A Study of Sales Performance of Fertilizer Industry of Gujarat State

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Abstract

The trend analysis of sales is a guide to follow the changes that are occurring in the business from period to period. With the help of analysis of sales, one can study about the development of a business concerned. Generally, it is suggested that for proper trend analysis, the trend should be studied at least over a period of five years or more.

Presently there are 26 fertilizer companies in India, out of which, four fertilizer companies located in the Gujarat state namely - IFFCO, KRIBHCO. GSFC and GNFC have been selected for the present research study and sales trend analysis has been made for a period of six years from 2005-06 to 2010-11. Chi-square test has been applied for testing the hypothesis. For the purpose of the trend analysis of sales in the selected fertilizer companies, the year 2005-06 has been selected as the base year and the amount of sales in the base year has been taken equal to 100. On the basis of the amount of sale for the base year, index number has been calculated for the remaining years. An increase in sales index would mean improvement in sales resulting favorable position for the profitability or vice versa of a business enterprise.

1.Concepts of Trend Analysis

A trend Analysis is an important tool of interpretative analysis of the financial position of a company. Trend analysis studies the percentage relationship that each item of the financial statement bears to the same item in the base year. Trend analysis can take the form of year-to-year comparison, though the use of index number, trend series and trend ratio. For the present research study, Index has been applied.

In order to calculate a series of index numbers, a base year has to be chosen. In the base year, all items are an index of 100. In choosing the base year one should keep in mind that a normal year, in which abnormal events have not taken place, is to be choosen, if there is no year which qualifies to be the base, for whatever reason, than an "Average Concept" can be employed. Index numbers of an item for different years are calculated with reference to the base year. If the value of the item in a year is less than that is the base year, the trend percent will be below 100 and if the amount is more than base amount, the trend percentage will be above 100.

2.Objective , Hypothesis and Scope of the study

2.1 Objective of the study

The research study "A Study of Sales Performance of Fertilizer Industry of Gujarat State" is undertaken with the objective-
ØTo make comparative study of sales trend of the selected fertilizer companies.

2.2 Hypothesis of the study

For the purpose of establishing causal relationship, regression line of variable 'Y' on variable 'X' has been calculated in the selected fertilizer companies because the relationship enables in prediction and control over the future course of action. The value of 'YC' has also been computed on the basis of the respective variables. Thereafter, the Chi-square (X2) test has been applied to find out whether the difference between the actual variables and computed variables, on the regression-line in various selected fertilizer companies are significant or not.

H0: Difference in the proportion of sales over the years and among selected fertilizer companies do not differ significantly.

H1: Difference in the proportion of sales over the years and among selected fertilizer companies differ significantly.

2.3Scope of the study

Presently there are 26 fertilizer companies in India, out of which four fertilizer companies have been selected for the research study.
The criterion for selecting these four fertilizer companies is - All the fertilizer companies having plant/ plants especially in Gujarat state have been selected viz.-
(1) IFFCO, a co-operative undertaking, having plants at kalol and Kandala (2 plants) in Gujarat, Phulpur (2 plants) and Aonla (2 plants) in Uttar Pradesh;
(2) KRIBHCO, a co-operative undertaking, having plants at Hazira in Gujarat, Varanasi in Uttar Pradesh and Lanja in Maharashtra;
(3) Gujarat State Fertilizer and Chemicals Limited, a joint sector enterprise, comprising of 49% of State Government participation and 51% of Public and Financial Institutions, (today the Government's involvement has come down to 38.4%) having plant at vadodara;
(4) Gujarat Narmada Valley Fertilizers Company Limited, a joint sector enterprise promoted by the Government of Gujarat and the Gujarat State Fertilizer and chemicals Company Ltd. having plant at Bharuch.
The main source of data used for the study is secondary, drawn from annual profit & loss accountant and balance sheet figures as found in the annual reports of the selected fertilizers company.

1.Sales Trends

Sales are the life blood of an enterprise, without which no business can exist. It is the sign of the operational efficiency of management as to how efficiently the management has used the available resources of the business enterprise. The high volume of sales indicates that the management is more efficient or vice versa. Sales are the amount of the output which has been provided to the consumers. The profitability of enterprise might be affected by sales volume. If other things remain unchanged, any increase in the sales would result in an increase in profit or vice versa. An excess of sales over the cost of a product is termed as net profit, while the excess of cost of a product over sales is be termed as net loss.

The trend analysis of sales is a guide to follow the changes that are occurring in the business from period to period. With the help of analysis of sales, one can study about the development of a business concerned. Generally, it is

suggested that for proper trend analysis, the trend should be studied at least over a period of five years or more.

For the purpose of the trend analysis of sales in the selected fertilizer companies, the year 2005-06 has been selected as the base year and the amount of sales in the base year has been taken equal to 100. On the basis of the amount of sale for the base year, index number has been calculated for the remaining years. An increase in sales index would mean improvement in sales resulting favourable position for the profitability or vice versa of a business enterprise.

