Financial performance of the selected Indian pharmaceutical companies: An empirical analysis

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CHRONICLE	ABSTRACT
	The Indian Pharmaceutical Industry has gained tremendous momentum during the last few decades. Considering its importance both in the social sector and in the economy of our country a study has been endeavored to analyze the nature and movement of Return on Equity (ROE) of 9 selected companies listed in National Stock Exchange (NSE) in India during a period of 15 years from 2006-07 to 2020-21. This analysis has been conducted using DuPont. Step Regression has been used to measure to explain ROE by its predictors such as Operating Profit Margin (OPM), Interest Expense Ratio (IER), Assets Turnover Ratio (ATR), Tax Retention Ratio (TRR) and Equity Multiplier (EM). Study shows a substantial relationship between ROE and OPM in case of large cap companies. But most of the mid and small cap companies have shown a different relationship where other predictors such as ATR, TRR and EM are proved to be significant to explain ROE.

1. Introduction

Indian Pharmaceutical Industries, since last several years, are propelling the access and realizing the true potential to be considered as a giant sector to contribute significantly to the economic growth of this country. The Indian Pharmaceutical market has some distinguished characteristics as compared to other global players. These characters may be summarized as

a) Domination of Branded Generics by 70 to 80% of the retail market occupancy.

b) Indigenous companies are enjoying better market penetration by their own formulation development capabilities.

c) The general price level of Indian pharmaceutical product is low as compared to global market

This market is growing significantly from 13.6 billion USD in 2008-09 to a projected value of 55 billion USD in the year 2020-21 with a CAGR of 14.50%. This sector has been contributing towards growth and development of the present liberalized domestic economy simultaneously with the development of human capital and intellectual property as well. Our central Government has opted for open market mechanism with the acceptance of Trade Related Intellectual Property Right Systems (TRIPS) as promulgated by World Trade Organization (WTO). This environment forced the domestic companies to shape themselves accordingly to acquire efficiency both in finance and operation.

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Pharmaceutical industry in India caters around 72 % of the country's requirements for bulk drugs, drug intermediaries, chemical formulations etc. There are about 250 large units and about 8000 small scale industries, which form the whole of the pharmaceutical industry in India.

Following the de-licensing of pharmaceutical industry, industrial licensing for most of the drugs and pharmaceutical products are not mandatory, thereby, manufacturers are free to produce any drug duly approved by the drug control authority. Technologically strong and to some extent self-reliant pharmaceutical industries in India have low production cost, low R&D costs and an increasing balance of trade.

This macro environment has created tough competition among the pharmaceutical companies. Hence they are experiencing huge corporate restructuring to create a competitive edge among themselves. Further, Research and Development has become a matter of paramount importance.

In this backdrop, our present study is being prepared to focus on the trend of profitability aspect of selected Pharmaceutical Companies.

2. Survey of existing literature

Since profitability plays a pivotal role for the sustainability of a company, researchers have given immense importance on this issue since long past. This chapter provides a review of previous studies on the issues of profitability and related matters. Some of those studies are as follows.

Sur (2000) studied the association between the liquidity and profitability of Indian private sector enterprises as a case study of the Aluminum producing industry. They have identified a very high degree of positive correlation between liquidity and profitability of the selected companies. He applied rank correlation coefficient analysis and this was applied to find the relationship between liquidity and profitability of Ahmadabad Electricity Corporation Limited, Bombay Sub-Urban Electric Supply Limited, Calcutta Electric supply Corporation Limited and Surat Electricity Corporation Limited. The rank correlation coefficients were positive. The influence of liquidity on profitability was significant in Bombay Sub-urban Electric Supply Limited and Calcutta Electric Supply Corporation Limited. Even though the rank correlation between liquidity and profitability was positive in Ahmadabad Electricity Corporation Limited and Surat Electricity Corporation Limited, the influence of liquidity on profitability was very low which confirmed the inefficiency in liquidity management of these two companies.

Mansur (2003) focuses on the financial performance of a textile unit using ratio analysis as a tool to determine the financial and operational efficiency of the unit. It seeks to improve the financial health and viability of the undertaking using ratio analysis as a diagnostic instrument to remove the financial and operational problems of the company. The textile unit was selected because of the quite low/negative profit for the past two years. The ratio analysis highlighted that managerial incompetence accounted for most of the problems. It also suggested toning up efficiency and effectiveness of all facets of management, to put the company on a profitable footing.

Zain (2008) discussed that the return on assets is an important percentage that shows the company's ability to use its assets to generate income. He said that a high percentage indicates that the company is doing a good utilization of the company's assets to generate income. He noticed that the following formula is one method for calculating the return on assets percentage. Return on Assets = Net Profit/Total Assets. The net profit figures to be used is the amount of income after all expenses, including taxes. He announced that the low percentage could mean that the company may have difficulties meeting its debt obligations. He also explained about the profit margin ratio - Operating Performance. He pronounced that the profit margin ratio is expressed as a percentage that shows the relationship between sales and profits. It is sometimes called the operating performance ratio because it's a good indication of operating efficiencies. The following is the formula for calculating the profit margin. Profit Margin = Net Profit/Net Sales.

