Trends in Production, Sales and Cost Structure of Select Pharmaceutical Industries in India: An Empirical Study

N. Pasupathi*

Abstract

The trend Analysis is a useful tool to project financial health and performance standard of the company. This method helps management to find appropriate point of intervention for better performance. In this article, trends in production, sales, the cost of sales and other costs have been analysed in detail. Trend analysis is effective only when relevant and related items are studied in conjunction with each other and their interactions. Also, trend results of each above factors have to be viewed in perspective of the resources employed. This paper analyses the trend values of all performancs and cost) viz. Porduction, sales and oter elelemnt od costs) of selected Pharma companies . The study selected time series data for ten years from 2005-06 to 2014-15. Taking 2005-06 as the base year, Indices have been calculated for the remaining years with reference to the base year. 9 Hypotheses have been tested on the basis of Chi-square tests and concluded that there are significant difference between actual and trend values of production, sales and respective expenses

Keywords : Trend Value, Actual value, indices, financial wealth

Introduction

The important areas of performance evaluation chosen for the present study are Trends of Production, Sales, Costs. To start with, relevant data are select on above variables from the total information set and analysis has been carried out on relationships among above indicators to evaluate and interpret results.

Production Trend - Production is one of the most important areas of performance. Production performance of a company can be measured by analysing capacity utilization along with the cost components.

Sales Trend - The sales index is reflection of managerial and marketing efficiency. Sales index is computed and compared with those of other similar companies for performance evaluation.

Cost Trend -. The cost trend plays an important role in forecasting, planning, and budgeting and in break

*Dr. N. Pasupathi,
Director,
PG & Research Department of Management
Science, PARK'S College, (Autonomous),
Tirupur – 641 605, Tamil Nadu.

even analysis; regulating wasteful expenditure. The Cost analysis also helps the company fix up rational prices. Thus, the cost trend helps measuring efficiency or inefficiency

Literatures review

The performance analysis of the corporate sector has always been an area of controversies due to difference in perspectives of different stakeholders i.e. the Government, shareholders, prospective inventors, creditors, employees and any other. While Several studies have been undertaken to evaluate the financial performance in various corporate sectors and have been reviewed only one paper on performance analyse of Pharma sector was reviewed. Literature review will cover performance analysis of both financial and other indicators in diverse sectors.

The paper by **Mittal (2012)** finds that low level of profitability of cement industry is due to mismanagement of current assets and liabilities. The main objective of working capital management is to arrange funds needed at right time from the right sources and for the right period so that trade-off between liquidity and profitability may be realized. The study points out that

the cement industry in India are failing to maintain the required level of working capital.

The paper by Sarangarajan, (2013) attempts to examine the performance and management of assets for four select cement companies in Tamilnadu over 1996-97 to 2005-06. The analysis found that the change in policy of offering credit to the large customer was a major cause for higher debt balance in the recent years.

Kar and sahoo (2001) finds that the average growth rate of current assets is high in Bajaj Auto Ltd. It is observed that there exists a high degree of positive correlation between sales and current assets.

Sankaran (2002) made a financial performance evaluation of ten (five Indian and five MNC'S) Pharmaceutical companies in India. The financial performance was analyzed with the help of liquidity, profitability and solvency perspectives. The companies were ranked for assessing corporate excellence by ET-HBSAT model, bankruptcy and average return on net worth with the help of Altman model. It identified that the financial performances of MNC Pharma companies were better than the Indian companies.

Mulia (2002) in his study on evaluation of financial health of textile mills found using ' Z ' score analysis that the textile mills were on the verge of financial collapse. The position of its performance front was very unviable. The textile mills had failed to achieve the sales target set for different years mainly due to the low achievement of production performance and underutilization of the existing capacity.

Fu et al. (2002) examined the relationship between profitability and financial capital for 1,276 small firms in Taiwan over the period 1992-1997. The results indicated a statistically positive relationship between profitability and capital growth. When financial capital was further divided into debt and equity, the results indicate a significantly positive relationship between profitability and equity financing, but a significantly negative relationship between profitability and debt financing.

