

FINANCIAL PERFORMANCE OF SUGAR MILLS IN PUNJAB: A COMPARATIVE STUDY

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ABSTRACT

The Punjab sugar industry comprises of co-operative and private sugar mills. The private sugar mills are operating better than the co-operative sugar mills with respect to sugar production, number of working days, recovery percentage, cane crushed and daily crushing capacity (Statistical Abstract of Punjab, 2016). But the performance of these sugar mills from financial perspective is a matter of concern for all the stakeholders of sugar industry of Punjab. In the present study, the financial performance (profitability, liquidity, solvency and activity status) of the private and co-operative sugar mills situated in the Doaba region of Punjab state has been examined and compared by applying ratio analysis. The results of the study demonstrate that profitability and the solvency of the private sugar mills is better than the co-operative sugar mills as these co-operative sugar mills are suffering from huge losses. The liquidity and activity of both the types of mills found to be in good statue. Further, the results of ANOVA have depicted that, there is a significant difference among the sugar mills both the sectors for most of the liquidity and solvency ratios. By applying PANEL DATA ANALYSIS the study has also provided empirical evidence about the financial ratios which affect the profitability of the sugar mills in both the sectors. As the study shows the present financial status of the sugar mills, hence these results of the study can provide valuable information to the Sugarfed, state government and the private managements who are incorporating the policies for the revival and growth of Punjab sugar industry.

KEYWORDS: Sugar Mills, Punjab, Profitability, Liquidity, Solvency, ANOVA.

Introduction

India is the second major sugar producing country in the world after Brazil. The Indian share of sugar production was 15 percent of the total world's sugar production for the year 2015-16 (United State Department of Agriculture, 2017). For the year 2015-2016, the top three Indian sugar producing states were Maharashtra (33.29 percent), Uttar Pradesh (27.32 percent) and Karnataka (16.63 percent). But as far as the production of Punjab sugar industry is concerned, it contributed only 2.4 percent toward the total indian sugar production (Global Agricultural Information Network, 2017). It indicates that though Indian sugar industry is performing well but the Sugar mills of the Punjab state are not able to provide significant contribution toward the sugar production of India. The state of Punjab consist of three regions i.e., Malwa, Majha and Doaba (NIDM, 2012). There are two types of sugar mills i.e. co-operative and private sugar mills situated in these different regions of Punjab (Randhawa and Gupta, 2014). In the Malwa region, out of total eleven sugar mills, six mills are under liquidation. In case of Majha rgion, out of total six mills, one sugar mill is under liquidation. But, as far as Doaba region is concerned there are three mills both in the co-operative and private sector and all these mills are operative (Statistical Abstract of Punjab, 2016). In this region, private sugar mills are performing better than the co-operative sugar mills with respect to different components of the sugar mills. The following table shows the components co-operative and private sugar mills in Doaba region of Punjab for the year 2016.

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Table 1 : Components of Operative Co-operative and private Sugar Mills in Doaba Region of Punjab for the Year 2016

Type of Mills	Co-operative sugar mills	Year of starting	Cane crushed (000 Tons)	Sugar production (000 Tons)	Recovery %	No of working days in a year
Co-operative sugar mills	Bhogpur Co-operative Sugar Mill Limited	1956	1542	171	11.09	127
	Nakodar Co-operative Sugar Mill Limited	1988	1777	167	9.40	123
	Nawanshahr Co-operative Sugar Mill Limited	1996	3615	342	9.46	155
Average			2311	226	9.983	135
Type of Mills	Private sugar mills	Year of starting	Cane crushed (000 Tons)	Sugar production (000 Tons)	Recovery %	No of working days in a year
Private sugar mills	AB Sugars Limited	1992	8806	900	10.22	148
	Indian Sucrose Limited	1990	10253	1078	10.52	160
	Wahid Sandhar Sugars Limited	2000	4479	449	10.03	121
Average			7846	809	10.25	143

Source: Statistical Abstract of Punjab, 2016.