Sheela and Karthikeyan (2012) attempted basically to measure the financial performance of the Pharmaceutical Industry taking top three companies like Cipla, Dr. Reddy's Laboratories and Ranbaxy for the period of 2002-03 to 2011-12. In order to achieve the goals they have measured the ratios of ROE, ROA applying the DuPont analysis. DuPont analysis (ROI and ROE) is an important tool to judge financial performance. It is an indication of the earning power of the firm. The return on equity disaggregates performance into three components: Net Profit Margin, Total Asset Turnover, and the Equity Multiplier. This analysis revealed that Cipla pharmaceutical has highest Returns on Equity and Investment by 23.10 and 0.21 followed by Dr. Reddy's Laboratories ROE is 17.00 and ROI is 0.18. The third position is secured by Ranbaxy Laboratories with ROE of 16.16 and ROI of 0.13. This showed that Cipla was concentrating on its financial performance by reducing its expenses and cost during the period of study.

Malichova and Durisova (2015) identified, a) ROA (Return on Assets), ROE (Return on Equity) and ROS (Return on Sales) as profitability indicators. b) Cash Ratio, Quick Ratio and Current Ratio are indicators of liquidity and c) Total Asset Turnover is considered as an indicator of commitment of total invested capital measuring efficiency of utilization of total

assets. The period of study was from 2012-13 to 2014-15. Analysis of financial performance indicators revealed the capability to appraise the financial management of enterprises during the studied period. The study also revealed that firms under study in the IT sector were able to manage themselves efficiently and used their assets to generate profit.

Sala et al. (2020) considered in their study that DuPont analysis is a classical tool for measuring financial performance of firms. They emphasized on compositional analysis of DuPont measurement. They tried to show a graphical display of firms in terms of earnings, turnover and leverage by means of standard compositional biplot. They also used k-means compositional analysis. Shahnia and Endri (2020) made a study on 7 companies listed in Jakarta Stock Exchange during the period 2014-18. They used DuPont analysis for measurement of financial performance of sample companies. They used both ROA and ROE as key indicators for performance analysis. Here performance in terms of ROE is decomposed into three components only, viz. Net profit margin, Total Assets Turnover and Equity Multiplier. Having a due consideration on the above issues on profitability this study basically attempts to measure the financial performance using DuPont analysis. DuPont Model is based on analysis of Return on Equity (ROE). The DuPont Model is a common and useful tool for assessing and understanding the drivers of profitability. The DuPont model is a ratio-based analysis allowing managers to observe the interactions among the important variables in the cost volume-profit chain. The DuPont model is a useful framework for visualizing financial information and is a good tool for assisting managers in understanding how operating, financing, and investment decisions impact financial performance. The DuPont model could be explained as a financial analysis and planning tool intended to develop an understanding of the factors that affect the return on equity (ROE) of the firm using straightforward accounting relationships. He argues that the DuPont model allows for the assessment of the components of ROE and assists management in examining the possible influence of strategic initiatives on financial performance.

3. Statement of the Problem

The development of a company generally depends on several factors such as finance, personnel, technology, quality control etc. Out of all these factors, finance and operating efficiencies play a critical role. Unless company management appreciates the worth of better financial and operating analysis, it will continue to face great predicament in the profitability position of the company. In this context this paper has undertaken an analysis to find out financial performance of selected companies in pharmaceutical industry in India.

4. Objective of the Study

- To assess the effects of selected efficiency measures on the profitability on each pharmaceutical company under study applying DuPont Analysis.
- To assess the impact of each element under DuPont construction on ROE with multiple and step regression analysis.

5. Methodology of the study

5.1 *Sample Design:*

The sample size of the study consists of nine well known pharmaceutical companies, three each from Large Cap, Mid Cap and Small Cap sector respectively, which are listed in National Stock Exchange (NSE) in India. The names of the companies are,

Large Cap Companies

1. Sun Pharmaceuticals Industries Ltd. (SUN PHARMA)
2. Divis Laboratories Ltd. (DIVI LAB)
3. DrReddys Laboratories Ltd. (DR REDDY)

Mid Cap Companies

4. Ajanta Pharma Ltd. (AJANTA PHARM)
5. Sanofi India Ltd (SANOFI)
6. Natco Pharma Ltd (NATCO)

Small Cap Companies

7. FDC Ltd (FDC)
8. Hikal Ltd (HIKAL)
9. Indoco Remedies Ltd (INDOCO)

5.2 Data Analysis

Construction of DuPont Analysis

DuPont analysis was initially conceived in 1914 by Donaldson Brown who was working in a company at that time whose name was DuPont. He used a method of decomposing a firm's key financial performance indicator into different financial ratios. Financial performance indicator has a responsibility to depict a firm's ability to generate profit out of the investment through different processes of economic activities like transformation, production or trade of goods or services. Measurement of this indicator may be conceptualized from two viewpoints; one of them is Return on Assets (ROA), where

$$\text{ROA} = \frac{Profit}{Assets} = \frac{Revenue - Cost}{Assets}$$

DuPont analysis was initially created to assess the Return on Assets (ROA) of a firm. According to this initial model, the product of net profit margin and total assets turnover equals Return on Assets (ROA), where

$$\text{Return on Assets (ROA)} = \frac{Net\ Income}{Sales} \times \frac{Sales}{Total\ Assets}$$

Maximization of ROA was a major concern till 1970.

