EVALUATING THE PERFORMANCE OF SUGAR MILLS IN ODISHA: A CASE STUDY OF SAKTHI SUGAR MILL

[1]Dr. Kishore Kumar Das

Associate Professor & Dean

School of Commerce,

Ravenshaw University, Cuttack, India

Abstract : This study has been undertaken to investigate the determinants of stock returns in Karachi Stock Exchange (KSE) using two assets pricing models the classical Capital Asset Pricing Model and Arbitrage Pricing Theory model. To test the CAPM market return is used and macroeconomic variables are used to test the APT. The macroeconomic variables include inflation, oil prices, interest rate and exchange rate. For the very purpose monthly time series data has been arranged from Jan 2010 to Dec 2014. The analytical framework contains.

Index Terms - Sugar industry, Economic development, Sakthi sugar mills, Financial performance, Employment

1.1   INTRODUCTION

Sugar is an essential commodity and the industry is regulated by government on sugarcane price, sugarcane procurement, sugar production and sale of sugar by mills in domestic and international markets .Indian sugar industry is the largest in the world and supports 50 million farmers and their families. The supply chain starts with the farmers who transport the cane as rapidly as possible to the sugar mill to maximise the content and quality of sugar produced. The juice extracted from the cane and is filtered, crystallised, refined and sent to the market for domestic consumption.

Sakthi Sugars Limited is an India-based company engaged in the business of sugar, industrial alcohol, power and soya products. Sakthi Sugars, established in 1964, is one of the largest producers of sugar in India with a capacity of over 13,500 tonnes of cane crushing per day. Sakthi Sugar has units / plants in the states of Tamil Nadu and Orissa.Sakthi Sugars first unit, set up by the riverside of Bhavani, has outbeaten many records in performance like the 17 lakh tonnes of cane crush in 2001–02. The unit also bagged the most prestigious National Efficiency Awards consecutively for serveral years. It has several most outstanding performances i.e. achieving the lowest sugar losses, highest standards of technical efficiency and the highest mill efficiency.

1.2   OBJECTIVE OF THE STUDY
The main objective of the study is to analyse the financial performance of Sakthi sugar mill in Odisha.

1.3   REVIEW OF LITERATURE & RESEARCH GAP
- Harish Damodaran and Harvi Singh (2007) in their article depicted the picture of sugar industry in Uttar Pradesh. Prior to independence, Uttar Pradesh was India's leading producer of both sugarcane and sugar. For every 30 tonnes of bagasse, there was 8-9 tonnes surplus available for mills to sell – especially to paper and particle board makers. This will replace conventional raw material such as bamboo and wood. With the processing of every tonne of cane today the mills can do additional business through selling 100 units of power and 9.9 liters of alcohol.
- Ray Sarbapriya (2012) in their paper they have attempted to measure the economic performance of Indian sugar industry in terms of capacity utilization measured econometrically at aggregate level over a

period from 1979-80 to 2008-09. In this study, Optimal output is defined as the minimum point on the firm's short run average total cost curve and the rate of capacity utilization is merely ratio of its actual output to capacity output level. Under Choice theoretic framework, the results suggest that a significant variation in the capacity utilization rates over years within same industry was found. There has been diminishing capacity utilization growth rate in this industry during post reform period. The impact of liberalization on economic capacity utilization of Indian sugar industry is noticed to have significant negative impact.

- Chellaswamy Dr.P.& Revathi S.V. (2013) in their article they have taken 34 companies among 119 universal companies. The data were appropriately tabulated and classified to analyze the tools like Annual compound growth rate, trend analysis by method of least squares. The productivity ratios and the production function were computed by Solow model. Multiple Regression analysis was used to ascertain its impact on variables and they were tested by 5% level of significance. The analysis reveals that the relationship between Raw Materials and other independent variables i.e. the Capital, Labour and Sales has contributed 99 percent on dependent variable of the companies which started after green revolution period. The growth of the northern region has positive growth in terms of output, capital employed and also there is better rainfall and irrigation in this region than that of the southern region. The trend line moves towards maximum in BHL companies. The average growth of sugar industry was slower in the southern region than that of northern region due to poor irrigation and rainfall. There is a need for improving the productivity and it can be done by improving the quality of labour compensation such as providing reward to their workers.

- Rajan C.R. (2015) in their article they have tried to find reasons for sustainability of sugar mills despite poor economics. Through secondary research, the supply chain and key financial metrics of five selected sugar mills are analyzed. Correlation coefficient is computed for the crucial pairs of financial ratios (control variables). The results indicated that sugar industries are able to sustain by leveraging the profits from by-products and the industry is suffering from the government policies of pricing sugar and sugarcane. Arrears in payments to farmers by sugar millers could be a way to regulate the supply (cultivation) of sugarcane by the farmers in the catchment area of their mills.

