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**DIMENSIONS OF OPERATIONAL EFFICIENCY OF INDIAN PAINT INDUSTRY: AN EMPIRICAL STUDY**

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**ABSTRACT**

*The operating efficiency of a corporate enterprise has been measured in terms of production, capacity utilisation, sales and market share. The study aims to the operating efficiency of companies so as to determine the overall success of an industry. The growth of the industrial sector promises to spur employment opportunities, increases per capita income, improve the standard of living and increases GDP and tax revenue of the government. Hence, it is necessary to study the operating efficiency of companies so as to determine the overall success of an industry. In this paper, an attempt has been made to analyse the production, capacity utilization, sales and market share of selected companies in Indian Paint Industry. The results of the study revealed fluctuating trend in all the period. The projections obtained through linear time trend model revealed that majority of the selected companies in Indian Paint industry showed increasing trend of production, capacity utilization, sales and market share in the years to come.*

**KEYWORDS**

Indian Paint Industry, Operating Efficiency, Production, Capacity Utilization, Sales and Market Share.

**INTRODUCTION**

 Operational Efficiency of an organization is the ability utilizes its available resources to the maximum extent. Operational Efficiency can be judged in the light of financial efficiency. It is the capability of an enterprise to deliver products or services to its customers in the most cost-effective manner possible while still ensuring the high quality of its products, service and support. Operational efficiency is often achieved by streamlining a company's core processes in order to more effectively respond to continually changing market forces in a cost-effective manner. In order to attain operational efficiency a company needs to minimize redundancy and waste while leveraging the resources that contribute most to its success and utilizing the best of its workforce, technology and business processes. The reduced internal costs that result from operational efficiency enable a company to achieve higher profit margins or be more successful in highly competitive markets. When improving operational efficiency, the output to input ratio improves. Inputs would typically be money (cost), people (headcount) or time/effort. Outputs would typically be money (revenue, margin and cash), new customers, customer loyalty, market differentiation, headcount productivity, innovation, quality, speed & agility, complexity or opportunities. It can be said that production trend, capacity utilisation, sales trend, market share and operating expenses provides good indicators measure of operational efficiency.

**PROBLEM STATEMENT**

Production is considered as the backbone of the manufacturing sector. Production function is considered as the effective tool to satisfy the customers' demand and to operate in an economical and efficient manner. The study of the production performance is important to know the operating level of the business and financial efficiency of the business enterprise. Survival of the business in the present competitive world depends on the quality production and the technological development in the business. Therefore, the present study attempts to study the production trend of the Indian paint industry. Further the analysis of capacity utilization can significantly provide the production performance of the industry as a whole. Therefore an attempt has also been made to study about the capacity utilisation of the selected sectors of the Indian paint industry. Sales are the important component for the development of the business. Sales can be enhanced only by following good sales policy. Due to the pricing policy of the government, the companies have to face some fluctuations in the sales. These fluctuations may lead to increase or decrease the financial risk of the companies. In order to study the sales trends of the paint industry in India, the present study is carried out. Further, an attempt has also been made to analyze the market share of each of the selected companies.

**SELECTION OF INDIAN PAINT INDUSTRY**

India is the second largest paint market with an annual demand of over two million tonnes, again second only to China. The Indian paint industry has overcome a long way from the days when paints were considered a luxury item. Today the awareness level on preventing corrosion through paints is relatively high, a development that should be a huge boost to the paint industry. The industry has witnessed increased activity in the industrial variety of paints with entry on MNC's in auto, consumer durables, etc. India's strong economic growth has propelled the paint industry to double-digit growth over the past few years and has made it Asia Pacific's fastest growing paint market. Despite fast growth, India's per capita paint consumption is still abysmally low at 2kg/year. Due to increased Government funding for infrastructure, demand for paints both in industrial and decorative segment is set to rise, thereby rendering Indian paint industry to be poised for further growth. Thus the Indian paint industry is in its growth phase and is expected to grow at a rate faster than that of GDP. The future prospects of the industry are strong. The Indian Paint industry has achieved growth of around 15 per cent to 16 per cent per year in the past five years, which is 1.5 times India's Gross Domestic Product (GDP) growth. The Indian paint industry saw a significant change in reduction of excise duties, custom duties which led to reduction in the prices of raw materials. Also, there was a restriction on increasing the capacity of plant which was removed afterwards by the government. The sector experienced a lot of capacity expansion, joint ventures with foreign companies, foreign acquisitions and investments in technology in the last decade. Thus, India has become a very viable option for establishment of paint manufacturing plants. Hence, there's a huge opportunity in the country and the industry is expected to continue with double-digit growth from 2015 to 2020. Therefore, paint industry has been selected for the study. Further, to meet the needs of growing population of India, production of paint products should be increased. To increase the production of paint products, a clear and elaborate operational efficiency is to be made to encourage entrepreneurship.

