



# Impact of Leverage on Profitability: A Study of Sabar Dairy

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**Abstract:** *The purpose of this paper is to study and understand the impact of leverage on the profitability of Sabar Dairy. The present study examines the relationship between return on capital employed (ROCE), return on equity (ROE), return on assets (ROA) and earnings per share (EPS) with operating leverage, financial leverage and total leverage. A data of Sabar Dairy is examined for the period 1985-86 to 2013-14. The empirical findings the result of regression indicates that the coefficient of DOL, DFL and DTL is positive with ROCE but not significant. However, the overall model is statistically significant; the coefficient of DOL, DFL and DTL is positive with ROE but not significant. However, the overall model is statistically significant, the coefficient of DOL and ROA is significant positive, coefficient of DFL and ROA is negative and coefficient of DTL and ROA is positive but not significant. However, the overall model is statistically significant and the coefficient of DOL, DFL and DTL is positive with EPS but not significant. However, the overall model is statistically significant. The result is concluded that Sabar Dairy has use the operating leverage, financial leverage and total leverage satisfactorily.*

**Keywords:** *Degree of financial leverage, Degree of operating leverage, Earnings per share, Return on assets, Return on capital employed, , Return on equity.*

## I. INTRODUCTION

The foremost objective of finance management is to increase the shareholders wealth of a firm. The objective can be achieved based on the investment decision or capital expenditure decision and the financing decision or capital structure decisions. The theory of capital structure is one of the most important financial themes in corporate finance and various studies use this theory to highlight the significance of debt financing. Capital structure of a firm is defined by its leverage; that is a mix of debt and equity financing which is subject to different financial difficulties. Financial leverage represents the total debt reported to the equity of a firm, reflecting the capacity of the firms to attract external financial resources in order to improve the efficiency of the equity. Leverage has been conceived also as a modality by which a firm can increase its growth opportunity. So, Leverage decision is fundamental for any business organization because of the need to maximize return to the various stake holders and also because of the fact that such decision has great impact on the firms' ability to deal with competitive environment. Leverage had incorporated also the meaning of the risk increasing philosophy. It is important for business that how to choose the combination of debt and equity to achieve optimum capital structure that would minimize the firm's cost of capital and improves return to owners of the business. One of the best ways in which firm increases its profit is through financial leverage. Financial leverage uses debt instruments so that the anticipated level return on the firm's equity would increase.

## II. LITERATURE REVIEW

**Edwin, Sawa Wabwile, et all (2014)**, the result of study indicates that there is a negative correlation between debt asset ratio and ROAC and ROCEC though not significant. That is as the debt ratio increases, it means the banks' most assets are being financed by both long-term and short-term liabilities and hence the return on such assets as well as that on capital employed is reduced to cater for the outstanding liabilities. There is positive correlation between the debt asset ratio and the EPS though not significant. There is a negative correlation between debt ratio and the PBV though not significant.

**Srivastava, Namita (2014)**, she studied about the variable determining the leverage and risk of cement companies operating in India. The study concluded that profitability, size and liquidity is negatively correlated with leverage whereas, tangibility has positive impact on leverage or capital structure of the company. The results also reveal that growth plays very insignificant role in defining capital structure of the company.

**Khushbakht, Tayyaba (2013)** in his study they are concluded that there is positive correlation between ROA and DFL while there is negative correlation between ROA and DOL. DFL and ROI have inverse relationship and similarly DOL and ROI also have inverse relationship. There is positive correlation between DFL and EPS while there is negative correlation between DOL



and EPS. These results does not affect significantly. So there is no significant effect of DFL and DOL on ROA, ROE, ROI and EPS.

**Georgeta, Vintilla et al (2012)**, The empirical finding indicate that high debt level cause significant positive impact on ROE. Debt is used by many companies to leverage their capital and profit.

**Khalid, Alkhatib (2012)**, the aim of his study was to empirically investigate the determinants of leverage of listed companies. The results show that for both industrial and services sectors; there were no statistical significant relationship. When the two sectors were separated, the results for the industrial sector revealed that liquidity and tangibly have significant relationship with leverage, whereas the results for the services sector revealed that the growth rate, liquidity, and tangibility have significant relationship with leverage.

**Peswani, Shilpa (2011)** in her study has analysed the impact of leverage on profitability of two best companies of FMCG sector i.e. Britannia Industries Ltd and Marico Industries. It was studied through analysis that Marico Industries Ltd was a high leveraged firm than Britannia Industries Ltd. A high leveraged firm was capable of providing high return on equity to its shareholders but the profitability of both the companies was similar.