As depicted under table 1, private sugar mills of the Doaba region have performed better than the co-operative sugar mills. The average cane crushed and sugar production is almost thrice in case of private sugar mills in comparison to co-operative sugar mills. These private sugar mills have performed better than the co-operative sugar mills with respect to recovery of sugar from sugar cane (10.25 percent private, 9.98 percent co-operative). The number of working days is more in case of private sugar mills than the co-operative sugar mills (143 days private, 135 days co-operative). Apart from this, for the year 2014-15 the state government had given ' 332.56 crores for the financial assistance and revival of the co-operative sugar mills¹. It indicates that the financial status of these co-operative sugar mills is not sound. On, the other hand no such assistance is provided by the state government to the private sugar mills. In context of the above discussions, current paper is an attempt to examine and compare the financial performance of the co-operative and private sugar mills in Doaba region of Punjab.

Examining the financial performance is not only a matter of concern for the stakeholders of these sugar mills but for the researchers also. So, research efforts in this direction have been initiated where the researchers have examined the financial status of sugar mills across India. Some of the significant studies which have provided the insight for the selection of variables and to conduct the present research are discussed below:

Previous Research Evidence

Chellaswamy and Revathi (2009) through profitability, solvency and activity ratios found poor financial status of ten Indian listed sugar mills. In the state of Tamil Nadu, profitability of the private sugar mills to be better than the co-operative sugar mills and most of the sugar mills fall in the healthy financial zone (Prabha 2010; Rajendran, 2013). Thakor (2014) revealed that for seventeen sugar manufacturing units in the state of Gujarat, liquidity was low but operating profit showed better results than net profit ratio. Hence, all the above studies have shown the relevance of profitability, liquidity, solvency and the activity for examining the financial performance in different states of India.

Further, as far as the factors affecting profitability are concerned, it is affected by categorical and non categorical variables. In this regard, profits are positively affected by growth of revenue, export and innovation (Fenny and Rogers, 1999). The liquidity ratios, activity ratios, past performance, financial leverage, size of assets and size of sales had positive impact on the profitability with special reference to return on capital employed (Chander and Aggarwal, 2008; Rehman 2013; Banerjee and De 2015). On the contrary, Kaen and Baumann (2003) observed that the profitability becomes less as the company grows and there was no relationship between the profitability and size of the firm. In another study, Devi (2012) found that in the state of Haryana, sugar mills work for very few days which have affected the financial performance of the sugar mills industry in a negative way. Sivathaasan et al. (2013) found the significant impact of capital structure and non tax debt shield on the profitability including return on assets and return on equity.

¹ Sugarfed Punjab. <http://punjabsugarfed.in>

All the above studies have highlighted the financial status of the sugar mills in some of Indian states and abroad as well. However, none of the studies have thrown light on the financial status of the sugar mills situated in the state of Punjab. Hence the present study is an effort in this direction.

Objectives of the Study

The present study aims at examining and comparing the financial performance (profitability, liquidity, solvency and activity) of the operative co-operative and private sugar mills situated in the Doaba region of Punjab state of India. Based upon the comparative financial results as depicted by the financial ratios, implications for the different stakeholders can be drawn. Further the study has explored the factors (financial ratios) which affect the profitability of the co-operative and private sugar mills in Punjab.

Rationale of the Study

In light of the above stated discussion it is reflected that sugar mills of Doaba region are functioning healthy amongst all other regions of Punjab. In this particular region, none of the sugar mills has been closed in co-operative as well as in private sector. Sector wise, private sugar mills are performing better than the co-operative sugar mills with respect to cane crushed, sugar production, recovery percentage and number of days worked (Statistical Abstract of Punjab, 2016). But as far as the financial health is considered, the situation is not delightful as the state govt has provided financial assistance for the revival of the co-operative sugar mills in the state. It can put a question mark on the financial performance of sugar mills of this region. In context of financial performance, it is considered as an integral part of survival and growth of business in the current competitive environment (Joshi, 2008). Hence, the present study is an endeavour to examine and compare the financial status of co-operative and private sugar mills situated in Doaba region of Punjab. Moreover, study can provide a direction to the state government, central government, management of these mills, Sugarfed and other stakeholders in framing and executing policies for the betterment of the financial status of the sugar industry in Punjab.

Research Methodology

- **Data**

The paper is based on the secondary sources of data for the eleven years (2003-04 to 2013-14) i.e., upto the year of decontrol of sugar industry from levy sugar and monthly release mechanism. For analyzing the financial status of the co-operative sugar mills, the data has been extracted from the annual balance sheets and audit reports of the sugar mills. These balance sheet and audit reports have been collected from Sugarfed and the accounts department of the respective sugar mills. Afterwards, the various financial ratios have been calculated for conducting the study. In case of private sugar mills the data has been extracted from Capitaline.