**OBJECTIVES OF THE STUDY**

The primary purpose of the present study is to obtain a true insight into the operational efficiency of the selected companies of Indian paint industry. An appraisal of the operational efficiency is made from the accounting point of view to assess the effectiveness of plans, policies and objectives of the companies of



Indian paint industry. However, the specific objective of the study is to analyse the trend of production, capacity utilization, sales and market share of the selected companies in Indian paint industry.

## METHODOLOGY

### SELECTION OF SAMPLE

Keeping in view the scope of the study, it is decided to include all companies under Indian paint industry working before or from the year 2000-01. But owing to several constraints such as non-availability of financial statement or non-working of a company in a particular year etc., it is compelled to restrict the number of sample companies to six. There are 40 companies operating in the Indian Paint Industry. The following criteria were used to select the companies from among these 40 companies. The sample set includes: (i) Companies which are listed in BSE; (ii) Companies which are started before 2000-2001; (iii) Companies which didn't undergo merger during the period of study; (iv) Companies which provided financial data for the study period of thirteen years and (v) Companies which maintained market share more than 2 per cent. Based on above criteria, only six companies are available. Therefore, all the six companies are included in the sample. Thus the findings based on the occurrence of such representative sample may be presumed to be true representative of selected companies in Indian paint industry. The list of companies selected in the present study along with their year of incorporation, ownership and its market share is presented in Table 1. It is evident from Table 1 that the sample companies represent 79.75 per cent of market share of Indian paint sector. Thus, the findings based on the occurrence of such representative sample may be presumed to be true representative of selected companies in Indian paint industry.

An attempt has also been made to estimate time trend co-efficient for production, capacity utilisation, sales and market share of selected companies in Indian paint industry during the study period by fitting a linear regression model. The linear model fitted is as follows:

$$P = \alpha + \beta t + e$$

Where,

**P** - measures the firm's rate of production / capacity utilisation / sales / market share

**t** - the time factor

**$\alpha$  and  $\beta$**  - are intercept and co-efficient respectively

**e** - stands for error term.

To test whether the difference between actual and trend value is significant or not, the following hypothesis is framed and tested.

**H<sub>0</sub>** – There is no significant difference between the actual and trend values among different years.

(or)

**H<sub>a</sub>** – There is significant difference between the actual and trend values of production among different years.

### PERIOD OF STUDY AND SOURCES OF DATA

The analysis of financial performance of selected companies in Indian paint industry is made for a period of thirteen years from the accounting year 2000-01 to 2012-13. The thirteen years period is chosen in order to have a fairly long, cyclically well balanced, for which reasonably homogenous, reliable and up to-date financial data would be available. The study was mainly based on secondary data. Secondary data were collected from PROWESS Database, which is the most reliable and empowered corporate database of Centre for Monitoring Indian Economy (CMIE).

## ANALYSIS OF RESULTS

### PRODUCTION TREND

The term 'Production' means the creation of goods and services. It is a process of transforming (converting) inputs (raw-materials) into outputs (finished goods). It is done to satisfy human wants. However, production creates and assembly of components and finished products for sale. Three common types of manufacturing production are Make-To-Stock (MTS), Make-To-Order (MTO) and Make-To-Assemble (MTA). It is the act of creating output, a good or service which has value and contributes to the utility of individuals. Production process helps a business unit to be alive. However, production process does not necessarily involve physical conversion of raw materials into tangible goods, an input may also be intangible and an output may be intangible too. Their activities too are productive activities. Whatsoever, production may be considered as the back bone of manufacturing business enterprises.

