

ARTICLES

Capital Structure and its Effect on Profitability: A Case Study of Large Private Sector Companies in Selected Industries

DR. K.C. PAUL

Reader and Head, Department of Commerce, Vidyasagar University, Midnapore (WB).

and

R.N. GHOSH

Lecturer in Commerce, Panskura Banamali College, Midnapore (WB).

The design of the capital structure of a company may have some bearing on the profitability. An attempt has been made here to find out the effect of change in capital structure on the profitability.

THE most crucial decision of any company is involved in the formulation of its appropriate capital structure. A long debate in this regard has been continuing by virtue of which different capital structure theories have emerged. But a company (or firm) is not yet in a position to design its capital structure on the basis of these theories, which may be considered to be the most appropriate. The best design or structure of the capital of a company obviously helps the management to achieve its ultimate objectives of minimising overall cost of capital, maximising profitability and also maximising the value of the firm. These will in turn help to maximise the earning per share (EPS). It is thus apparent that the design of the capital structure of a company may have some bearing on the profitability of that company. In this article an attempt has been made to find out the effect of change in capital structure on the profitability of the company/firm.

TERMINOLOGY

Capital structure ordinarily implies the proportion of debt and equity in the total capital of a company. Since a company may tap any one or more of the different available sources of funds to meet

its total financial requirement, the total capital of a company may thus be composed of all such tapped sources. The term, 'structure', has thus been associated with the term 'capital'. Ordinarily, total fund or capital of a company may broadly be categorised into 'equity' and 'debt'. Equity¹ consists of equity share capital + preference capital + premium + free reserve + surplus + discretionary provisions for contingencies + development rebate reserves. Similarly, 'debt'² means all borrowings from Government, semi-government, statutory financial corporations and other agencies + borrowing from bank against own debentures and other mortgages + 'other borrowings' against own debentures and other mortgages and also deferred payment liabilities. Considering arguments for accepting short term loans and advances as debt by some academicians, we too have accepted it as debt. For the purpose of this study, equity means ordinary share capital + preference share capital + retained earning and debt means both short & long term debt inclusive of debentures. On the other hand, the term, 'profitability' indicates the profit earning capacity. A firm may employ huge amount of funds into the business. Whether these funds are effectively and judiciously used is judged by profitability.

Other things remaining unchanged, any increase in the employment of funds with corresponding increase in profitability may logically lead us to the idea that the rate of return of the incremental fund is higher than the cost (rate) of that fund. Obviously, such employment of funds helps the company to improve its profitability. Conversely, rate of return lower than the cost of fund will tell upon the profitability. Different techniques are available to measure the profitability. Of these, considering the suitability for the study, we use 'Return on Capital Employed' (ROCE) to measure the profitability.

Therefore,

$$\text{Profitability} = \frac{\text{EBIT (earning before interest \& taxes)}}{(\text{Net worth} + \text{Long term debt} + \text{Short term loan})} \times 100$$

$$= \frac{\text{Net Profit (before tax) + Interest}}{\text{Net worth} + \text{Long \& Short term debt} + \text{Debenture}} \times 100$$

DETERMINATION OF CAPITAL STRUCTURE

Ordinarily infant companies (or new companies) cannot collect sufficient debt as per their requirements so easily because they are yet to establish their credit-worthiness in the market. Naturally, they have to depend on equity very much. Consequently, for a new company simple, i.e. equity based capital structure is generally noticed. But established companies generally have track record of their profit earning capacity, which helps them to create their creditworthiness. The lenders feel safe to invest their funds in this type of companies. Naturally, there is ample scope for this type of companies to collect debt. But a company cannot accept debt freely i.e. without having any limit. The company must have to chalk out a plan to collect debt in such a way that the acceptance of debt becomes beneficial for the company in terms of increase in EPS, profitability and value of the firm.

1. RBI Bulletin, June 1962, pp. 860-861 (taken from S.K. Chakraborty, *Corporate Capital Structure and Cost of Capital*, ICWAI, 1977 p. 72).

2. RBI Bulletin, January 1974, p. 55.

ARTICLES

Different studies, so far conducted, fail to reach unanimity as to the appropriate debt-equity ratio. One such study conducted by B.K. Madan³ suggested 2:1 as the standard debt-equity ratio. But at the same time he opined that the standard ratio may vary depending on the nature of the company.

Of course, low debt-equity ratio does not necessarily mean much dependence on collecting funds by equity issues; it may also be so due to increase in the retained earnings component of 'equity'. Again, it is equally pertinent to note that a highly profitable company may keep aside a sizeable portion of its profit in the reserve fund. It may help the company not to rely on external debt to meet further requirement of the funds and accordingly debt-equity ratio may appear to be at a low level.