- **Sample**

All the operative sugar mills situated in the Doaba region of Punjab constitute the sample of the study. In total there are six operative sugar mills i.e., three in the co-operative sector (Bhogpur, Nakodar and Nawanshahr co-operative sugar mills) and three in the private sector (AB Sugars Limited, Indian Sucrose Limited and Wahid Sandhar Sugars Limited) situated in the Doaba region of Punjab.

- **Research Tools**

The variables considered for examining the profitability are gross profit ratio, operating profit ratio, net profit ratio and return on capital employed. The liquidity of the co-operative and private sugar mills has been examined and compared by calculating current ratio and quick ratio. The solvency of these sugar mills has been analysed on the basis of debt equity ratio, fixed asset net worth ratio and proprietary ratio. In the last, for examining the activity, total asset turnover ratio, working capital turnover ratio, fixed asset turnover ratio and inventory turnover ratio has been considered. Compound Annual Growth Rate (CAGR) has been computed for the liquidity and the activity ratios. However, CAGR has not been calculated for examining the profitability and solvency ratios due to negative profits/losses and negative shareholders fund. The formula applied for calculating CAGR is

$$CAGR = \left(\frac{\text{Ending Value}}{\text{Beginning Value}} \right)^{\left(\frac{1}{\text{Number of years}} \right)} - 1$$

Hypotheses testing have been done to examine the difference of profitability, liquidity and solvency within the co-operative and private sugar mills. For this purpose, ANOVA test have been applied on different ratios by using SPSS software.

The effect of various financial ratios on the profitability has been examined by conducting PANEL DATA ANALYSIS. The panel data has been applied by considering ROCE as a measure of profitability and the other financial ratios have been considered as independent variables. Panel data analysis has been done by applying STATA software. For conducting the current study Hausman test has been applied for the viability of the fixed or random effect model. The following models have been considered as fixed or random effect.

- Fixed Effect Model: $Y_{it} = B_1 + y_i + \text{Dummy}Y_i + B_2X_{2it} + B_3X_{3it} + \dots + B_nX_{nit} + U_{it}$.
 - Random Effect Model: $Y_{it} = B_1 + B_2X_{2it} + B_3X_{3it} + \dots + B_nX_{nit}$.
- $B_1 =$ Constant across firms, $Y_i =$ Heterogeneity across firms, $i = 1, 2, \dots, N$ (Number of mills), $t = 1, 2, \dots, N$ (Time series), $X =$ Variables, $B_1 = B_i + i$

Results and Discussion

The analysis of the data is categorised into two sections. The first section (Section-A) is further divided into four parts. The first part (Part I) assesses the profitability of the selected sugar mills. The second part (Part II) analyses the liquidity and the third part (Part III) examines the solvency of these mills. In the last part (Part IV), the activity of the selected sugar mills has been analysed.

The second section (Section-B) elaborates the effect of various financial ratios (other than profitability ratios) on the profitability of the co-operative (part I) and private sugar mills (part II).

Section- A

Part - I

Analysis of Profitability: Profit is the mainstay of business and every investor is keen to know about the profitability of the concerned business (Joshi, 2010).

Table2: Profitability Ratios of Co-operative and Private Sugar Mills

Profitability ratios		Co-operative Sugar Mills*			Private Sugar Mills**		
		Bhogpur	Nakodar	Nawanshahr	AB Sugars	Indian Sucrose	Wahid Sandhar
Gross Profit Ratio	Mean	-9.31	-13.37	4.92	27.39	21.77	23.64
	SD	24.88	30.09	14.68	4.85	6.31	5.34
ANOVA		F Value = 1.750, P Value = .191			F Value = 2.952, P Value = .068		
Operating Profit Ratio	Mean	-15.70	-32.37	-1.49	15.21	17.06	15.56
	SD	28.32	42.33	15.83	5.09	5.49	5.73
ANOVA		F Value = 2.773, P Value = .079			F Value = .359, P Value = .701		
Net Profit Ratio	Mean	-23.33	-31.07	-2.91	4.17	3.51	3.03
	SD	31.61	44.11	15.92	3.84	3.95	1.60
ANOVA		F Value = 2.184, P value = .130			F Value = .328, P Value = .723		
Return on Capital Employed	Mean	-6.78	-36.35	3.64	9.45	14.04	7.73
	SD	35.40	57.97	25.22	5.62	8.38	2.00
ANOVA		F Value = 2.706, P Value = .083			F Value = 3.312, P Value = .050		

Source: *Annual Balance Sheets of the Co-operative Sugar Mills; **Captopline.