Patel (2004) in his study made an attempt to examine the profitability of Colour–Chem Limited during the period 1981-1999. The multiple correlation coefficient technique was used for analyzing the impact of net fixed assets, sales and net worth on the profitability. The result of the study showed that sales and net fixed assets, sales and net worth, and net fixed assets and net worth had significant effect on net profit of colour–Chem limited. The analysis of profitability ratios showed that the company was in a round positions.

Kasturi Rangan, S.(2008) in his study made an attempt to identify the factors determining the profitability of the banks on the basis of partial correlation co efficient for the period from March 2000 to 2007. These banks were categorized into 5 different groups for the purposes of analysis.

Objectives of the Study:

Literature Review shows that there is scanty research on Performance analysis on Pharma Sector. This way, present study is valuable attempt to original contribution.

Thus, in order to fill in the gap of research, this paper sets the objective to analyse the trends of production, sales and costs of the selected pharmaceutical units in India and to find their efficiency of operation of selected Pharma companies.

Period of study

The period of ten years from 2005-06 to 2014-15 is selected for the study of performance efficiency analysis of the pharmaceutical industry in India as the period is cyclically well balanced, reasonably homogenous, reliable and upto-date financial data are available. Further, the period is an era of growth of Indian Pharmaceutical industries with genuine economic significance as these are early years of liberalization and globalization.

Selection of sample

There are seventeen companies operating in Pharmaceutical Industry in India. But, owing to several constraints such as non-availability of financial statements or non-working of a company in a particular year etc. the researcher is compelled to restrict the number of sample companies to ten.

Source of data

The study is mainly based on secondary data collected from "PROWESS" database, which is the most reliable on the empowered corporate database of Centre for Monitoring Indian Economy (CMIE). It contains a highly normalized database built on a sound methodology on

around 12,000 companies of India, which include public, private, co-operative and joint sector companies. The database provides financial statements, ratio analysis, funds flow, cash flow, product profiles, returns and risk on the stock market etc.

Besides prowess databases, relevant secondary data have also been collected from BSE Stock Exchange Official Directory, CMIE Publications, Annual Survey of Industry, Business newspapers, Reports on Currency and Finance, and through Internet etc. The study required variety of data therefore; websites like http://indiainfoline.com, www.indiastat.com and www.google.com have been comprehensively searched.

Limitations of the study

Data used in this study have been taken only secondary sources and findings depends entirely on the accuracy of such data at the source.

Results and Discussions

1. Trends in Production

In business enterprise, production is considered to be very effective and useful when it serves the dual purpose: 1) It must operate primarily to satisfy customer demands and 2) It must permit production activities to operate in an economical and efficient manner. In the economic sense "production" means both making goods and rendering services that add value to a product.

Ho1: There is no significant difference between actual value of and the trend value of production among different years in Pharma. Industry.

The value of production of the pharmaceutical industry for the period of study from 2005-06 to 2014-15 has been shown in Table 1.The production of pharmaceutical industry has marked an increasing trend throughout the period. In the year 2005-06, the production was Rs.13.627.20 crore which increased to Rs.59320.27 crores in 2014-15, an increase of 435.31 per cent in the indices. The mean value of production of pharmaceutical industry during the study period was Rs.33143.97 crores. The compound annual growth rate of production was 15.85 per cent. The CV value of actual value of production was 32.88 per cent which

indicates fluctuation in the production of pharmaceutical industry during study period.

The comparison of actual value of production has been shown in Table 1 which depicts that the trend values differed from the actual production. The original values of production were lower than the trend values in 2007-08, 2008-09, 2009-10, 2010-11 and 2011-12. It may be pointed out that in the remaining year, the original values of production were higher than the trend values. The calculated c^2 value comes to 63983.39 which is higher than the table value of 16.919 at 5 per cent level. It indicates that the differences between actual values of production and trend values of production in different years were significant.

2. Trends in Sales

'Sales' is the indicator of the operational efficiency of management in how efficiently the management has used the assets of the business. The higher amount of sales more profitable the business is and vice versa. The trend of sales indicates the direction in which a concern is going and on the basis of which forecast can be made. The trend analysis of sales helps to understand the growth of a business enterprise.

