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   REVIEW OF LITERATURE

   NEED/IMPORTANCE OF THE STUDY

   STATEMENT OF THE PROBLEM

   OBJECTIVES

   HYPOTHESES

   RESEARCH METHODOLOGY

   RESULTS & DISCUSSION

   FINDINGS

   RECOMMENDATIONS/SUGGESTIONS

   CONCLUSIONS

   SCOPE FOR FURTHER RESEARCH

   ACKNOWLEDGMENTS

   REFERENCES

   APPENDIX/ANNEXURE

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- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

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- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

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- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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ONLINE RESOURCES

- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

WEBSITE

- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

THE IMPACT OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY: EVIDENCE FROM SUGAR INDUSTRY IN INDIA

GOPINATHAN RADHIKA
RESEARCH SCHOLAR
KANCHI MAMUNIVAR CENTRE FOR POST GRADUATE STUDIES
PUDUCHERRY

DR. RAMACHANDRAN AZHAGAIAH
ASSOCIATE PROFESSOR OF COMMERCE
KANCHI MAMUNIVAR CENTRE FOR POST GRADUATE STUDIES
PUDUCHERRY

ABSTRACT
Working Capital (WC) is regarded as the lifeblood of a business. It plays a pivotal role in keeping the wheels of a business enterprise running. However, the management of WC is a delicate area as it involves complex decision-making. Every organization whether profit oriented or not, depends on its size and nature of business needs requisite amount of WC. Sugar Industry in India is well developed with a consumer base of more than billion of people. It is also the second largest producer of sugar in the world. There is around 45 millions of sugar cane growers in India and a larger portion of rural labourers in the country largely rely upon this industry. This paper is a maiden attempt on the impact of working capital management on profitability using liquidity ratios, and turnover ratios. Correlation and regression models are applied to associate the relationship and estimate the association between explained and explaining variables. The regression model viz., measure of WC management shows that the ratios like Current Ratio and Inventory Turnover Ratio have highly significant positive coefficient with profitability while Quick Ratio has significant negative coefficient with profitability.

KEY WORDS
Profitability (***P***), Return on Investment (***ROI***), Working Capital (***WC***), Working Capital Management (***WCM***), Working Capital Ratios (***WCR***).

JEL CLASSIFICATION
G30, G32

INTRODUCTION
Working Capital (***WC***) refers to a firm's investment in short- term assets, viz, cash, short term securities, bills receivables and inventories of raw materials, work in progress and finished goods. It can also be regarded as that portion of the firm's total capital which is employed in short -term operations. ***WC*** is the investment needed for carrying out day to day operations of the business smoothly. Efficient Working Capital Management (***WCM***) is an integral component of the overall corporate strategy to create shareholders' value. WC is the resultant need of time lag between the expenditure for the purchase of raw material and collections from the sale of the finished product. The continuing flow of cash starting from suppliers of inventory to accounts receivables and back into cash is referred to as the Cash Conversion Cycle (***CCC***). The way in which WC is managed can have a significant impact on both the liquidity as well as the profitability of the firm.

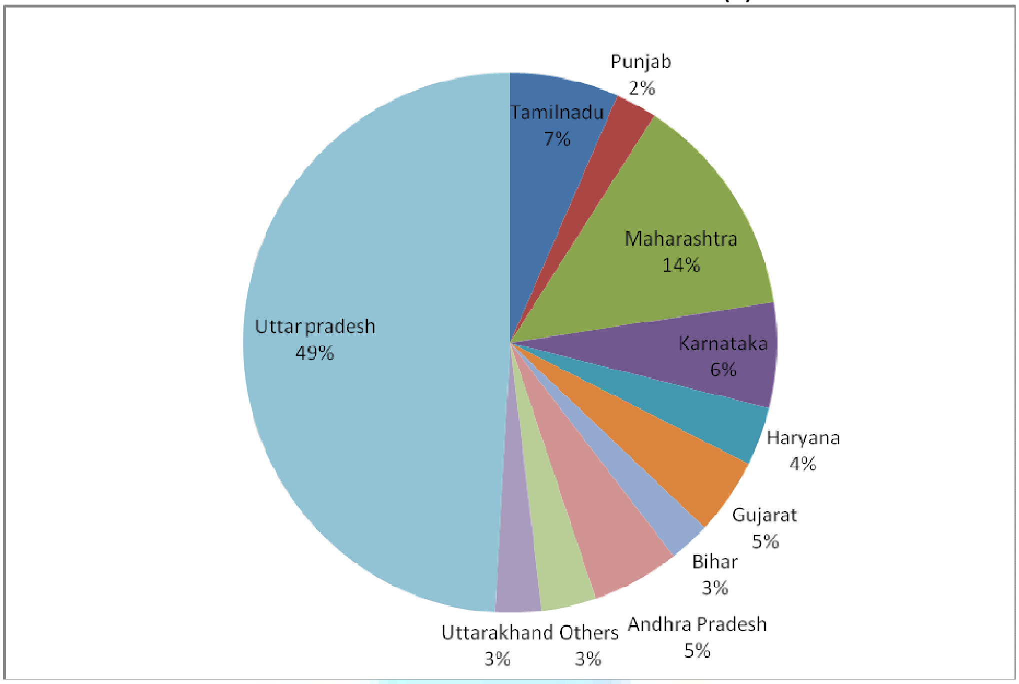
MANAGEMENT OF WORKING CAPITAL IN INDIA
- An Indian corporate firm seems to have adequate and satisfactory level of working capital as reflected in their liquidity ratios. The foreign controlled corporate firms are placed in a better position relative to the domestic corporate firms.
- There are wide inter-industry variations in the liquidity ratios of the corporate enterprises. With the exception of sugar, all other industries have safe and satisfactory liquidity position.
- Majority of Indian corporate firms maintain relatively a lower cash / bank balances. Marketable securities are yet to emerge as a popular means of cash management. The excess cash is deployed to short-term debt / in short-term bank deposits.
- Accounts payable and short- term loans are the major components of current liabilities.
- The length of the operating cycle is the most widely used method to determine ***WC*** need. The ***WC*** financing policy is based on the matching approach.