- Patil Dilip S. et al (2017) in their paper aims at making financial analysis of a sugar entity in terms of liquidity, solvency, operational efficiency and profitability. Management practices with professional approach tend to improve the financial performance of sugar factories by implementing some innovative practices to reduce the controllable cost and generating additional revenues."

The present survey of related literature indicates that, even a good number of studies have been conducted on sugarcane industries in India; there is also a perceptible gap, which needs for further study. There is a lot of scope for analysing the financial performance of sugar mills.

1.4 RESEARCH METHODOLOGY

This study aims to measure the financial viability and profitability of the major sugar industry of Odisha i.e. Sakthi sugar mill . In this study, the secondary data has been provided wherever required; the secondary data has been collected from various sources like Books, Journals, Newspapers, Abstract industries report Annual audited reports and internet. The research tools like auto correlation, Box Ljung Statistics, correlation matrix and regression have been applied to measure the trend values, relation to group variables and with profit changes as per the inputs. The period coverage applied here from the data ranges from 2005-06 to 2014-15 with the following financial variables as: Share capital-, Share capital-cooperative, Share capital-state government and Share capital-NCDC.

1.5 DATA ANALYSIS
1.5.1 FINANCIAL ANALYSIS OF SAKTHI SUGAR INDUSTRY

SHARE CAPITAL

Table-1 Autocorrelations of Share Capital of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.279	.274	1.037	1	.309
2	-.276	.258	2.182	2	.336
3	-.144	.242	2.537	3	.469
4	-.192	.224	3.277	4	.513
5	-.250	.204	4.773	5	.444
6	-.050	.183	4.849	6	.563
7	.122	.158	5.446	7	.606
8	.024	.129	5.481	8	.705

Sources: collected and compiled data
   a. The underlying process assumed is independence (white noise).

The auto correlation table-1 indicates the lag relationship of Share capital of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period but positive at the end . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of share capital   . Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Share capital during the period and at the end part it indicates 5.481 which means the trend is increasing at the end part.

RESERVE

Table-2 Autocorrelations of Reserve of Sakthi Sugar Mill

Lag	Autocorrelation	Std.Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.258	.274	.889	1	.346
2	.140	.258	1.182	2	.554
3	-.311	.242	2.837	3	.417
4	-.441	.224	6.723	4	.151
5	-.334	.204	9.396	5	.094
6	-.165	.183	10.214	6	.116
7	.194	.158	11.726	7	.110
8	.004	.129	11.727	8	.164

Sources: collected and compiled data
   a. The underlying process assumed is independence (white noise).
   b. Based on the asymptotic chi-square approximation.

The auto correlation table-2 indicates the lag relationship of Reserve of Sakthi Sugar Industry   from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Reserve. Overall situation is fluctuating over the years. Similarly Box

Ljung statistics interprets the similar trend in Reserve during the period and at the end part it indicates 11.727 which means the trend is increasing at the end part.

SECURED LOAN

Table-3 Autocorrelations of Secured Loan of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.158	.274	.332	1	.565
2	-.062	.258	.390	2	.823
3	.226	.242	1.265	3	.737
4	-.199	.224	2.060	4	.725
5	-.208	.204	3.096	5	.685
6	-.108	.183	3.445	6	.751
7	-.218	.158	5.339	7	.619
8	-.083	.129	5.756	8	.675

Sources: collected and compiled data
  a. The underlying process assumed is independence (white noise).
  b. Based on the asymptotic chi-square approximation.

The auto correlation table-3 indicates the lag relationship of Secured Loan of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Secured Loan. Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Secured Loan during the period and at the end part it indicates 5.756 which means the trend is increasing at the end part.

CURRENT LIABILITY

Table-4 Autocorrelations of Current Liability of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.655	.274	5.712	1	.017
2	.345	.258	7.494	2	.024
3	.153	.242	7.896	3	.048
4	-.118	.224	8.177	4	.085
5	-.280	.204	10.063	5	.073
6	-.357	.183	13.884	6	.031
7	-.321	.158	18.016	7	.012
8	-.351	.129	25.418	8	.001

Sources: collected and compiled data
  a. The underlying process assumed is independence (white noise).

The auto correlation table-4 indicates the lag relationship of Current Liability of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that

means an insignificant increase in the trend of Current Liability. Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Current Liability during the period and at the end part it indicates 25.418 which means the trend is increasing at the end part.