Ho2: There is no significant difference between the actual value and trend value of sales among different years for Pharma Industry

The value of sales of the pharmaceutical industry for the period of study from 2005-06 to 2014-15 has been shown in Table 1. The actual sales of pharmaceutical industry have marked an increasing trend throughout the period. In the year 2005-06 the sales were Rs.13367.30 crores which increased to 58093.50 crores in 2014-15, marking an increase of 434.59 indices. The mean value of sales during the study period was Rs.32562.73. The SD and CV value were 15338.03 and 47.10 per cent which indicate more fluctuation in the sales of pharmaceutical industry during the study period. The CAGR values were registered at 2.93 per cent.

The comparison of actual value of sales and trend value of sales have been shown in Table 1 which depicts that the trend values differed from actual sales except in the year 2008-09 and 2013-14. The original values of sales were lower than the trend values in the year 2007-

08, 2008-09, 2009-10, 2010-11 and 2011-12. In the remaining years, the original values of sales were higher than the trend values. The calculated c^2 value comes to 62883.70 which is higher than the table value of 16.919 at 5 per cent level. It indicates that the differences between actual value of sales and trend value of sales in different years were significant.

3. Trends in Cost of Production

The price for the product is usually fixed by taken into account the cost of the production and adding a mark-up which may be stated as a percentage of the cost for profit. The unit cost of production is determined by the sum of the cost of the resources that went into making it. The cost can be composed of the material costs, wage costs, manufacturing costs, power and fuel costs etc. If there is better utilization of plant and the use of better technology, the cost of production falls. In the same manner, a fall of prices of inputs like raw materials, or a fall in transport charges will also reduce the average cost of production.

Ho3: There is no significant difference between Actual Values and Trend Values of Cost of Production in different years in Pharma Industry.

The cost of production of pharmaceutical industry for the period of study from 2005-06 to 2014-15 has been shown in Table 2. The cost of production of pharmaceutical industry has marked an increasing trend throughout the period. The mean value of cost of production of pharmaceutical industry during the study period was Rs.20740.49 crores. The SD and CV values of cost of production were 9450.06 and 45.56 per cent respectively during the study period. The CAGR value was marked 15.10 per cent.

The comparison of actual value and trend value of cost of production has been depicted in Table 2 which shows that the trend values were different from the actual value of cost of production except during the year 2005-06 to 2014-15. The original values of cost of production were lower than the trend values from 2008-09 to 2011-12. It may be pointed out that this was the lowest cost of production for the pharmaceutical industry. In the remaining year, the original values of cost of production were higher than the trend values. The calculated c^2 value comes to 37521.15 which is

higher than the table value of 16.919 at 5 per cent level of significance. It indicates that the difference between the actual and trend values of cost of production in different years were significant.

4. Trends in Raw Material Expenses

Raw material is a very important factor of production and largest component of costs. According to the Indian Association of Materials Management, 64 paise in a rupee are spent on raw materials by Indian industries. The figure has been arrived at by adding the cost of opening stock of raw materials to the purchase of raw material and deducting the cost of closing stock.

Ho4: There is no significant difference between actual values and trend values of raw material expenses in different years for Pharma Industry.

The value of raw material expenses of pharmaceutical industry during the study period from 2005-06 to 2014-15 has been shown in Table 2. The raw material expenses of pharmaceutical industry have marked an increasing trend throughout the period. In the year 2005-06, raw material expenses was Rs.6324.91 crores which crossed the mark of Rs.9028.15 crores during the year 2007-08 and reached Rs.22137.11 crores in the year 2014-15, marking an increase of 350.00 indices. The mean value of raw material expenses was Rs.13317.86 crores. The SD and CV values were 5382.92 and 40.42 per cent respectively which indicates more fluctuation in the raw material expenses of pharmaceutical industry during the study period. The CAGR value was 13.35 per cent.

The actual and trend value of raw material expenses comparison shown in the Table 2 depicts that the trend value differed from the actual value of raw material. The original values were lower than the trend values from 2008-09 to 2011-12. It indicates during the years the lower raw material expenses were incurred. In the remaining years, the original values were higher than the trend values. The calculated c^2 value comes to 19154.56 which is higher than the table value of 16.919 at 5 per cent level. It indicates that the differences Rs.1464.61 crores between actual value and trend value of raw material expenses in different years were significant.