The majority of the corporate firms have occasionally experienced ***WC*** shortage due to mainly excess inventory accumulation and poor debt collection.

PROFILE OF SUGAR INDUSTRY IN INDIA
The Sugar Industry constitutes one of the most important agro-based industries in India. Although this industry has a long tradition in this country, it started growing in an organized way during the 1930s after introduction of the Sugar Industry Protection Act in 1932. But the industry achieved a spectacular growth under the plan periods. While the number of sugar mills has gone up from 139 in 1950 to 400 in 1989, the corresponding sugar production has increased from 1.4 million tons to 11 million tons. However, there were large variations in the pattern of growth between different states as well as between regions. Among the various states of the Indian Union, Uttar Pradesh occupies an important place in the sugar industry. Both in terms of number of mills as well as in terms of sugar production, its share have been around 30%. In spite of this high growth rate in sugar production since 1970s the industry is beset with a number of problems like *shortage in sugarcane supply, obsolete technology, low capacity utilization, poor financial performance, and discriminatory government policies*. Due to these problems most of the sugar mills have been victims of high cost of production, which adds to their persistent losses thereby the number of sick sugar mills has been increasing during the recent past two decades.

Four factors determine sugar production in India:
- Area under sugarcane production (Max. acreage of 4.43 million hectare)
- Sugarcane yield per hectare (Max. yield of 71.3 tons per hectare)
- The production of sugarcane that is crushed by sugar factories in relation to the total sugarcane produced (Max drawl percentage = 69%)
- Recovery of sugar (Max recovery = 10.48%)

CHART – A: STATE WISE CULTIVATION AREA OF SUGARCANE (%) IN INDIA



Source: *Computed results based on compiled data collected from CMIE prowess Pvt. Ltd*

LITERATURE REVIEW

Hyun-Han Shin and **Luc Soenen (1998)** found in a research study on a large sample of listed American firms for the 1975-94 periods titled Efficiency of Working Capital Management and Corporate Profitability that efficient WCM is an important part of the overall corporate strategy to create shareholders' value and the profitability of firms. They also found a strong negative relationship between length of the firm's net trading cycle and its profitability. **Chiou** and **Cheng (2006)**, who analyzed the determinants of ***WCM,*** explored how far ***WCM*** of a firm influenced by different variables like *business indicators, industry effect, operating cash flows, growth opportunity for a firm, firm's performance and the size of a firm*. The study has depicted consistent results of leverage and operating cash flow for both net liquid balance and working capital requirements while variables like *business indicator, industry effect, growth opportunities, performance of firm, and size of firm* were unable to produce consistent conclusions for net liquid balance and working capital requirements of firms.

Abdul Raheman (2007), who studied the link between WCM and Profitability of a sample of 94 Pakistani firms listed on Karachi Stock Exchange for a period of 6 years (1999-2004) stated that there is a strong negative relationship between variables of the WC and profitability of the firm which means that as the increase in cash conversion cycle leads to decrease in profitability of the firm, and managers can convert cycle to possible minimum level. **Uyar (2009)**, in his paper titled "The Relationship of cash conversion cycle with Firm Size and Profitability: An Empirical Investigation on Turkey firms" examined the industry benchmarks for ***CCC*** of merchandising and manufacturing companies and found that merchandising industry has shorter ***CCC*** than that of the manufacturing industries. Further, the study examined the relationship between the length of the ***CCC*** and the size of the firms and found a significant negative correlation between the length of ***CCC*** and the firm size, in terms of both net sales and total assets.

