Research Paper

Efficiency and Profitability of the selected Pharmaceutical companies: An analytical study

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ABSTRACT: *The research focus on the net profit margins and working capital days of the top 5 pharmaceutical companies by employing the ANOVA and a pairwise comparison technique. The net profit margins (NPM) are very critical for a company to get success. The working capital days (WCD) draw light on the efficiency with which a company converts its working capital into revenue. The results highlighted that the company Sun Pharma is at number one in terms of its profitability and at the same time it is at number fifth in terms the Working Capital Days efficiency, whereas in terms of Working Capital Days, the company Divis is at number one slot and at the second slot with reference to the profitability.*

KEYWORDS: *Efficiency, Net Profit Margins, Profitability, Pharmaceutical, Working Capital Days.*

I. INTRODUCTION

The domestic Pharmaceutical companies are worried over various international drug regulators, working together for keeping a check on the manufacturing practices and ensuring the quality of medicines. Each country has different quality norms and the companies are expected to follow those norms and produce the drugs. The domestic pharmaceutical companies earned over 60% of their revenues from exports. The exports of these companies to the US rose nearly 32% last year to $4.2 billion. India contributes nearly 40% of generic drugs and over-the-counter products and 10% of finished dosages used in the US [1]. The research focus on the net profit margins and working capital days of the top 5 pharmaceutical companies. The net profit margins are very critical for a company to get success because firstly, they exhibit the cost control measures of a company and secondly, they act as a big pool of profits available to the various stakeholders. The working capital days draw light on the efficiency with which a company converts its working capital into revenue. The company always tries to reduce the days, in order to earn revenue as early. Through the research, an attempt has been made to analyze the NPM and WCD of the companies and compare them with the others. The ranks have been allotted to the companies with regards to these measures of profitability and efficiency. Study is the first of its kind to focus on the efficiency and profitability of the companies.

II. LITERATURE REVIEW

The review helps in the selection of the dependent as well as the independent variables. The literature highlights the work done by the other researchers and provides a direction with regards to the conception, initiation and as well as for the conclusion of the study. There are some studies that have tried to explore the financial performance of the companies like **Nizamuddin and Alam (2013) [2]** gave ranks to the Information technology companies according to their profitability & consistency. The study results confirmed that the variables such Gross Profit Margin, Net profit Margin and operating Expenses Ratio, play an important role for measurement of the profitability and consistency of the firm. On the other hand **Deloof (2003) [3]** studied the relationship between the profitability and accounts receivables. The author found a significant negative relation between gross operating income and the number of days accounts receivable, inventories and accounts payable of the Belgian firms. Similarly **Arunkumar and Ramanan (2013) [4]** employed correlation analysis and group

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wise weighted least squares regression analysis to study the relationship of debtor days, inventory days, creditor's days, current ratio, the ratio of current liability to total assets, assets turnover ratio, financial assets to total assets, and size with return on assets employed. The correlation analysis shows that the firms' profitability is highly influenced by the variables relating to assets.

The present study is analytical in nature where an attempt has been made to rank the companies in the context of the Working Capital Days efficiency and the profitability, making the study first of its kind.

III. RESEARH OBJECTIVES

The research has been undertaken to achieve the following objectives:
1) To evaluate the Efficiency of the companies.
2) To evaluate the Profitability of the companies.
3) To rank the companies on the basis of Working Capital Days and Net Profit Margins respectively.
4) To study the significant differences among the companies with regards to the profitability and efficiency.

IV. RESEARCH HYPOTHESIS

To study the objectives of the research, hypothesis have been framed out:
H1: There is a significant difference in the Net Profit Margins of the companies.
H2: There is a significant difference in the Working Capital Days of the companies.

V. RESEARCH METHODOLOGY

A sample of the five companies was taken to analyze the profitability and efficiency. The top 10 pharmaceutical companies, listed on NSE, were taken on the basis of their market capitalization. Out of these 10 companies, the sample of 5 was selected on the convenient basis. The period ranges from 2008 to 2012 keeping in view the availability. The data have been collected from the secondary sources comprising the annual reports of companies, reputed websites (moneycontrol), newspapers, articles, journals, etc. The data have been analyzed through the use of SPSS statistical software.

The independent variables for the study are Net Profit Margins (NPM) and Working Capital Days (WCD), whereas the dependent variables are Profitability and Efficiency respectively. For the purpose of analysis and testing the hypothesis, the One Way ANOVA technique has been used. The ANOVA test helps in analyzing the significant differences in the means of different groups.

$$NPM = Net\ profits\ divided\ by\ Sales\ [5]$$

$$WCD = \frac{Average\ working\ capital * 365}{Annual\ Sales\ Revenue}$$

The number of days a firm takes to convert working capital into sales revenue. The fewer number of days, more efficient the use of working capital [6]. The assumptions of the One Way ANOVA have been checked first and then the analysis has been further initiated.

