

## Determinants of Capital Structure: Evidence from NSE200 corporate



*The importance of financing decision for an organisation needs no emphasis. Therefore, an in-depth understanding of factors affecting debt/equity choice and rationale for choosing one source over another seems imperative for Chartered Accountants in industry, banks, investment banking, M&A and consulting. In the present study, an examination of the financing pattern reveals that sample Indian corporate have shown a total debt to equity ratio (based on Balance Sheet) of 1:1 over the period 2003-2013. Apparently, the Indian corporate follow a conservative financing pattern. In addition, on an average 70% of the variance in the debt equity ratios seems to be explained by profitability, tangibility, growth, size of the firm and the existing leverage. For most of the industries as well as for the entire sample, tangibility and size of the firm emerge as the most significant factors affecting the capital structure. As per questionnaire responses, majority of Indian corporate seem to prefer internal funds to external ones (in tune with pecking order theory). This analysis is expected to bridge the theory practice gap and facilitate CAs in an effective and efficient decision making. Read on...*

### Introduction

A firm's capital structure is the combination of its equity, debt and hybrid securities which finances the total business operations. In other words, the term capital structure may be considered as the proportions of total financing provided by various sources of funds broadly grouped as equity and long term debt. Modigliani and Miller, the pioneers of capital structure theory, published their seminal work in 1958. The theory propounded by them, widely known as the MM theory, proposed that the capital structure of the firm holds no importance or relevance to the firm's value at all. As a result of continuous debate on the assumptions of the MM theory, today a huge body of financial literature exists. It includes competing theories of capital structure, namely, trade off theory,



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agency theory and pecking order theory. Taking cue from these theories, various empirical studies have been conducted to explain the capital structure determinants.

With the objective of exploring the determinants of capital structure, pooled data regression has been attempted on 126 non-financial companies of CNX 200 index as sample. To this end, data has been collected from balance sheet and profit and loss account for the period beginning from 1<sup>st</sup> April, 2003 and ending on 31<sup>st</sup> March, 2013. For detailed analysis, these sample companies have been classified into seven industry groups (Table 1).

**Table 1: Industry-wise classification of sample companies**

Industry classification	Number of companies	Percentage
Construction	5	11.90
Consumer goods	18	14.29
Energy	19	15.08
Healthcare	14	11.11
ICT	14	11.11
Industrial manufacturing	39	30.95
Service	7	5.56
Total	126	100

## Determinants of Leverage

### 1. Tangibility

Literature has plethora of definitions for dependent and independent variables. In their widely cited works, Rajan and Zinagles (1995) and Titman and Wessels (1988) state that assets tangibility will have a positive relationship with debt equity ratio, because greater collateral may alleviate the agency cost of the debt itself. This argument is in support of static trade off theory. While according to *pecking order theory*, Debt ratio and assets tangibility have a negative relationship because firms holding more tangible assets will be less prone to asymmetric information problems. Hence, we propose tangibility of assets as one of the independent variables.

### 2. Profitability

Similarly, the *static trade off theory* states that firms will acquire more debt to prevent managers from wasting cash free flows gained from profits. A High level of profit will also allow firms to have higher debt capacity and further easing the procurement of debt. Therefore, a positive relationship between profitability and debt level can be expected. However, according to *pecking order theory*, profitable companies will choose to use internal financing because it is cheaper than borrowing from external sources. This will result in

the negative relationships between the profitability and debt level. Negative relationships have been confirmed by Titman and Wessels (1988). Hence, profitability can be considered as second explanatory variable.

### 3. Size

Again, Rajan and Zingales (1995) supporting *static trade off theory* state that a bigger company has lower chance of bankruptcy. Thus, the company will be able to borrow more money because the creditors are also willing to lend money. Moreover, in most cases, large companies have the better credit rating which allows them to take more risk by increasing debt. According to *pecking order theory*, however, the incentives for issuing equity are bigger because the asymmetric information will be smaller between the companies and the investors. A positive relationship between size and leverage was confirmed by Sayilgan *et. al* (2006). Thus, the size is proposed as the third independent variable.

### 4. Growth

Further, as per the research supporting *static trade off theory*, the leverage of companies with high growth level will be smaller because, both the company and creditors are unwilling to borrow and lend money. Growing companies may feel that their maneuverability will be limited if they use debt as their source of funding. Creditors, for the similar reason, want to limit companies to invest only in safe projects to lower the chance of bankruptcy and may be reluctant to lend to growing companies which undertake a lot of risky projects. On the other hand, according to the supporters of *pecking order theory*, growing companies need a huge amount of funding and may turn to creditors to gain more fund. Consequently, our fourth explanatory variable is growth.

