# INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE & MANAGEMENT



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**NEED/IMPORTANCE OF THE STUDY** 

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**HYPOTHESIS (ES)** 

RESEARCH METHODOLOGY

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#### THE DETERMINANTS OF PROFITABILITY: AN EMPIRICAL INVESTIGATION ON SUN PHARMA

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#### **ABSTRACT**

The profit of a business may be measured by studying the profitability of investment in it. It is the test of efficiency, powerful motivational factor and the measure of control in any business. Profitability is highly sensitive economic variable which is affected by host of factors operating through a variety of ways. The objective of this study is to examine the determinants of profitability of Sun Pharma. Determinants of profitability are analyzed using the techniques of ordinary least squares. It is evident from the results that size is the strongest determinants of profitability of Sun Pharma followed by the variables vertical integration, past profitability, leverage, current ratio, inventory turnover ratio, fixed assets turnover ratio and operating expenses. The study concluded that the company should consider all these possible determinants while considering its profitability.

#### **KEYWORDS**

sun pharma, determinants of profitability, profitability and leverage and vertical integration.

#### INTRODUCTION

ndian pharmaceutical sector has come a long way, being a small sector 1970 to a vital supplier of healthcare products, serving almost 95 per cent of the countries pharmaceutical needs. It ranks third in the world in terms of production volume and 13<sup>th</sup> in domestic consumption volume. Indian pharmaceutical industry grew at 15.7 per cent during December 2011. The Indian pharmaceutical industry is estimated to grow at 20 per cent compound annual growth rate (CAGR) over the next five years. India is now among the top five pharmaceutical emerging markets. There will be new drug launches, new drug filings, and phase II clinic trials throughout the year. On back of increasing sales of generic medicines, continued growth in chronic therapies and a greater penetration in the rural markets, the domestic pharm market will grow at 10-12 percent in FY 15 as compared to 9 percent FY 14.

Sun pharmaceutical was set up in 1983 and the company started off with only 5 products to cure psychiatric illness. Sun pharma is known worldwide as the manufacture of specialty Active Pharmaceuticals Ingredients and formulations. However, the company is also concerned with chronic treatments such as cardiology, psychiatry, neurology, gastroenterology, diabology, and respiratory ailments. Active Pharmaceuticals Ingredients (API)includes peptides, steroids, hormones, and anti-cancer drugs and their quality is internationally approved. The international offices of Sun Pharmaceuticals Industries Ltd. are located in British Virgin Islands, Russia, and Bangladesh. In India, the offices are in Vapi, Silvassa, Panoli, Ahmednagar, and Chennai.

The question of determination of profit is of great importance. The profit of a business may be measured by studying the profitability of investment in is. Profitability is a relative term and its measurement can be achieved by profit and its relation with the other objects by which the profit is affected. It is the test of efficiency, powerful motivational factor and the measure of control in any business. Actually profitability is highly sensitive economic variable which is affected by a host of factors operating through a variety of ways. Some of them affect product prices and quantities; some affect the cost of production while others make changes in capital stock, size, market share and growth of the firm. Further, corporate policy relating to various functions will affect profitability. Some of them are relevant in short run while others have impact in the long run. It is doubtful to build a theory of profitability, which accounts for all such factors. Because of these difficulties, it is quite natural to analyse the variation in profitability by taking the partial approach i.e., to find the effect of certain major variables, ignoring the implications of other left out independent variables at a time. The present study is a step towards this direction.

#### THEORETICAL BACKGROUND AND THE DEVELOPMENT OF HYPOTHESES

The study of how and why firms attain profitability levels has been the main pre-occupation of industrial organization economists for the last 13 years. In determining factors influencing performance diversity, literature dealing with such work suggests that industrial performance and performance differences among firms can be explained as arising from various characteristics: those which are firm – specific ant those which are industry specific.

Lyroudi & Lazaridis (2000) suggests that the profitability of the company depends on working capital management where the cash conversion cycle has a significant impact with the company's liquidity.