The performance of manufacturing companies largely depends upon its performance of production. The production data of a company may give an idea as to how the company has performed in the year under review as compared to the past or how the company has performed as compared to other companies of the same industry. The production performance of the company can be measured in a number of ways. Production performance of the industry as a whole can be compared for different years; also the comparison can be done in between the competitive companies. For appraising the production performance of individual companies, production in different years can be compared and inter-company comparison between companies under study may be more meaningful for this purpose. All these techniques have been adopted to appraise the production performance of the selected companies in Indian paint industry.

The company-wise dispersion in production over the study period of 13 years is done through the estimation of mean, co-efficient of variation and compound annual growth rate. Further estimates of time trend co-efficient for production has been computed and presented in Table 2 to Table 4. The annual production of selected companies in Indian paint industry for the period of study has been shown in Table 2. Asian Paints Ltd was leading with mean value of production with 4.20 lakhs tonnes during the study period followed by Berger Paints India Ltd (1.15), Kansai Nerolac Paints Ltd (1.13), Shalimar Paints Ltd (0.37) and Akzo Nobel India Ltd (0.06). The least mean value of production was 0.05 lakhs tonnes found in Jenson & Nicholson (India) Ltd. The mean annual production of Indian paint industry during the study period was 8.69 lakhs tonnes. The CV value indicates that the production was highly fluctuated during the study period except Jenson & Nicholson (India) Ltd. whereby production was erotically fluctuated. All the selected companies except Akzo Nobel India Ltd and Jenson & Nicholson (India) Ltd registered positive CAGR of production during the study period. However Akzo Nobel India Ltd and Jenson & Nicholson (India) Ltd showed negative CAGR which indicate production of these companies had been decreased year after year. The analysis of t-test revealed that the production of all the selected companies significantly differ from the whole industry production. The analysis of variance (F ratio) also showed that the production between the year and between the companies significantly differ the during the study period.

The result of estimates of time trend co-efficient for production of selected companies in Indian paint industry are presented in Table 3 which shows that yearly increase in production was the highest in Asian Paints Ltd (0.49) as its  $\beta$  value was the highest followed by Berger Paints India Ltd (0.14), Kansai Nerolac Paints Ltd (0.14) and Shalimar Paints Ltd (0.03). The negative  $\beta$  value of Akzo Nobel India Ltd (0.01) and Jenson Nicholson (India) Ltd (0.01) implies that their production declined over the study period. Further, it is clear from the table that the calculated value of chi-square of all the selected companies was lower than table value of chi-square. Hence, the null hypothesis was accepted and it is concluded that there is no significant differences between the actual and trend value of production of all the selected companies in Indian paint industry during the study period. The projections obtained for production of selected companies in Indian paint industry are depicted in Table 4. The table explains that Asian Paints Ltd, Berger Paints India Ltd, Kansai Nerolac Paints Ltd and Shalimar Paints Ltd registered increasing trend of production, whereas Akzo Nobel India Ltd and Jenson & Nicholson (India) Ltd registered decreasing trend of production in the years to come.

### CAPACITY UTILIZATION TREND

Capacity utilisation measures the extent to which a business is using its production potential. Capacity utilisation can be defined as - the percentage of total capacity that is actually being achieved in a given period. It is often used as a measure of productive efficiency. Average production costs tend to fall as output rises – so higher capacity utilisation can reduce unit costs, making a business more competitive. So firms usually aim to produce as close to full capacity as possible. It is important to remember that increasing capacity often results in higher fixed costs. A business should aim to make the most productive use of its existing capacity. The investment in production capacity is often significant. The analyses of capacity utilization significantly prove the production performance of a company or of the industry as a whole.

