A Study on Performance Evaluation of Selected Pharmaceutical Companies by using Data-Envelopment Analysis Model

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Abstract:

It is necessary to evaluate the performance of companies to make investment in that particular company. So, in present research paper, researcher selected Cadila Healthcare, Glenmark Pharmaceuticals and Cipla for the performance evaluation by using Data-Envelopment Analysis model. Data Analysis is considered as the main part of any research. In this research paper data analysis is done by using statistical tools like averages, ratios and by using Data-Envelopment Analysis Model. The period of the study is one year i.e.2017. An efficiency score of Cipla Limited, Glenmark Pharmaceuticals and Cadila Healthcare is 0.03, 0.63 and 0.07 respectively during 2017. The score of Glenmark Pharmaceuticals is highest in the year 2017. So, it stood at first position and score of Cipla Limited is 0.03 so it stood at 3rd position in the year 2017.

Key Words:

- Performance Evaluation,
- Efficiency,
- DEA Model,
- Score

Introduction:

All the business organizations and companies are carried out with an objective of making a good profit. All the stakeholders i.e. Shareholders, Debenture holders, Preference shareholders, creditors and investors of company or the business organization will want to know whether an organization will do well in future in order to keep their interest in that organization. Forensic Accounting is one of the forms of investing accounting that helps to examine the financial records of the company with respect to fraud and distress. In today's competitive world it is necessary to evaluate the performance of the firm or industry on the regular basis to sustain in the market. With the help of evaluation of performance, we can find out the efficiency score of Company.

Research Gap:

1. Study Period
2. Sample

3. Test

Title of the Study:

"A Study on Performance Evaluation of Selected Pharmaceutical Companies by using Data-Envelopment Analysis Model"

Objectives of the Study:

1. To measure the Performance of Selected Pharmaceuticals Company
2. To know the profitability of Selected Pharmaceuticals Company
3. To measure efficiency score of Selected Pharmaceuticals Company

Review of Literature:

Eva Garmanova & Herbert Strunz (2017)[20] the aim of research paper entitle "Efficiency of Insurance Companies: Application of DEA and Tobit Analysis" was to determine the relationship between technical efficiency and profitability of selected insurance companies. Total 15 commercial insurance companies of Solvakis were selected for the research work. The period of study was 2013 to 2015. For analysis of Data, Data Envelopment Analysis Model, Mann-Whitney, U-test, Tobit Regression were used. It conclude that there is statistically significant difference between average technical efficiency score within the group of selected commercial insurance companies.

. Gascon, J. Lozano, B. Ponte, D. Fuente (2017)[22] research paper entitled "Measuring the efficiency of large pharmaceutical companies: An industry analysis" was conducted to measure relative efficiency of pharmaceutical laboratories. For research work total 37 large pharmaceutical laboratories were selected. The period of study was 2008 to 2013. The data analysis was done with the help of data envelopment analysis approach. Total seven variables were used in the final model of DEA. Out of that three inputs, three Output And one input as well as output. The inputs were size of workforce, total assets and investment in research and development whereas outputs were net profit, Market Capitalization and Total Sales. Number days of authorized innovative medicines considering the France effects that is input as well as out. The average level of efficiency was 93.45% and out of all 10 Companies were found inefficient as per Data envelopment analysis model.

Lam Weng, Fai & Hoe (2017)[42] research paper and title "An empirical investigation on the

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efficiency of healthcare companies in Malaysia with DEA model" was conducted to evaluate and compare the assistance of healthcare companies which were listed in Malaysia Stock Market. 12 Companies were selected for research work the period of study work was 2011 to 2015. The study concluded that a AHEALTH, HAIO, IHH, PHARMA and YSPSAHARE identified as efficient companies during study period.

Subir Kumar Sen & Joy Das (2016)[62] they have examined the overall efficiency of the public sector enterprise Steel Companies using DEA Model. The study period was 2010-11 to 2013-14. Sample size for the study was five steel companies. This paper conclude that SRCL stood at 1st position and FSNL stood at last position during the study period.

Research Methodology

Population / Universe of Study:

The population of the study is all listed Pharmaceuticals Companies which are listed in BSE and NSE.

Sample Size:

From the whole population Cadila Healthcare, Glenmark Pharmaceuticals and Cipla selected for the study which are listed in BSE.

Data Collection:

There are basically 2 methods of data collection. They are Primary and Secondary data collection. This study will be based on secondary data collection in which data is collected from the selected companies annual report, websites and magazines.

Period of the Study:

The period of the study is one year i.e. 2017.