Chakraborty and Bandopadhyay (2007) In their research studied strategic working capital management, and its role in corporate strategy development, ultimately ensuring the survival of the firm. They also highlight how strategic current asset decisions and strategic current labilities decisions had multi-dimensional impact on the performance of a company.

Raheman and Nasr (2007) In their study made an attempt to show the effect of different variables of working capital management including average collection period, inventory turnover in days, average payment period, cash conversion cycle, and current ratio on the net operating profitability of Pakistani firms. They selected a sample of 94 Pakistani firms listed on Karachi Stock Exchange for a period of six years from 1999 – 2004 and found a strong negative relationship between variables, it leads to decreasing profitability of the firm and mangers can create a positive value for the shareholders by reducing the cash conversion cycle to a possible minimum level.

Samiloglu and Demirgunes (2008) analyze the impact of working capital management on companies with profitability and the results of the study is the existence of a relationship between profitability and average collection, inventory and leverage while the variable sales growth has a significant positive relationship with profitability.

Karaduman et al. (2010) analyze the impact of working capital management revenue in the Turkish companies listed where results indicate the need for a balance between profitability and risk, which could lead to influence financial decisions.

Hifza Malik (2011) investigated the determinants of profitability in insurance companies of Pakistan and examine effects f firm specific factor(age, size, volume of capital, leverage ratio and loss ratio) on profitability peroxide by ROA. It includes 35 listed life and non life insurance companies under the period of 2005-2009 lastly concluded that there is no relationship between profitability and age of the company and there is significantly positive association between size of company and profitability. It also shows that volume of capital is significantly and positively related to profitability. Loss ratio and leverage ratio shows negative but significant relationship with profitability.

**Dhulia Hirenkumar Kantilal (2012)** studied on analysis of gross profit to sales ratio of top ten pharmaceutical companies and shows that there is significance difference between in the gross profit to sales ratio among different companies under study as well as different years of each company lastly the researcher concluded that Gross Profit to sales ratio among different companies and among different years under study is not same.

Sandhar et.al (2013) examined the relationship between liquidity and profitability of selected Indian cement companies using regression analysis and revealed that current ratio and liquid ratio are negatively associated with return on assets (ROA), return on investment (ROI) and cash turnover ratio is negatively associated with ROI and ROA.

**R.Amsaveni & Gomathi (2013)** analyzed the fundamental analysis of BSE listed FMCG companies for a period 2006-07 to 2011-2012. Researcher has studied economic, industry and company analysis and found that from economic analysis, GNP, Inflation, Interest rates, Exchange rate foreign exchange reserves, Agricultural Production, Government Receipts and expenditure has a positive growth rate during the study period and gross domestic product, gross domestic capital formation savings and balance of payments has negative growth rate during the study period.

Sarvanan and Abarna (2014) conducted study on liquidity analysis of selected automobile companies in India using Anova and found that there is significant difference among the absolute liquid ratios of the selected automobile companies.

#### **PROFITABILITY**

Many researchers use different measures of firm profitability in the analysis of the determinants of profitability. Among, return on assets (Hall & Weiss, 1967; Shepherd, 1972; Bothwell et al., 1984; Amato & Wilder, 1990;) and Return on sales (Samuels and Smyth, 1968; Nagarajan and Barthwal, 1990; Amit Mallick and Debasish Sur, 1998; Vijayakumar, 2002) are widely used measures of profitability – It is assumed that management may be concerned with effective utilization of all resources and these two measures could be proper in this line of arguments. The profit rates measured by sales will give a short-term perspective of profitability because sales are annual flows. On the other hand, the return on assets will give us long-term perspective of profitability. In this study, ratio of profit margin on sales is used as dependent variable in the specified model.