It may be noted that the dependent variable in this study is **leverage level**. It is worth mentioning that all the variables in the study are based on book values in line with the argument by Myers(1984) that book values are proxies for the value of assets in place (Hall *et. al*, 2000).

Table 2 presents proxies for the chosen variables.

**Table 2: List of variables used in regression analysis**

Variables	Code	Measurements
<u>Dependent variables</u>		
Y Debt ratio (long term leverage)	L1	Long term liabilities/Total assets
Debt ratio (leverage)	L2	Total outside liabilities/Total assets
<u>Independent variables</u>		

X1 Tangibility of assets	TANG	(Fixed assets + capital work in progress + Inventories)/Total assets
X2 Size	SIZE	Natural log (sales)
X3 Growth	GRW	[Sales(t)- sales(t-1)]/ sales(t-1)
X4 Profitability	PROF	Operating profit/ Total sales

Rationale for chosen measures of variables:

- Jensen and Meckling (1976), and Myers (1977) have indicated that stockholders of the leveraged firms tend to invest sub-optimally to expropriate wealth from the firm's bondholders, and thus, a positive relation between debt ratios, i.e. leverage, and the collateral value of assets, i.e. tangibility, exists. A good proxy for this is asset tangibility which is measured as the ratio of the net fixed assets, capital work in progress and tangible current assets to total assets.
- Titman and Wessels (1988) suggested that logarithmic transformation of sales reflects the size effect and therefore, Log of Total Sales has been taken as proxy.
- In tune with the definition of size mentioned above as suggested by Titman and Wessels (1998), the growth rate of sales has been assumed as proxy for growth opportunities.
- Since the interest and tax rates have varied across the time frame of the study, EBIT has been used for measuring the profitability.

Based on the chosen variables, regression equation can be stated as:

$$Lev_{it} = \alpha + \beta_1 LAG_{it} + \beta_2 TANG_{it} + \beta_3 SIZE_{it} + \beta_4 GRW_{it} + \beta_5 PROF_{it} + \varepsilon_{it} \quad (1)$$

## Analysis of Capital Structure Determinants

This section seeks to examine the capital structure determinants of the sample industries on aggregate as well as individual levels.

### 1. Construction industry

As indicated in table 3, the regression model performed quite well on construction industry with adjusted R<sup>2</sup> of 0.60 for Model 1. The lagged dependent variable as well as tangibility is statistically significant at 5% level. LAG seems to be relevant (across all the industry models) because of correlation between lagged dependent variable and the dependent variable. Further, leverage is taken from balance sheet which is prepared on accrual basis. Therefore, the leverage ratio of a company on a particular date may be considered to be significantly affected by the financing mix of the concerned company in previous periods. The variable TANG with a positive

coefficient of 0.47 signifies that there are more tangible assets in this industry. Also, the concerned corporates are likely to acquire more debt. This is in conformity with the findings of Harris and Raviv (1991), and Myers (1977).

Interestingly, in Model 2, in addition to lagged dependent variable and tangibility, size and growth are also statistically significant. The SIZE coefficient is positive at 0.02 is in conformity with Barclay and Smith Jr's (1995) argument that large enterprises obtain short term debt instead of long term debt. Whereas the growth variable (GRW) with a positive coefficient of 0.0001 is in contrast of tenets of static trade off theory. With an adjusted R<sup>2</sup> of .74 the Model 2 appears to be appropriate.

**Table 3: Regression results of construction industry**

Variables	Coefficient	Prob.
<b>Model 1</b>		
C	-0.0352	0.7177
LAGL1	0.4061	<b>0.0000</b>
TANG	0.4742	<b>0.0000</b>
SIZE	-0.0020	0.8430
GRW	0.0000	0.8201
PROF	0.0004	0.6796
Adjusted R-squared	0.6019	
<b>Model 2</b>		
C	-0.1041	0.2386
LAGL2	0.5204	<b>0.0000</b>
TANG	0.3856	<b>0.0000</b>
SIZE	0.0264	<b>0.0039</b>
GRW	0.0001	<b>0.0200</b>
PROF	-0.0001	0.9333
Adjusted R-squared	0.7366	

### 2. Consumer goods industry

For the consumer goods industry, we have obtained an adjusted R<sup>2</sup> of 0.70. LAGL1 TANG and SIZE appear to be statistically significant at 5% level (Table 4). The tangibility signifies that the assets serve as collateral. This helps in mitigation of information asymmetry and agency problems to secure the interests of lenders. The negative coefficient of 0.05 for SIZE is in contrast with the findings of Bennett and Donnelly (1993), and Gatchev *et. al* (2009). It is worth mentioning that profitability is also significant and negatively related at 10 % level of significance.