The capacity utilization of selected companies in Indian paint industry from the year 2000-01 to 2012-13 was presented in Table 5 to Table 7. However, the data relating to capacity utilization of Jenson Nicholson (India) Ltd was not available in the database. Hence, this company is omitted for the analysis of trend of capacity utilization. The Table 5 shows that the Asian Paints Ltd is ahead with its leading mean value of 112.69 per cent of capacity utilization and it is followed by Shalimar Paints Ltd (85.77 per cent), Akzo Nobel India Ltd (78.78 per cent), Berger Paints India Ltd (72.56 per cent) and Kansai Nerolac Paints Ltd (67.29 per cent). The mean annual capacity utilization of Indian paint industry during the study period was 79.77 per cent. The mean value of capacity utilization varies greatly in all the selected companies in Indian paint industry under the study. The analysis of CV value indicates that the capacity utilization of all the selected companies was fluctuating during the study period. The compound annual growth rate of capacity utilization was positive in the case of Akzo Nobel India Ltd, Asian Paints Ltd, Kansai Nerolac Paints Ltd and Shalimar Paints Ltd, whereas the Berger Paints India Ltd registered negative compound annual growth rate during the study period. The analysis of t-test revealed that the capacity utilization of all the selected companies were significantly differ from the whole industry of capacity utilization whereas Akzo Nobel India Ltd and Shalimar Paints Ltd does not significantly differ from the whole industry during the study period. The analysis of variance (F ratio) showed that the capacity utilization between the years does not significantly differ and between the companies significantly differ during the study period.

The results of estimates of time trend co-efficient for capacity utilization of selected companies in Indian paint industry are presented in Table 6 which shows that the yearly increase in capacity utilization was the highest in Kansai Nerolac Paints Ltd (3.47) followed by Asian Paints Ltd (2.96), Shalimar Paints Ltd (2.18) and Akzo Nobel India Ltd (1.71) as its  $\beta$  value was highest. The negative  $\beta$  value of Berger Paints India Ltd (1.22) implies that their capacity utilization declined over the study period. Further it is clear from the table that the calculated value of chi-square of all the selected companies except Akzo Nobel India Ltd was lower than the table value of chi-square. Thus, null hypothesis was accepted and it is concluded that there is no significant differences between actual and trend value of capacity utilization. Only in the case of Akzo Nobel India Ltd it was greater than the table value of chi-square. Hence, the null hypothesis was rejected and it is concluded that there is significant differences between the actual and trend value of capacity utilization. The projections obtained for capacity utilization of selected companies in Indian paint industry by linear growth model were spelled out in Table 7. The table depicts that Akzo Nobel India Ltd, Asian Paints Ltd, Kansai Nerolac Paints Ltd and Shalimar Paints Ltd are moving towards an increasing trend. On the other hand, Berger Paints India Ltd industry registered a negative trend of capacity utilization in the years to come.

#### SALES TREND

Sales are the main source of fund to any business enterprises, to which finance is the life blood. Sales gear all other activities of business concerns. Moreover, good sales volume of a business indicates efficient management, efficient utilization of assets, higher profitability etc. Table 10 to Table 12 indicates the trend analysis of sales of selected companies in Indian paint industry which helps to understand the growth of the companies under review. The sales performance of an enterprise can be ascertained by comparing the sales with different years and by comparing between the competitive companies.

The annual sales of selected companies in Indian paint industry for the study period have been shown in Table 8. The table explains that the annual sales of whole paint industry were the mean value of Rs.90,118 millions. Asian Paints Ltd was leading mean value of sales Rs.41,653 millions followed by Kansai Nerolac Paints Ltd (Rs.16,218 millions), Berger Paints India Ltd (Rs.14,990 millions), Akzo Nobel India Ltd (Rs.9,963 millions), Shalimar Paints Ltd (Rs.3,116 millions) and the least mean value was (Rs.533 millions) of Jenson & Nicholson (India) Ltd. The analysis of CV value indicates that the sale of Shalimar Paints Ltd was highly fluctuating and remaining companies' sales were erotically fluctuated. The compound annual growth rate of all the sales of selected companies in Indian paint industry were found in positive except Jenson & Nicholson (India) Ltd during the study period. The analysis of t-test revealed that the annual sales of all the selected companies significantly differ from the whole industry sales. The analysis of variance (F ratio) also showed that the annual sales between the year and between the companies significantly differ during the study period.