**Chandra kumaramanglam and Govindasamy (2010)** have examined the impact of leverage on the profitability of selected cement companies in India. It explained the relationship between debt equity ratio & earning per share and how effectively the firm uses debt financing. Its results of the study suggested that leverage, profitability and growth are positively related and leverage had impact on profitability of firm

**Varsha, Virani (2010)** in her study on “Impact of leverage on Profitability of Pantaloon Retail India Ltd” had stated that finance decision was concerned with selection of correct mix of debt and equity in its capital structure. Its conclusion was that the company should reframe its capital structure and capacity utilization for further capability in future.

**Camelia, Burjal (2011)** Using combined sources to fund activities and increase debt to a certain level that doesn't affect the financial autonomy of the company is another way designed to increase the assets' ability to generate profit. In the analyzed situation, action of the financial leverage was favourable and it acted in the sense of increasing the ROA, this aspect justifying the company's financing strategy through increasing debts.

**Zhang and Li (2008)** discussed that increase in leverage decrease the agency cost. The results of the study explain that increase in the leverage may reduce the agency cost. In this study they also stated that if the leverage is increased from the optimal level then those results in the opposite put effect on the agency cost of free cash flow. They discussed that sometimes increase in the debt causes bankruptcy cost. They said that the increase in the debt level reduces the agency cost but increases the bankruptcy cost.

**Titman and Wessels (1988)** said that highly profitability firms have lower levels of leverage than less profitable firms because they first use their earning before looking for external capital.

### III. CONCEPT OF LEVERAGE

The term ‘Leverage’ may be defined as the percent of change in one variable by the percent of change in some other variable or variables. In the field finance management, the term leverage is used to describe the firm's ability to use fixed cost assets or funds; the former is popularly known as ‘Operating Leverage’ and the latter is known as ‘Financial Leverage’. In the worlds of James Horne, ‘Leverage may be defined as the employment of an asset or funds for which the firm pays a fixed cost or fixed return. Thus, according to him, a leveraged firm employs assets or sources of funds which have a fixed cost or return. The former may be termed as ‘fixed operating cost’, while the latter may be termed as ‘fixed financial cost’. The leverage is also described by some as ‘trading on equity’.

#### A. Operating Leverage

Operative Leverage results from the existence of fixed operating expenses to magnify the effect of changes in sales on earnings before interest and taxes (EBIT). Operating leverage depends on the proportion of fixed operating expenses in total operating cost of the firm. Generally, operating leverage is grater for firms with a higher proportion of fixed operating costs. Specifically, for a percentage increase in sales, the greater the operating leverage, the greater the percentage of increase in EBIT.

#### B. Degree of operating Leverage (DOL)

The degree of operating leverage is defined as the percentage change in earnings before interest and taxes (EBIT) that results from a given percentage change in sales. In effect, the DOL is an index number which measures the effect of a change in sales on earnings before interest and taxes (EBIT).

#### C. Financial Leverage



Financial Leverage is caused due to fixed financial interest in every organization. Businesses use fixed financial charges to increase the effects of changes in earnings before interest and tax on profits. It includes the use of those funds that are obtained at a fixed cost in the expectation of increasing the return to the shareholders in future. The financial leverage used by every firm is anticipated to earn more return on the fixed-charge funds than their costs. The surplus (or deficit) will increase (or decrease) the return on the owner's equity and return on investments.

#### **D. Degree Of Financial Leverage (DFL)**

The degree of financial leverage is defined as the percentage change in earnings after interest and before taxes (EBT) that results from a given percentage change in earnings before interest and taxes (EBIT). In effect, the DFL is an index number which measures the effect of a change in EBIT on EBT.

#### **E. Combined Leverage**

Operating and financial leverages together cause wide variation in EBT for a given change in sales and operating costs. Total leverage is simply expressed as operating leverage multiplied by financial leverage. The operating leverage affects the EBIT and the financial leverage affects the EBT, EPS, ROE and ROI. The management needs to manage the true combination of the operating and financial leverage. A firm whose sales vary widely and occasionally should avoid use of high leverage because it will be exposed to a very high degree of risk. Combined leverage shows the entire effect of the operating and financial leverages. In other words, it shows the total risks associated with the firm. It is the result of both the leverages. Degree of Combined Leverage (DCL) = DOL \* DFL