The other viewpoint is Return on Equity (ROE). Modification in this model with a shift from ROA to ROE (Return on Equity), makes it more powerful as a tool for decision making in any firm. ROE can be conceptualized as follows

$$\text{ROE} = \frac{Profit}{Equity} = \frac{Revenue - Cost}{Total\ Assets - External\ Liabilities}$$

Current modification in the DuPont model uses five components to find out Return on Equity. These components are (1) Operating Profit Margin, (2) Interest Expense Ratio, (3) Assets Turnover Ratio, (4) Tax Retention Ratio and (5) Equity Multiplier, where,

$$\text{Operating Profit Margin (OPM)} = \frac{EBIT}{SALES}$$

$$\text{Interest Expense Ratio (IER)} = \frac{EBT}{EBIT}$$

$$\text{Assets Turnover Ratio (ATR)} = \frac{SALES}{TOTAL\ ASSETS}$$

$$\text{Tax Retention Ratio (TRR)} = \frac{PAT}{EBT}$$

$$\text{Equity Multiplier (EM)} = \frac{TOTAL\ ASSETS}{EQUITY}$$

So, $$\text{ROE} = \frac{EBIT}{SALES} \times \frac{EBT}{EBIT} \times \frac{SALES}{TOTAL\ ASSETS} \times \frac{PAT}{EBT} \times \frac{TOTAL\ ASSETS}{EQUITY}$$

For proper analysis of the data to be used in this study, different mathematical/statistical tools like percentages, averages, standard deviation and various ratios related to DuPont are to be used. For the purpose of further analysis of impact of each predictors on ROE a multiple regression equation which will be best fitted may be drawn as follows,

$$\text{ROE} = \beta_0 + \beta_1 OPM + \beta_2 IER + \beta_3 ATR + \beta_4 TRR + \beta_5 EM + \text{€}$$

where, β_0 is constant and β_1, β_2, β_3, β_4 and β_5 are the regression co-efficient and € is error term. In order to examine whether the computed values of step regression coefficients were statistically significant or not, t test and F test were used respectively.

5.3 Collection of Data

The data of the selected nine domestic companies in the Indian pharmaceutical industry for the period 2006-07 to 2020-21 used in this study were collected from secondary sources i.e. Capitaline Corporate Database of Capital Market Publishers (I) Ltd. Mumbai. The data used in this study pertains to the financial year figures of each year under study.

6. Analysis of the Study

Table 1 shows the results of the 5 point analysis.

Table 1
The results of 5 Point DuPont Analysis

			Sun Pharmaceuticals Industries Ltd (SUN PHARMA)			
YEAR	ROE	OPM	IER	ATR	TRR	EM
2020-21	0.14	0.22	0.98	0.59	0.88	1.23
2019-20	0.09	0.16	0.94	0.57	0.75	1.33
2018-19	0.09	0.19	0.9	0.53	0.72	1.37
2017-18	0.07	0.19	0.9	0.51	0.63	1.4
2016-17	0.2	0.3	0.96	0.64	0.77	1.43
2015-16	0.16	0.25	0.93	0.65	0.69	1.5
2014-15	0.21	0.25	0.92	0.83	0.71	1.49
2013-14	0.3	0.43	0.99	0.74	0.73	1.29
2012-13	0.25	0.43	0.99	0.72	0.7	1.16
2011-12	0.24	0.42	0.99	0.65	0.79	1.13
2010-11	0.21	0.37	0.96	0.6	0.89	1.1
2009-10	0.18	0.35	1	0.51	0.95	1.05
2008-09	0.3	0.46	1	0.67	0.93	1.06
2007-08	0.38	0.48	0.99	0.73	0.93	1.19
2006-07	0.36	0.4	0.99	0.57	0.94	1.7
Mean	**0.21**	**0.33**	**0.96**	**0.63**	**0.80**	**1.30**
Max	**0.38**	**0.48**	**1**	**0.83**	**0.95**	**1.7**
Min	**0.07**	**0.16**	**0.9**	**0.51**	**0.63**	**1.05**
SD	**0.10**	**0.11**	**0.04**	**0.09**	**0.11**	**0.19**

From the above analysis it shows that SD of ROE is 0.10, OPM is 0.11, IER is 0.04, ATR is 0.09, TRR is 0.11 and EM is 0.19. It seems that the financial performance of SUN PHARMA during the period under study is quite stable as the SD of ROE is significantly low. Further separate calculation of SD of each element of ROE reveals a strong stability in case of IER (0.04) and ATR (0.09).

Table 2
The results of 5 Point DuPont Analysis

			Divis Laboratories Ltd (DIVI LAB)			
YEAR	ROE	OPM	IER	ATR	TRR	EM
2020-21	0.24	0.38	1	0.83	0.74	1.01
2019-20	0.19	0.34	1	0.75	0.76	1.01
2018-19	0.21	0.38	1	0.76	0.73	1.02
2017-18	0.16	0.32	1	0.68	0.71	1.01
2016-17	0.22	0.34	1	0.83	0.76	1.01
2015-16	0.29	0.37	1	0.96	0.81	1.01
2014-15	0.26	0.35	1	0.96	0.79	1.01
2013-14	0.28	0.39	1	0.92	0.78	1.01
2012-13	0.26	0.37	1	0.91	0.77	1.02
2011-12	0.27	0.37	0.99	0.93	0.78	1.03
2010-11	0.26	0.36	1	0.78	0.91	1.02
2009-10	0.25	0.41	0.99	0.66	0.88	1.03
2008-09	0.4	0.39	0.98	1.05	0.93	1.07
2007-08	0.5	0.38	0.97	1.26	0.92	1.17
2006-07	0.42	0.32	0.95	1.23	0.85	1.35
Mean	0.28	0.36	0.99	0.90	0.81	1.05
Max	0.5	0.41	1	1.26	0.93	1.35
Min	0.16	0.32	0.95	0.66	0.71	1.01
SD	0.09	0.03	0.01	0.18	0.07	0.09

From the above analysis it shows that SD of ROE is 0.09, OPM is 0.03, IER is 0.01, ATR is 0.18, TRR is 0.07 and EM is 0.09. It shows a decrease in ROE of **DIVI LAB** in 2009-10 and this low ROE persisted during the whole period up to 2020-21, at the same time the SD of ROE shows a robust stability during the period of study. As far as SD of other elements of ROE is concerned, OPM (0.03) and IER (0.01) show strong consistency. This reveals stability in Operating Profit Margin and Debt-Equity ratio during the period under study.