It is revealing to note that, the only significant variable apart from LAGL2 is PROF. With a high negative coefficient of 0.68, PROF is consistent with *pecking order theory*, in which profitable firms prefer internal sources of funds (Najjar and Hussainey, 2011). It may be noted that TANG and GRW are also significant at 10% level.

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**Table 4: Regression results of consumer goods industry**

Variables	Coefficient	Prob.
<b>Model 1</b>		
C	0.4221	<b>0.0007</b>
LAGL1	0.4167	<b>0.0000</b>
TANG	0.2644	<b>0.0002</b>
SIZE	-0.0499	<b>0.0017</b>
GRW	-0.0443	0.3872
PROF	-0.3794	0.0512
Adjusted R-squared	0.7005	
<b>Model 2</b>		
C	0.2954	<b>0.0372</b>
LAG1L2	0.4698	<b>0.0000</b>
TANG	0.1729	0.0515
SIZE	-0.0025	0.8818
GRW	0.1170	0.0685
PROF	-0.6787	<b>0.0058</b>
Adjusted R-squared	0.5359	

### 3. Energy industry

As expected, Table 5 shows that TANG is statistically significant at 5% level. An explanation for these results may be the huge amount of fixed assets, that the energy industry requires for its operations. These assets can be used as collateral for debt. Further, agency theory indicates that firms that have more tangible assets tend to have greater ability to issue debt and thus, have lower agency costs associated with it (Scott, 1977). As per Model 1, about 78% of the variance in long-term debt ratio can be assumed to be explained by our explanatory variables.

The results of Model 2 are not much different from that of Model 1. The only difference being the significance of SIZE in Model 2. A positive coefficient of size verifies the propositions of trade off theory. Also, Cheng and Shiu (2007) assert that large firms have a higher debt capacity and thus, lower financial distress costs than smaller firms have.

**Table 5: Regression results of energy industry**

Variables	Coefficient	Prob.
<b>Model 1</b>		
C	0.0331	0.6134
LAGL1	0.5693	<b>0.0000</b>
TANG	0.0397	<b>0.0039</b>
SIZE	0.0108	0.1829
GRW	0.0274	0.1778
PROF	-0.0888	0.3484
Adjusted R-squared	0.7797	
<b>Model 2</b>		
C	-0.0300	0.6335

LAGL2	0.2186	<b>0.0059</b>
TANG	0.0874	<b>0.0000</b>
SIZE	0.0430	<b>0.0000</b>
GRW	0.0206	0.3062
PROF	0.0088	0.9251
Adjusted R-squared	0.7465	

### 4. Healthcare industry

Though the chosen variables explain only about 50% of the variance in long term funds to total assets ratio (Table 6), it claims the appropriateness of Model 1. LAGL1 and SIZE appear to be the only statistically significant variables. The negative coefficient of 0.09 points to inconsistency with transaction cost theory. This theory indicates that large firms tend to be more diversified and have more access to debt financing (Najjar and Hussainey, 2011).

The results of Model 2 closely resemble to that of Model 1. On an average, the long term debt to total assets ratio for the industry is 0.23. Also, the total debt to total assets ratio is 0.43, indicating heavy reliance on internal funds. This seems to be in line with the view of Titman and Wessels (1988) and Hutchinson and Hunter (1995). With 0.66 as adjusted R<sup>2</sup> the model appears to be suitable.

**Table 6: Regression results of healthcare industry**

Variables	Coefficient	Prob.
<b>Model 1</b>		
C	0.7778	<b>0.0005</b>
LAGL 1	0.3667	<b>0.0001</b>
TANG	0.1218	0.3417
SIZE	-0.0996	<b>0.0003</b>
GRW	0.0685	0.2456
PROF	0.1052	0.4365
Adjusted R-squared	0.4969	
<b>Model 2</b>		
C	0.5575	<b>0.0003</b>
LAGL2	0.4279	<b>0.0000</b>
TANG	0.0126	0.8908
SIZE	-0.0484	<b>0.0075</b>
GRW	0.0674	0.1054
PROF	0.0952	0.3186
Adjusted R-squared	0.6663	

### 5. Information and communication technology (ICT) industry

Table 7 shows that Model 1 performed better on ICT than on Healthcare, with an increased adjusted R<sup>2</sup> of 0.56. With SIZE as a statistically significant variable, along with LAGL1, the results are by and large similar to that of Healthcare. The results for Model 2 follow the results of Model 1.