FIXED ASSET

Table-5 Autocorrelations of Fixed Asset of Sakthi Sugar Mill

| Lag | Autocorrelation | Std. Error[a] | Box-Ljung Statistic | | |
			Value	df	Sig.[b]
1	.261	.274	.908	1	.341
2	-.277	.258	2.059	2	.357
3	-.057	.242	2.115	3	.549
4	.150	.224	2.565	4	.633
5	.043	.204	2.609	5	.760
6	-.421	.183	7.938	6	.243
7	-.313	.158	11.866	7	.105
8	.048	.129	12.007	8	.151

Sources: collected and compiled data
   a. The underlying process assumed is independence (white noise).
   b. Based on the asymptotic chi-square approximation.

The auto correlation table-5 indicates the lag relationship of Fixed Asset of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Fixed Asset . Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Fixed Asset during the period and at the end part it indicates 12.007 which means the trend is increasing at the end part.

INVESTMENT

Table-6 Autocorrelations of Investment of Sakthi Sugar Mill

| Lag | Autocorrelation | Std. Error[a] | Box-Ljung Statistic | | |
			Value	df	Sig.[b]
1	-.019	.274	.005	1	.944
2	-.449	.258	3.025	2	.220
3	-.010	.242	3.027	3	.388
4	-.025	.224	3.039	4	.551
5	-.020	.204	3.049	5	.692
6	-.014	.183	3.055	6	.802
7	-.016	.158	3.065	7	.879
8	.017	.129	3.083	8	.929

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-6 indicates the lag relationship of Investment of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means a significant increase in the trend of Investment. Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Investment during the period and at the end part it indicates 0.708 which means the trend is increasing at the end part.

CURRENT ASSET

Table-7 Autocorrelations of Current Asset of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.687	.274	6.297	1	.012
2	.339	.258	8.017	2	.018
3	-.185	.242	8.606	3	.035
4	-.398	.224	11.776	4	.019
5	-.473	.204	17.150	5	.004
6	-.312	.183	20.063	6	.003
7	-.157	.158	21.047	7	.004
8	-.022	.129	21.075	8	.007

Sources: collected and compiled data
a. The underlying process assumed is independence (white noise).

The auto correlation table-7 indicates the lag relationship of Current Asset of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Current Asset . Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Current Asset during the period and at the end part it indicates 21.075 which means the trend is increasing at the end part.

CASH

Table-8 Autocorrelations of Share Capital of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	-.405	.274	2.192	1	.139
2	.193	.258	2.753	2	.253
3	-.245	.242	3.784	3	.286
4	-.023	.224	3.795	4	.435
5	.108	.204	4.074	5	.539
6	-.228	.183	5.631	6	.466
7	.134	.158	6.351	7	.499
8	-.045	.129	6.472	8	.595

Sources: collected and compiled data
a. The underlying process assumed is independence (white noise).

Table-8 Autocorrelations of Share Capital of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	-.405	.274	2.192	1	.139
2	.193	.258	2.753	2	.253
3	-.245	.242	3.784	3	.286
4	-.023	.224	3.795	4	.435
5	.108	.204	4.074	5	.539
6	-.228	.183	5.631	6	.466
7	.134	.158	6.351	7	.499
8	-.045	.129	6.472	8	.595

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-8 indicates the lag relationship of Cash of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Cash . Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Share capital during the period and at the end part it indicates 6.472 which means the trend is decreasing at the end part.

BANK

Table-9 Autocorrelations of Bank of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.223	.274	.662	1	.416
2	-.032	.258	.677	2	.713
3	-.044	.242	.709	3	.871
4	-.037	.224	.737	4	.947
5	-.078	.204	.885	5	.971
6	.025	.183	.904	6	.989
7	-.241	.158	3.217	7	.864
8	-.253	.129	7.044	8	.532

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-9 indicates the lag relationship of Bank amount of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means a significant increase in the trend of Bank amount . Overall situation is fluctuating but increasing over

the years. Similarly Box Ljung statistics interprets the similar trend in Bank amount during the period and at the end part it indicates 7.044 which means the trend is increasing at the end part.

LOAN & ADVANCES

Table-10 Autocorrelations of Loan & Advances of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.761	.274	7.718	1	.005
2	.362	.258	9.684	2	.008
3	-.066	.242	9.759	3	.021
4	-.383	.224	12.698	4	.013
5	-.471	.204	18.021	5	.003
6	-.360	.183	21.901	6	.001
7	-.221	.158	23.856	7	.001
8	-.106	.129	24.536	8	.002

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-10 indicates the lag relationship of Loan & Advances of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means a significant increase in the trend of Loan & Advances. Overall situation is increasing over the years. Similarly Box Ljung statistics interprets the similar trend in Loan & Advances during the period and at the end part it indicates 24.536 which means the trend is increasing at the end part.