Table 3
The results of 5 Point DuPont Analysis

			DrReddys Laboratories Ltd (DR REDDY)			
YEAR	ROE	OPM	IER	ATR	TRR	EM
2020-21	0.12	0.15	0.97	0.99	0.71	1.19
2019-20	0.12	0.16	0.97	0.98	0.68	1.17
2018-19	0.14	0.11	0.95	0.97	1.07	1.22
2017-18	0.15	0.16	0.96	0.85	0.83	1.36
2016-17	0.08	0.1	0.94	0.8	0.7	1.43
2015-16	0.1	0.11	0.96	0.84	0.83	1.36
2014-15	0.19	0.19	0.97	1.01	0.75	1.37
2013-14	0.26	0.2	0.96	1.11	0.81	1.53
2012-13	0.28	0.21	0.95	1.18	0.74	1.59
2011-12	0.27	0.19	0.96	1.28	0.71	1.62
2010-11	0.29	0.2	0.94	1.33	0.72	1.64
2009-10	0.26	0.16	0.97	1.27	0.84	1.5
2008-09	0.16	0.16	0.97	1.3	0.53	1.48
2007-08	0.07	0.13	0.88	1.14	0.33	1.49
2006-07	0.1	0.13	0.84	0.77	0.8	1.53
Mean	**0.17**	**0.16**	**0.95**	**1.05**	**0.74**	**1.43**
Max	**0.29**	**0.21**	**0.97**	**1.33**	**1.07**	**1.64**
Min	**0.07**	**0.1**	**0.84**	**0.77**	**0.33**	**1.17**
SD	**0.08**	**0.04**	**0.04**	**0.19**	**0.16**	**0.15**

It shows that the SD of ROE is 0.08, OPM is 0.04, IER is 0.04, ATR is 0.19, TRR is 0.16 and EM is 0.15. The SD of ROE (0.08) shows a robust consistency during the period under study. As far as SD of other elements of ROE is concerned, OPM (0.04) and IER (0.04) show strong consistency. This reveals stability in Operating Profit Margin and Debt-Equity ratio during the period under study.

Study of three top Large Cap Segment companies reveals following two major findings.

1. Mean ROE of **DR REDDY** is lower than its peers under study.
2. The range between Max and Min ROE of **SUN PHARMA** is higher than its peers; consequently, the SD of ROE in case of **SUN PHARMA** is also higher than its peers.

Table 4
The results of 5 Point DuPont Analysis

			Ajanta Pharma Ltd. (AJANTA)			
YEAR	ROE	OPM	IER	ATR	TRR	EM
2020-21	0.23	0.28	0.99	1.05	0.78	1.02
2019-20	0.23	0.31	0.99	1.01	0.73	1.03
2018-19	0.19	0.26	0.98	1.04	0.7	1.03
2017-18	0.18	0.25	1	0.94	0.75	1.02
2016-17	0.26	0.29	1	1.17	0.75	1.01
2015-16	0.37	0.33	1	1.39	0.78	1.03
2014-15	0.41	0.32	0.99	1.59	0.74	1.08
2013-14	0.43	0.31	0.99	1.79	0.68	1.15
2012-13	0.47	0.28	0.97	1.93	0.71	1.27
2011-12	0.32	0.21	0.9	1.81	0.63	1.48
2010-11	0.29	0.16	0.85	1.47	0.85	1.76
2009-10	0.25	0.15	0.76	1.19	0.9	2.02
2008-09	0.2	0.14	0.66	1	0.88	2.4
2007-08	0.17	0.15	0.56	0.98	0.85	2.45
2006-07	0.17	0.15	0.64	1.14	0.76	2.16
Mean	**0.28**	**0.24**	**0.89**	**1.30**	**0.77**	**1.46**
Max	**0.47**	**0.33**	**1**	**1.93**	**0.9**	**2.45**
Min	**0.17**	**0.14**	**0.56**	**0.94**	**0.63**	**1.01**
SD	**0.10**	**0.07**	**0.15**	**0.34**	**0.08**	**0.55**

This analysis shows an increasing trend of ROE of **AJANTA** from 2007-08 to 2014-1**5.** This analysis shows that SD of ROE is 010, OPM is 0.07, IER is 0.15, ATR is 0.34, TRR is 0.08 and EM is 0.55. The SD of ROE (0.10) shows stability during the period of study. As far as SD of other elements of ROE is concerned, OPM (0.07) and TRR (0.08) show strong uniformity along with ROE. This reveals stability in Operating Profit Margin and Tax retention ratio during the period under study. The trend of IER since 2012-13 onward reveals that **AJANTA** has been running in almost debt free condition.