The trend of sales from 2005-06 to 2010-11 of the selected fertilizer companies have been shown table 1 and chart 5.

The company wise analysis is as under-

Ø Indian Farmers Fertilizer Co-operative Limited (IFFCO)

The indices of sales in Indian Farmers Fertilizer Co-operative Limited (IFFCO) have registered a fluctuating trend during the study period. In compared to base year 2005-06, it increased to 18.80 percent in 2005-06. It decreased by 18.88 percent in the year 2007-08. But these increased by 45.32 percent, 34.42 percent and 3.89 percent in the years 2008-09 to 2010-11 respectively. Thus sales have increased at the highest rate during the year 2008-09. An average sale of IFFCO from 200-02 to 2010-11 is Rs. 7386.12 crore. It shows a good performance of IFFCO during the study period.

Table 1
Sales Trend of the selected Fertilizer Companies

Company's Name	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
IFFCO						
Sales	5281.95	6274.92	5090.08	7396.98	9942.93	10330.11
Indices of Sales	100.00	118.80	81.12	145.32	134.42	103.89
KRIBHCO						
Sales	981.59	886.06	1200.96	1140.07	1508.08	1680.93
Indices of Sales	100.00	90.27	135.54	94.93	132.28	111.46
GSFC						
Sales	1954.43	1836.52	2106.24	2606.57	2830.71	3318.72
Indices of Sales	100.00	93.97	114.69	123.75	108.60	117.24
GNFC						
Sales	1404.79	1377.45	1446.84	1822.61	2147.57	2739.27
Indices of Sales	100.00	98.05	105.04	125.97	117.83	127.55

Source: Annual reports of IFFCO, KRIBHCO, GSFC and GNFC from 2005-06 to 2010-11.

Note: Indices have been calculated with the base year 2005-06 at 100 percent.

Ø Krishak Bharati Co-operative Limited (KRIBHCO)

In Krishak Bharati Co-operative Limited (KRIBHCO), the indices of sales have recorded a fluctuating trend during the study period. In compared to base year 2005-06, the indices of sales decreased by 9.73 percent in 2006-07 and increased by 35.54 percent in 2007-08, in last two year it increased by 32.28 percent and 11.46 percent 2009-10 and 2010-11 respectively. Average sales of KRIBHCO from 2005-06 to 2010-11 is Rs. 1232.95 crore.

Ø Gujarat State Fertilizers & Chemicals Ltd (GSFC)

In GSFC, the indices of sales have shown a fluctuating trend during the study period. In compared to base year 2005-06, the indices of sales decreased by 6.03 percent in 2006-07 and it increased by 14.69 percent, 23.75 percent, 8.60 percent and 17.24 percent in the years 2007-08 to 2010-11 respectively. Average sales of GSFC from 2005-06 to 2010-11 is Rs. 242.20 crore.

Ø Gujarat Narmada Valley Fertilizers Company Ltd (GNFC)

The Indices of sales in Gujarat Narmada Valley Fertilizers Company Ltd (GNFC) have recorded a fluctuating trend during the study period. In compared to base year 2005-06, the indices of sales decreased by 1.95 percent in 2006-07 and these increased by 5.04 percent, 25.97 percent, 17.83 percent and 27.55 percent in the years 2007-08 to 2010-11 respectively. Average sales of GSFC from 2005-06 to 2010-11 is Rs. 1823.09 crore.

On the basis of above analysis, it is found that the indices of sales were the highest in IFFCO during 2008-09 followed by KRIBHCO, GNFC and GSFC respectively. In 2006-07 the fertilizer companies' indices of sales were lower than base year during the study period except IFFCO. All fertilizer companies have recorded a fluctuating trend during the study period. The trend of sales indices has increased during the last two years 2009-10 and 2010-11 almost in all the companies under study, which indicates a sign of improvement of the fertilizer companies in the state.

Ü Time-series Analysis

A time-series analysis is a set of observations taken at equal intervals of time. From a long term time-series, the direction taken by it can be decided correctly. This decision of direction is termed "Fitting of the trend". For this purpose the method of least-square can be used.

An attempt has been made by the researcher to fit straight line trend of sales (Y) during the study period (X) with the help of least square method in the present research study. The straight line trend is calculated by the following equation.

$$Yc = a + bx.$$

Where, Yc shows the computed trend value, 'a' is the intercept and 'b' shows the slop of the trend line. Any change in 'Y' variable depends on the change in 'X' variable. The 'X' variable in time-series analysis shows the time.

The null hypothesis is that there is no significant different between actual sales and computed sales in the selected fertilizer companies under study, while the alternative hypothesis is that there is significant different between actual sales and computed sales in selected fertilizer companies under the study.

To test the hypothesis, table 2 to 5 have been prepared showing the computed value of the trend through least square method.

