Determinants of Financial Leverage : An Empirical Analysis of Manufacturing Companies in India

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Abstract

The paper attempted to examine the determinants of financial leverage of manufacturing companies in India. The financial data of 39 large cap companies listed in National Stock Exchange for a period of 14 years from 2004 to 2017 were used for analysis. The panel data results indicated that out of the seven selected companies' level determinants, all were significantly influencing financial leverage, except dividend payouts. While profitability, size of the firm, and cost of borrowing negatively influenced financial leverage, the other three significant determinants such as tangibility, liquidity, and growth positively influenced leverage. We concluded that capital structure decision of manufacturing companies in India was consistent with the hypothesis of pecking order theory rather than the trade - off theory.

Keywords : **capital structure, financial leverage, random effects model, manufacturing**

JEL Classification : G3, G32, G35

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Financing decisions are the most important decisions of any corporate business enterprise. Every firm should set its capital structure to maximize its value in the market place (Brigham & Ehrhardt, 2008). A firm cannot maintain its financial stability without proper maintenance of its capital structure. Unplanned capital structure of a firm may help it to flourish in the short run. However, in the long run, it may negatively impact the wealth of the shareholders. So, finding an optimal capital structure is a fundamental need of every company (Purohit & Khanna, 2012). An optimal capital structure is that choice of ownership capital and borrowed capital which maximizes the value of a company. Debt being a cheaper source of capital can decrease overall cost of capital, but it also brings financial risk to a company. So, it is indispensable for companies to have a balanced combination of debt and equity (Srivastava, 2014).

Raising debt capital is not an easy task for new companies, and therefore, they rely more on equity capital in their initial stages. Later, these companies can go for more debt capital as equity capital is a more expensive source for companies than debt. The cost of borrowed capital is lesser than equity and moreover, interest on debt is tax deductible. This can have leverage effect on the shareholders' returns. On the other hand, excessive use of debt creates more financial risk and, therefore, is less advisable when companies are having lower operating profit to

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cover debt obligations. Hence, companies must go for a judicious combination of debt and equity in their capital structure. Practicing financial managers have come up with a number of factors that determine the companies' capital structure. A number of theories have emerged explaining the various factors which have a bearing on the mix of capital structure. Existing literature supports factors such as nature and size of business, earning capacity, growth or expansion opportunity, floatation cost of new securities, tax rates, and so on in varied magnitudes. However, contradicting previous empirical findings regarding the determinants of corporate debt - equity mix is a common affair among researchers (Acaravci, 2015; Azhagaiah & Gavoury, 2018 ; Bulet, Cuneyt, Arif, 2013 ; Chadha & Sharma, 2016 ; Jong, Kabir, & Nguyen, 2008 ; Murray & Goyal, 2009).

Literature Review

Researchers in finance are still striving to develop a more compactable model that would help firms in designing their optimal capital structure. Amongst the several theories advanced to explain capital structure of companies, the static trade - off theory and pecking order theory (Myers & Majluf, 1984) are the most discussed theories on corporate leverage. The essence of pecking order theory is that companies will use internal financing (retained earnings) to the maximum possible extent than any form of external funds. Moreover, when companies go for external financing, long - term debt will be the first choice followed by convertible securities, preferred stock, and common stock, respectively. However, the trade-off model suggests a static approach to financing decisions based on a target debt-equity ratio.

Pathak, Ranajee, and Pradhan (2012) in their study found that factors such as growth, business risk, profitability, tangibility of assets, and firm size had a significant influence on leverage in the Indian context. Ali (2011) found a statistically significant influence of leverage on profitability, size, tangibility, growth, dividend, and inflation among Pakistani companies. The negative relationship between profitability and leverage ; positive relationship between growth and long - term debt; and dividend and total debt of firms confirmed the presence of pecking order theory in determining the financing behaviour of Pakistani firms.