INTESREST EXPENDED

Table-11 Autocorrelations of Interest Expended of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	-.131	.274	.230	1	.632
2	-.366	.258	2.238	2	.327
3	.279	.242	3.574	3	.311
4	-.217	.224	4.516	4	.341
5	-.095	.204	4.730	5	.450
6	.290	.183	7.257	6	.298
7	-.132	.158	7.955	7	.337
8	-.200	.129	10.350	8	.241

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-11 indicates the lag relationship of Interest Expended of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it

indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Interest Expended . Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Interest Expended during the period and at the end part it indicates 10.350 which means the trend is increasing at the end part.

DIRECT EXPENSES

Table-12 Autocorrelations of Direct Expenses of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.319	.274	1.353	1	.245
2	-.148	.258	1.682	2	.431
3	-.011	.242	1.684	3	.640
4	-.145	.224	2.104	4	.717
5	-.264	.204	3.781	5	.581
6	-.255	.183	5.727	6	.455
7	-.081	.158	5.990	7	.541
8	.059	.129	6.196	8	.625

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-12 indicates the lag relationship of Direct Expenses of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means a significant increase in the trend of Direct Expenses . Overall situation is fluctuating but increasing over the years. Similarly Box Ljung statistics interprets the similar trend in Direct Expenses during the period and at the end part it indicates 6.196 which means the trend is increasing at the end part.

INDIRECT .EXPENSES

Table-13 Autocorrelations of Indirect expenses of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.617	.274	5.075	1	.024
2	.221	.258	5.811	2	.055
3	-.103	.242	5.991	3	.112
4	-.239	.224	7.137	4	.129
5	-.211	.204	8.211	5	.145
6	-.256	.183	10.180	6	.117
7	-.192	.158	11.654	7	.113
8	-.223	.129	14.625	8	.067

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

Table-13 Autocorrelations of Indirect expenses of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.617	.274	5.075	1	.024
2	.221	.258	5.811	2	.055
3	-.103	.242	5.991	3	.112
4	-.239	.224	7.137	4	.129
5	-.211	.204	8.211	5	.145
6	-.256	.183	10.180	6	.117
7	-.192	.158	11.654	7	.113
8	-.223	.129	14.625	8	.067

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-13 Indicates the lag relationship of Indirect Expenses of Sakthi Sugar Industry   from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means a significant increase in the trend of Indirect Expenses. Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Indirect Expenses during the period and at the end part it indicates 14.625 which means the trend is increasing at the end part.

INDIRECT INCOME

Table-14 Autocorrelations of Indirect Income of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	-.160	.274	.339	1	.560
2	-.113	.258	.530	2	.767
3	-.111	.242	.743	3	.863
4	-.228	.224	1.784	4	.775
5	.444	.204	6.519	5	.259
6	-.084	.183	6.731	6	.346
7	-.027	.158	6.760	7	.454
8	-.048	.129	6.896	8	.548

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-14 indicates the lag relationship of Indirect Income of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Indirect Income. Overall situation is fluctuating over the years.

Similarly Box Ljung statistics interprets the similar trend in Indirect Income during the period and at the end part it indicates 6.896 which means the trend is increasing at the end part.

PURCHASES

Table-15 Autocorrelations of Purchases of Sakthi Sugar Mill

| Lag | Autocorrelation | Std. Error[a] | Box-Ljung Statistic | | |
			Value	df	Sig.[b]
1	.343	.266	1.659	1	.198
2	-.092	.246	1.798	2	.407
3	-.196	.246	2.431	3	.488
4	-.549	.225	8.401	4	.078
5	-.279	.201	10.334	5	.066
6	.046	.174	10.405	6	.109
7	.048	.142	10.519	7	.161

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-15 indicates the lag relationship of Purchases of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means a significant increase in the trend of Purchases . Overall situation is fluctuating over the years, but in mid part it indicate more amount of purchases in the company . Similarly Box Ljung statistics interprets the similar trend in Purchases during the period and at the mid part it indicates 10.519 which means the trend is increasing at the mid part and there after also increasing .