5. Trends in Wages and Salaries Expenses

The amount paid to employees by way of salaries, wages, bonus, gratuities, and contribution towards the provident funds, superannuation funds, family pension scheme, staff welfare expenses, Voluntary Retirement Service (VRS) compensation funds have been classified as 'Wages and Salaries' in the present study.

Ho5: There is no significant difference between actual value and trend value of wages and salaries expenses among different years.

The value of wages and salaries expenses of pharmaceutical industry for the period of the study from 2005-06 to 2014-15 has been shown in Table 3. The wages and salary expenses of pharmaceutical industry have marked an increasing trend from 2004-05 and 2005-06 which increased upto 123.54 indices. In the year 2007-08 to 2012-13, the wages and salaries expenses declined to Rs.5311.89 crores and again increased to Rs.7557.71 crores in 2014-15, marking an increase of 685.44 indices from 2005-06 to 2014-15. The mean value of wages and salaries expenses was Rs.3552.84 crores. The SD and CV values were 2265.33 and 63.76 per cent which indicates the fluctuation found during the study period. The CAGR value was 21.23 per cent.

The comparison of actual value and trend value of wages and salaries expenses is depicted in the Table 3 which shows that the trend values differed materially from the actual wages and salaries expenses except the years from 2005-06 to 2014-15. The actual value of wages and salaries expenses is lower than the trend value during the year 2007-08 to 2012-13. The actual value is higher than the trend value in 2005-06, 2006-07, 2013-14 and 2014-15. It may be pointed out that the higher wages and salaries expenses were incurred the pharmaceutical industry. The calculated c^2 value is 12253.71 which is higher than the table value of 16.919 at 5 per cent level of significance. It indicates that the difference between actual and trend values of wages and salaries in different years were significant.

6. Trends in Manufacturing Expenses

The manufacturing expenses include freight inwards and transportation, packaging materials, job work/contract/processing charges, stores consumed, repairs on plant and machinery/buildings, technical fees paid, license fee/operation charges and other operating expenses have been grouped as manufacturing expenses for the purpose of the study.

Ho6: There is no significant difference between actual value and trend value of manufacturing expenses in different years in Pharma Indistry .

The manufacturing expenses of pharmaceutical industry for the period of study from 2005-06 to 2014-15 have been shown in Table 3. The manufacturing expenses marked an increasing trend throughout the study period. In the year 2005-06, the manufacturing expenses were Rs.784.85 crores which increased to Rs.3630.36 crores in 2006-07, marking an increase of 462.55 per cent in the indices. The mean value was Rs.1911.56 crores. The CAGR value was 16.55 per cent. The SD and CV values were 884.33 and 46.26 per cent which shows more fluctuation in the manufacturing expenses of Pharmaceutical industry during the period under study.

The comparison of actual and trend value of manufacturing expenses of pharmaceutical industry has been shown in Table 3 which depicts that the trend value differed materially from the actual manufacturing expenses. The original values of manufacturing expenses were lower than the trend values from 2009-10 to 2012-13. In the remaining years the original values were higher than the trend values. The c^2 value comes to 3405.20 which is found to be statistically significant. It indicates that the differences between the actual and trend of manufacturing expenses in different years were significant.

7. Trends in Power and Fuel Expenses

Electricity expenses in pharmaceutical industry play a vital role. For the purpose of analysis any expenses related to electricity and for other fuel have been considered under this study.

Ho7: There is no significant difference between the actual and trend value of power and fuel expenses among different years.

The power and fuel expenses of pharmaceutical industry for the period of study from 2005-06 to 2014-15 have been shown in Table 3. The power and fuel expenses of pharmaceutical industry have marked an increasing trend throughout the period. In the year 2005-06,

the power and fuel expenses were Rs.387.40 crores which increased to Rs.1809.80 crores marking an increase of 467.17 per cent of the indices. The mean value of power and fuel of pharmaceutical industry during the study period was Rs.1016.52. The SD and CV were 538.07 and 52.93 per cent respectively which indicates that there was fluctuation found during the study period. The CAGR value was 16.67 per cent.