Thippayana (2014) examined the determinants of capital structure of Thailand companies and found that leverage ratio increased with firm size and decreased with profitability. Moreover, no significant relationship was found between leverage ratio and the determinants such as tangibility, growth, and business risk of firms. Acaravci (2015) investigated the capital structure determinants of Turkey firms by applying panel data methods. Empirical analysis found that profitability, tangibility, growth opportunities, and size of firms influenced leverage. Pratheepan and Yatiwella (2016) examined the determinants of capital structure of selected listed companies in Colombo Stock Exchange and found strong evidence for pecking order theory application by manufacturing firms. Arsov and Naumoski (2016) investigated capital structure determinants of firms in Balkan countries and found that the larger firms exhibited higher leverage ; whereas, the more profitable firms and firms with tangible assets used lesser debt. Other variables, such as ownership, riskiness of profits, and the tax rates were insignificant to leverage. Nguyen, Nguyen, and Dang (2017) investigated the determinants of capital structure for the listed real estate firms on Ho Chi Minh stock exchange in Vietnam and observed that the real estate firms there tended to use more debts to finance their investments. Cevheroglu - Acar (2018) studied the determinants of capital structure in Turkey and concluded that profitability, non - debt tax shield, size, tangibility, and liquidity were the significant determinants of the capital structure, size being the most robust one. On the other hand, growth of firms and volatility were not significantly related to leverage.

All the earlier studies reviewed above identified variables such as profitability, size of the firm, tangibility of assets, growth, liquidity, dividend pay-out, cost of borrowings, business risk, and so on as the determinants of capital structure. However, comprehensive studies in the context of developing countries are still a few in number. Moreover, empirical evidences from these studies differ with reference to region, industry-type, and time

(Amsaveni & Gomathi, 2012 ; Artikis & Nifora, 2012 ; De & Banerjee, 2017 ; Khanna, Srivastava, & Medury, 2015 ; Kumar & Bindu, 2018 ; Vijayalakshmi & Manoharan, 2014 ; Viviani, 2008). Moreover, developing countries like India have undergone a substantial transformation since the previous decade on account of liberalization, privatization, and globalization. All these have widened and deepened the financial markets including the capital markets.Therefore, a new study in the emerged Indian context on the financial leverage of manufacturing companies is found contextual to bring into light the various determinants of capital structure of these companies.

Objective and Hypothesis

The study examines the determinants of financial leverage of manufacturing companies in India. The following hypothesis was set for testing the influence of various determinants of financial leverage in the Indian context.

↳ **H1:** The financial leverage of manufacturing companies in India represented by total debt to total assets ratio (TDTA) is determined by their (a) profitability, (b) tangibility, (c) liquidity, (d) growth, (e) size, (f) dividend payments, and (g) cost of borrowings.

Methodology, Data, and Model Specifications

Thirty - nine large cap manufacturing companies included in NIFTY 100 were chosen as sample companies for the study. Annual reports of the selected companies formed the principal source of data. These reports were primarily obtained from the research database PROWESS. The official websites of SEBI, CRISIL, and NSE also acted as sources of data.The study covers an analysis of 14 years' data from 2003-04 to 2016-17. The dependent variable of the study is financial leverage represented by the ratio of total debt to total assets (TDAR) (Cespedes, Gonzalez, & Molina, 2010 ; Chakraborty, 2010 ; Kayo & Kimura, 2011). The dependent variable and the seven independent variables selected to test the empirical relationship are given in the Table 1.

Table 1. List of Variables

Variable	Symbol	Proxy	Variable Type
Financial Leverage	*TDAR*	Total debt/ Total assets	Dependent
Profitability	*PRF*	Profit after tax/Total assets	Independent
Tangibility	*TANG*	Tangible fixed assets/Total assets	Independent
Liquidity	*LIQ*	Current Assets/Current liability	Independent
Growth	*GROW*	Year to year growth of sales	Independent
Size	*SIZE*	Natural log of total assets	Independent
Dividend	*DPO*	Equity share dividend/Profit after tax	Independent
Cost of Borrowings	*CB*	Finance cost/ Total borrowings	Independent

Regression Model

The study considers two well-known panel data regression models namely fixed effects (FE) model and random effects (RE) models, which are briefly discussed below :

↳ **The Fixed Effects Model :** In this model, all behavioural differences between individual companies are

assumed to be captured by the intercept. Individual intercepts are included to control for company - specific, time - invariant characteristics. A model with these features is called the FE model. The FE model can be written as :

$$y_{it} = \beta_{1i} + \beta_{2i}\, x_{2it} + \beta_{3i}\, x_{3it} + e_{it} \quad \text{(Hill, Griffiths, \& Lim, 2011)} \qquad (1)$$

An i^{th} subscript added to each coefficient implies that the coefficients ($\beta_1, \beta_2, \beta_3$) can be different for each company.