However, before accepting further debt a company has to think over the following two important aspects:

- (i) **Return:** Whether the return from the investment of the proposed debt will at least be equal to the cost of capital i.e. cost to procure such debt; and
- (ii) **Repayment capacity:** Whether the company is in a position to repay the debt within the stipulated time.

As to the first aspect, if the cost of capital is greater than the return, it will have an adverse effect on company's profitability, value of the firm and its earning per share (EPS). Similarly, for the second aspect, if company is unable to repay the debt within the scheduled period (may be due to some other reasons) it will affect the goodwill of the company in the credit market and consequently may create problems in future for collecting further debt.

Other factors remaining constant, the company should select its appropriate capital structure with due consideration of the above two factors. It is also to be noted here that coverage ratios have a great bearing on the abovementioned two factors.

PROBLEMS OF MAINTAINING FIXED CAPITAL STRUCTURE

A company may have a target debt ratio⁴ which may help to formulate its optimal capital structure. But without going into the debate on the existence or otherwise of the optimality point of capital structure, it may safely be said that a company cannot always maintain a fixed capital structure, be it optimal or otherwise. Because in order to finance a particular project it is practically next to impossible to collect definite amounts of debt and equity within the given time frame to maintain the desired debt-equity ratio. Collecting funds by issue of shares is time consuming and at the same time it requires observance of more formalities. It is more uncertain too. On the other hand, debt capital may be collected more easily in comparatively short period provided the creditworthiness of the company is good enough. Hence, a company may not always be able to maintain fixed capital structure; because strict adherence to the fixed capital structure may ultimately cause delay to the project schedule.

RELATIONSHIP BETWEEN CAPITAL STRUCTURE & PROFITABILITY

What is the relationship between capital structure and

profitability—is an important question to be considered carefully. Ordinarily, increase in debt in the capital structure i.e. improvement of debt-equity ratio implies greater amount of interest payment than before. So, the company must have to be sure enough of getting steady return so as to bear the additional burden of interest. Likewise, profitability depends, *inter alia*, on cost of capital. Actually, a negative correlation should always exist between cost of capital and profitability. So, increase in cost of capital means decrease in profitability. Since acceptance of more and more debt means payment of greater and greater amount of interest, the company must have to think twice about its effect on profitability. If due to acceptance of debt, profitability decreases i.e. a negative correlation results, such debt acceptance will not be advantageous to the company. On the other hand, if any change in the capital structure by way of increasing the proportion of debt can affect the profitability favourably then such change i.e. increase in debt may be considered beneficial to the company. As per different capital structure theories, specially traditional approach and Modigliani Miller approach, increase in debt-equity ratio helps to increase the profitability upto a certain level. In this article an attempt has been made to see whether the said theories hold good in cases of the sample companies.

DATA AND METHODOLOGY

The present study relates to the large private sector companies in some selected industries like the chemicals, drugs, pharmaceuticals, refineries and plastics industry in India. The term, 'large', has been defined and taken to include all the companies having a paid up capital of Rs. 1 crore or more at the beginning of the study period. The study relates to the 15 years period from 1976 to 1990. Data have been collected from the Bombay Stock Exchange Directory. All the companies which have satisfied the above two criteria relating to the minimum limit of paid up capital and to the continuity of operation during the study period, have been selected. In effect, 32 companies were primarily identified. Out of these 32 companies a sample of 10 companies using random number has been finally selected for the purpose of our study. To find out the relationship between debt-equity ratio and profitability, simple correlation technique has been used. 't' test is also carried out to judge the significance of the correlation.

DEBT-EQUITY AND PROFITABILITY BEHAVIOUR

The average debt-equity ratio and the average profitability of all the 32 companies are presented in Table 1 (see page 1043). The companies have been listed in the table in order of increasing debt-equity ratio. The average profitability of all the 32 companies over the 15-year study period has been computed as 14.85 per cent. This is taken as the standard profitability for the purpose of our study. Each company's average profitability is compared to this standard and presented in the table in the forms of 'A' meaning 'Above standard' and 'B' meaning 'Below standard'. Thus, it appears that the profitabilities of 13 companies (representing 40.63 per cent of the population) are below standard. Distribution of these 13 companies or in other words, the distribution of the other 19 companies amongst the different levels of debt-equity ratios may reveal some important features as to the association or otherwise of debt-equity ratio with profitability. So, for a better understanding a grouped frequency distribution Tables (No. 2) (see page 1043) is prepared.