SALES

Table-16 Autocorrelations of Total Sales of Sakthi Sugar Mill

| Lag | Autocorrelation | Std. Error[a] | Box-Ljung Statistic | | |
			Value	df	Sig.[b]
1	.148	.274	.291	1	.589
2	-.036	.258	.311	2	.856
3	-.034	.242	.330	3	.954
4	-.456	.224	4.492	4	.344
5	-.209	.204	5.540	5	.354
6	-.101	.183	5.848	6	.440
7	-.024	.158	5.872	7	.555
8	.143	.129	7.096	8	.526

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-16 indicates the lag relationship of Sales of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Sales . Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Sales during the period and at the end part it indicates 7.096 which means the trend is increasing at the end part.

GROSS PROFIT

Table-17 Autocorrelations of Gross Profit of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.378	.274	1.901	1	.168
2	.016	.258	1.905	2	.386
3	.028	.242	1.919	3	.589
4	-.123	.224	2.222	4	.695
5	-.312	.204	4.553	5	.473
6	-.397	.183	9.274	6	.159
7	-.111	.158	9.765	7	.202
8	.015	.129	9.778	8	.281

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-17 indicates the lag relationship of Gross profit of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Gross profit . Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Gross profit during the period and at the mid part it indicates 9.778 which means the trend is increasing at the mid part and there after declined .

DEPRECTIATION

Table-18 Autocorrelations of Depreciation of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.354	.274	1.669	1	.196
2	-.004	.258	1.669	2	.434
3	.314	.242	3.357	3	.340
4	.011	.224	3.360	4	.500
5	-.347	.204	6.250	5	.283
6	-.254	.183	8.188	6	.225
7	-.206	.158	9.879	7	.196
8	-.240	.129	13.321	8	.101

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

Table-18 Autocorrelations of Depreciation of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	.354	.274	1.669	1	.196
2	-.004	.258	1.669	2	.434
3	.314	.242	3.357	3	.340
4	.011	.224	3.360	4	.500
5	-.347	.204	6.250	5	.283
6	-.254	.183	8.188	6	.225
7	-.206	.158	9.879	7	.196
8	-.240	.129	13.321	8	.101

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-18 indicates the lag relationship of Depreciation of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means an insignificant increase in the trend of Depreciation . Overall situation is fluctuating over the years. Similarly Box Ljung statistics interprets the similar trend in Depreciation during the period and at the end part it indicates 13.321 which means the trend is increasing at the end part.

NET PROFIT

Table-19 Autocorrelations of Net Profit of Sakthi Sugar Mill

Lag	Autocorrelation	Std. Error[a]	Box-Ljung Statistic		
			Value	df	Sig.[b]
1	-.295	.274	1.158	1	.282
2	-.314	.258	2.633	2	.268
3	.101	.242	2.809	3	.422
4	.003	.224	2.809	4	.590
5	.201	.204	3.779	5	.582
6	-.112	.183	4.156	6	.656
7	-.312	.158	8.058	7	.327
8	.267	.129	12.327	8	.137

Sources: collected and compiled data

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

The auto correlation table-19 indicates the lag relationship of Net Profit of Sakthi Sugar Industry from the year 2005-06 to 2014-15 i.e. for 10 years . The correlation effect gradually increased as it indicate negative for the entire period . In between the period of study, the coefficient value fluctuates merely that means a significant increase in the trend of Net Profit . Overall situation is fluctuating over the years. Similarly Box

Ljung statistics interprets the similar trend in Net Profit during the period and at the end part it indicates 12.327 which means the trend is increasing at the mid part.

1.5.2 CORRELATION ANALYSIS
CAPITAL STRUCTURE

Table-20 Descriptive Statistics

	Mean	Std. Deviation	N
Share capital	8198.2450	6882.89742	10
Reserve	50892.7180	15831.08276	10
Secured loan	49113.4660	51301.87361	10

Sources: collected and compiled data

The descriptive results of Share capital , Reserve and Loan have been measured through the pattern of using the inputs in the equity . Here the standard deviation of Share Capital is much lower that means there is no such increase in the pattern of equity , where as in case of secured loan , the deviation is marked more i.e. 51301.873 , which indicate a higher fluctuation in the amount in different years in Sakthi Sugar Mill during the year 2005-06 to 2014-15. The amount of loan is also indicate higher during the period, which could be minimised .