The actual and trend values of power and fuel expenses comparison are depicted in Table 3 which shows that the trend value differed materially from the actual value of power and fuel expenses except in the year 2007-08. The original values of power and fuel expenses were lower than the trend values from 2007-08 to 2010-11. In the remaining years, the original values of power and fuel expenses were higher than the trend values. The calculated c^2 value comes to 2441.57 which is found to be statistically significant. It indicates that the differences between actual and trend values of power and fuel expenses in different years were significant.

8. Trends in Selling and Administrative Expenses

Selling and distribution expenses include the amount spent in the sales process and promotion and delivery of goods sold. The expenses relating to advertisement, commission to selling agents, marketing expenses, service charges, delivery charges, freight and transportation etc. are covered under the above head. The expenses relating to office and general administration of companies like the director's remuneration, legal expenses, rent, rates, taxes and depreciation of office building and equipment have been grouped as administrative expenses.

Ho8: There is no significant difference between actual value and trend value of selling and administrative expenses among different years.

The selling and administrative expenses of pharmaceutical industry during the study period from 2005-06 to 2014-15 have been shown in Table 4. The selling and administrative expenses of pharmaceutical industry marked an increasing trend throughout the period. In the year 2005-06 the selling and administrative expenses were Rs.2137.25 crores which increased to Rs.8093.15 crores in 2014-15, marking an increase of 378.67 per cent of indices. The mean value

was Rs.4821.63 crores. The SD and CV values were 1965.48 and 40.76 per cent respectively which indicates that fluctuation was found in the selling and administrative expenses of pharmaceutical industry during the study period. The CAGR value was 14.24 per cent.

The actual and trend value of selling and administrative expenses comparison is depicted in the Table 4 which shows that the trend value differed materially from the actual value of selling and administrative expenses. The original values lower than the trend values from 2009-10 to 2011-12. It indicates that the lower selling and administrative expenses growth were found in pharmaceutical industry. In the remaining years, the original values were higher than the trend values. The calculated c^2 value comes to 7034.15 which is found to be statistically significant. It indicates that the differences between actual value and trend value of selling and administrative expenses in different years were significant.

9. Trends in Miscellaneous Expenses

The miscellaneous expenses include donations, loss on sale of assets, loss on sale of investments, loss on revaluation of investment, bad debts, expenses amortized, provision on doubtful loan/deposit/advances and other provision for contingency have been considered under this head for the purpose of the study.

Ho9: There is no significant difference between actual value and trend value of miscellaneous expenses among different years.

The miscellaneous expenses of pharmaceutical industry during the study period from 2005-06 to 2014-15 have been shown in Table 4. The miscellaneous expenses of pharmaceutical industry have marked an decreasing trend during the year 2005-06, 2006-07, 2007-08, 2010-11, 2012-13, 2013-14 and 2014-15 then slightly increase in 2008-09, 2009-10 and 2011-12 finally, it shows a fluctuating trend throughout the study period 2005-06 to 2014-15. In the year 2005-06, the miscellaneous expense were Rs.483.25 crores which increased to

in 2014-15. In 2007-08, 2010-11, 2012-13 and 2014-15 indices value showed decreasing and finally an index of the study period was 303.08 per cent. The mean value was Rs.1273.91 crores. The SD and CV values were 611.10 crores and 47.97 respectively which indicates that fluctuation was found in the miscellaneous expenses of pharmaceutical industry during the study period. The CAGR value was 11.73 per cent.

The actual and trend value of miscellaneous expense comparison is depicted in the Table 1 which shows that the trend values are different from the actual value of miscellaneous expenses except in 2011-12. The original values were lower than the trend values in the year 2005-06, 2006-07, 2007-08, 2010-11, 2012-13, 2013-14 and 2014-15. In the remaining years, the original values were higher than the trend values. The calculated c^2 value comes to 887.55 which is higher than the table value of 16.919 at 5 per cent significant level. It indicates that the differences between actual value and trend value of miscellaneous expenses in different years were significant.

The Table 5 explains the cost structure of pharmaceutical industry. The proportion of raw material cost with 51.43 per cent is the highest followed by wages and salaries with 13.72 per cent, manufacturing expenses with 7.38 per cent, power and fuel with 3.93 per cent, selling and administrative expenses with 18.62 per cent and miscellaneous expenses with 4.92 per cent during the study period.