Table 5
The results of 5 Point DuPont Analysis

			Sanofi India Ltd (SANOFI)			
YEAR	ROE	OPM	IER	ATR	TRR	EM
2020-21	0.27	0.26	1	1.31	0.76	1.04
2019-20	0.21	0.23	1	1.23	0.71	1.03
2018-19	0.19	0.22	1	1.29	0.68	1.02
2017-18	0.18	0.22	1	1.28	0.62	1.02
2016-17	0.17	0.21	1	1.23	0.63	1.03
2015-16	0.17	0.2	1	1.31	0.63	1.03
2014-15	0.17	0.18	1	1.38	0.67	1.02
2013-14	0.14	0.15	1	1.37	0.64	1.03
2012-13	0.21	0.21	1	1.39	0.68	1.03
2011-12	0.15	0.17	0.99	1.33	0.68	1.03
2010-11	0.18	0.22	1	1.21	0.67	1.02
2009-10	0.16	0.22	0.99	1.12	0.66	1.01
2008-09	0.18	0.25	1	1.11	0.65	1.02
2007-08	0.22	0.26	1	1.3	0.64	1.02
2006-07	0.23	0.26	1	1.31	0.65	1.02
Mean	**0.19**	**0.22**	**1.00**	**1.28**	**0.66**	**1.02**
Max	**0.27**	**0.26**	**1**	**1.39**	**0.76**	**1.04**
Min	**0.14**	**0.15**	**0.99**	**1.11**	**0.62**	**1.01**
SD	**0.03**	**0.03**	**0.00**	**0.08**	**0.04**	**0.01**

From the above analysis of SANOFI it shows that SD of ROE is 0.03, OPM is 0.03, IER is 0.00, ATR is 0.08, TRR is 0.04 and EM is 0.01. It is also observed that SD of ROE (0.03) shows a robust steadiness in return during the period of study. As far as SD of other elements of ROE is concerned, OPM (0.03) and EM (0.01) show very strong regularity along with ROE. This reveals stability in Operating Profit Margin and Equity Multiplier during the period under study. The IER of the whole period of study reveals that **SANOFI** has been running in almost debt free condition, this in turn creates consistency in Equity Multiplier.

Table 6
The results of 5 Point DuPont Analysis

			NatcoPharma Ltd (NATCO)			
YEAR	ROE	OPM	IER	ATR	TRR	EM
2020-21	0.08	0.24	0.97	0.38	0.79	1.1
2019-20	0.13	0.34	0.97	0.43	0.81	1.12
2018-19	0.2	0.44	0.98	0.54	0.79	1.1
2017-18	0.29	0.43	0.98	0.79	0.79	1.09
2016-17	0.33	0.33	0.97	1.15	0.78	1.12
2015-16	0.16	0.23	0.91	0.8	0.8	1.2
2014-15	0.19	0.26	0.84	0.66	0.99	1.35
2013-14	0.17	0.28	0.81	0.67	0.78	1.47
2012-13	0.16	0.25	0.82	0.69	0.7	1.61
2011-12	0.15	0.24	0.78	0.66	0.75	1.61
2010-11	0.16	0.22	0.82	0.7	0.81	1.54
2009-10	0.17	0.25	0.81	0.76	0.78	1.44
2008-09	0.18	0.26	0.78	0.76	0.8	1.46
2007-08	0.2	0.28	0.85	0.8	0.73	1.43
2006-07	0.13	0.19	0.81	0.76	0.76	1.48
Mean	**0.18**	**0.28**	**0.87**	**0.70**	**0.79**	**1.34**
Max	**0.33**	**0.44**	**0.98**	**1.15**	**0.99**	**1.61**
Min	**0.08**	**0.19**	**0.78**	**0.38**	**0.7**	**1.09**
SD	**0.06**	**0.07**	**0.08**	**0.18**	**0.06**	**0.20**

From the above analysis it shows that SD of ROE is 0.06, OPM is 0.07, IER is 0.08, ATR is 0.18, TRR is 0.06 and EM is 0.20. From the above analysis of ROE of **NATCO,** it is observed that there is a very creeping upward trend up to 2017-18, but there is a steep fall from 2018-19 thereby the range between Max and Min ROE is high. But SD of ROE (0.06) shows consistency during the period of study. As far as SD of other elements of ROE is concerned, ATR (0.18) and EM (0.20) show instability as compared to other elements.

Considering the analysis of Mid Cap Segment companies it reveals following observations,

  a. AJANTA has the highest range in ROE, thereby; its SD of ROE is highest amongst the peers.

  b. Range of NATCO is also high, this shows wide variations in ROE.

Table 7
The results of 5 Point DuPont Analysis

			FDC Ltd (FDC)			
YEAR	ROE	OPM	IER	ATR	TRR	EM
2020-21	0.18	0.29	0.99	0.81	0.78	1.01
2019-20	0.16	0.24	0.99	0.89	0.75	1.01
2018-19	0.12	0.22	0.99	0.8	0.72	1
2017-18	0.14	0.23	0.99	0.84	0.72	1
2016-17	0.16	0.25	0.99	0.86	0.75	1
2015-16	0.17	0.23	0.99	0.98	0.73	1
2014-15	0.17	0.23	0.99	1	0.73	1
2013-14	0.17	0.26	0.99	1.03	0.62	1
2012-13	0.18	0.22	0.99	1.04	0.78	1.01
2011-12	0.2	0.24	0.99	1.07	0.78	1.01
2010-11	0.26	0.25	0.99	1.23	0.86	1.01
2009-10	0.31	0.29	0.99	1.32	0.83	1.01
2008-09	0.22	0.19	0.98	1.44	0.8	1.03
2007-08	0.16	0.14	0.98	1.37	0.84	1.03
2006-07	0.21	0.19	0.98	1.38	0.79	1.02
Mean	**0.19**	**0.23**	**0.99**	**1.07**	**0.77**	**1.01**
Max	**0.31**	**0.29**	**0.99**	**1.44**	**0.86**	**1.03**
Min	**0.12**	**0.14**	**0.98**	**0.8**	**0.62**	**1**
SD	**0.05**	**0.04**	**0.00**	**0.22**	**0.06**	**0.01**

From the above analysis it shows that SD of ROE is 0.05, OPM is 0.04, IER is 0.00, ATR is 0.22, TRR is 0.06 and EM is 0.01. From the above analysis of ROE of **FDC,** it is observed that SD of ROE (0.05) shows a robust consistency during the period of study. As far as SD of other elements of ROE is concerned, OPM (0.04) and EM (0.01) show very strong consistency. This reveals stability in Operating Profit Margin and Equity Multiplier during the period under study. The IER of the whole period of study reveals that **FDC** has been running in almost debt free condition, this in turn creates consistency in Equity Multiplier. But ATR shows relatively higher volatility which in turn depicts frequent ups and downs in ATR during the period under study.