Tools and Techniques:

Data Analysis is considered as the main part of any research. In a this research data analysis is be done using statistical tools like

- Averages,
- Ratios
  - ✓ Liquidity Ratio
  - ✓ Activity Ratio
  - ✓ Leverage Ratio
  - ✓ Economic Indicator
  - ✓ Profitability Ratio
- By using Data-Envelopment Analysis model

Data Analysis and Interpretation:

Liquidity Ratio

Company	CR	QR	WCR
CIPLA	2.63	1.56	2.66
GLENMARK	5.74	5.1	0.95
CADILA	2.49	1.92	1.32

Activity Ratio

Company	ARR	ITR	ATR	CPR
CIPLA	5.62	3.47	0.82	65.72
GLENMARK	2.33	5.02	0.79	174.91
CADILA	2.45	3.97	0.39	104.96

S p e c i a l   I s s u e - I n t e r n a t i o n a l   O n l i n e   C o n f e r e n c e
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Leverage Ratio

Company	DER	ICR	ER
CIPLA	2.47	31.46	0.01
GLENMARK	22.73	17.71	0.002
CADILA	29.62	58.13	0.01

Economic Indicator:

Company	EVA
CIPLA	4936.79
GLENMARK	2715.39
CADILA	1761.2

Profitability Ratio

Company	ROA	ROCE	ROCA	ROE	OP to Sales
CIPLA	9.39	14.89	26.51	766.36	14.82
GLENMARK	22.13	26.83	51.23	9579.13	35.81
CADILA	6.86	1.01	34.34	630.08	9.94

Now multiply with respective weights given in the model in order to get input and output:

Liquidity Ratio							
Ratio	**Weight**	**Cipla**		**Glenmark**		**Cadila**	
Current Ratio	**0.5**	2.63	1.32	5.74	2.87	2.49	1.25
Quick Ratio	**0.3**	1.56	0.47	5.1	1.53	1.92	0.58
Working Capital	**0.2**	2.66	0.53	0.95	0.19	1.32	0.26
Input 1			2.32		4.59		2.09
Activity Ratio							
Ratio	**Weight**	**Cipla**		**Glenmark**		**Cadila**	
Account Receivable	0.2	5.62	1.12	2.33	0.47	2.45	0.49
Inventory Turnover	0.25	3.47	0.87	5.02	1.26	3.97	0.99
Assets Turnover	0.35	0.82	0.29	0.79	0.28	0.39	0.14
Collection Period	0.2	65.72	13.14	174.91	34.98	104.96	20.99
Input 2			15.42		36.99		22.61
Leverage Ratio							
Ratio	**Weight**	**Cipla**		**Glenmark**		**Cadila**	
Debt Equity	**0.5**	2.47	1.24	22.73	11.37	29.62	14.81
Interest Coverage	**0.3**	31.46	9.44	17.71	5.31	58.13	17.44
Equity Ratio	**0.2**	0.01	0.002	0.002	0.0004	0.01	0.002
Input 3			10.68		16.68		32.25
Economic Indicator							
Ratio	**Weight**	**Cipla**		**Glenmark**		**Cadila**	
EVA	1	4936.79	4936.79	2715.39	2715.39	1761.2	1761.2
Input 4			4936.79		2715.39		1761.2
Profitability Ratio							
Ratio	**Weight**	**Cipla**		**Glenmark**		**Cadila**	
Return on Assets	**0.35**	9.39	3.29	22.13	7.75	6.86	2.40
ROCE	**0.22**	14.89	3.28	26.83	5.90	1.01	0.22
Return on C.A	**0.1**	26.51	2.65	51.23	5.12	34.34	3.43
Return on Equity	**0.18**	766.36	137.94	9579.13	1724.24	630.08	113.41
Operating profit to Sales	**0.15**	14.82	2.22	35.81	5.37	9.94	1.49
Output			149.38		1748.38		120.95

S p e c i a l I s s u e - I n t e r n a t i o n a l O n l i n e C o n f e r e n c e
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Now find out efficiency with the help of formula:

Cipla Company:

Input 1 + Input 2 + Input 3 + Input 4

4965.21

Output = 149.38

Efficiency = output/Input

$\quad$ =149.38/4965.21

$\quad$ 0.03

Glenmark Company:

Input 1 + Input 2 + Input 3 + Input 4

2773.65

Output = 1748.38

Efficiency = output/Input

$\quad$ =1748.38/2773.65

$\quad$ = 0.63

Cadila Company:

Input 1 + Input 2 + Input 3 + Input 4

1818.15

Output =120.95

Efficiency = output/Input

$\quad$ =120.95/1818.15

= 0.07

Company	Efficiency	Rank
Cipla	0.03	3
Glenmark Pharmaceuticals	0.63	1
Cadila Healthcare	0.07	2

Conclusion and Findings:

With the help of this study a stakeholder can easily identify the company which is more efficient. Same way company also can know about the financial health and zone which it belongs to. An efficiency score of Cipla Limited, Glenmark Pharmaceuticals and Cadila Healthcare is 0.03, 0.63 and 0.07 respectively during 2017. The score of Glenmark Pharmaceuticals is highest in the year 2017. So, it stood at first position and score of Cipla Limited is 0.03 so it stood at 3rd position in the year 2017.

Limitations of the Study:

- Only 3 companies are selected for the study
- Study period is only 1 year

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