### **IV. SABAR DAIRY PROFILE**

"The Sabarkantha District Co operative Milk Producer's Union Limited" is a milk processing unit at Himatnagar, Sabarkantha District, Gujarat State, India. It is also known as SABAR Dairy. The Sabar Dairy was established in the year 1964 as a co operative society. In the year 1971 under Operation Flood-I Programme of Indian Dairy Corporation a dairy project was sanctioned for handling 1.50 lakh liters of milk per day. Under Operation Flood-II programme the dairy plant was expanded to handle 4.00 lakh liters of milk per day. The chilling centre of the Union was established at Dhansura, Khedbrahma, Shamlaji, besides the above three milk chilling centres the Union presently operates three other milk chilling centres at places like Bayad, Prantij and Idar to cover all the milk collected from the entire district. The main objective of Sabar Dairy is to collect milk from Sabarkantha District and manufacture different types of milk products. Sabar Dairy produces the different milk base products but those all products marketed by GCMMF (Gujarat Co-operative Milk Marketing Federation Limited, Anand) as AMUL brand. In short all major marketing activities are done on the priority of GCMMF. Total no's of registered village milk producers co-operative societies are 1874 and total no's of its members is 361030 in the year 2013-14.

### **V. OBJECTIVES OF THE STUDY**

The present study is concerned with the analysis of the impact of leverage and liquidity on profitability of Sabar Dairy. The objectives of this study are as follows:

- To understand and evaluate the leverage of the Sabar Dairy.
- To examine the impact of leverage on profitability and Earning per Share.
- To review the relationship between the financing mix and profitability.

### **VI. METHODOLOGY**

#### **A. Selection of Variables**

The seven variables are considered in the study to analyze the effect of leverage on the profitability. The four variables are used as dependent variables and three variables are used as independent.

#### **Dependent variables**

1. Return on Capital Employed (ROCE) =  $\text{EBIT} / \text{Total Assets} - \text{Current liabilities}$
2. Return on Equity (ROE) =  $\text{PAT} / \text{Equity fund}$
3. Return on Assets (ROA) =  $\text{PAT} + \text{Interest Expenses} / \text{Total Assets}$
4. Earnings per share (EPS) =  $\text{PAT} / \text{No's of Equity Shares}$

#### **Independent variables**

1. Degree of Operating Leverage (DOL) = % of change in EBIT (Earnings before Interest and Tax) / % of change in sales.
2. Degree of Financial Leverage (DFL) = % of change in EBT (Earnings before Tax) / % of change in EBIT
3. Degree of Combined Leverage (DCL) = DOL \* DFL



DOL and DFL – In order to calculate the percentage of change in sales, percentage of change in EBT and percentage of change in EBIT, the

**B. Models**

Model 1:  $ROCE = a + \beta_1DOL + \beta_2DFL + \beta_3DTL + \epsilon$

Model 2:  $ROE = a + \beta_1DOL + \beta_2DFL + \beta_3DTL + \epsilon$

Model 3:  $ROA = a + \beta_1DOL + \beta_2DFL + \beta_3DTL + \epsilon$

Model 4:  $EPS = a + \beta_1DOL + \beta_2DFL + \beta_3DTL + \epsilon$

Where: a= constant and  $\epsilon$  = the error term  $\beta$ : the regression coefficient Leverage.

**C. Data**

This study is related to Sabar Dairy; the reason of selecting this firm is that the data or financial statements are easily available for annual reports. Twenty nine years data from the period 1985-86 to 2013-14 is used for the purpose of analysis. The data is analyzed by calculating Descriptive Statistics, Correlation Coefficients and Regression. The software used to analysis of research study is SPSS.

**VII. EMPIRICAL RESULTS**

**A. Descriptive Statistics**

The descriptive table 1 explains the central values of the data. It is used to check the effect of leverage on profitability. The table shows the mean and standard deviation value for variables.

TABLE-1  
Descriptive Statistics of Variables

	N	Minimum	Maximum	Mean	Std. Deviation
ROCE	28	3.09	20.68	8.81	3.82
ROE	28	1.72	18.42	6.82	4.53
ROA	28	1.75	10.97	4.51	1.93
EPS	28	15.83	110.39	38.80	25.52
DOL	28	0.20	1.23	0.66	0.32
DFL	28	-3.78	3.02	0.81	1.45
DTL	28	-3.20	2.31	0.37	0.97

Mean represents the average value; standard deviation shows deviation of value from mean. The return on capital employed (ROCE) standard deviation is 3.82. The return on capital employed (ROCE) average is 8.81 for the selected time period of 1986-87- 2013-14. The ratio of return on equity (ROE) mean is 6.82 and standard deviation is 4.53. The ratio of return on assets (ROA) mean is 4.51 and standard deviation is 1.93. The degree of operating leverage (DOL), degree of financial leverage (DFL) and degree of total leverage(DTL) average are approximately 0.66, 0.81 and 0.37 respectively. The standard deviation for DOL, DFL and DTL are 0.32, 1.45 and 0.97 respectively.