Table 8
The results of 5 Point DuPont Analysis

			Hikal Ltd (HIKAL)			
YEAR	ROE	OPM	IER	ATR	TRR	EM
2020-21	0.15	0.14	0.85	1.13	0.64	1.74
2019-20	0.12	0.13	0.73	1.03	0.67	1.85
2018-19	0.14	0.13	0.72	1.15	0.69	1.93
2017-18	0.12	0.12	0.69	1.02	0.69	1.99
2016-17	0.13	0.13	0.62	0.88	0.84	2.16
2015-16	0.09	0.12	0.46	0.85	0.77	2.45
2014-15	0.1	0.14	0.5	0.81	0.68	2.61
2013-14	0.17	0.2	0.59	0.79	0.65	2.84
2012-13	0.19	0.21	0.58	0.66	0.76	3.03
2011-12	0.2	0.2	0.52	0.74	0.83	3.12
2010-11	0.13	0.16	0.44	0.55	1.07	3.23
2009-10	0.26	0.27	0.73	0.59	0.65	3.48
2008-09	0.3	0.16	0.7	0.72	0.99	3.72
2007-08	0.19	0.09	0.63	0.86	1.05	3.61
2006-07	0.18	0.09	0.56	0.92	0.99	3.62
Mean	**0.16**	**0.15**	**0.62**	**0.85**	**0.80**	**2.76**
Max	**0.3**	**0.27**	**0.85**	**1.15**	**1.07**	**3.72**
Min	**0.09**	**0.09**	**0.44**	**0.55**	**0.64**	**1.74**
SD	**0.06**	**0.05**	**0.12**	**0.18**	**0.16**	**0.71**

From the above analysis it shows that SD of ROE is 0.06, OPM is 0.05, IER is 0.12, ATR is 0.18, TRR is 0.16 and EM is 0.71. From the above analysis of ROE of **HIKAL,** it is observed that SD of ROE (0.05) shows a robust consistency during the period of study. As far as SD of other elements of ROE is concerned, OPM (0.05) shows very strong consistency. This reveals stability in Operating Profit Margin during the period under study. The SD of EM (0.71) is very high and the IER for the whole period of study shows higher values that may create instability in EM of **HIKAL.**

Table 9
The results of 5 Point DuPont Analysis

	Indoco Remedies Ltd (INDOCO)					
YEAR	ROE	OPM	IER	ATR	TRR	EM
2020-21	0.13	0.12	0.86	1.21	0.7	1.41
2019-20	0.04	0.05	0.52	1.13	0.84	1.46
2018-19	0	0.01	-0.82	0.99	0.31	1.47
2017-18	0.06	0.07	0.67	1.07	0.85	1.46
2016-17	0.13	0.09	0.94	1.27	0.85	1.38
2015-16	0.15	0.11	0.89	1.46	0.83	1.26
2014-15	0.17	0.14	0.91	1.41	0.76	1.24
2013-14	0.13	0.12	0.79	1.3	0.8	1.29
2012-13	0.11	0.11	0.69	1.19	0.88	1.33
2011-12	0.13	0.12	0.76	1.17	0.9	1.33
2010-11	0.15	0.12	0.94	1.15	0.9	1.27
2009-10	0.14	0.11	0.94	1.13	0.98	1.21
2008-09	0.12	0.11	0.85	1.14	0.95	1.17
2007-08	0.16	0.14	0.9	0.94	1.25	1.14
2006-07	0.2	0.16	0.9	1.3	0.9	1.16
Mean	**0.12**	**0.11**	**0.72**	**1.19**	**0.85**	**1.31**
Max	**0.2**	**0.16**	**0.94**	**1.46**	**1.25**	**1.47**
Min	**0**	**0.01**	**-0.82**	**0.94**	**0.31**	**1.14**
SD	**0.05**	**0.04**	**0.44**	**0.14**	**0.19**	**0.11**

From the above analysis it shows that SD of ROE is 0.05, OPM is 0.04, IER is 0.44, ATR is 0.14, TRR is 0.16 and EM is 0.71. From the above analysis of ROE of **INDOCO,** it is observed that SD of ROE (0.05) shows a robust consistency during the period of study. As far as SD of other elements of ROE is concerned, OPM (0.04) shows very strong consistency, but the overall performance is poor as compared to other companies under the Small Cap segment. Performance in 2018-19 is nil. The Range and SD of IER is high. This reveals poor management of the capital structure of **INDOCO.** While applying stepwise regression analysis of the data of the companies under study following outcome was revealed. We used SPSS software for our purpose.