Conclusion:

This study finds that there has been an increasing trends of all factor considered throughout the period except in 2007-08 and 2009-10. The cost structure analysis also reveals a significant increasing trend during the study period. To find out the difference between actual and trend values of production, sales and respective expenses, chi-square test has been applied. The results of the analysis reveal that computed chi-square value is greater than the critical value. Hence, the hypotheses are rejected. It is concluded that "There are significant difference between actual and trend values of production, sales and respective expenses."

References:

1. Agiomirgianakis, G., Voulgaris, F. & *Papadogonas* T. (2006) Financial factors affecting profitability and employment growth: the case of Greek manufacturing, *International Journal of Financial Service Management*, 1 (2/3). 232-242. doi.10.1504/IJFSM.2006.009628

2. Bardia,S.C. (2004). Liquidity management- A case study of steel Authority of India, Finance India 16 (3).463-467.

3. Bhayani , S. J. (2006). Financial Performance in paper Industry – A case study, The Management Accountant,30(5). 327-336

4. Glen, J., Lee, K. and Singh, A. (2002). Corporate profitability and the dynamics of competition in emerging markets – A time series analysis, ESRC Center for Business Research, University of Cambridge, Working Paper No.248.

5. Hamasalakshmi and Manickam (2005). "Financial performance analysis of selected software companies", Finance India, 19(3) . 915–935

6. Kaen, F. R. and Baumann, H. D. (2003). Firm Size, Employees and Profitability in U.S. Manufacturing Industries doi.org/10.2139/ssrn.382402 Available at SSRN: https://ssrn.com/abstract=382402 Accessed on July 10, 2006.

7. Kantawala A S. (2001-02) "Financial performance of Non Banking Finance companies in India", *The Indian Economic Journal* 49(1). 88-92.

   Kar.N.C and sahoo,s.k,(2001) "Working capital management. A comparison of Bajaj Auto ltd and Telco" *JIMS 8m*. Jan-March. 20-24.

8. Krishna, P.K. (2013) The study was designed to investigate the progress of Indian cements Published by European Centre for Research, Training and Development, UK British Journal of Marketing Studies 1(1) .1-15.

9. Leahy, A. S. (2004). The determinants of profitability in the Liquor Industry, Briefing Notes in Economics, No.61. 1-6.

10. Luther, C.T.R. (2007), Liquidity, Risk and profitability analysis: A case study of. Madras Cements Ltd. The management accountant, 42(10). 784-789.

11. Mansur M. A. (2002). Use of 'Z' Score Analysis for Evaluation of Financial Health of Textile Mills – A case study", Abhigyam. 19(4). 37-41.

12. Muslumov, A. (2005). The Financial and operating performance of privatized companies in Turkish cement Industry, METU studies in Development, 32(1). 59-100.

13. Nand Kishore Sharma (2002) Financial appraisal of cement Industry in India, The management Accountant. August. 622-625.

14. Padmaja, M. (2002) "*An Analystical study in Profitability of cement industry in India* ". Unpublished Thesis, Bharathiar University. Patel, D.M.(2004). Proft and Profitability (A case study of Colour-Chem Limited), ACCSTResearch Journal, II(2). 89- 95

15. Prasad Sangameshwaran(2002) 'Cementing Brand Equity', Indian Cement Review', October. 5-6.

16. Rangan, K. S. (2008) "Determinants of Profits and Banks - Studying their correlation". The Indian Banker, (3).52-54.

17. Ray, S. and Pal M. K. (2010) "Trade Liberalization and Industrial Performance of Cement Industry in India, International Journal of Productivity and Quality Management, 6 (3). 332-353.

18. Reddy, B. R. and Reddy, B. Y. (2007) A case study, The management Accountant, 35(5). 377-378.

19. Shanmugasundaram and Ratnam (2002) "Measures for Sustaining Profitability of Spinning Mills", *The South India Textile Research Association, Coimbatore*, 47(5). 1-36.

20. Sankaran (2002) "Financial performance evaluation of pharmaceutical companies in India", Finance India, 16(3). 1059-1061.

