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**A STUDY ON PROFITABILITY OF SELECT  
PHARMACEUTICAL COMPANIES IN INDIA BASED ON  
GROSS PROFIT MARGIN – A MULTIPLE REGRESSION  
APPROACH**

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**ABSTRACT**

The researcher examined the Gross profit margin on select pharmaceutical companies using a Multiple Regression approach. In this study the Gross Profit Margin is predicted based on the four Independent variable such as Inventory Turnover Ratio (ITR), Debtors Turnover Ratio (DTR), Creditors Velocity (CRSV) and Total Asset Turnover Ratio. Based on 2013-14 survey leading pharmaceutical companies', the first 5 companies is identified for this study were Cipla Pharmaceutical Limited, Dr. Reddy's Lab, Glasko Smithline Pharmaceutical Limited (GSK), Lupin Pharmaceutical Limited and Sun Pharmaceutical Limited. The objectives of the study are the Gross Profit Margin of select pharmaceutical companies in India using Multiple regression approach. To study the relationship between the Inventory turnover ratio, Debtors turnover ratio, Creditors velocity and Total asset turnover ratio with Gross profit margin. To determine the profitability based on Gross profit margin of selected Indian pharmaceutical companies such as Cipla, Dr. Reddy, GSK, Lupin and Sun pharma. To determine the GPM 10 yrs (2004-2013) of data were collected from annual report of the respective companies. Thus the four dimensions ITR, DTR, CRSV and TATR

creates impact towards GPM the researcher adopted multiple regressions modeling with the help of statistical package for social science (SPSS) Package. V.20.

**Keywords:** Gross profit margin, pharmaceutical company, Cipla, Dr.Reddy, GSK, Lupin and Sun pharma, Multiple regression, Inventory turnover ratio, Debtors turnover ratio, Creditors velocity, and Total asset turnover ratio.

## **INTRODUCTION**

Every corporate unit is interest in increasing profitability consistently, for which the corporate struggle to identify the right strategy. So it is necessary to analyze and interpret the profitability in the corporate sector as a whole. The business firms are generally expressed with the view of profit earning from the business operation. Greater the volume of profit, higher the efficiency of concern. The profit of a business may be measured by studying the profitability determination using Gross Profit Margin (GPM) which is attained by the business. Ramana Reddy (2011) found the profitability management is essential for sound financial recital as it has a direct impact on profitability of the company. Panwala (2009) explained that the ultimate goal of profitability can be achieved by efficient use of resources. It is concerned with maximization of shareholders or owners wealth. Lazaridis (2006) examined the relationship of corporate profitability and working capital management.

The study reported that there is statistical significance between profitability, measured through gross operating profit. In this study the researcher use the ratio as a benchmark for measuring the gross profit margin. Many researchers have studied the profitability determination in many ways. But none of them has studied on the profitability determination using gross profit margin with Multi Regression approach. Because of this, researcher chose this research work to show how the Gross profit margin in Multi Regression approach can be used in determining of profitability in selected pharmaceutical companies like (Cipla, Dr. Reddy's Laboratory, Glaskosmithline (GSK), Lupin and Sun pharma). The researcher has taken five dimensions, such as Inventory Turnover ratio (ITR), Debtors Turnover ratio (DTR), Creditors Velocity (CRSV) and Total Asset Turnover ratio (TATR) as independent variable are considered to measure Gross Profit Margin (GPM) which is dependent variable of selected pharmaceutical companies in India.

## **REVIEW OF LITERATURE**

### **INVENTORY TURNOVER RATIO (ITR)**

Inventory turnover ratio is generally calculated by dividing the cost of goods sold by the average inventory. The average inventory is calculated by adding the beginning and ending inventories and dividing by two. If there is decline in the inventory turnover ratio that indicates that companies stock more goods. Nweze (2011) says then the companies should determine why specific inventory are not selling well and identify the cause for the reason. At the same time Emekekwe (2005) commented that, inventory before converting it to cash, length of time holding the inventory should be identified. If the stocks are costly, holding of huge inventory will end up costly to the business. But in the same case if the inventory is not costly, delays in disposing stocks may

profitable in the inflationary period. It must be estimated that sales will be values at cost, because the stock will be valued at cost. Thus sales figure and cost of stocks are essential. Importantly, inventory turnover ratio identifies that average number of days for which the stock is held up or holds. It will help in determining the stock utilization efficiency. There may be various other reasons affect the stock level based on demand pattern, seasonal variation, competition, similar products, alternative products and funds availability.