Table 10
Model Summary (SUN PHARMA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.902(a)	.813	.799	.04268
2	.963(b)	.927	.915	.02769
3	.976(c)	.952	.939	.02354
4	.993(d)	.986	.981	.01314

a Predictors: (Constant), OPM
b Predictors: (Constant), OPM, EM
c Predictors: (Constant), OPM, EM, TRR
d Predictors: (Constant), OPM, EM, TRR, ATR

From the stepwise regression analysis of the data of **SUN PHARMA** it reveals that OPM individually has a major impact on ROE, the value of R is 0.902, which signifies a very high positive relationship between OPM and ROE. At the same time the value of R^2 is 0.813, which indicates almost 81.30% of the observed variations are explained by OPM. Further combination of OPM and EM has a greater impact on ROE. The value of R in this case is 0.963, this also implies a very high positive relationship between ROE and OMP & EM. The value of R^2 (0.927) implies that about 92.70% variations are explained by OPM & EM. OPM, EM and TRR have the next greater impact on ROE. Here R is 0.976 and R^2 is 0.952 which signifies that there is a strong positive relation between dependent variables and predictors mentioned above. At the same time it depicts that 95.2% variation in ROE is explained by the predictors. At last, the combined effect of OPM, EM, TRR, ATR on ROE is also very significant having a R value of 0.993 and R^2 is 0.986. There is no significant impact of IER on ROE. In the above estimation Standard Error is less than 1 in all steps making it very significant.

Table 11
Model Summary (DIVI LAB)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.916(a)	.839	.827	.03806
2	.980(b)	.960	.953	.01986

a Predictors: (Constant), ATR
b Predictors: (Constant), ATR, TRR

In case of **DIVI LAB** it reveals that ATR individually has a major impact on ROE, the value of R is 0.916, which signifies a very high positive relationship between ATR and ROE. At the same time value of R^2 is 0.839, which indicates almost 83.90% of the observed variations are explained by ATR. Further combination of ATR and TRR has next greater impact on ROE. The value of R in this case is 0.980; this also implies a very high positive relationship between ROE and ATR &

TRR. The value of R^2 (0.960) implies that about 96.00% variations are explained by ATR & TRR. In the case of DIVI LAB the other predictors such as OPM, IER and EM have insignificant impact on ROE during the period of study. In the above estimation Standard Error is also less than 1 in all steps making it very significant.

Table 12
Model Summary (DR REDDY)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.850(a)	.723	.702	.04312
2	.899(b)	.807	.775	.03744
3	.967(c)	.936	.918	.02259
4	.989(d)	.979	.971	.01352

a Predictors: (Constant), OPM
b Predictors: (Constant), OPM, TRR
c Predictors: (Constant), OPM, TRR, ATR
d Predictors: (Constant), OPM, TRR, ATR, EM

In case of **DR REDDY, the** impact of OPM (R=0.850) on ROE is comparatively low and the EM is not considered a better predictor as compared to **SUN PHARMA**. From the stepwise regression analysis of the data, it reveals that OPM individually has a major impact on ROE, the value of R is 0.850, which signifies moderately high positive relationship between OPM and ROE. At the same time the value of R^2 is 0.723, which indicates almost 72.30% of the observed variations are explained by OPM. Further combination of OPM and TRR has a greater impact on ROE. The value of R in this case is 0.899; this implies a high positive relationship between ROE and OMP & TRR. The value of R^2 (0.807) implies that about 80.70% variations are explained by OPM & TRR. OPM, TRR and ATR have the next greater impact on ROE. Here R is 0.967 and R^2 is 0.936 which signifies that there is a strong positive relation between dependent variables and predictors mentioned above. At the same time, it depicts that 93.6% variation in ROE is explained by the predictors. At last, the combined effect of OPM, TRR, ATR & EM on ROE is also significant having a R value of 0.989 and R^2 is 0.979. There is no significant impact of IER on ROE in this case because of high consistency on IER. In the above estimation Standard Error is less than 1 in all steps making it very significant.

Table 13
Model Summary (AJANTA)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.906(a)	.820	.806	.04404
2	.955(b)	.912	.898	.03200
3	.994(c)	.988	.985	.01221
4	.996(d)	.992	.989	.01042

a Predictors: (Constant), ATR
b Predictors: (Constant), ATR, OPM
c Predictors: (Constant), ATR, OPM, TRR
d Predictors: (Constant), ATR, OPM, TRR, EM

In the case of **AJANTA,** ATR plays the most determining role in explaining ROE. From the stepwise regression analysis of the data, it reveals that ATR individually has a major impact on ROE, here value of R is 0.906, which signifies a very high positive relationship between ATR and ROE. At the same time the value of R^2 is 0.820, which indicates almost 82.00% of the observed variations are explained by ATR. Further combination of ATR and OPM has a greater impact on ROE. The value of R in this case is 0.955, this also implies a very high positive relationship between ROE and ATR & OPM. The value of R^2 (0.912) implies that about 91.20% variations are explained by ATR & OPM. ATR, OPM and TRR have the next greater impact on ROE. Here R is 0.994 and R^2 is 0.988 which signifies that there is a strong positive relation between dependent variables and predictors mentioned above. At the same time, it depicts that 98.8% variation in ROE is explained by the predictors. At last, the combined effect of ATR, OPM, TRR, EM on ROE is also very significant having a R value of 0.996 and R^2 0.992. There is no significant impact of IER on ROE in this case. Here also EM is considered as a less impactful predictor. In the above estimation Standard Error is less than 1 in all steps making it very significant.

Table 14
Model Summary (SANOFI)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.592(a)	.350	.300	.02843
2	.737(b)	.543	.467	.02482

a Predictors: (Constant), TRR
b Predictors: (Constant), TRR, IER

In the case of **SANOFI,** only 2 predictors out of 5 identified in our study have shown their best fit. TRR (R=0.592) plays a considerable role in determining ROE. This shows a positive relationship between ROE and TRR. At the same time the value of R^2 is 0.350, which indicates almost 35.00% of the observed variations are explained by TRR. This has proved TRR to be a poor predictor. Next best combined predictors are TRR and IER having R = 0.737. This proves a greater impact on ROE. Here R^2 is 0.543: this indicates that only 54.30% variation of dependent variable is explained by above-mentioned

predictors. Here the predictors are poor as compared to other companies in explaining the criterion variable. Here other predictors are not significant.