Table 2 reveals that out of the three co-operative sugar mills situated in Doaba region of Punjab, the average gross profit and return on capital employed is positive only in case of Nawanshahr co-operative sugar mill. The operating and net profit ratio is found negative for all the co-operative sugar mills. On the other hand, all the private sugar mills have shown positive results with respect to gross profits, operating profits and net profits. Among these mills, the highest mean for gross profit is found in case of AB Sugars Limited (See Table 2). As far as the difference among the profitability among of the co-operative sugar mills is concerned the results of the ANOVA could not find any significant difference among co-operative sugar mills for gross profit ($p = .191$), operating profits ($p = .079$), net profits ($p = .130$) and return on capital employed ($p = .083$). Similarly, insignificant difference is found among private sugar mills for gross profit ($p = .068$), operating profits ($p = .701$) and net profits ($p = .723$) and operating profits ($p = .050$).

Implications

- The better gross profit ratio represents high efficiency of the management or less cost of production with effective utilization of the machinery (Joshi, 2010). Hence, private sugar mills are run by better with respect to these parameters in comparison to the co-operative sugar mills.

- The managements of the co-operative sugar mills should put more efforts for the better business operations as operating losses reflect the poor business operations (Ravi, 2005).
- Private sugar mills are doing better than the co-operative sugar mills with respect to manufacturing, administering, selling and financing as net profits shows the better efficiency with respect to these parameters (Manickavasugi, 2011)..
- Higher return on capital employed represents the better utilization of capital to generate more revenue and high satisfaction of the shareholders (Pitchaimani, 2013). So, in this regard the shareholders of the private sugar mills are more satisfied than that of the co-operative sugar mills.

Part - II

Analysis of Liquidity: Liquidity ratios measure the ability of a firm to meet its short-term financial obligations (Joshi, 2008).

Table 3: Liquidity Ratios of Co-operative and Private Sugar Mills

Liquidity ratios		Co-operative Sugar Mills*			Private Sugar Mills**		
		Bhogpur	Nakodar	Nawanshahr	AB Sugars	Indian Sucrose	Wahid Sandhar
Current Ratio	CAGR	-2.00	-6.37	-4.98	-2.00	12.75	-11.14
	Mean	2.89	2.76	8.65	3.20	2.09	3.78
	SD	1.17	1.76	4.64	1.13	0.72	1.76
ANOVA		F Value =14.369, P Value =.000			F Value =4.998, P Value =.013		
Quick Ratio	CAGR	-1.03	-6.20	49.46	-0.64	18.91	-3.33
	Mean	0.49	0.09	0.23	1.36	0.86	0.87
	SD	0.45	0.12	0.29	0.42	0.36	0.30
ANOVA		F Value =4.998, P Value =.013			F Value =6.657, P Value =.004		

Source: *Annual Balance Sheets of the Co-operative Sugar Mills; **Captaline.

Table 3 reveals that the current ratio is healthy for all the co-operative and private sugar mills. But as far as the quick ratio is concerned, it is found better for the private sugar mills than the co-operative sugar mills. The mean for the current ratio is found to be highest for the Nawanshahr co-operative sugar mill. In case of private sugar mills, the mean current ratio is highest for Wahid Sandhar Sugars Limited. As far as, growth of the current ratio is concerned; it is negative for all the private sugar mills and positive only in case of Indian Sucrose Limited. Further, results of the ANOVA found that co-operative sugar mills significantly differ from each other with regard to current ratio ($p=.000$) and quick ratio (0.013). Similarly, private sugar mills significantly differ from each other with regard to current ratio ($p=.013$) and quick ratio ($p=0.04$).