VI. RESULTS AND DISCUSSION

To study the objectives of the research, the data relating to the working capital days and the net profit margins of the companies have been collected. After the collection of the data, the same was tabulated in SPSS for the purpose of the analysis. The findings of the two cases, which were created, have been under mentioned.

6.1 Case (A): Net Profit Margins Of the Pharmaceutical companies
The test of Homogeneity Of Variances (Levene Test) was statistically significant, thereby violating one of the main assumptions of the ANOVA analysis. Table-I list out the net profit margins of the companies over a period of time kept into consideration for the purpose of the study.

Table I: Net Profit Margins

YEAR	SUN PHARMA	DR.REDDY	AUROBINDO	CIPLA	DIVIS
2008	31.01	13.57	12.41	16.43	33.77
2009	31.43	13.20	04.54	14.58	34.97
2010	33.99	18.48	16.09	16.14	35.99
2011	41.91	16.84	14.33	14.95	32.48
2012	38.94	13.51	09.27	15.77	29.00

Source: Collected by Author

If the equal variance assumption has been violated (e.g., if the significance of the Levene's test is less than 0.05), we can use an adjusted F statistic. Two such types of adjustments are provided by the Welch statistic and the Brown-Forsythe statistic (table-II). The Welch test is more powerful and more conservative than the Brown-Forsythe test. If the F ratio is found to be significant with either the Welch statistic or the Brown-Forsythe statistic, an appropriate post hoc test would be required. The Games-Howell post hoc test, for example, is appropriate when the equal variances assumption has been violated [7].

Table II: Robust Tests of Equality of Means

Net Profit Margin

	Statistic[a]	df1	df2	Sig.
Welch	57.165	4	8.756	.000
Brown-Forsythe	55.449	4	12.610	.000

a. Asymptotically F distributed.
Source: SPSS analysis

The F ratio, F (4,12.6) = 55.449, p = 0.0000 is statistically significant, which exhibits that there is a significant difference in the Net Profit Margins(NPM) of the companies. The hypothesis H1 is accepted. The significant difference in the NPM of the companies, can also further leads to the rank wise and pairwise comparisons of the companies with each other.

Table III: Ranking

S.NO.	Company	Mean (NPM)	Rank
1	Sun Pharma	35.45	1
2	Dr. Reddy	15.12	4
3	Aurobindo Pharma	11.32	5
4	Cipla	15.57	3
5	Divis	33.24	2

The rank list (table-III) positions the Sun Pharma at a higher and the first rank, whereas the Aurobindo Pharma is on the last level and at the 5th rank with regards to the profitability. The Net Profit margins (average) Of the Sun Pharma is the highest making it the most profitable company in terms of the Net profitability. A higher profit margin spotlights the profitability of a company that has better control over its costs compared to its competitors and a greater portion of profits available to the stakeholders of the company. The Sun Pharma has a better place in the eyes of the customers, which is ultimately leading towards the higher sales and higher profits.

6.2 Unplanned comparisons:

As the assumption of equality of variances has not been met, the unplanned comparisons with the help of Games-Howell post hoc test shall be performed (table-IV). The test shows that there is a statistical significant difference in the NPM of Sun Pharma and Dr. Reddy, Aurobindo Pharma and Sun Pharma, Sun Pharma and Cipla, Dr. Reddy and Divis and lastly Cipla & Divis at 5% significance level. Apart from this, the test highlighted the insignificant differences in the NPM of the companies, Sun Pharma and Divis, Dr. Reddy and Aurobindo Pharma, Cipla and Dr. Reddy and lastly Aurobindo Pharma & Cipla, at 5% significance level.

Table IV: Multiple Comparisons
Dependent Variable: NPM [Games-Howell]

(I) CO.	(J) CO.	M. D.(I-J)	S. E	Sig.	95% Confidence Interval	
					L.B.	U. B.
Sun Pharma	DR. Reddy	20.33600*	2.39631	.001	11.2852	29.3868
	Aurobindo	24.12800*	2.95879	.000	13.8999	34.3561
	Cipla	19.88200*	2.17240	.003	10.4761	29.2879
	Divis	2.21400	2.46281	.888	-6.8699	11.2979
DR. Reddy	Sun Pharma	-20.33600*	2.39631	.001	-29.3868	-11.2852
	Aurobindo	3.79200	2.30327	.522	-4.8243	12.4083
	Cipla	-.45400	1.12690	.993	-5.0312	4.1232
	Divis	-18.12200*	1.61741	.000	-23.7306	-12.5134
Aurobindo	Sun Pharma	-24.12800*	2.95879	.000	-34.3561	-13.8999
	DR. Reddy	-3.79200	2.30327	.522	-12.4083	4.8243
	Cipla	-4.24600	2.06931	.376	-13.1822	4.6902
	Divis	-21.91400*	2.37237	.000	-30.5835	-13.2445
Cipla	Sun Pharma	-19.88200*	2.17240	.003	-29.2879	-10.4761
	DR. Reddy	.45400	1.12690	.993	-4.1232	5.0312
	Aurobindo	4.24600	2.06931	.376	-4.6902	13.1822
	Divis	-17.66800*	1.26215	.000	-22.8803	-12.4557
Divis	Sun Pharma	-2.21400	2.46281	.888	-11.2979	6.8699
	DR. Reddy	18.12200*	1.61741	.000	12.5134	23.7306
	Aurobindo	21.91400*	2.37237	.000	13.2445	30.5835
	Cipla	17.66800*	1.26215	.000	12.4557	22.8803
* The mean difference is significant at the 0.05 level. Source: SPSS analysis						