↳ **The Random Effects Model :** This model also assumes that company-wise differences are captured by the intercept parameters but recognize that each company in the sample was randomly selected, thus treat the individual differences as random rather than fixed as in the case of the fixed effects model. The RE model can be written as :

$$y_{it} = \overline{\beta}_1 + \beta_2\, x_{2it} + \beta_3\, x_{3it} + (e_{it} + \mu_i) \qquad (2)$$

$$= \overline{\beta}_1 + \beta_2\, x_{2it} + \beta_3\, x_{3it} + v_{it}) \quad \text{(Hill et al., 2011)}$$

where, $\overline{\beta}_1$ is the intercept parameter, v_{it} is the error term composed of a component μ_i that represents the random individual effects, and the component e_{it} is the usual regression random error.

Thus, a panel regression model is set for testing whether the profitability (PRF), tangibility (TANG), liquidity (LIQ), growth of sales (GROW), size of firm (SIZE), dividend pay out (DPO), and cost of borrowings (CB) have any effect on firms' financial leverage.

Analysis and Results

Table 2 shows the descriptive statistics of dependent and independent variables of the study. The average financial leverage and average profitability of the large cap companies is 14%. The tangibility (0.23) indicates that the average investment of tangible fixed assets is 23% of the total assets. The average ratio of current assets to current liability is 1.5. The average year to year growth of sales is 15%. The mean value of dividend payout (0.34) signifies that the manufacturing firms declared one - third of their earnings as dividend annually. The average cost of borrowings of the manufacturing firms is 11%.

The Table 3 shows the correlation coefficients of independent variables of the study. Since there is no high correlation between the independent variables, the model is free from the multicollinearity problem. It is also found that the correlation between profitability and liquidity ; profitability and dividend ; profitability and cost of borrowings ; tangibility and size ; tangibility and dividend ; tangibility and cost of borrowings ; growth and cost of borrowings ; size and cost of borrowings ; and dividend and cost of borrowings is positive. The correlation of all other pairs of variables is negative.

Phillips - Perron test and Fisher chi - square test is used for checking the unit root in the data series. If the *p* -

Table 2. Descriptive Statistics

Variables	*TDAR*	*PRF*	*TANG*	*LIQ*	*GROW*	*SIZE*	*DPO*	*CB*
Mean	0.14	0.14	0.23	1.54	0.15	3.65	0.34	0.11
Median	0.08	0.13	0.22	1.36	0.14	3.65	0.30	0.07
Maximum	0.60	0.98	0.75	8.43	1.84	4.77	3.27	2.69
Minimum	0.00	-0.47	-0.17	0.36	-0.83	2.28	-6.89	0.00
Std. Dev.	0.14	0.09	0.13	0.89	0.20	0.53	0.48	0.21
Observations	546	546	546	546	546	546	546	546

Table 3. Correlation Matrix of Independent Variables

Variables	*PRF*	*TANG*	*LIQ*	*GROW*	*SIZE*	*DPO*	*CB*
PRF	1.00						
TANG	-0.09	1.00					
LIQ	0.13	-0.20	1.00				
GROW	-0.02	-0.03	-0.03	1.00			
SIZE	-0.27	0.09	-0.10	-0.06	1.00		
DPO	0.20	0.06	-0.07	-0.11	-0.09	1.00	
CB	0.08	0.02	-0.04	0.09	0.001	0.02	1.00

Table 4. Unit Root Test Results

Variables	Statistic	Probability	Cross-sections	Observations
TDAR	138.80	0.000***	37	481
PRF	139.19	0.000***	39	507
TANG	138.02	0.000***	39	507
LIQ	113.62	0.005***	39	507
GROW	221.91	0.000***	39	507
SIZE	125.82	0.000***	39	507
DPO	156.05	0.000***	39	507
CB	186.38	0.000***	37	481

Note. ***significant @ 1%.

value is < 0.05, the null hypothesis of unit root in the data series is to be rejected at the 5% level. It means that the data is stationary. It is clear from the Table 4 that all the variables are stationary in nature at level itself.