The estimates of time trend co-efficient of annual sales of selected companies in Indian paint industry are shown in Table 9. The positive  $\beta$  value Akzo Nobel India Ltd, Asian Paints Ltd, Berger Paints India Ltd, Kansai Nerolac Paints Ltd, Shalimar Paints Ltd and Whole Industry imply an increasing sales trend, on the other hand negative  $\beta$  value of Jenson & Nicholson (India) Ltd showed declining trend of annual sales during the study period. The calculated value of chi-square of all the selected companies was greater than table value of chi-square. Hence, the null hypothesis was rejected and it is concluded that there is significant differences between the actual and trend value of annual sales of all the selected companies in Indian paint industry during the study period. The projections obtained for annual sales of selected companies in Indian paint industry are depicted in Table 10. The table depicts that Akzo Nobel India Ltd, Asian Paints Ltd, Berger Paints India Ltd, Kansai Nerolac Paints Ltd and Shalimar Paints Ltd and Whole Industry are moving towards an increasing trend of annual sales, whereas Jenson & Nicholson (India) Ltd registered decreasing trend of annual sales in the years to come.

#### MARKET SHARE TREND

Market share commonly means how much a company occupies its market or the contribution or participation of a company in its market. Sales performance and market share are directly proportionate to each other. The target share of the market and the expected volume of sales are the most important consideration in pricing the products. A good market share is a better indication of the progress of the company. No doubt market share can be increased besides attracting new users. The analysis of market share can also significantly prove the sales performance of a company.

The market shares of selected companies of Indian paint industry from the year 2000-01 to 2012-13 are presented in Table 11. The dispersion of market share over the study period is achieved through the estimation of mean, co-efficient of variation and compound annual growth rate. The table shows that the Asian Paints Ltd was leading mean value of 37.72 per cent followed by Kansai Nerolac Paints Ltd (15.65 per cent), Berger Paints India Ltd (14.30 per cent), Akzo Nobel India Ltd (9.14 per cent), Shalimar Paint Ltd (3.18 per cent) and Jenson & Nicholson (India) Ltd (0.79 per cent). The mean rates of market share vary greatly in all the selected companies under study. Jenson & Nicholson (India) Ltd had erotically fluctuating trend in their market share as their co-efficient of variation is the highest. On the other hand, all the other selected companies had consistent market share during the study period. The compound annual growth rate of market share of Asian Paints Ltd and Berger Paints India Ltd were positive while in the case of the remaining companies it was negative over the study period. The analysis of variance (F ratio) also showed that the market share between the years does not significantly differ whereas between the companies, it was significantly differ during the study period.

[The result of estimates of trend co-efficient for market share of selected companies in Indian paint industry are presented in Table 12 which shows that yearly increase in market share was the highest in Asian Paints Ltd as its  $\beta$  value was the highest followed by Berger Paints India Ltd. The negative  $\beta$  value of Akzo Nobel India Ltd, Jenson & Nicholson (India) Ltd, Kansai Nerolac Paints Ltd and Shalimar Paints Ltd implies that their market share declined over the study period. Further, it is clear from the table that the calculated values of chi-square of all the selected companies were lower than the table value of chi-square. Hence, the null hypothesis was accepted and it is concluded that there is no significant difference between the actual and trend value of market share of all the selected companies in Indian paint industry during the study period. The projections obtained for market share of selected companies in Indian paint industry by linear growth model have been presented in Table 13. It is found from the table that Asian Paints Ltd and Berger Paints India Ltd have grown marginally and have fast emerging growing market share and all other companies and whole industry were decline trend of market share in the years to come.

#### CONCLUSION

The results of the study revealed fluctuating trend in all the period. The projections obtained through linear time trend model revealed that majority of the selected companies in Indian Paint industry showed increasing trend of production, capacity utilization, sales and market share in the years to come. The study concluded that Asian Paints Ltd, Berger Paints India Ltd, Kansai Nerolac Paints Ltd and Shalimar Paints Ltd among the selected Indian paint companies registered improved performance for all the dimensions of operational efficiency. The sector experienced a lot of capacity expansion, joint ventures with foreign companies, foreign acquisitions and investments in technology in the last decade. Thus, India has become a very viable option for establishment of paint manufacturing plants. Hence, there's a huge opportunity in the country and the industry is expected to continue with double-digit growth from 2015 to 2020. So, there is a lot of growth potential for Indian paint companies.