#### SIZE

Firm size is one of the most acknowledged determinants of a firm's profits in terms of its effect on competitive market power in given industry (Beard & Dess, 1981). Economies of scale, raw material costs and production strategy are a few of the benefits larger firms employ because their structure allows for the minimization of operational costs (Sidhu and Bhatia, 1998) and higher returns on account of access to capital market (Hall and Weiss, 1967). Hence, generally a positive hypothesis is set for size – profitability relationship. The size – profitability relationship is perhaps best explained as a curvi – linear relationship where beyond a certain point, scale economies cease to exist and the relationship then may reverse owing to the problems associated with size (enlarged demand, imperfections, increased tariff protection and inflationary conditions in the Economy). Therefore, impact of firm size on profitability cannot be determined a priori. Thus, from this theoretical background, the study advances the following hypothesis.

#### $H_0$ 1: Firm size is significantly associated with profitability.

The existing literature mentions an array of alternative measures of firm size. Generally, two sizes measures are employed; they are assets (Shepherd, 1972; Amato & Wilder, 1990; Sidhu & Bhatia, 1998) and sales turnover (Amirkhalkhali et al, 1993; Abdurahman et al., 2003; Vijayakumar 2002). Assets express amount of resources utilized for producing output whereas sales is an output variable. Sales are an annual flow depending upon output produced and sold in the market. Therefore, in this study the log of total assets as the measure of size has been employed.

#### **LEVERAGE**

Leverage has been employed widely as a measure of risk in previous studies of financial performance reflecting a trade – off between shareholders returns and risk (Hall & Weiss, 1967; Scott & Pascoe, 1986; Pant, 1991). The usual supposition is that a leveraged firm with relatively more borrowed capital represents a greater financial risk to equity holders than a firm with relatively low debt (Bothwell, Cooley & Hall, 1984). Depending on the cost of debt, the effect of Leverage may be favorable or unfavorable. When the cost of debt is lower than the company's rate of return, Shareholders' earnings will be magnified. However, when the rate of return on the company's assets is lower than the cost of debt capital, then the leverage effect will be unfavorable. It seems that the relationship between leverage and rate of return is indeterminate a priori. Based on this theoretical background, the study advances the following Hypothesis:

#### H<sub>0</sub> 2: Leverage is significantly associated with profitability.

The debt equity ratio as the measure of leverage has been employed in this study.

#### **CURRENT RATIO**

The management of working capital involves decisions about the amount and composition of current assets and how they are financed. Such decisions involve a tradeoff between solvency and profitability. In inter-firm comparison, the firm with higher current ratio has better liquidity. A high ratio of current assets to current liabilities may be indicative of slack management practices, as it might signal poor credit management in terms of over-extended accounts receivables. So far as these current assets are kept for meeting the working capital requirements, it may exert positive influence on profitability through growth, otherwise, negative effect on profitability can be expected. Therefore, the study proposes the following hypothesis:

#### $H_{\text{0}}$ 3: Current ratio is significantly associated with profitability.

#### INVENTORY TURNOVER RATIO

Another variable, which can influence the profitability, is the inventory turnover ratio. It is the ratio of sales to inventory which indicates the number of times inventory is replaced during the year. Instead of taking year end stock of inventory, an average of the opening and closing stock of inventory is considered. A high ratio implies good inventory management. But low inventory will adversely affect the ability of a firm to meet customer demand and in turn will affect profitability. On the other hand, a very low inventory turnover ratio signifies excessive inventory or over investment in inventory and high carrying cost. The sign of inventory coefficient is ambiguous. With the respect to the above line of argument, the study proposes the following hypothesis:

#### H<sub>0</sub> 4: Inventory turnover ratio is significantly associated with profitability.

#### FIXED ASSETS TURNOVER RATIO

Sarkaria and Shergill (2000) suggest that firms seeking to improve profitability performance must shift from labour intensive to capital intensive methodologies. This would lead to process modernization, improved product quality, wastage reduction and better cost of production. It should be noted however that large investment made in fixed assets may find a firm to a certain business even if the business is declining. Moreover, whether capital intensity increases profitability would also depend on the cost of input (Sidhu & Bhatia, 1998). Based on this argument, the study proposes the following hypothesis:

#### $H_0\,5$ : Fixed Assets Turnover ratio is significantly associated with profitability.

#### **OPERATING EXPENSES TO SALES RATIO**

Apart from the above discussed factors operating expenses ratio is included as an explanatory variable in this study. A low operating ratio is by and large a test of operational efficiency. The implication of low operating expenses ratio is that relatively a high percentage share of sales is available for meeting financial liabilities like interest, taxes and dividends. Therefore, a negative relationship is expected with operating expenses and profitability. Therefore, the study proposes the following hypothesis:

#### $\mbox{H}_{\mbox{\scriptsize 0}}$ 6: Operating Expenses to Sales ratio is significantly associated with profitability.

#### VERTICAL INTEGRATION

Firm-specific vertical integration motivated by considerations such as the avoidance of costs incurred in using the market of organize production, government policies and also consideration of market power is an important determinant of profitability. The costs of using the market alternatively known as transaction costs include search cost, cost of drawing up contracts, monitoring costs, etc., In our context government policies assume an important role in determining vertical integration. The degree of vertical integration is sought to be measured by the value added to sales ratio in the analysis. Value added is defined as total sales revenue less costs of purchased inputs, repair charges and customs and excise duty. With respect to the research presented above, the study advances the following hypothesis:

#### H₀ 7: Vertical Integration is significantly associated with profitability.

#### PAST PROFITABILITY

The hypothesis that the level of future profitability of a company will reflect its past profitability is one of appealing simplicity. (Geoffrey Whittington, 1971). However, the future cannot be analyzed; it is only an expectation, and any such expectation, would not be dependable unless based on the past experience. So, Past Profitability (Pt-1) may have the relevance as a determinant of current profitability. If profitability depends on the quality of a firm's management, or on the monopoly power which the firm enjoys or on both of these factors, we should expect to find some persistency in the profitability of firms over successive years. (Singh and Whittington, 1968). Since there is usually some continuity of good management and of monopoly power, so we expect that profitability in the previous year will determine the profitability in the current year. But if profitability in the previous years, is purely a chance phenomenon, then it may not affect the profitability in the current year. In order to test this general notion, the study postulates the following hypothesis:

H<sub>0</sub> 8: Past profitability is significantly affects profitability.

#### VARIABLES SPECIFICATIONS AND EMPIRICAL MODEL

In order to explain the profitability of Sun Pharma, the various factors discussed above, have been taken together. The analysis of data employs the use of correlation and a multiple regression model that consists of factors associated with profitability of Sun Pharma. The basic model consists of a multiple regression of profitability on a set of independent variables. The dependent variables of the regression model are return on capital employed which relates the profitability to the asset base. This study investigates the effect of size, leverage, current ratio and inventory turnover ratio, fixed assets turnover ratio, operating expenses to sales ratio, vertical integration and past profitability. The current study use correlation analysis to identify the association between profitability and the independent variables, as well as regression analysis to estimate the causal relationship. The researcher considers the following regression model.

 $PR_{it} = \beta_0 + \beta_1 \text{ (Size)}_{it} + \beta_2 \text{ (Leverage)}_{it} + \beta_3 \text{ (Current ratio)}_{it} + \beta_4 \text{ (Inventory Turnover ratio)}_{it} + \beta_5 \text{ (Fixed Assets Turnover Ratio)}_{it} + \beta_6 \text{ (Operating Expenses to Sales Ratio)}_{it} + \beta_7 \text{ (Vertical Integration)}_{it} + \beta_8 \text{ (Past Profitability)}_{it} + e_{it}$ 