3. B.K. Madan Report on a Study of the Debt-Equity Ratio Norms, Management Development Institute, New Delhi, 1978, P.J.

4. B. Banerjee, Financial Policy & Management Accounting, The World Press Private Ltd., Calcutta, 2nd ed., 1987, p. 556.

TABLE-1

Average Debt-Equity Ratio and Average Profitability

Sl. No.	Name of the Company	Average		Above (A)/Below (B) the Standard Profitability
		Debt-Equity Ratio	Profitability (%)	
1.	Reckit & Colman of India Ltd.	0.08	21.11	A
2.	Hindustan Ciba-Geigy Ltd.	0.25	16.83	A
3.	Pfizer Ltd.	0.29	11.29	B
4.	Herdilla Chemicals	0.35	12.29	B
5.	Union Carbide (India) Ltd.	0.41	11.59	B
6.	Searle (India) Ltd.	0.51	22.86	A
7.	Hindustan Lever	0.54	19.09	A
8.	Gujarat State Fertilizer Co. Ltd.	0.55	12.67	B
9.	IDL Chemicals Ltd.	0.56	13.93	B
10.	Synthetics & Chemicals Ltd.	0.68	9.45	B
11.	Polyofins Industry Ltd.	0.74	15.17	A
12.	Bayer (India) Ltd.	0.78	15.50	A
13.	National Peroxide Ltd.	0.81	15.35	A
14.	Sandoz (India) Ltd.	0.93	15.91	A
15.	Colour Chem. Ltd.	0.99	17.03	A
16.	National Organic Chemical Industries Ltd.	1.04	15.31	A
17.	Dharamji Morarji Chemicals Co. Ltd.	1.08	17.66	A
18.	Chemicals & Plastics India Ltd.	1.11	14.47	B
19.	Tata Chemicals Ltd.	1.13	14.43	B
20.	BASF India Ltd.	1.17	16.48	A
21.	Excell Industries Ltd.	1.35	18.12	A
22.	EID Parry (India) Ltd.	1.36	15.57	A
23.	Rallis India Ltd.	1.50	15.34	A
24.	Indian Dyestuff Industries Ltd.	1.50	12.04	B
25.	Zuari Agro Chemicals Ltd.	1.51	16.72	A
26.	Travancore Electro Chemical Industries Ltd.	1.59	14.59	B
27.	Sudarshan Chemical Industries Ltd.	1.67	12.55	B
28.	German Remedies Ltd.	1.86	16.74	A
29.	Boehringer Knoll Ltd.	1.84	15.35	A
30.	Ranbaxy Laboratory Ltd.	2.44	15.31	A
31.	Mangalore Chemicals & Fertilizers	4.40	8.94	B
32.	Cochin Refineries	4.64	12.96	B

TABLE-2

Frequency Distribution of Companies

Range of D/E Ratio	No. of Companies	Profitability	
		A (No.) (%)	B (No.) (%)
< 0.5	5	2 (10.53)	3 (23.08)
0.5 to < 1.0	10	7 (36.84)	3 (23.08)
1.0 to < 1.5	7	5 (26.32)	2 (15.38)
1.5 to < 2.0	7	4 (21.05)	3 (23.08)
2.0 and More	3	1 (5.26)	2 (15.38)
	32	19 (100.00)	13 (100.00)

From Table 2 it is apparent that the highest concentration (10 out of 32) is in the D/E ratio range of 0.5 and 1.0. Moreover, roughly half of the companies (15 out of 32) are maintaining average D/E ratio of less than unity. In case of 10 companies the D/E ratio is 1.5 and above. Again, among these 10 companies there are two companies having a very high (4.40 & 4.64) D/E ratio. If these two companies are excluded, we have only 8 companies (i.e. 25 per cent) having D/E ratio around so called 'ideal ratio' of 2:1 (i.e. between 1.5 and 2.5).

Similar to the D/E ratio, the highest concentration (36.84 per cent) of 'A' category profitability is identified with the D/E range of 0.5 to 1.0. Interestingly enough, there is only one company of 'A' category profitability in the D/E range of '2.0 and more'.