Random Effects Model

The model explains the relationship between financial leverage and its selected determinants. A panel regression model is set for testing whether the *PRF, TANG, LIQ, GROW, SIZE*, *DPO*, and *CB* have positive or negative effects on firms' financial leverage. Hausman test is used for choosing whether FE or RE models fit for the data. Since the probability value (1.000) of the test is > 0.05, the RE model is appropriate for this data set (Table 5). The random effects model can be represented as :

$$TDAR = 0.495 - 0.537*PRF + 0.132*TANG + 0.009*LIQ + 0.053*GROW - 0.088*SIZE - 0.008*DPO - 0.067*CB$$

The results of the empirical model using the RE method in Table 5 confirms the relationship between financial leverage and the determinants of leverage. The R^2 (27.5%) and a significant *F*- statistic (*p* - value : 0.000) signifies the good fitness of the model. The model explains around 28% of variation of the dependent variable by the selected independent variables. The variables : profitability, size, and cost of borrowings have a significant negative relationship with financial leverage. But tangibility, liquidity, and growth have a significant positive association with the financial leverage of manufacturing companies in India. However, dividend has no significant association with leverage of the companies.

Table 5. Random Effects Model

Variable	Coefficient	Std. Error	*t*-Statistic	Probability
C	0.495	0.047	10.352	0.000***
PRF	-0.537	0.052	-10.262	0.000***
TANG	0.132	0.047	2.791	0.005***
LIQ	0.009	0.005	1.690	0.091*
GROW	0.053	0.019	2.767	0.005***
SIZE	-0.088	0.011	-8.012	0.000***
DPO	-0.008	0.008	-1.015	0.310
CB	-0.067	0.019	-3.467	0.000***

R - squared : 0.275 Hausman Test;

F - statistic : 29.205 Chi square statistic: 0.000

Probability : 0.000***Probability: 1.000

Note. *significant @10% and ***significant @ 1%.

Since all the selected determinants except dividend payments significantly influence financial leverage of manufacturing companies in India, the hypothesis set for the study (H1) that the financial leverage of manufacturing companies in India represented by total debt to total assets ratio (TDTA) is determined by their (a) profitability, (b) tangibility, (c) liquidity, (d) growth, (e) size, (f) dividend payments, and (g) cost of borrowings stands rejected. However, it can be inferred that the financial leverage is significantly influenced by profitability (H1a), tangibility (H1b), liquidity (H1c), growth (H1d), size of firms (H1e), and cost of borrowings (H1g). Moreover, the lower average financial leverage ratio of 14% supports the pecking order hypothesis as the lower debt ratio of the companies substantiates their more dependence for internal sources of finance.

Research Implications

The results of the study have important implications. The positive influence of tangibility, liquidity, and growth ; and the negative influence of profitability, size of the company, and cost of borrowings to leverage would guide the practicing financial managers to factor in these variables while setting up appropriate capital structure for their companies. The non - influence of dividend payments in deciding leverage is also a very significant information to practicing managers. The lower financial leverage ratio of the companies (14%) hints at their more use of equity finance and still the dividend payouts on that equity finance is immaterial while setting debt - equity ratio or leverage. Moreover, the study supports the pecking order hypothesis, which means that the firms should give priority to internal finances rather than external finances.

Conclusion

Financial leverage is essential for a company to acquire its assets, run its operations, finance future growth, and finally to maximize its valuation. Thus, what are the determinants of a firm's leverage is the basic question of the study. Considering the case of manufacturing companies in India, the study confirms that the leverage ratio increases with firms' investment in tangible fixed assets, liquid assets, and growth of sales, but decrease with profitability, size of the firm, and cost of borrowings. However, there is no significant relation between dividend decisions and financial leverage. To conclude, profitability, tangibility, liquidity, growth, size, and cost of borrowings are the significant factors of leverage of manufacturing companies in India.

Limitations of the Study and Scope for Further Research

The study is concentrated only on large cap companies in India. Therefore, the generalization of the findings to other types of firms may not be possible. The study has chosen seven independent variables from the existing literature/theory based on a comprehensive literature survey to examine financial leverage. Still, there may be some other variables, which may influence leverage and such an omission, if any, may bring some changes in the coefficient values of the predictors. The micro and macro level factors such as GDP, inflation, risk, bank rate, tax rate, etc. may also impact leverage of companies. However, they are not considered for the study. Thus, future researchers have immense scope to include these micro and macro factors of leverage in their research attempts.

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