**B. Correlations**

TABLE-2  
Pearson Bivariate Correlations

	ROCE	ROE	ROA	EPS	DOL	DFL	DTL
ROCE	1						
ROE	.455*	1					
ROA	.895**	.349	1				
EPS	.293	.821**	.258	1			
DOL	.495**	.324	.713**	.348	1		
DFL	.153	.530**	-.146	.332	-.361	1	
DTL	.416*	.745**	.237	.508**	.106		1

Source: SPSS output. \*\*Correlation is significant at the 0.01 level (2-tailed) \* significant at the 0.05 level (2-tailed).

The above mentioned table indicates the relationship between the various independent and dependent variables used in the study. Table 2 explains that the correlation between ROCE, ROE, ROA, EPS and DOL shows positive correlation which means increase in DOL, increases the ROCE, ROE, ROA and EPS. The correlation between ROCE, ROA and DOL is significant positive correlation.



The correlation between ROCE, ROE, EPS and DFL shows positive correlation, which means increase in DFL, increases the ROCE, ROE and EPS. The correlation between ROE and DFL is significant positive correlation. The correlation between ROA and DFL is negative correlation. i.e; increase in DFL, decreases the ROA.

The correlation between ROCE, ROE, ROA, EPS and DTL shows positive correlation, which means increase in DTL, increases the ROCE, ROE, ROA and EPS. The correlation between ROCE, ROE, EPS and DTL is significant positive correlation.

**C. Regression**

TABLE-3  
Linear Regression estimates on factors affecting profitability

Parameter	Model 1	Model 2	Model 3	Model 4
Dependent Variable	ROCE	ROE	ROA	EPS
Constant	4.069	2.067	2.227	5.956
DOL	6.231	4.999	3.470*	39.318
DFL	0.335	0.692	-0.374	7.294
DTL	1.008	2.445	0.815	2.984
R	0.616	0.787	0.737	0.604
R square	0.380	0.62	0.543	0.364
Adjusted R Square	0.302	0.573	0.486	0.285
F Value	4.902**	13.06**	9.507**	4.584**

Source: SPSS output. \*and\*\* Denotes significance level at 5 and 1% levels, respectively

**Regression Explanation: The table 3 explains the regression analysis:**

**Model-1:** The result of regression indicates that the coefficient of DOL, DFL and DTL is positive with ROCE but not significant. However, the overall model is statistically significant, as it is indicated by the F value of 4.902(P<01). The multiple correlation coefficients between ROCE and the independent variables taken together are 0.616. The model’s adjusted R square implies that only 30.2 percent of the variation in the profitability of the Sabar dairy can be explained by the model.

**Model-2:** The result of regression indicates that the coefficient of DOL, DFL and DTL is positive with ROE but not significant. However, the overall model is statistically significant, as it is indicated by the F value of 13.06(P<01), the multiple correlation coefficients between ROE and the independent variables taken together are 0.787. It indicates that the profitability was highly responded by its degree of leverage indicators. The value of Adjusted R squares that 57.3 percent of variation in ROE is accounted by the join variation in DOL, DFL and DTL.

**Model-3:** The result of regression indicates that the coefficient of DOL and ROA is significant positive, coefficient of DFL and ROA is negative and coefficient of DTL and ROA is positive but not significant. However, the overall model is statistically significant, as it is indicated by the F value of 9.507(P<01). The multiple correlation coefficients between ROA and the independent variables taken together are 0.737. The model’s adjusted R square implies that 48.6 percent of the variation in the profitability of the Sabar dairy can be explained by the model.

**Model-4:** The result of regression indicates that the coefficient of DOL, DFL and DTL is positive with EPS but not significant. However, the overall model is statistically significant, as it is indicated by the F value of 4.584(P<01), the multiple correlation coefficients between EPS and the independent variables taken together are 0.604. It indicates that the profitability was responded by its degree of leverage indicators. The value of Adjusted R squares indicate that only 28.5 percent of variation in EPS is accounted by the join variation in DOL, DFL and DTL.

**VIII. CONCLUSION**

This paper explained the studies on the leverage analysis and its impact on profitability with reference to Sabar Dairy. Using the Panel data of firm between 1985-86 and 2013-14, we examined that whether there is effect of leverage on profitability or not. I used return on capital employed, return on equity, and return on asset and Earning per share as dependent variables and degree of operating leverage, degree of financial leverage and degree of total leverage as independent variables. After applying regression, correlation descriptive analysis it is concluded that DOL, DFL, DTL and ROCE, ROE, EPS have positive relationship, and DOL and ROA, DTL and ROA also positive relationship while DEL and ROA have inverse relationship. The overall all model is statistically significant at as it is indicated by the (P<01).The result is concluded that Sabar Dairy has use the operating leverage, financial leverage and total leverage satisfactorily.



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