It is worth mentioning, that the equivalence in results of ICT and Healthcare may be attributed to their similar operations.

**Table 7: Regression results of ICT industry**

Variables	Coefficient	Prob.
<b>Model 1</b>		
C	0.3706	<b>0.0129</b>
LAGL1	0.3140	<b>0.0003</b>
TANG	-0.0263	0.8457
SIZE	-0.0355	<b>0.0279</b>
GRW	-0.0426	0.2148
PROF	0.0561	0.7208
Adjusted R-squared	0.5670	
<b>Model 2</b>		
C	0.6031	<b>0.0001</b>
LAGL2	0.2289	<b>0.0038</b>
TANG	0.0342	0.8025
SIZE	-0.0390	<b>0.0161</b>
GRW	0.0148	0.6701
PROF	-0.1067	0.5053
Adjusted R-squared	0.6697	

## 6. Industrial manufacturing industry

Industrial manufacturing is one of the largest (in terms of sample size) industry groups in the sample. The adjusted R<sup>2</sup> for the model 1 is 0.75 (Table 8). At the significance level (5%) only LAGL1 and GRW sound statistically significant. The negative coefficient (-0.03) of growth insists on agency theory. Due to the agency cost of debt, firms with high growth opportunities are expected to rely more on retained earnings and shareholder's investment than debt financing.

It is surprising to observe that, apart from LAGL2, no other variable is statistically significant. In addition, adjusted R<sup>2</sup> indicates, that 70% of the variance in total liabilities to total asset ratio is explained by these insignificant variables. The doubts about this result are dispelled by a high F statistic of 20.47.

**Table 8: Regression results of industrial manufacturing industry**

Variables	Coefficient	Prob.
<b>Model 1</b>		
C	0.1305	0.1154
LAGL 1	0.4543	<b>0.0000</b>
TANG	-0.0413	0.4815
SIZE	0.0026	0.7816
GRW	-0.0344	<b>0.0335</b>
PROF	0.0003	0.8854
Adjusted R-squared	0.7528	
<b>Model 2</b>		
C	0.2423	<b>0.0030</b>
LAGL2	0.3993	<b>0.0000</b>

TANG	0.0604	0.2991
SIZE	0.0053	0.5531
GRNN'	0.0242	0.1217
PROF	0.0030	0.1980
Adjusted R-squared	0.7053	

## 7. Service industry

Similar to results of Model 2 industrial manufacturing sector, Model 1 of service industry has only one significant variable i.e. LAGL1 (Table 9).

In sharp contrast to Model 1, all the variables seem to be statistically significant in Model 2. It is evident from Table 9 in case of service industry, total leverage, size and profitability is greater than index average. TANG (0.36) strengthens the results of previous studies. A positive relationship between growth opportunities and capital structure is contradiction of agency theory and pecking order theory. In contrast, a positive relationship between firm size and capital structure is consistent with the transaction cost theory. In close nexus with the hypothesis of pecking order theory, PROF shows a negative and high coefficient. It is worth mentioning that Model 2 of service industry has the highest F-statistic (39.2) across all the models for all the industry groups.

**Table 9: Regression results of service industry**

Variables	Coefficient	Prob.
<b>Model 1</b>		
C	0.0585	0.8452
LAGL1	0.5691	<b>0.0000</b>
TANG	0.2481	0.2956
SIZE	0.0121	0.7205
GRW	0.0201	0.6909
PROF	-0.4406	0.1640
Adjusted R-squared	0.6038	
<b>Model 2</b>		
C	-0.4367	<b>0.0418</b>
LAGL2	0.6179	<b>0.0000</b>
TANG	0.3616	<b>0.0405</b>
SIZE	0.0853	<b>0.0008</b>
GRW	0.1007	<b>0.0167</b>
PROF	-0.7358	<b>0.0030</b>
Adjusted R-squared	0.8714	

A bird's eye view of the sample (126 of CNX 200 index) is presented in Table 10.

