact on profitability of IT firms in India. Hence, it is concluded that there has been a strong one-to-one relationship between CS variables and Profitability variables (ROA and ROCE), and the CS has a significant influence on Profitability, and increase in the use of debt fund in CS tends to reduce the net profit of the IT firms listed in Bombay Stock Exchange in India.

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