22. Sarangarajan, T. (2095) Financial Ratio Analysis of the Electric power Industry, Asia –pacific Journal of operational Research, 22(3)513-528

23. Sueyoshi, T. (2005). Financial Ratio Analysis of the Electric power Industry, *Asia –pacific Journal of operational Research*, 22 (3). 349-376.

Tze-wei Fu, Mei-Chiu ke and Yen-Sheng Huang (2002) Capital Growth, Financing source and profitability of small Business: Evidence from Taiwan Small Enterprises, Small Business Economics. 18(4), 257-267.

24. Victoria Bellou, Andronikidis,(2009) Examining Organizational climate in Greek Hotels journal of contemporary Hospitality management, 2009, vol.21, issue: 3. 294-30.

Table 1
Actual Value and Trend Value of Production of Pharmaceutical industry

(Values Rs. In Crores)

Year	Production	Indices	Trends Values (YC)	Sales	Indices	Trends Values (Yc)
2005-06	13627.20	100.00	10328.93	13367.30	100.00	10143.80
2006-07	18111.82	132.91	15398.94	17847.51	133.52s	15125.79
2007-08	20103.29	147.52	20468.94	19688.22	147.29	20107.77
2008-09	23566.43	172.94	25538.95	23219.64	173.70	25089.75
2009-10	26910.83	197.48	30608.96	26200.27	196.00	30071.73
2010-11	32407.64	237.82	35678.97	31936.45	238.91	35053.72
2011-12	37904.47	278.15	40748.98	37457.60	280.22	40035.70
2012-13	46155.98	338.70	45818.99	45151.22	337.77	45017.68
2013-14	53331.74	391.36	50889.00	52665.55	393.99	49999.67
2014-15	59320.27	435.31	55959.01	58093.50	434.59	54981.65
Mean	33143.97	Computed X^2 Value = 63983.39		32562.73	Computed X^2 Value = 62883.70	
SD	15609.02	Critical Value of X^2 with (n-1)=9, Degree of freedom is 16.919 at 5% Significant Level		15338.03	Critical Value of X^2 with (n-1)=9, Degree of freedom is 16.919 at 5% Significant Level	
CV (%)	32.88			47.1		
CAGR (%)	15.85	Result : H_o is Rejected		2.93	Result : H_o is Rejected	

Table 2
Actual Value and Trend Value of Cost Production, Expenses of Raw Material
of Pharmaceutical industry

(Values Rs. In Crores)

Year	Cost of Production	Indices	Trends Values (YC)	Raw Material Expenses	Indices	Trends Values (Yc)
2005-06	9060.86	100.00	6919.69	6324.91	100.00	5404.90
2006-07	11231.57	123.96	9990.98	7743.25	122.42	7163.34
2007-08	13072.16	144.27	13062.27	9028.15	142.74	8921.77
2008-09	15061.36	166.22	16133.56	10031.52	158.60	10680.21
2009-10	16643.83	19204.85	19204.85	11399.76	180.24	12438.64
2010-11	20564.37	226.96	22276.13	13282.24	210.00	14197.08
2011-12	23832.43	263.03	25347.42	15088.35	238.55	15955.51
2012-13	28727.26	317.05	28418.71	18440.35	291.55	17713.95
2013-14	32238.76	355.80	31490.00	19702.95	311.51	19472.38
2014-15	36972.29	408.04	34561.28	22137.11	350.00	21230.81
Mean	20740.49	Computed X^2 Value = 37521.15		13317.86	Computed X^2 Value = 19154.56	
SD	9450.06	Critical Value of X^2 with (n-1)=9, Degree of freedom is 16.919 at 5% Significant Level		5382.92	Critical Value of X^2 with (n-1)=9, Degree of freedom is 16.919 at 5% Significant Level	
CV (%)	45.56			40.42		
CAGR (%)	15.1	Result : H_o is Rejected		13.35	Result : H_o is Rejected	

Table 3
Actual Value and Trend Value of Production, Wages & Salaries, Manufacturing, Power & Fuel, Selling & Administrative and Miscellaneous of Pharmaceutical industry

(Values Rs. In Crores)