Table 15
Model Summary (NATCO)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.765(a)	.585	.553	.04106
2	.975(b)	.950	.942	.01477
3	.984(c)	.968	.960	.01230

a Predictors: (Constant), ATR
b Predictors: (Constant), ATR, OPM
c Predictors: (Constant), ATR, OPM, TRR

In the case of **NATCO**, again ATR (0.765) plays a considerable role in explaining ROE. The value of R is 0.765, which signifies a moderately high positive relationship between ATR and ROE. But the value of R^2 is 0.585, which indicates only 58.50% of the observed variations are explained by ATR. Further combination of ATR and OPM has a greater impact on ROE. The value of R in this case is 0.975; this implies a very high positive relationship between ROE and ATR & OPM. The value of R^2 (0.950) implies that about 95.00% variations are explained by ATR & OPM. This spike in both R and R^2 implies that OPM creates a synergy effect in explaining the dependent variable. ATR, OPM and TRR have the next greater impact on ROE. Here R is 0.984 and R^2 is 0.968 which signifies that there is a strong positive relation between dependent variables and predictors mentioned above. At the same time it depicts that 96.8% variation in ROE is explained by the predictors. In the above estimation Standard Error is also less than 1 in all steps making it very significant. Here other predictors like IER and EM are not significant.

Table 16
Model Summary (FDC)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.659(a)	.434	.391	.03737
2	.966(b)	.933	.922	.01341
3	.988(c)	.976	.969	.00836
4	.995(d)	.990	.986	.00570

a Predictors: (Constant), ATR
b Predictors: (Constant), ATR, OPM
c Predictors: (Constant), ATR, OPM, TRR
d Predictors: (Constant), ATR, OPM, TRR, EM

In the case of **FDC** also ATR (R = 0.659) plays a considerable role in explaining ROE. This value of R signifies a moderately high positive relationship between ATR and ROE. But the value of R^2 is 0.434, which indicates only 43.40% of the observed variations are explained by ATR. Further combination of ATR and OPM has a greater impact on ROE. The value of R in this case is 0.966; this implies a very high positive relationship between ROE and ATR & OPM. The value of R^2 (0.933) implies that about 93.30% variations are explained by ATR & OPM. This spike in both R and R^2 implies that OPM creates a synergy effect in explaining the dependent variable. ATR, OPM and TRR have the next greater impact on ROE. Here R is 0.984 and R^2 is 0.968 which signifies that there is a strong positive relation between dependent variables and predictors mentioned above. At the same time it depicts that 96.8% variation in ROE is explained by the predictors. In the 4th step ATR, OPM, TRR & EM jointly possess a very high positive relationship with their criterion variable ROE. Here R is 0.995 and R^2 is 0.990; this signifies that 99.0% variations in ROE could be explained by predictors mentioned here. In the above estimation Standard Error is also less than 1 in all steps making it very significant. Here other predictor IER is not significant.

Table 17
Model Summary (HIKAL)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.700(a)	.490	.451	.04302
2	.923(b)	.853	.828	.02407
3	.953(c)	.909	.884	.01979

a Predictors: (Constant), EM
b Predictors: (Constant), EM, IER
c Predictors: (Constant), EM, IER, OPM

In the case of **HIKAL,** interestingly EM (R = 0.700) plays a moderate role for amplification of ROE, but R^2 (0.490) shows a poor explanation of the variations of ROE. The combined effect of EM and IER (R = 0.923) a strong positive relationship with ROE, here R^2 is 0.853 that implies 85.30% variations of ROE could be explained by this combination. Here IER plays a synergic impact along with EM. EM, IER and OPM have the next greater impact on ROE. Here R is 0.953 and R^2 is 0.909 which signifies that there is a strong positive relation between dependent variables and predictors mentioned above. At the same time, it depicts that 90.9% variation in ROE is explained by the predictors. Here the other elements under ROE like ATR and TRR are not significant.

Table 18
Model Summary (INDOCO)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.963(a)	.928	.923	.01440

a Predictors: (Constant), OPM

In the case of **INDOCO,** only OPM (R=0.963) plays a pivotal role for amplification of ROE. Value of R^2 (0.928) also moves in tune with the R value. Here no other predictors show any significance in explaining ROE. This shows poor management in other fronts of this company during the period under study.

7. Conclusion

From the entire analysis of 9 companies it reveals following conclusions,

a.   There is a robust consistency in ROE in case of all the companies under study. This goes in the line of stability of the whole industry during the period under study.
b.   Interestingly the Large Cap Companies' ROE are substantially influenced by their OPM.
c.   3 Companies under Mid and Small Cap segments used substantially their Assets Turnover Ratio (ATR) in construction of ROE during the period under study.
d.   1 Company (SANOFI) used Tax Retention Ratio (TRR) as the best variable to explain ROE.
e.   HIKAL shows Equity Multiplier (EM) as the best explanatory variable for ROE.
f.   Only in the case of INDOCO, the mean ROE (0.12) during the period under study is poor as compared to its peers. Further its ROE is mainly influenced by its OPM, maintaining other insignificant factors. This shows relatively poor financial management as compared to others.

Generally, it is considered that OPM is the highest influential variable in shaping ROE, but our study shows some different results. Considering this phenomenon further research may be conducted on volatility of market price of shares of those companies where OPM is not the best fit.

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