### **DEBTORS' TURNOVER RATIO (DTR)**

Debtors' Turnover ratio determine the company's credit function on profitability by taking account receivable variable. This impact considers the risk associated with the credit extending. Leahy (2012) suggests that higher the ratio of account receivable to sales, the manufacturer will receive higher profitability. If the relationship between account receivable to sales and profitability could not be determined then there is no purpose of determining this function. Nweze (2011) stated that debtor's ratio consist of collection period and debtor's turnover ratio. The turnover is calculated by dividing the net credit sales by the average number of debtors. The debtor's turnover calculates the number of times debts are collected during the financial year. The higher the ratio is better, which means that the company collects quickly from their customers. If the ratio is inverse then creates serious problem in collecting from the customers. Therefore the company should give careful analysis towards credit policy. The number of days sales remain with the debtors is determined by dividing the debtor's turnover into 365 days. If the collection period is higher than the customers balance may be uncollectible. Chandra (2008) argues that debtor's turnover ratio explains how many times sundry debtor's turnover during the financial year.

### **CREDITORS VELOCITY (CRSV)**

Creditor's velocity or creditor's turnover explains the average number of times creditors turnover is pain within a financial year. If there is high creditors turnover ratio which shows that the company is not interested in taking advantage of credit facility. If the company does not take advantage of it, this may end up in loss of profit as a result of interest of borrowed funds or bank overdraft. At the same time, on the other hand low creditor's turnover ratio indicates that the company is not taking any advantage of discount associated with timely payment and this may end up in increase of cost of sales, which will decrease in profit Okwuosa (2005). Thus it is advisable that creditor's turnover ratio should not be too high or too small. Creditor's turnover ratio also measures the negotiate ability of the manufacturer towards purchases. The impact of creditor's turnover ratio mainly depends upon how the business is financed. If the business is financed through retained earnings, higher the ratio of accounts payable to the cost of goods sold, the company will receive the expected profitability.

### **TOTAL ASSETS TURNOVER RATIO (TATR)**

The total assets turnover ratio explains the number of times the value of assets utilized by the company and converted into sales, Ezeamama (2010). Pandey (2010) defines that total assets turnover ratio determine the company's ability in converting sales from all available financial

resources which is committed to total assets of the company. Nweze (2011) argues that total assets turnover ratio determines the capital investment made by the company relative to volume of sales. From the total assets turnover ratio the financial managers should understand how well they are managing company overall assets.

### **GROSS PROFIT MARGIN (GPM)**

Gross profit margin is seen as a measure of firm's sales operation efficiency with respect to the cost of goods sold by the firm by Osioma (1996). By determining the gross profit figure, the firm can identify the non-operating cost and revenue, and it can limit itself towards estimating trading and manufacturing operation. The gross profit margin is calculated based on firm's net sales, because firms mainly frame strategy for sales. Sales are the heart of the firm, without which there could not be any profit. The cost of firm's goods will be relatively high if the gross profit margin is low.

### **OBJECTIVES OF THE STUDY**

1. To study the Gross profit margin of select pharmaceutical companies in India using multiple regression approach.
2. To identified the relationship between the Inventory turnover ratio, Debtors turnover ratio, Creditors velocity and Total asset turnover ratio with Gross profit margin.
3. To determine the profitability based on Gross profit margin of select Indian pharmaceutical companies such as Cipla, Dr. Reddy, GSK, Lupin and Sun pharma.

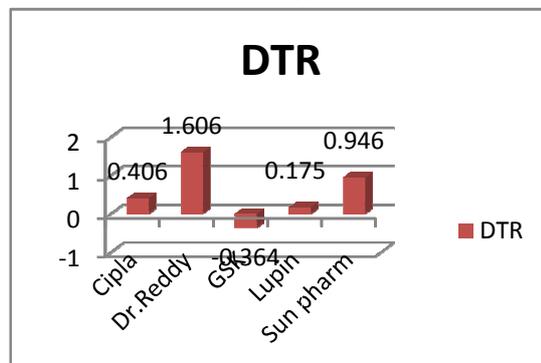
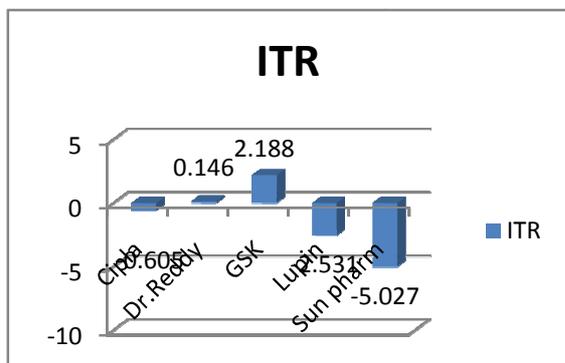
### **RESEARCH METHODOLOGY**