Implications

- The healthy current ratio represents a firm's ability to meet the short term liabilities (Vyas, 2012). Most of the co-operative and private sugar mills of Doaba region of Punjab have possessed good current ratio. Overall, both the types of mills are in a comfortable position to meet their short term liabilities.
- The data in the table 3 reveals that as the private sugar mills are having better liquidity in comparison to the co-operative sugar mills.

Part – III

Analysis of Solvency: "Solvency of a company refers to its ability to meet the long term liabilities" (Subramanian, 2009).

Table 4: Solvency Ratios of Co-operative and Private Sugar Mills

Solvency ratios		Co-operative Sugar Mills*			Private Sugar Mills**		
		Bhogpur	Nakodar	Nawanshahr	AB Sugars	Indian Sucrose	Wahid Sandhar
Debt Equity Ratio	Mean	-1.61	4.12	2.10	1.51	2.64	2.27
	SD	1.43	18.89	2.31	0.55	0.68	0.59
ANOVA		F Value: .767 P Value .473			F Value: 9.725 P value: 0.001		
Fixed Asset Net Worth Ratio	Mean	0.21	0.29	1.46	1.36	1.98	2.09
	SD	0.84	1.18	4.48	0.41	0.96	0.38
ANOVA		F Value: .726, P Value .492			F Value: 4.199, P value: 0.025		
Proprietary Ratio	Mean	-0.60	-0.61	0.44	0.38	0.20	0.26
	SD	0.36	0.55	0.25	0.16	0.05	0.04
ANOVA		F Value: 24.170, P Value .0000			F Value: 9.225 P value: 0.001		

Source: *Annual Balance Sheets of the Co-operative Sugar Mills; **Captaline.

Table 4 reveals that the solvency ratios in the form of debt equity ratio, fixed asset net worth ratio and proprietary ratio are positive for all the private sugar mills. On the other hand, the co-operative sugar mills have shown negative debt equity ratio (Bhogpur) and proprietary ratio (Bhogpur and Nakodar). It represents the negative shareholders' fund. Overall, the sugar mills in both the sectors have utilized more outsiders fund than the own funds. The private sugar mills have used more funds for acquiring the fixed assets and total assets. On the difference part, co-operative sugar mills are found significantly different from each other only for proprietary ratio ($p=0.000$). But, private sugar mills are found statistically different from each other for debt equity ratio ($p=0.001$) fixed asset net worth ratio (0.025) and proprietary ratio (0.001).

Implications

- The debt equity ratio is very important from the creditor's point of view as it measures the extent to which their interest in the business is covered by owned funds (Ravi, 2005). Hence from the creditor's point of view, private sector sugar mills are performing much better than the co-operative sugar mills.
- The private sugar mills have shown better fixed asset net worth ratio and proprietary ratio. It symbolizes that shareholders of the private sugar mills have invested more toward the fixed as well as in total assets rather than the outsiders.

Part – IV

Analysis of Activities: "Activity ratios examine that the assets of the organization are utilized properly or not" (Manickavasugi, 2011).

Table 5: Activity Ratios of Co-operative and Private Sugar Mills

Activity Ratios		Co-operative Sugar Mills*			Private Sugar Mills**		
		Bhogpur	Nakodar	Nawanshahr	AB Sugars	Indian Sucrose	Wahid Sandhar
Total Assets Turnover Ratio	CAGR	-8.94	-7.52	16.76	8.44	-5.44	0.06
	Mean	1.07	1.11	1.07	0.78	0.70	0.60
	SD	0.83	0.72	0.52	0.24	0.30	0.09
ANOVA		F Value: .014, P Value .986			F Value: 1.772; P value: 0.187		
Working Capital Turnover Ratio	CAGR	1.15	7.57	5.15	-0.75	NA	5.84
	Mean	1.82	2.43	1.38	1.86	0.20	1.95
	SD	1.15	1.46	0.50	0.39	7.12	0.46
ANOVA		F Value: 2.506, P Value .99			F Value: .625 P value: 0.542		
Fixed Assets Turnover Ratio	CAGR	-31.40	6.40	66.47	7.00	2.80	-2.25
	Mean	35.33	13.91	27.44	1.72	1.99	1.17
	SD	22.77	6.46	13.40	0.54	0.89	0.31
ANOVA		F Value: 5.236 P Value .011			F Value: 4.806 P value: 0.015		
Inventory Turnover Ratio	CAGR	1.28	5.04	8.01	0.19	-5.35	2.74
	Mean	1.23	1.23	1.07	1.73	1.71	1.45
	SD	0.33	0.37	0.25	0.47	0.74	0.33
ANOVA		F Value: .885, P Value .423			F Value: .881 P value: 0.425		

Source: *Annual Balance Sheets of the Co-operative Sugar Mills; **Capitaline.