PR	Measures the firm profitability with Return on Capital employed as a percentage of sales turnover for the firm (i) in the year (t)				
Size	Natural logarithm of firm's sales for the firm (i) in the year (t)				
Leverage	Measures with debt to equity for firm (i) in the year (t)				
Current ratio	Current ratio for the firm (i) in the year (t)				
Inventory turnover ratio	Inventory Turnover Ratio for the firm (i) in the year (t)				
Fixed assets turnover ratio	Fixed Assets Turnover Ratio for the firm (i) in the year (t)				
Operating expense to sales ratio	Operating Expenses to Sales ratio for the firm (i) in the year (t)				
Vertical Integration	Vertical Integration for the firm (i) in the year (t)				
Past profitability	One year lagged profitability for the firm (i) in the year (t)				

#### **ANALYSIS AND DISCUSSION**

This section describes descriptive statistics summary, correlation, regression analysis and discussion of results.

#### **DESCRIPTIVE STATISTICS AND ANALYSIS**

Descriptive statistics includes the mean, standard deviation, minimum and maximum for the period of 2001-2014.

Table 1 contains descriptive statistics of the variables used in this study. The table reveals that profit rate ranges between 0.01 percent to 35.95 per cent with mean of 21.76 per cent and a standard deviation 10.49. The same applies leverage, current ratio, inventory turnover ratio, fixed assets turnover ratio, operating expenses to sales ratio, vertical integration and past profitability, which show that the Standard deviation is less than the Mean. This implies that there is a low variation in the firm's mean.

#### CORRELATION ANALYSIS

A correlation analysis was performed to verify a possible association between and among the variables, in order to test whether there is any linear correlation between and among the variables. Collinearity explains the dependence of one variable to other. When variables are highly correlated they both express essentially the same information. Table 2 reports the Pearson correlation co-efficient of all the variables employed in the study. Simple correlations among the variables that are reported in table 2 are quite low. Hence, the performance variables used in this study do not seem to pose a serious multicollinearity problem and this allows for standard interpretation of the regression coefficients.

#### **DISCUSSION OF RESULTS**

Using pooled regression technique, the study ran the regression of the profitability on the firm structure variables like size, leverage, current ratio and inventory turnover ratio, fixed assets turnover ratio, operating expenses to sales ratio, vertical integration and past profitability with aim to investigate whether these variables have significant explanatory powers. The estimated results are reported in table1.

It can be observing from the table that the estimated value of the R-Square is 0.99. This implies that more than 90 per cent of the variation in profitability of the firms is jointly determined by the said variables. The value of F-statistic indicates that the overall model is good. The Durbin-Watson statistic is also close to 2 which imply that the successive values of estimated residuals are not dependent on each other. This means that there is evidence to accept that there is no auto correlation problem in the estimated model.

It is evident from the results that vertical integration is stronger determinant of profitability followed by fixed assets turnover ratio, size, inventory turnover ratio, past profitability, operating expenses to sales ratio, current ratio and leverage.

It is evident from the result that co-efficient of size shows the increase of 1.18 per cent in profitability as a result of one per cent increase in size, which is statistically significant at 5 per cent level. The co – efficient of leverage indicated that a decrease of 2.79 per cent in profitability as a result of one per cent increase in leverage which is significant at 10 per cent level. It is appeared from the result that value of one per cent increase in current ratio resulted in 2.45 per cent decrease in profitability, which is significant at 10 per cent lever. One per cent increase in fixed assets turnover ratio shows 2.92 per cent increase in profitability during the study period. The co – efficient of operating expenses to sales ratio indicated that a decrease of 0.21 per cent in profitability as a result of one per cent increase in operating turnover ratio at 10 per cent level. Further, one per cent increase in vertical integration and past profitability shows 19.06 per cent and 0.39 per cent increase in profitability in the study period. However, the co – efficient of inventory turnover ratio shows 0.82 per cent increase in profitability as the result of one percent increase in inventory turnover ratio. This is not statistical significant.

The overall explanatory power of regression appears to be good. This may be inferred from the co – efficient of determination (R<sup>2</sup>) which is the measure of extent of movement in the dependent variable that is explained by the independent variables. It is 99 per cent and the adjusted explanation is around 96 per cent.