As the study mainly concentrate towards predicating Gross Profit Margin based on four dependent variables the study is cause and effect in nature. The dependent variables are Inventory turnover ratio (ITR), Debtors turnover ratio (DTR), Creditors velocity (CRSV), and Total asset turnover ratio (TATR). The leading pharmaceutical companies were identified based on survey report of business today. In this study the first 5 pharmaceutical companies were considered for the study. The select companies are Cipla, Dr. Reddy Laboratory, Glasko Smithline, Lupin and Sun Pharma. The study mainly depends upon the secondary data. The data were collected from annual reports of the respective selected companies from the period 2004 to 2013. Thus the study period was ten years. To identify the cause and effect multiple regressions were used with the help of statistical package for social science (SPSS) Package. V.21.

### **LIMITATION**

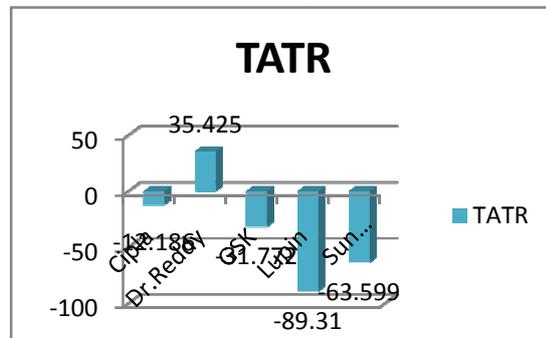
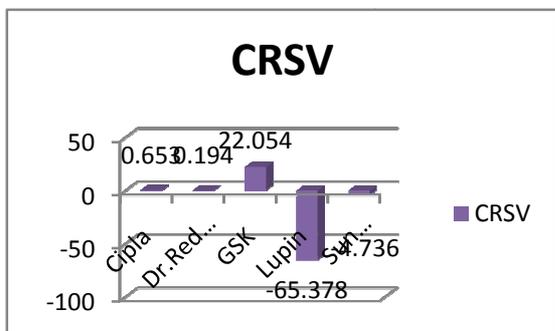
Only GPM is considered to determine the profitability of selected pharmaceutical company. Many other financial tools are also available to determine the profitability.

**RESULTS AND DISCUSSION**



The above diagram shows the graphical representation of selected pharmaceutical companies ITR. It is inferred from the above graph GSK has the maximum value (2.188) followed by Dr. Reddy. The remaining three companies have the negative values. The cipla has the minimum value of ITR (-.604) followed by Lupin (-2.531) and finally Sun Pharma (-5.027)

The above diagram shows the graphical representation of selected pharmaceutical companies DTR. It is inferred from the above graph Dr. Reddy has the maximum value (1.606) followed by Sun Pharma, Cipla and Lupin. But GSK have the negative value of DTR (-0.364)



The above diagram shows the graphical representation of selected pharmaceutical companies TATR. It is inferred from the above graph Dr. Reddy has the maximum value (35.425) followed by Cipla. The remaining three companies have the negative values. The Lupin has the minimum value of TATR (-89.31) followed by Sun pharma (-63.599) and finally GSK (-31.772).

The above diagram shows the graphical representation of selected pharmaceutical companies CRSV. It is inferred from the above graph GSK has the maximum value (22.054) followed by Cipla and Dr. Reddy. The remaining two companies have the negative values. The Lupin has the minimum value of CRSV (-65.378) followed by Sun Pharma (-4.736).