Table 5 reveals that the most of the activity ratios in the form of total assets turnover ratio, working capital turnover ratio and fixed asset turnover ratio are better in co-operative sugar mills in comparison to the private sugar mills. The inventory turnover ratio is found better in private sugar mills which show that these mills are holding fewer inventories in comparison to the co-operative sugar mills. In the co-operative sector, highest growth of total asset turnover ratio, fixed asset turnover ratio and inventory turnover ratio is found for Nawanshahr co-operative sugar mill. Among the private sugar mills, AB sugars has shown maximum growth for total asset turnover ratio and fixed asset turnover ratio whereas the Wahid Sandhar sugar mill has shown the highest growth for working capital and inventory turnover ratio. The results of the ANOVA found a significant difference among the co-operative sugar mills for the fixed asset turnover ratio ($p=0.011$). Likewise, significant difference among the private sugar mills for the fixed asset turnover ratio is found ($p=0.015$).

Implications

- Overall, the co-operative sugar mills are able to generate more sales with moderate value of total assets, fixed assets and working capital. It represents better utility of fixed and net current assets by the co-operative sugar mills in comparison to the private sugar mills (Vyas, 2012).

- The higher value of inventory turnover ratio reflects that the finished stock is sold in the market in the shorter period of time (Aravamudhan, 2009). Hence, for most of the co-operative and private sugar mills finished stock is sold in market in a shorter span of time.

Section-B

Panel Data Analysis

In the present study, cross sectional heterogeneity across the mills is probable due to omitted variables (age of the mills, board composition, availability of the resources etc.) affecting financial performance. Hence, separate intercept models in the form of fixed affect model and random effect model have been considered. In the present section, balanced panel data has been applied as t (time period) is same for all number of mills. Based upon the literature, the relationship between financial performance and self explanatory variables has been studied as follows.

$$\text{Profitability} = F (\text{liquidity, solvency and activity ratios})$$

Return on capital has been regarded as the dependent variable for measuring the financial performance as it is one of the best indicators of profitability from the point of view of different stakeholders (Chander and Aggarwal, 2008 and Sivathaasan et al., 2013). The independent variables considered are current ratio, quick ratio, debt equity ratio, fixed asset net worth ratio, proprietary ratio, total asset turnover ratio, working capital turnover ratio, fixed asset turnover ratio and inventory turnover ratio. This section is divided into two parts. The first part deals with the panel for the co-operative sugar mills and the second part deals with the panel data analysis for the private sugar mills.

Part I

Panel Data Analysis for the Co-operative Sugar Mills
Table: 6 Panel Data Analysis of Co-operative Sugar Mills

Variable	Coef.	Std. Err	t	P> t
Current ratio	-0.8315	0.991115	-0.84	0.411
Quick ratio	12.4363	9.939414	1.25	0.225
Debt equity ratio	-0.0994	0.261486	-0.38	0.708
Fixed asset net worth ratio	3.04037	1.203904	2.53	0.020
Proprietary ratio	32.0033	7.708634	4.15	0.000
Total asset turnover ratio	75.8907	7.883166	9.63	0.000
Working capital turnover ratio	-12.416	5.572062	-2.23	0.037
Fixed asset turnover ratio	0.15466	0.19532	0.79	0.437
Inventory turnover ratio	-81.619	16.35229	-4.99	0.000
Constant	27.1801	14.64271	1.86	0.078
N	33			
Prob>F	0.00			
R squared	0.8497			

Source: Calculated from secondary Data

In case of co-operative sugar mills, fixed effect model has been applied as the value depicted by the Hausman test is significant (0.000). The fixed effect model calculated the explained variation to be 84.9 percent. Table 6 explains that solvency ratios (fixed assets net worth ratio) have positive effect on the profitability. In addition, all the activity ratios (total assets turnover ratio, working capital turnover ratio and inventory turnover ratio) have negative impact on the profitability except for the total asset turnover ratio. Hence, the management of the co-operative sugar mills should take care of the solvency and the activity ratios of these sugar mills.