Table- 21 Correlations

		Share capital	Reserve	Secured loan
Share capital	Pearson Correlation	1	-.437	.378
	Sig. (2-tailed)		.206	.281
	N	10	10	10
Reserve	Pearson Correlation	-.437	1	.262
	Sig. (2-tailed)	.206		.464
	N	10	10	10
Secured loan	Pearson Correlation	.378	.262	1
	Sig. (2-tailed)	.281	.464	
	N	10	10	10

Sources: collected and compiled data

The bi-variate analysis of Share capital, Reserve and Secured Loan of Sakthi Sugar Mill have been presented in the table-20 for the period 2005-06 to 2014-15. So here N, i.e No. of years is taken as 10 and it has been measured in both 95 percent and 99 percent level of significance. In this coefficient values, no significant relation is marked among these factors . But, Share capital, is related negatively with Reserve amount at 0.437 and positively with secured loan at 0.378 , which indicate a growth in the part of Capital Structure in forms of secured loan to mix up the finance of the company .

WORKING CAPITAL STRUCTURE:
Table-22 Descriptive Statistics

	Mean	Std. Deviation	N
Current liability	55230.76	36757.75	10
Current asset	52932.23	20075.81	10

The descriptive results of Current Liability and Current Asset have been measured through the pattern of using the inputs in the Working capital. Here the standard deviation of current asset is much lower that means there is no such increase in the pattern of working capital , where as in case of current liability loan , the deviation is marked more, which indicate a higher fluctuation in the amount in different years in Sakthi Sugar Mill during the year 2005-06 to 2014-15. .

Table-23 Correlations

		Current liability	Current asset
Current liability	Pearson Correlation	1	-.766**
	Sig. (2-tailed)		.010
	N	10	10
Current asset	Pearson Correlation	-.766**	1
	Sig. (2-tailed)	.010	
	N	10	10

**. Correlation is significant at the 0.01 level (2-tailed).

The bi-variate analysis of Current Liability and Current asset of Sakthi Sugar Mill have been presented in the table-22 for the period 2005-06 to 2014-15. So here N, i.e No. of years is taken as 10 and it has been measured in both 95 percent and 99 percent level of significance . In this coefficient values , Negative significant relation at 99 percent significance level is marked among these two factors . which indicate a negative growth in the part of liability in forms of working capital to mix up the finance of the company .

TOTAL ASSET

Table-24 Descriptive Statistics

	Mean	Std. Deviation	N
Fixed asset	134978.8860	41316.36315	10
Investment	17158.3790	5460.52871	10
Current asset	52932.2340	20075.81428	10

The descriptive results of Fixed Asset, Investment and current asset have been measured through the pattern of using the inputs in the Total Asset. Here the standard deviation of Investment is much lower that means there is no such increase in the pattern of total asset generation , where as in case of current asset , the deviation is marked more, which indicate a higher fluctuation in the amount of working capital generation in different years in the company during the year 2005-06 to 2014-15. .

Table-25 Correlations

		Fixed asset	Investment	Current asset
Fixed asset	Pearson Correlation	1	.500	-.229
	Sig. (2-tailed)		.141	.524
	N	10	10	10
Investment	Pearson Correlation	.500	1	.336

	Sig. (2-tailed)	.141		.343
	N	10	10	10
Current asset	Pearson Correlation	-.229	.336	1
	Sig. (2-tailed)	.524	.343	
	N	10	10	10

The bi-variate analysis of Fixed Asset, Investment and current asset of Sakthi Sugar Mill have been presented in the table-24 for the period 2005-06 to 2014-15. So here N, i.e No. of years is taken as 10 and it has been measured in both 95 percent and 99 percent level of significance . In this coefficient values , no significant relation is marked among these factors . But, Fixed asset is related negatively related with Current asset , which indicate a less growth in the part of Asset creation in the company .

CURRENT ASSET PERFORMANCES

Table-26 Descriptive Statistics

	Mean	Std. Deviation	N
Cash	71.8680	20.71019	10
Bank	6955.4050	7695.57978	10
Loan& advances	22588.9520	14571.66726	10
Current asset	52932.2340	20075.81428	10

The descriptive results of Cash management system   have been measured through the pattern of using the inputs of Cash, bank, Loan & advances and total current asset . Here   the standard deviation of cash is much lower that means there is no such increase in the pattern of total current asset , where as in case of current asset , the deviation is marked more, which indicate a higher fluctuation in the amount in different years in Sakthi Sugar Mill during the year 2005-06 to 2014-15. The amount of loan& advances is also indicating higher during the period, which could be minimised.