## MULTIPLE REGRESSIONS

**TABLE - 1**

Model	R	R Square	Adjusted R Square	ANOVA (Sig)	Std. Error of the Estimate
Cipla	.806	.650	.369	2.318 (.005)	2.06732
Dr. Reddy	.903	.816	.668	5.528 (.044)	1.72885
GSK	.877	.768	.583	4.145 (.050)	5.51385
Lupin	.974	.949	.909	23.355 (.005)	4.19055
Sun Pharma	.848	.719	.494	3.201 (.050)	20.85206

**Predictors:** (Constant), Inventory Turnover ratio, Debtors Turnover ratio, Creditors Velocity, Total Asset Turnover ratio

**Dependent Variable:** Gross Profit Margin

The R value of Cipla shows that high correlation (.809) exists between the predictors. Based on the R – Square value the predictors, predicts 65% of Cipla Gross Profit Margin the dependent variable. The ANOVA value shows that there is significant relationship between the predictors. The Dr.Reddy shows that there is high correlation between the predictors based on the r value (.903). The R-Square of Dr.Reddy shows that the predictors predict 81.6% of the dependent variable Gross Profit Margin. The GSK shows that there is high relationship between the predictors. The predictors of GSK predict 76.8% of the predictors. The ANOVA value shows there is relationship between the predictors. The Lupin shows that there is high correlation between the predictors. The predictors of Lupin show that 94.9% predict the dependent variable. The ANOVA value shows that there is significant relationship between the predictors. The Sun Phrama shows that there is high relationship between the predictors. The predictors predict 71.9% of the dependent variable Gross profit margin. The ANOVA value shows that there is significant relationship between the predictors.

## COEFFICIENTS

**TABLE - 2**

Model		Unstandardized Coefficients – Beta	Unstandardized Coefficients – Std. Error	Standardized Coefficients – Beta	t	Sig.
Cipla	ITR	-.605	7.050	-.031	-.086	.935
	DTR	.406	1.147	.112	.354	.738
	CRSV	.653	1.475	.163	.443	.676
	TATR	-12.186	5.199	-.791	-2.344	<b>.066</b>
Dr. Reddy	ITR	.146	.046	.658	3.151	<b>.025</b>
	DTR	1.606	.673	.500	2.386	<b>.063</b>

	CRSV	.194	.114	.364	1.702	.149
	TATR	35.425	9.686	.831	3.657	<b>.015</b>
GSK	ITR	2.188	1.476	1.640	1.482	.198
	DTR	-.364	.880	-.404	-.413	.696
	CRSV	22.054	6.813	1.903	3.237	<b>.023</b>
	TATR	-31.772	14.739	-.909	-2.156	<b>.084</b>
Lupin	ITR	-2.531	.585	-.705	-4.324	<b>.008</b>
	DTR	.175	.155	.194	1.125	.312
	CRSV	-65.378	18.423	-.434	-3.549	<b>.016</b>
	TATR	-89.310	21.354	-.735	-4.182	<b>.009</b>
Sun Pharma	ITR	-5.027	2.467	-.590	-2.038	<b>.097</b>
	DTR	.946	3.087	.095	.306	.772
	CRSV	-4.736	2.765	-.438	-1.713	.147
	TATR	-63.599	49.923	-.328	-1.274	.259

**Predictors:** (Constant), Inventory Turnover ratio, Debtors Turnover ratio, Creditors Velocity, Total Asset Turnover ratio

**Dependent Variable:** Gross Profit Margin

The five dimensions Inventory Turnover ratio, Debtors Turnover ratio, Creditors Velocity and Total Asset Turnover ratio are considered to measure Gross Profit Margin of select companies Cipla, Dr.Reddy, GSK, Lupin and Sun Pharma. The standardized coefficient beta of **Cipla** reveals that Inventory Turnover ratio shows negative influence (-.301) towards gross profit margin and it is not significant at (.005) level. The Debtors Turnover ratio shows positive influence (.112) towards Gross Profit Margin but it is not significant at (.005) level. The Creditors Velocity (.163) shows highest beta value towards Gross Profit Margin, but it is not significant at (.005) level. The Total Asset Turnover ratio (-.791) shows highest negative influence towards Gross Profit Margin but it is not significant at (.005) level.

$$\text{Predicted Value of Cipla (GPM)} = 67.414 - (.605) \text{ ITR} + (.406) \text{ DTR} + (.653) \text{ CRSV} - (12.186) \text{ TATR} + 2.06732$$

The standardized coefficient beta of **Dr. Reddy** reveals that Inventory Turnover ratio shows highest beta value (.658) towards gross profit margin and it is not significant at (.005) level. The Debtors Turnover ratio shows positive influence (.500) towards Gross Profit Margin but it is not significant at (.005) level. The Creditors Velocity (.364) shows positive influence towards Gross Profit Margin, but it is not significant at (.005) level. The Total Asset Turnover ratio (.831) shows highest beta value towards Gross Profit Margin but it is not significant at (.005) level.