Part II

Panel Data Analysis for Private Sugar Mills
Table: 7 Panel Data Analysis of Private Sugar Mills

Variable	Coef.	Std. Err	t	P> t
Current ratio	-.1650435	0.991115	-0.84	0.411
Quick ratio	1.928835	3.295349	0.59	0.558
Debt equity ratio	-4.089107	2.648238	-1.54	0.123
Fixed asset net worth ratio	8.003082	6.201236	1.29	0.197

Proprietary ratio	-9.104218	29.19833	-0.31	0.755
Total asset turnover ratio	2.270052	20.54061	0.11	0.912
Working capital turnover ratio	.5149947	.4158076	1.24	0.216
Fixed asset turnover ratio	9.191607	6.992651	1.31	0.189
Inventory turnover ratio	-4.012801	3.806192	-1.05	0.292
Constant	-4.962662	17.46939	-0.28	0.776
N	33			
Prob>F	0.20			
R squared	0.5306			

Source: Calculated from secondary Data

For the private sugar mills, the insignificant value of Hausman test (0.688) ensures the applicability of random effect model which explains 53 percent of the total variation. Since the study is based upon the differentiating the co-operative and the private sugar mills, the same dependent and independent variables have been selected in case of the private sugar as considered in case of the co-operative sugar mills. As depicted by the table 7, current ratio, debt equity ratio, proprietary ratio and inventory turnover ratio is negatively related to the profitability. The other ratios are positively related the profitability though there is no significant effect is observed ($p > 0.005$).

Conclusion

To conclude, study shows that the co-operative sugar mills of Doaba region of Punjab are not financially sound. All these co-operative sugar mills are suffering from huge losses as depicted by profitability ratios. The profitability of these co-operative sugar mills is affected by solvency and activity ratios. In contrast, profitability of the private sugar mills is much better as compared to co-operative sugar mills. As far as liquidity is concerned, it is found satisfactory for both types of mills. Hence, both the co-operative and private sugar mills are able to meet the short term financial obligations. The long term solvency of the co-operative sugar mills is unhealthy as most of these co-operative sugar mills are suffering from negative shareholders' fund. On the other hand, all the private sugar mills are having healthy solvency ratios. All these private sugar mills are possessing positive shareholders' fund. Regarding their activity, instead of possessing modest value of assets and working capital, co-operative sugar mills are able to generate healthy level of activities in the form of sales. However, the private sugar mills are also able to generate vigorous sales volume with adequate level of assets and working capital. Hence, the activities in case of both types of sugar mills are healthy. Overall from the point of view of the shareholders, owners, bankers and government the private sugar mills are performing much better than the co-operative sugar mills.

Managerial Implications

As most of the sugar mills especially in the co-operative sector are not financially sound, Sugarfed (an apex organisation for controlling the co-operative sugar mills in Punjab state) and all the other stakeholders of the co-operative sugar mills should take necessary steps for the revival of co-operative sugar mills immediately. These steps includes rationalising of minimum support price of sugar cane for controlling the cost of production, writing off accumulated losses of the co-operative sugar mills, controlling administering, selling and financing expenses, and modernization of machinery for better recovery percentage/better output etc.

Limitations of the Study

- Although the co-operative sugar mills are governed by the Sugarfed, but still there is a lack of uniformity among the mills with regard to the items of the balance sheets. As a result, accountants of the respective mills have been approached personally for the inclusion of items for analysis purpose.
- The findings of this study can't be generalized to the sugar mills situated in the other states of India, as the study is confined only to the state of Punjab.
- For the profitability and solvency ratios the CAGR has not been calculated due to the negative values for these ratios.

Scope for Future Research

Future studies might explore in depth the financial performance and strength of co-operative and private sugar mills of Punjab by considering capital structure ratios of these mills. Since the current

study is confined only to the Doaba region of Punjab, the other studies can be extended to the other regions of Punjab and India as well. Such studies can also be conducted in the other manufacturing industries like steel, cement, textile etc. In addition, future studies might be able to exclusively explore the factors including categorical variables responsible for such financial position and can direct for the betterment of the sugar industry.

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