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APPENDIX

TABLE 1: LIST OF SAMPLE COMPANIES INCLUDED IN THE PRESENT STUDY

S. No.	Companies	Year of Incorporation	Ownership	Market Share (%)
1	Akzo Nobel India Ltd.	1954	I.C.I (F) Group	9.70
2	Asian Paints Ltd.	1945	Asian Paints Group	35.05
3	Berger Paints India Ltd.	1923	Private (India)	13.59
4	Jenson & Nicholson (India) Ltd.	1922	Jenson & Nicholson Group	2.12
5	Kansai Nerolac Paints Ltd.	1920	Private (Foreign)	15.78
6	Shalimar Paints Ltd.	1902	Om Prakash Jindal Group	3.51
<b>Total</b>				<b>79.75</b>

Source: Prowess Database, 2013

TABLE 2: ANNUAL PRODUCTION OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY

Name of the company	Range (Lakhs in Tonnes)	Mean	CV	CAGR	t-test
Akzo Nobel India Ltd	0.02 - 0.11	0.06	0.50	- 8.75	13.23*
Asian Paints Ltd	1.84 - 7.11	4.20	0.45	11.92	20.64*
Berger Paints India Ltd	0.41 - 2.02	1.15	0.48	14.21	14.69*
Jenson & Nicholson (India) Ltd	0.01 - 0.14	0.05	0.80	- 8.22	13.31*
Kansai Nerolac Paints Ltd	0.39 - 1.99	1.13	0.49	14.55	15.00*
Shalimar Paints Ltd	0.22 - 0.52	0.37	0.29	5.95	13.38*
<b>Whole Industry</b>	<b>6.37 - 3.52</b>	<b>8.69</b>	<b>0.26</b>	<b>4.27</b>	

Source: Computed from the annual reports of the respective companies

\* Significant at 0.01 level,

F (between the year) = 3.22<sup>5</sup>; F (between the company) = 63.10<sup>5</sup>

S = Significant at 0.05 level

TABLE 3: ESTIMATES OF TREND CO-EFFICIENT FOR PRODUCTION OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY (2000-01 TO 2012-13)

Name of the company	P = α + βt + e			Calculated Value of Chi-square	Hypothesis
	α	β	R <sup>2</sup>		
Akzo Nobel India Ltd	0.09	- 0.01	0.57	0.07	Accepted
Asian Paints Ltd	0.80	0.49	0.96	0.55	Accepted
Berger Paints India Ltd	0.16	0.14	0.98	0.13	Accepted
Jenson & Nicholson (India) Ltd	0.08	- 0.01	0.21	0.32	Accepted
Kansai Nerolac Paints Ltd	0.14	0.14	0.98	0.11	Accepted
Shalimar Paints Ltd	0.19	0.03	0.84	0.05	Accepted
<b>Whole Industry</b>	<b>4.99</b>	<b>0.53</b>	<b>0.78</b>	<b>1.67</b>	<b>Accepted</b>

Source: Computed

Table value of Chi-square (0.05) = 21.0 with df = 12

TABLE 4: PROJECTIONS FOR PRODUCTION OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY (Lakhs in tonnes)

Name of the company	2014-15	2015-16	2016-17	2017-18
Akzo Nobel India Ltd	- 0.02	- 0.02	- 0.01	- 0.01
Asian Paints Ltd	7.35	7.84	8.33	8.82
Berger Paints India Ltd	2.26	2.40	2.54	2.68
Jenson & Nicholson (India) Ltd	- 0.01	0	- 0.01	- 0.01
Kansai Nerolac Paints Ltd	2.24	2.38	2.52	2.66
Shalimar Paints Ltd	0.58	0.61	0.63	0.66
<b>Whole Industry</b>	<b>12.94</b>	<b>13.47</b>	<b>14.00</b>	<b>14.53</b>

Source: Computed

TABLE 5: ANNUAL CAPACITY UTILIZATION OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY

Name of the company	Range (in Percentage)	Mean	CV	CAGR	t-test
Akzo Nobel India Ltd	51.46 - 111.20	78.78	0.27	4.68	0.03
Asian Paints Ltd	87.87 - 33.61	112.69	0.12	1.50	6.20*
Berger Paints India Ltd	61.07 - 8.56	72.56	0.11	-0.84	2.86*
Jenson & Nicholson (India) Ltd	-	-	-	-	-
Kansai Nerolac Paints Ltd	44.39 - 88.11	67.29	0.21	5.88	2.10*
Shalimar Paints Ltd	62.68 - 98.83	85.77	0.11	2.19	1.50
<b>Whole Industry</b>	<b>69.29 - 95.90</b>	<b>79.77</b>	<b>0.09</b>	<b>-2.62</b>	

Source: Computed from annual reports of the respective companies

\* Significant at 0.01 level,

F (between year) = 1.83<sup>NS</sup>; F (between company) = 222.64<sup>S</sup>

S = Significant at 0.05 level, NS = Not Significant

TABLE 6: ESTIMATES OF TREND CO-EFFICIENT FOR CAPACITY UTILIZATION OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY (2000-01 TO 2012-13)

Name of the company	P = $\alpha + \beta t + e$			Calculated Value of Chi-square	Hypothesis
	$\alpha$	$\beta$	R <sup>2</sup>		
Akzo Nobel India Ltd	66.79	1.71	0.10	63.56	Rejected
Asian Paints Ltd	91.96	2.96	0.70	6.45	Accepted
Berger Paints India Ltd	81.08	- 1.22	0.33	7.35	Accepted
Jenson & Nicholson (India) Ltd	-	-	-	-	-
Kansai Nerolac Paints Ltd	43.00	3.47	0.90	3.98	Accepted
Shalimar Paints Ltd	70.55	2.18	0.71	4.60	Accepted
<b>Whole Industry</b>	<b>89.87</b>	<b>- 1.55</b>	<b>0.65</b>	<b>3.06</b>	<b>Accepted</b>

Source: Computed

Table value of chi-square (0.05) = 21.0 with df = 12

TABLE 7: PROJECTIONS FOR CAPACITY UTILIZATION OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY (in Percentage)

Name of the company	2014-15	2015-16	2016-17	2017-18
Akzo Nobel India Ltd	92.44	94.15	95.86	97.57
Asian Paints Ltd	136.36	139.32	142.28	145.24
Berger Paints India Ltd	- 62.78	- 61.56	- 60.34	- 59.12
Jenson & Nicholson (India) Ltd	-	-	-	-
Kansai Nerolac Paints Ltd	95.05	98.52	101.99	105.46
Shalimar Paints Ltd	103.25	105.43	107.61	109.79
<b>Whole Industry</b>	<b>- 66.62</b>	<b>- 65.07</b>	<b>- 63.52</b>	<b>- 61.97</b>

Source: Computed

TABLE 8: ANNUAL SALES OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY

Name of the company	Range (Rs. in Millions)	Mean	CV	CAGR	t-test
Akzo Nobel India Ltd	3,805 - 24,050	9,963	0.63	16.40	8.11*
Asian Paints Ltd	13,737 - 1,00,454	41,653	0.67	18.03	10.34*
Berger Paints India Ltd	5,616 - 33,118	14,990	0.58	15.94	8.23*
Jenson & Nicholson (India) Ltd	185 - 1,256	533	0.67	- 5.27	7.80*
Kansai Nerolac Paints Ltd	6,744 - 3,35,854	16,218	0.56	38.50	2.40*
Shalimar Paints Ltd	1,381 - 6,002	3,116	0.48	13.03	7.87*
<b>Whole Industry</b>	<b>40,934 - 1,52,769</b>	<b>90,118</b>	<b>0.45</b>	<b>11.60</b>	

Source: Computed from annual reports of the respective companies

\* Significant at 0.01 level

F (between the years) = 9.95<sup>S</sup>; F (between the company) = 62.24<sup>S</sup>

S = Significant at 0.05 level



TABLE 9: ESTIMATES OF TREND CO-EFFICIENT FOR SALES OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY (2000-01 TO 2012-13)