M.D. (Mean Difference); S.E. (Standard Error); L.B. (Lower Bound); U.B. (Upper Bound)

6.3   Case (B): Working Capital Days Of The Pharmaceutical Companies
In order to study the Efficiency of the companies, the number of days of Working Capital has been studied (table-V). The lesser the days , the better the company is with regards to its efficiency. All the assumptions about the One Way- ANOVA have been checked first.

Table V: Working Capital Days

YEAR	SUN PHARMA	DR.REDDY	AUROBINDO	CIPLA	DIVIS
2008	274.06	211.04	279.42	201.02	119.59
2009	221.25	217.13	257.48	196.07	160.75
2010	187.91	144.48	214.21	190.01	200.80
2011	261.56	190.22	214.53	201.12	165.91
2012	211.92	174.40	177.77	175.71	148.33

Source: Collected by Author

Table VI: Test of Homogeneity of Variances
Working Capital Days

Levene Statistic	df1	df2	Sig.
1.848	4	20	.159

Source: SPSS analysis

The assumption of Homogeneity Of Variances (table-VI) have been met as the significance value is greater than 0.05. There is enough evidence available to accept the null hypothesis that the variances are equal.

Table VII: ANOVA
Working Capital Days

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	18444.914	4	4611.228	4.884	.007
Within Groups	18882.916	20	944.146		
Total	37327.829	24			

Source: SPSS analysis

The F-value F (4,20) = 4.884, p = 0.007, is significant thereby entailing to the acceptance of the Hypothesis H2, that states that there is a significant difference in the Working Capital Days of the companies (table VII). The working Capital Days are significantly different and not just due to any sample error.

6.4   Unplanned Comparisons:
As the assumptions of equality of variance has been satisfied, the unplanned comparisons can be performed between the companies (table-VIII). These comparisons will let us know the pair wise significant differences among the companies as well as the ranks with regards to the efficiency concerned.

Table VIII: Working Capital Days
Tukey HSD

Ranks	CO.	N	Subset for alpha = 0.05	
			1	2
1	Divis	5	159.0760	
2	DR. Reddy	5	187.4540	187.4540
3	Cipla	5	192.7860	192.7860
4	Aurobindo	5		228.6820
5	Sun Pharma	5		231.3400
	Sig.		.437	.200

Source: SPSS analysis

There is a significant difference in the Working Capital Days of the companies, namely, Sun Pharma and Divis & Divis and Aurobindo at 5% significance level. The rest pairs are not statistically significant at 5% significance level. The ranks have been given to the companies with regards to their Working Capital Days. The lesser the days the better efficient the company is. At the first rank, the company with an average WCD of 159 days is Divis. The company is very efficient as compared to its other peers. The company at the fifth rank is Sun Pharma with an average WCD of 231 days. This shows that it took around 231 days for the company to convert its working capital into revenue. The number of days are very high.

VII.   CONCLUSION
The study highlighted the profitability and the efficiency of the companies in the pharmaceutical sector. The Sun Pharma has been adjudged as number one in terms of its profitability and at the same time it is at number 5th in terms of the Working Capital Days efficiency. This shows that even though the number of days for converting the working capital to revenue are high, the company's margins are very strong as compared to its peers and the company has an effective control over its cost drivers. The profit margins are helping the company to remain at the top, but the company should also try to reduce the days of working capital because ultimately the number of days of the company is very high, which could become a threat for the company in near future. In terms of WCD, the company Divis is at number one slot whereas it is at the second slot with reference to the profitability. The company is very efficient amongst all in managing its resources and earning revenue quickly. The F-values are significant for both the cases and thereby leading to the acceptance of both the hypothesis. There is significant differences in the profitability and the efficiency of the companies. The analysis has been done keeping in view the profitability and efficiency, but there are certain other parameters like liquidity, financial position which can be included and studied. The study has been done on major five companies, but the future research could be done by including the number of companies and number of parameters.

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