In addition to this overview, the association of D/E ratio with profitability is statistically tested on a random sample of 10 companies (out of 32 companies) with the help of correlation co-efficient. The results along with 't'-values to judge the significance of the correlation co-efficients are presented in Table-3 (see below) (Companies are again serialised in order of increasing D/E ratio). From Table-3, it is clear that out of 10 companies, six have negative correlation between debt-equity ratio and profitability and other four companies have positive correlation. So, in general it appears that there is a negative association between debt-equity ratio and profitability. Since the results are against the existing theoretical view (i.e. there should be a positive correlation between debt-equity ratio and profitability at least upon a particular debt-equity mix as propounded by the proponents of Traditional Approach and later on by the Modigliani and Miller by their revised opinion) we have calculated correlation co-efficients of all the 32 companies. The result is that out of 32 companies 23 companies (71.88 per cent) have negative correlation between debt-equity ratio and profitability. Therefore, the population-result is in conformity with the sample-result. Again, in almost all cases the results of the correlation are accepted as significant as per result of 't' test.

However, a close scrutiny of the results of the 10 sample companies reveals that a company (Pfizer Ltd.) having low average debt-equity ratio (0.29) resulted in highest degree of positive correlation (+0.79). Besides, Gujarat State Fertilizer Co. Ltd. and Hindustan Lever have also resulted in positive correlation despite their low average debt-equity ratios as 0.55 & 0.54 respectively.

On the other hand, for Hindustan Ciba-Geigy Ltd. the correlation is negative though this company is having the lowest debt-equity ratio among the sample companies. Therefore, if we concentrate our attention on the above results, we may conclude that there is no definite relationship between debt-equity ratio & profitability.

FINDINGS AND CONCLUSION

The main findings may now be summarised as follows:

- (i) There is no industry-specific 'optimum' debt-equity ratio. Had it been so, the best profitability within an industry would never correspond to the D/E ratio at a lower level. Because existing theories indicate that increasing D/E ratio contributes to the increasing profitability. So, indirectly it comes to this that the advantage of significant amount of debt (indicating higher level of D/E ratio) must be availed to optimise the profitability.
- (ii) Low D/E ratio does not always indicate low profitability. Likewise, high D/E ratio is not also recognised as the only factor to improve upon the profitability. In other words, there does not exist any direct and positive relationship between D/E ratio and profitability.
- (iii) Apart from D/E ratio, other factors like age of the company, past track records, growth rate, risk perception, availability of debt, etc. have a greater say on the profitability of the company. It is evident from the case of Pfizer Ltd. The company had no debt during the first five years of the study period owing to huge surpluses generated earlier; it was till continuing (without debt) with reasonable level of profitability.

So the belief that there is a positive association between D/E ratio and profitability, is not substantiated by the results of the present study. To reiterate, in most of the cases of the present study, the said relationship is negative and in certain cases there does not exist any definite relationship. One of the causes of such unexpected result may lie in defining the terms 'debt' and 'equity'. Besides, the effect of taxation has also not been considered in our study. Though no generalisation is desirable on the basis of the results of the sample of such a small size, yet what transpires from the present study is that D/E ratio (or in other words, the capital structure) is not the only guiding factor to improve the profitability. There might be certain other non-quantitative factors which play dominant roles in selecting the appropriate capital structure.

TABLE-3
Correlation Between Average D/E Ratio and Average Profitability

Sl. No.	Name of the Company	Average		Correlation Coefficient (%)	n-2 Degree of Freedom	Table Value	Calculated 't'-value
		D/E Ratio	Profitability (%)				
1.	Hindustan Ciba-Geigy Ltd.	0.25	16.83	(-) 0.63	12	1.78	(-) 2.82
2.	Pfizer Ltd.	0.29	11.29	(+) 0.79	—	—	—
3.	Hindustan Lever	0.54	19.09	(+) 0.04	13	1.77	0.14
4.	Gujarat State Fertilizer Co. Ltd.	0.55	12.67	(+) 0.35	12	1.78	1.29
5.	Synthetics & Chemicals Ltd.	0.68	9.45	(-) 0.41	12	1.78	(-) 1.56
6.	Tata Chemicals Ltd.	1.13	14.43	(-) 0.28	13	1.77	(-) 1.05
7.	Excell Industries Ltd.	1.35	18.12	(-) 0.51	12	1.78	(-) 2.05
8.	Indian Dyestuff Industries Ltd.	1.50	12.04	(-) 0.75	13	1.77	(-) 4.08
9.	Ranbaxy Laboratory Ltd.	2.44	15.31	(+) 0.31	12	1.78	1.13
10.	Mangalore Chemicals & Fertilizers Ltd.	4.40	8.94	(-) 0.15	—	—	—

Note: In case of Pfizer Ltd. & Mangalore Chemicals & Fertilizers Ltd. 't' value could not be calculated due to the non-availability of data for more than 10 years.