$$\text{Predicted Value of Dr. Reddy (GPM)} = 39.559 + (.146) \text{ ITR} + (1.606) \text{ DTR} + (.194) \text{ CRSV} + (35.425) \text{ TATR} + 1.72885$$

The standardized coefficient beta of **GSK** reveals that Inventory Turnover ratio shows highest beta value (1.640) towards gross profit margin and it is not significant at (.005) level. The Debtors Turnover ratio shows negative influence (-.404) towards Gross Profit Margin but it is not significant at (.005) level. The Creditors Velocity (1.903) shows highest positive influence towards Gross Profit Margin, but it is not significant at (.005) level. The Total Asset Turnover ratio (-.909) shows highest negative influence towards Gross Profit Margin but it is not significant at (.005) level.

$$\text{Predicted Value of GSK (GPM)} = 39.890 + (2.188) \text{ ITR} - (.364) \text{ DTR} + (22.054) \text{ CRSV} - (31.772) \text{ TATR} + 5.51385$$

The standardized coefficient beta of **Lupin** reveals that Inventory Turnover ratio shows negative influence (-.705) towards gross profit margin and it is not significant at (.005) level. The Debtors Turnover ratio shows beta value (.194) towards Gross Profit Margin but it is not significant at (.005) level. The Creditors Velocity (-.434) shows negative influence towards Gross Profit Margin, but it is not significant at (.005) level. The Total Asset Turnover ratio (-.735) shows highest negative influence towards Gross Profit Margin but it is not significant at (.005) level.

$$\text{Predicted Value of Lupin (GPM)} = 225.451 - (2.531) \text{ ITR} + (.175) \text{ DTR} - (65.378) \text{ CRSV} - (89.310) \text{ TATR} + 4.19055$$

The standardized coefficient beta of **Sun Pharma** reveals that Inventory Turnover ratio shows negative influence (-.590) towards gross profit margin and it is not significant at (.005) level. The Debtors Turnover ratio shows beta value (.095) towards Gross Profit Margin but it is not significant at (.005) level. The Creditors Velocity (-.438) shows negative influence towards Gross Profit Margin, but it is not significant at (.005) level. The Total Asset Turnover ratio (-.328) shows negative influence towards Gross Profit Margin but it is not significant at (.005) level.

$$\text{Predicted Value of Sun Pharma (GPM)} = 93.324 - (5.027) \text{ ITR} + (.946) \text{ DTR} - (4.736) \text{ CRSV} - (63.599) \text{ TATR} + 20.85206$$

### GPM PREDICTED VALUES

Sl.No	Name of the company	Predicted Value	Average Gross Profit Margin
1.	Cipla Pharmaceutical Limited	57.74932	57.45513
2.	Dr. Reddy Laboratory	77.65885	
3.	Glasko Smithline Pharmaceuticals Ltd	37.50985	
4.	Lupin Pharmaceutical Limited	72.59755	
5.	Sun pharmaceutical Limited	41.76006	

The above table shows the predicted value of Select Pharmaceuticals Gross Profit Margin. Based on the predicted value of Gross Profit Margin, the average Gross profit margin of select companies were 57.45513. Out the selected five companies, only 2 companies were above average. The companies are Dr. Reddy laboratory and Lupin Pharmaceutical Limited. The remaining three companies were below average. The companies which were below average in order were Cipla Pharmaceutical Limited; Sun pharmaceutical Limited and finally Glasko Smithline Pharmaceuticals Ltd.

## **CONCLUSION**

The management should understand that creditor's velocity must be consistent, because it should be at a zero point. The creditor velocity should be neither too high nor too low. The creditor's velocity should be in the point such that creditors and cost of sales are equal. If so the company will take advantage of credit facility and discount.

The company should be made continuous investment by reinvesting funds collected from the customers. This can be achieved by the companies if they maintain high debtor's turnover ratio. The inventory of the company should be checked and monitored periodically and regularly, which will reduce over storage of inventories. The assets should be utilized effectively and efficiently by the management which will increase path way for generating more income for the company. Thus gross profit margin will give clear picture to the company that when to expand the business, in order to increase more sales and more profit.

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