Table-27 Correlations

		Cash	Bank	Loan & advances	Current asset
Cash	Pearson Correlation	1	.010	.211	.168
	Sig. (2-tailed)		.979	.558	.642
	N	10	10	10	10
Bank	Pearson Correlation	.010	1	.174	.070
	Sig. (2-tailed)	.979		.631	.847
	N	10	10	10	10
Loan & advances	Pearson Correlation	.211	.174	1	.962[**]
	Sig. (2-tailed)	.558	.631		.000
	N	10	10	10	10
Current asset	Pearson Correlation	.168	.070	.962[**]	1
	Sig. (2-tailed)	.642	.847	.000	

	N	10	10	10	10

**. Correlation is significant at the 0.01 level (2-tailed).

The bi-variate analysis of Cash management system of Sakthi Sugar Mill have been presented in the table-27 for the period 2005-06 to 2014-15. So here N, i.e No. of years is taken as 10 and it has been measured in both 95 percent and 99 percent level of significance . In this coefficient values , a significant relation is marked in between current asset and Laon & advances at 99 percent significance level . But, Cash, bank, is related insignificantly positively with current asset trend , which indicate a mere growth in the part of asset to mix up the finance of the company .

TRADING EXPENSES:

Table-28 Descriptive Statistics

	Mean	Std. Deviation	N
Direct expenses	20671.5620	11168.70610	10
Gross profit	45846.6880	22501.02670	10

The descriptive results of Direct expenses and Gross profit   have been measured through the pattern of using the inputs in the Trade   . Here   the standard deviation of direct expenses is much lower that means there is no such increase in the pattern of gross profit and the deviation is marked more, which indicate a higher fluctuation in the amount in different years in Sakthi Sugar Mill during the year 2005-06 to 2014-15.

Table-29 Correlation Matrix of Gross profit

		Direct expenses	Gross profit
Direct expenses	Pearson Correlation	1	.967**
	Sig. (2-tailed)		.000
	N	10	10
Gross profit	Pearson Correlation	.967**	1
	Sig. (2-tailed)	.000	
	N	10	10

The bi-variate analysis of Direct Expenses and Gross profit trend of Sakthi Sugar Mill have been presented in the table-29 for the period 2005-06 to 2014-15. So here N, i.e No. of years is taken as 10 and it has been measured in both 95 percent and 99 percent level of significance . In this coefficient values , a significant positive relation is marked among these two factors , which indicate a growth in the part of both the factors in financial performance of the company .

TRADING PROFIT ANALYSIS

Table-30 Descriptive Statistics

	Mean	Std. Deviation	N
Purchases	73664.0122	37538.18902	9
Sales	121142.1710	43468.66527	10
Gross profit	45846.6880	22501.02670	10

The descriptive results of Trading Profit Analysis have been measured through the pattern of using the inputs of Purchase and sales in the Profit analysis . Here the standard deviation of Gross Profit is much lower that means there is no such increase in the pattern of Profit in relation to purchase and sales . A higher fluctuation in the amount of sales is marked in different years in Sakthi Sugar Mill during the year 2005-06 to 2014-15.

Table-31 Correlations

		Purchases	Sales	Gross profit
Purchases	Pearson Correlation	1	.864**	.105
	Sig. (2-tailed)		.003	.787
	N	9	9	9
Sales	Pearson Correlation	.864**	1	.577
	Sig. (2-tailed)	.003		.080
	N	9	10	10
Gross profit	Pearson Correlation	.105	.577	1
	Sig. (2-tailed)	.787	.080	
	N	9	10	10

**. Correlation is significant at the 0.01 level (2-tailed).

The bi-variate analysis of Trade profit Trend of Sakthi Sugar Mill have been presented in the table-31 for the period 2005-06 to 2014-15. So here N, i.e No. of years is taken as 10 and it has been measured in both 95 percent and 99 percent level of significance . In this coefficient values , no significant relation is marked among these factors . But, Purchase and sales are significantly positively related at 0.864**, which indicate a growth in the part of trade to raise up the profit of the company .

NET PROFIT ANALYSIS

Table-32 Descriptive Statistics

	Mean	Std. Deviation	N
Net interest earned	564.6980	676.18564	10
Depreciation	4866.9230	2187.76043	10
Indirect income	833.4990	1042.50179	10
Indirect expenses	10941.4630	8580.94645	10
Net profit	8408.4450	3944.65456	10

The descriptive results of Net profit Analysis have been measured through the pattern of using the inputs like Net interest earned, Depreciation, Indirect income and Indirect expenses in the Net profit. Here the standard deviation of Net interest earned is much lower that means there is no such increase in the pattern of equity , where as in case of Indirect income, the deviation is marked also more, which indicate a higher fluctuation in the amount in different years in Sakthi Sugar Mill during the year 2005-06 to 2014-15. So, there is an impact of indirect income an d Net interest earned to raise net profit of the company during these years .