Table 2
Trend of Sales in IFFCO

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Sales (Actual)	5281.95	6274.92	5090.08	7396.98	9942.93	10330.11
Computed sales *	4632.47	5733.94	6835.42	7936.90	9038.38	10139.86
Deviations	649.48	540.98	-1745.34	-539.92	904.55	190.25

Ü Calculated value of Chi-Square(X2) = 718.58

Ü Table value of Chi-Square(X2) at 5% level (d.f.=5) = 11.07

Ü* The equation of the straight line trend of sales(Y) is =
     Yc = 4632.47 + 1101.48x

Ü Taking 2005-06 as year of origin

It is clear from the table 5.18.1 that the difference between the values of actual sales and the values of computed sales is significant in IFFCO as the Calculated value of Chi-Square(X2) = 718.58 is higher than the table value of Chi-Square(X2) = 11.07 at 5% level (d.f=5) of significance. Hence, the null hypothesis is rejected and the alternative hypothesis is accepted. The difference between the values of actual sales and the values of computed sales is significant because the computed values of sales is very higher than the values of actual sales in 2007-08 and 2008-09 years.

It is clear from the table 2 that the difference between the values of actual sales and the values of computed sales is significant in KRIBHCO as the calculated value of Chi-Square(X2) = 61.15 is higher than the table value of Chi-Square(X2) = 11.07 at 5% level (d.f=5) of significance. Hence, the null hypothesis is rejected and the alternative hypothesis is accepted.

In KRIBHCO, the difference between the values of actual sales and the values of computed sales is significant because the computed values of sales is very higher than the values of actual sales in 2006-07 and 2008-09 years.

Table 3
Trend of Sales in KRIBHCO

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Sales (Actual)	981.59	886.06	1200.96	1140.07	1508.08	1680.93
Computed sales *	854.24	1005.73	1157.21	1308.69	1460.17	1611.65
Deviations	127.35	-119.67	43.75	-168.62	47.91	69.28

Ü Calculated value of Chi-Square(X2) = 61.15
Ü Table value of Chi-Square(X2) at 5% level (d.f.=5) = 11.07
Ü * The equation of the straight line trend of sales(Y) is = Yc = 854.24 + 151.48x
Ü Taking 2005-06 as year of origin

It is clear from the table 3that the difference between the values of actual sales and the values of computed sales is significant as the calculated value of Chi-Square(X2) = 72.40 is higher than the table value of Chi-Square(X2) = 11.07 at 5% level (d.f=5) of significance. Hence, the null hypothesis is rejected and the alternative hypothesis is accepted

The difference between the values of actual sales and the values of computed sales in GSFC is significant because the computed values of sales is higher than the values of actual sales in 2006-07, 2007-08 and 2009-10 years.

Table 4
Trend of Sales in GSFC

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Sales (Actual)	1954.43	1836.52	2106.24	2606.57	2830.70	3318.72
Computed sales *	1703.17	2000.58	2294.99	2589.40	2883.81	3178.22
Deviations	248.26	-164.06	-188.75	17.17	-53.11	140.50

Ü Calculated value of Chi-Square(X2) = 72.40
Ü Table value of Chi-Square(X2) at 5% level (d.f.=5) = 11.07
Ü * The equation of the straight line trend of sales(Y) is = Yc = 1706.17 + 294.41x
Ü Taking 2005-06 as year of origin

It is clear from the table 4 that the difference between the values of actual sales and the values of computed sales is significant as the calculated value of Chi-Square(X2) = 126.89 is higher than the table value of Chi-Square(X2) = 11.07 at 5% level (d.f=5) of significance. Hence, the null hypothesis is rejected and the alternative hypothesis is accepted.In GNFC, the difference between the values of actual sales and the values of computed sales is significant because the computed values of sales is very higher than the values of actual sales from 2006-07 to 2009-10 years.

Table 5
Trend of Sales in GNFC

Particulars	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Sales (Actual)	1404.79	1377.45	1446.84	1822.61	2147.57	2739.27
Computed sales *	1154.62	1422.01	1689.40	1956.78	2224.17	2491.55
Deviations	250.17	-44.56	-246.56	-134.17	-76.60	247.72

Ü Calculated value of Chi-Square(X2) = 126.89
Ü Table value of Chi-Square(X2) at 5% level (d.f.=5) = 11.07
Ü * The equation of the straight line trend of sales(Y) is = Yc = 1154.62 + 267.39x
Ü Taking 2005-06 as year of origin

It is clear from above table 2 to 4 that the all fertilizer companies, under study differ significantly regarding the sales trend.

1.Conclusion

The indices of sales in all fertilizer company have recorded a fluctuating trend during the study period. The indices of sales are the highest in IFFCO during 2008-09 followed by KRIBHCO, GNFC and GSFC respectively. The trend of sales indices has increased during the last two years 2009-10 and 2010-11 almost in all the companies under study which indicates a sign of improvement of the fertilizer companies in the state.

The time-series analysis of sales and the application of chi-square test reveal that there is a significant difference in actual sales and trend values (Y) of the selected fertilizer companies.

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