Model 1 with an F-statistic of 20.29 works well, for the index as a whole. Adjusted R<sup>2</sup> creates an impression that our independent variables have the power to explain 77% of variance in leverage 1 (L1). GRW and LAGL1 emerge as two statistically significant variables at the 5% level. A negative coefficient of growth

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magnifies the concepts of pecking order theory. With an impressive average growth rate of 27%, the sample companies have almost 1:4 debt to total assets ratio. It's heartening to report that the sample companies seem to have a debt equity ratio of 1:1. Thus, even if the value of assets falls by 50%, by and large the companies will be able to pay off all their outside liabilities.

Model 2 shows LAGL2 and TANG as the only significant variables. The significance and positive sign of TANG coefficient are in line with the expectations. It is expected that firms can offer fixed assets as collateral to borrow debt. The sample companies on an average have 44% tangible assets. But, a total debt to equity ratio of 1:1 indicates under-utilisation of the power to borrow on the part of the sample companies. It seems reasonable to state that Indian firms follow a conservative financing pattern.

**Table 10: Regression results of 126 non-financial companies of CNX 200 index**

Variables	Coefficient	Prob.
<b>Model 1</b>		
C	0.1673	0.2089
LAGL 1	0.6493	<b>0.0000</b>
TANG	0.1438	0.1312
SIZE	-0.0192	0.1436
GRW	-0.0006	<b>0.0196</b>
PROF	0.0049	0.8914
Adjusted R-squared	0.7739	
<b>Model 2</b>		
C	0.2909	<b>0.0150</b>
LAGL2	0.4537	<b>0.0002</b>
TANG	0.1658	<b>0.0175</b>
SIZE	-0.0118	0.2067
GRW	-0.0001	0.6550
PROF	-0.0007	0.9790
Adjusted R-squared	0.8647	

As stated earlier, the secondary data shows that sample companies on an average have a total debt to equity ratio of 1:1. This may be viewed as equal preference for debt and equity by practitioners. For better insight on this issue, a questionnaire survey was administered. The questionnaire was mailed to 154 non-financial companies of CNX 200 index. A total of 34 (22%) responses were received.

**Table 11: Industry-wise average of the variables used for regression analysis**

Industry	LT leverage	Total leverage	Tangibility	Size	Growth	Profitability
Construction	0.31	0.60	0.48	7.20	0.50	0.22
Consumer goods	0.18	0.53	0.41	7.36	0.22	0.14
Energy	0.30	0.52	0.59	8.75	0.22	0.32
Healthcare	0.23	0.43	0.46	7.29	0.21	0.22

ICT	0.13	0.36	0.29	7.68	0.25	0.28
Industrial manufacturing	0.23	0.54	0.44	8.07	0.25	0.00
Service	0.29	0.53	0.38	8.17	0.25	0.31
Average	0.24	0.50	0.44	7.79	0.27	0.21

As evident from Table 11, it seems purely incidental that the average debt to equity ratio for sample companies over a period of 10 years (2003-2013) is 1:1. This 10 year period covers a full business cycle from boom to recession to recovery. In view of this, it appears reasonable to state that firms may be choosing the source of fund as per the prevailing circumstances. Further, a 10 year period may be considered long enough to smoothen out the dominance of debt or equity. To sum up, convergence to the ratio of 1:1 may be seen as a healthy sign for the economy.

Though the analysis of capital structure determinants has been attempted in the preceding discussions, this puzzle is approached once again, but with a different perspective.

A large percentage of practitioners seem to be choosing debt over equity, because of the belief that debt is cheaper than equity. This response is startling, as they seem to be ignoring the bankruptcy costs associated with raising of debt. Another angle to this may be that, they prefer debt only when they are in a comfortable position to meet their obligations.

When practitioners prefer equity over debt, they unanimously do so because of flexibility in paying dividend. This may be construed as that in times of liquidity crunch; firms may be opting for equity.

## Concluding observations

The examination of factors affecting capital structure reveals that, in most of the industries, tangibility has a significant role in determining the debt equity ratio. Size and growth of firms are also significant factors. Interestingly, the factors which appear significant in calculating the total external liabilities to total assets ratio, not necessarily play a significant role in determining the long term liabilities to total assets ratio. To sum up, the capital structure of most of the Indian industries exhibit trends enunciated in pecking order theory. Even the negative responses towards setting of target debt equity ratio, seem to suggest the same. It is worth stating that it may be unreasonable to dispel agency theory in the Indian context. As the finance portfolio usually vests in CAs, this study could be of enormous practical use to them by providing them an insight of the state of the art, industry trends and vision to factor matters like agency costs and bankruptcy costs in their coveted responsibility. ■