#### **CONCLUSION**

It can be concluded from the above analysis that the selected variables explain 99 per cent of variation in profitability in Sun Pharma. It is evident from the results that vertical integration is the strongest determinant of profitability followed by the variables fixed assets turnover ratio, size, inventory turnover ratio and past profitability. The selected variables have both positive and negative contribution in variation of profit rate. In nutshell, it can be concluded that firm should consider all these possible determinants while considering its profitability.

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#### **TABLES**

**TABLE - 1: DESCRIPTIVE STATISTICS** 

Variables	Mean <u>+</u> SD	Minimum	Maximum	N
PR	21.76 <u>+</u> 10.49	0.94	35.45	13
S	7.44 <u>+</u> 0.58	6.55	8.04	13
LEV	0.31 <u>+</u> 0.52	0.01	1.64	13
CR	2.93 <u>+</u> 1.44	0.79	5.57	13
ITR	5.45 <u>+</u> 1.46	2.8	7.07	13
FATR	2.58 <u>+</u> 0.73	1.41	3.97	13
OPES	37.83 <u>+</u> 20.67	17.69	81.9	13
VI	0.32 <u>+</u> 0.08	0.25	0.55	13
PP	PP 24.01 <u>+</u> 8.61		35.95	13

PR – Return on Capital Employed; S - Natural logarithm of Sales; LEV- Leverage; CR- Current Ratio; ITR – Inventory Turnover Ratio; FATR – Fixed Assets Turnover Ratio; OPES – Operating Expenses to Sales Ratio; VI – Vertical Integration; PP – Past Profitability of Return on Capital Employed.

TABLE - 2: CORRELATION MATRIX

TABLE 2. CORRELATION WATRIX									
	PR	S	LEV	CR	ITR	FATR	OPES	VI	PP
PR	1.00								
S	0.18	1.00							
LEV	-0.17	0.36	1.00						
CR	-0.04	0.34	0.16	1.00					
ITR	0.47	0.46	0.39	0.36	1.00				
FATR	0.19	0.43	-0.02	0.32	0.32	1.00			
OPES	-0.26	-0.18	-0.14	-0.41	-0.40	-0.47	1.00		
VI	-0.46	-0.46	0.17	-0.29	-0.31	-0.31	0.42	1.00	
PP	0.38	0.32	0.24	0.02	0.13	0.39	-0.50	-0.45	1.00

PR – Return on Capital Employed; S - Natural logarithm of Sales; LEV- Leverage; CR- Current Ratio; ITR – Inventory Turnover Ratio; FATR – Fixed Assets Turnover Ratio; OPES – Operating Expenses to Sales Ratio; VI – Vertical Integration; PP – Past Profitability of Return on Capital Employed.

TABLE - 3: DETERMINANTS OF PROFITABILITY - MULTIPLE REGRESSION MODEL

Dependent Variable: Return on Capital Employed (PR)

(PR=13.80+1.18S-2.79LEV-2.45CR+0.82ITR+2.92FATR-0.21OPES+19.06VI+0.39PP)

Variables	Beta Co-efficient	t value	Significant / Not Significant
Constant	13.80		
Size (S)	1.18	3.60	Significant*
Leverage(LEV)	-2.79	2.07	Significant*
Current Ratio (CR)	-2.45	3.49	Significant*
Inventory Turnover Ratio (ITR)	0.82	0.79	Not Significant**
Fixed Assets Turnover Ratio (FATR)	2.92	3.75	Significant*
Operating Expenses to Sales Ratio (OPES)	-0.21	2.85	Significant*
Vertical Integration (VI)	19.06	4.06	Significant*
Past Profitability(PP)	0.39	3.60	Significant*
$R^2 = 0.99$			
Adj R <sup>2</sup> = 0.96			
F = 44.43			
D.W = 2.07			

D.W - Durbin-Watson Statistics; \* - Significant at 0.05 levels; \*\* - Significant at 0.10 level; Source: Computed.

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