Table-33 Correlations

		Net interest Earned	Depre Ciation	Indirect Income	Indirect expenses	Net profit
Net int.earned	Pearson Correlation	1	-.137	-.382	.098	.402
	Sig. (2-tailed)		.706	.276	.788	.250
	N	10	10	10	10	10
Depreciation	Pearson Correlation	-.137	1	.091	.699*	.092
	Sig. (2-tailed)	.706		.802	.024	.801
	N	10	10	10	10	10
Indirect Income	Pearson Correlation	-.382	.091	1	.122	-.338
	Sig. (2-tailed)	.276	.802		.737	.339
	N	10	10	10	10	10
Indirect Expenses	Pearson Correlation	.098	.699*	.122	1	.005
	Sig. (2-tailed)	.788	.024	.737		.989
	N	10	10	10	10	10
Net Profit	Pearson Correlation	.402	.092	-.338	.005	1
	Sig. (2-tailed)	.250	.801	.339	.989	
	N	10	10	10	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

The bi-variate analysis of Net profit Analysis of Sakthi Sugar Mill have been presented in the table-33 for the period 2005-06 to 2014-15. So here N, i.e No. of years is taken as 10 and it has been measured in both 95 percent and 99 percent level of significance . In this coefficient values , no significant relation is marked among these factors . But, Indirect Income and Net profit are related negatively with each other , which indicate a lack in growth in the part of profitability to mix up the financial preferences of the company .

1.6 FINDINGS AND CONCLUSION

In capital Structure of Share capital, is related negatively with Reserve amount at 0.437 and positively with secured loan at 0.378, which indicate a mere growth in the part of Capital Structure. In working capital, the standard deviation of current asset is much lower that means there is no such increase in the pattern of working capital , contrary to it, current liability & loan , the deviation is marked more, which indicate a higher fluctuation during the period . The standard deviation of Investment is much lower that means there is no such increase in the pattern of total asset generation, where as in case of current asset , the deviation is marked more, which indicate a higher fluctuation in the amount. The standard deviation of cash is much lower that means there is no such increase in the pattern of total current asset , where as in case of current asset , the deviation is marked more, which indicate a higher fluctuation in the amount. The amount of loan& advances is also indicate higher during the period. Standard deviation of direct expenses is much lower that means there is no such increase in the pattern of gross profit and the deviation is marked more. The standard deviation of Gross Profit

is much lower that means there is no such increase in the pattern of Profit in relation to purchases and sales. A higher fluctuation in the amount of sales. Purchase and sales are significantly positively related, which indicate a growth in the part of trade. Here the standard deviation of Net interest earned is much lower that means there is no such increase in the pattern of equity , where as in case of Indirect income, the deviation is marked also more, which indicate a higher fluctuation in the amount. Bit net profit shows increasing in some years .

So it is concluded that the company is facing a lot of problem in raising profit especially for reserve accumulation, secured loan, fixed asset creation, indirect income generation, net interest earned and depreciation accumulation. Further current liability is a strain to raising working capital in the companies like direct expenditures.

REFERENCES

1. Harish Damodaran & Harvi Singh, "Sugar Industry in Uttar Pradesh: Rise, Decline and Revival", Economic and Political Weekly, September 29, 2007, pp.3952-3957.
2. Ray, S. (2012). Reviewing performance of Indian sugar industry: an economic analysis. Food Science and Quality Management, 3, 35-53.
3. Chellaswamy, P., & Revathi, S. V. (2013). A Study on growth and productivity of Indian Sugar Companies. IOSR Journal of Business and Management, 9(5), 1-10.
4. Rajan, C. R., & Chandrasekaran, N. DRIVERS OF FINANCIAL PERFORMANCE OF SUGAR INDUSTRY IN INDIA.
5. Patil, D. S., & Mohanthy, J. N. (2017). Analysis of Financial Statements in the Sugar Industry.
6. http://entrance-exam.net/top-sugar-companies-in-india/
7. http://upsma.org/
8. https://www.solidaridadnetwork.org/news/building-climate-resilience-among-sugarcane-farmers-in-india
9. http://www.fao.org/docrep/005/X0513E/x0513e20.htm
10. http://www.yourarticlelibrary.com/india-2/sugar-industry/sugar-industry-in-uttar-pradesh-and-bihar/75125
11. https://business.mapsofindia.com/sugar-industry/uttarpradesh.html
12. https://www.kenresearch.com/blog/2016/03/revenues-sugar-industry-projected-increase-inr-1033-billion-fy2020-ken-research/