Year	Wages and Salaries Expenses	Indices	Trend Values (Yc)	Manuf-acturing Expenses	Indices	Trend Values (Yc)	Power & Fuel Expenses	Indices	Trend Values (Yc)
2005-06	1102.60	100.00	283.89	784.85	100.00	647.56	387.40	100.00	236.01
2006-07	1362.16	123.54	1010.33	1079.72	137.57	928.45	479.75	123.84	409.46
2007-08	1635.19	148.30	1736.76	1234.81	157.33	1209.33	544.80	140.63	582.90
2008-09	1984.67	180.00	2463.19	1572.67	200.38	1490.22	649.82	167.74	756.35
2009-10	2389.15	216.68	3189.63	1615.08	205.78	1771.11	714.93	184.55	929.80
2010-11	3501.64	317.58	3916.06	1771.66	225.73	2052.00	1022.05	263.82	1103.24
2011-12	4256.32	386.03	4642.49	2080.31	265.06	2332.89	1278.47	330.01	1276.69
2012-13	5311.89	481.76	5368.92	2316.55	295.16	2613.78	1620.51	418.30	1450.14
2013-14	6427.09	582.90	6095.36	3029.56	386.00	2894.67	1657.67	427.90	1623.58
2014-15	7557.71	685.44	6821.79	3630.36	462.55	3175.56	1809.80	467.17	1797.03
Mean	3552.84	Computed X^2 Value = 12253.71		1911.56	Computed X^2 Value = 3405.20		1016.52	Computed X^2 Value = 2441.57	
SD	2265.33	Critical Value of X^2 with (n-1)=9, Degree of freedom is 16.919 at 5% Significant Level	884.33		Critical Value of X^2 with (n-1)=9, Degree of freedom is 16.919 at 5% Significant Level	538.07		Critical Value of X^2 with (n-1)=9, Degree of freedom is 16.919 at 5% Significant Level	
CV (%)	63.76		46.26			52.93			
CAGR(%)	21.23	Result : H_o is Rejected	16.55		Result : H_o is Rejected	16.67		Result : H_o is Rejected	

Table 4
Actual Value and Trend Value of Selling & Administrative and Miscellaneous of Pharmaceutical industry

(Values Rs. In Crores)

Year	Selling & Administrative Expenses	Indices	Trend Values (Yc)	Miscellaneous Expenses	Indices	Trend Values (Yc)
2005-06	2137.25	100.00	1936.35	483.25	100.00	747.09
2006-07	2695.53	126.12	2577.53	583.54	120.75	864.17
2007-08	3429.41	160.46	3218.70	484.01	100.16	981.24
2008-09	3909.20	182.91	3859.87	1868.90	386.74	1098.31
2009-10	4214.76	197.20	4501.04	1944.59	402.40	1215.38
2010-11	4611.57	215.77	5142.21	972.35	201.21	1332.45
2011-12	5368.95	251.21	5783.38	2074.45	429.27	1449.52
2012-13	6432.62	300.98	6424.56	1349.60	279.28	1566.59
2013-14	7323.83	342.68	7065.73	1513.84	313.26	1683.66
2014-15	8093.15	378.67	7706.90	1464.61	303.08	1800.73
4821.63	Computed X^2 Value = 7034.15			1273.91	Computed X^2 Value = 887.55	
1965.48	Critical Value of X^2 with (n-1)=9, Degree of freedom is 16.919 at 5% Significant Level			611.1	Critical Value of X^2 with (n-1)=9, Degree of freedom is 16.919 at 5% Significant Level	
40.76				47.97		
14.24	Result : H_o is Rejected			11.73	Result : H_o is Rejected	

Sources : Annual Reports of the Respective units

Table 5

COST STRUCTURE OF PHARMACEUTICAL INDUSTRY

(2005-06 to 2014-15)

S.No	Cost Structure	Average Values (Rs. In Crores)	Percentage as Total
1	Raw Material Expenses	13317.86	51.43
2	Wages & Salaries Expenses	3552.842	13.72
3	Manufacturing Expenses	1911.557	7.38
4	Power & Fuel Expenses	1016.52	3.93
5	Selling & Administrative Expenses	4821.627	18.62
6	Miscellaneous Expenses	1273.914	4.92
	Total	**25894.32**	**100.00**

Sources: Computed