Name of the company	P = $\alpha + \beta t + e$			Calculated Value of Chi-square	Hypothesis
	$\alpha$	$\beta$	R <sup>2</sup>		
Akzo Nobel India Ltd	- 451.54	1487.80	0.84	129.34	Rejected
Asian Paints Ltd	- 6074.80	6818.20	0.89	250.09	Rejected
Berger Paints India Ltd	- 168.15	2165.50	0.91	104.03	Rejected
Jenson & Nicholson (India) Ltd	783.19	-35.70	0.15	22.73	Rejected
Kansai Nerolac Paints Ltd	45,546.00	12,120.00	0.29	124.98	Rejected
Shalimar Paints Ltd	462.77	379.04	0.96	59.40	Rejected
<b>Whole Industry</b>	<b>17,024.00</b>	<b>10,442</b>	<b>0.97</b>	<b>40.41</b>	<b>Rejected</b>

Source: Computed

Table value of chi-square (0.05) = 21.0 with df = 12

TABLE 10: PROJECTIONS FOR SALES OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY (Rs. in Millions)

Name of the company	2014-15	2015-16	2016-17	2017-18
Akzo Nobel India Ltd.	21,865	23,353	24,841	26,329
Asian Paints Ltd.	96,195	1,03,013	1,09,831	1,16,649
Berger Paints India Ltd.	32,322	34,488	36,654	38,820
Jenson & Nicholson (India) Ltd.	- 247	- 211	- 176	- 140
Kansai Nerolac Paints Ltd.	1,36,254	1,48,374	1,60,494	1,72,614
Shalimar Paints Ltd.	6,149	6,528	6,907	7,286
<b>Whole Industry</b>	<b>1,73,654</b>	<b>1,84,096</b>	<b>1,94,538</b>	<b>2,04,980</b>

Source: Computed

TABLE 11: MARKET SHARE OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY

Name of the company	Range (in Percentage)	Mean	CV	CAGR
Akzo Nobel India Ltd	8.26 - 10.04	9.14	0.05	- 0.32
Asian Paints Ltd	32.74 - 42.96	37.72	0.09	2.29
Berger Paints India Ltd	13.38 - 14.88	14.30	0.03	0.87
Jenson & Nicholson (India) Ltd	0.29 - 3.00	0.79	1.24	- 17.23
Kansai Nerolac Paints Ltd	13.97 - 16.79	15.65	0.04	- 0.57
Shalimar Paints Ltd	2.83 - 3.35	3.18	0.05	- 0.90

Source: Computed from annual reports of the respective companies

F (between year) = 0.46<sup>NS</sup>; F (between company) = 886.50<sup>S</sup>  
 S = Significant at 0.05 level, NS = Not Significant

TABLE 12: ESTIMATES OF TREND CO-EFFICIENT FOR MARKET SHARE OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY (2000-01 TO 2012-13)

Name of the company	P = $\alpha + \beta t + e$			Calculated Value of Chi-square	Hypothesis
	$\alpha$	$\beta$	R <sup>2</sup>		
Akzo Nobel India Ltd	9.42	- 0.04	0.08	0.36	Accepted
Asian Paints Ltd	31.62	0.87	0.88	0.48	Accepted
Berger Paints India Ltd	13.65	0.09	0.44	0.14	Accepted
Jenson & Nicholson (India) Ltd	2.06	- 0.18	0.51	1.48	Accepted
Kansai Nerolac Paints Ltd	16.42	- 0.11	0.30	0.33	Accepted
Shalimar Paints Ltd	3.36	- 0.02	0.33	0.08	Accepted

Source: Computed

Table value of chi-square (0.05) = 21.0 with df = 12

TABLE 13: PROJECTIONS FOR MARKET SHARE OF SELECTED COMPANIES IN INDIAN PAINT INDUSTRY (in Percentage)

Name of the company	2014-15	2015-16	2016-17	2017-18
Akzo Nobel India Ltd	- 8.82	- 8.22	- 7.62	- 7.02
Asian Paints Ltd	44.67	45.54	46.41	47.28
Berger Paints India Ltd	15.00	15.09	15.18	15.27
Jenson & Nicholson (India) Ltd	- 0.64	- 0.82	- 1.00	- 1.18
Kansai Nerolac Paints Ltd	- 14.77	- 14.66	- 14.55	- 14.44
Shalimar Paints Ltd	- 3.06	- 2.76	- 2.46	- 2.16

Source: Computed



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