Chinta Venkateswara Rao *et al***. (2010**) in their study "Financial management focus on ***WC*** Utilization in the Indian cotton textile industry: Methodological analysis" analyzed the trends and patterns of efficiency of working capital utilization in respect of size of firms of cotton textile industry in India on the application of three indices viz., Performance Index (***PI)***, Utilization Index (***UI***), and Efficiency Index (***EI***). The study revealed that linear growth rate (***LGR***) of ***PI***, ***UI*** and ***EI*** in respect of working capital efficiency of small size firms is significant while that of the medium size firms, the trend of ***UI*** only is significant while the trend of ***PI***, ***EI*** and ***UI*** for large size firms is insignificant.

SIGNIFICANCE OF THE STUDY

The study is to make an attempt to analyze the impact of working capital management on profitability of sugar industry in India. Efficient management of ***WC*** is a fundamental part of the overall corporate strategy in creating the shareholders' value. Today, the management of ***WC*** is one of the most important and challenging aspects of the overall financial management. Optimization of ***WC*** i.e., minimizing the ***WC*** requirements and realizing maximum possible revenues is the order of the day. Efficient ***WCM*** increases firm's growth opportunities and return to shareholders. Very few studies have been made in relation to ***WCM*** especially in sugar industry in India. Therefore, the present study is a maiden attempt to analyze the impact of ***WCM*** on profitability of sugar industry in India.

OBJECTIVES OF THE STUDY AND HYPOTHESES DEVELOPMENT

- To study the impact of ***WC*** on profitability of Sugar Industry in India.
- To analyze the determinants of profitability for examining the sensitivity of ***ROI*** to changes in the level of ***WC*** of the corporate firms.

In order to reach the stated objectives the following hypotheses have been developed:

- $\mathbf{H_0^1}$**:** There is no significant relationship between current ratio (***CR***) and return on investment (***ROI*****).**
- $\mathbf{H_0^2}$**:** There is no significant relationship between quick ratio (***QR***) and return on investment (***ROI***).
- $\mathbf{H_0^3}$**:** There is no significant relationship between working capital turnover ratio (***WCTR***) and return on investment (***ROI***).
- $\mathbf{H_0^4}$**:** There is no significant relationship between debtor turnover ratio (***DTR***) and return on investment (***ROI***).
- $\mathbf{H_0^5}$**:** There is no significant relationship between creditor turnover ratio (***CTR***) and return on investment (***ROI***).
- $\mathbf{H_0^6}$**:** There is no significant relationship between inventory turnover ratio (***INV***) and return on investment (***ROI***).

PERIOD OF THE STUDY

The data used for the study are related to the selected Sugar Industry in India for a period of five years on a year to year basis ranging from 2005-2010. There are two basic reasons behind the selection of the period as the period of the study:

- This period relates to the post- liberalization era of the Indian economy, and
- This is the period for which the maximum financial data were available in the database.

METHODOLOGY

DATA COLLECTION

Since the study is based on financial data, the main source of data was financial statements, such as balance sheets, income statements of listed companies for the period from 2005-2010. Data have also been collected from secondary sources i.e., annual reports of the companies, Centre for Monitoring Indian Economy Prowess database and from various websites concerned.

SAMPLING DESIGN

MULTI-STAGE SAMPLING TECHNIQUE

STAGE 1 → Total Number of Sugar Mills = 155 corporate firms

↓

STAGE 2 → Full-fledged data available for the study period - 63 corporate firms

Hence, 63 corporate firms of Sugar Industry in India are selected for the study.

RESEARCH METHODS

WCM MEASURES (RATIOS)

``For measuring the WCM, simple mathematical tool viz., ratio has been extensively used. The ratios relating to working capital management which have been computed and used for the analysis are:

WCM Measures (Ratios)	Elements of Ratios	Description
Current ratio (CR)	Current Assets / Current Liabilities	Current assets include cash, accounts receivable, inventory, marketable securities, prepaid expenses and other liquid assets that can be readily converted into cash. Current liabilities include short term debt, accounts payable, accrued liabilities and other debts.
Quick ratio (QR)	Quick Assets / Quick Liabilities	For calculating quick assets, stock and prepaid expenses are excluded from current assets in order to have high degree of liquidity of current assets. Quick liabilities are calculated by eliminating bank overdraft from current liabilities
Debtors' turnover ratio(DTR)	Net Credit Sales / Average Debtors	The trade debtors for the purpose of this ratio include the amount of Trade Debtors & Bills Receivables. The average receivables are found by adding the opening receivables and closing balance of receivables and dividing the total by two.
Inventory turnover ratio(INV)	Net Sales / Inventory	Net sales is the amount of sales generated by a company after the deduction of returns, allowances for damaged or missing goods and any discounts allowed. Average inventory is the median value of an inventory throughout a certain time period. The basic calculation for average inventory would be: (Current Inventory + Previous Inventory) / 2.
Cash turnover ratio(CTR)	Net Sales / Cash Balances	Net sales is the amount of sales generated by a company after the deduction of returns, allowances for damaged or missing goods and any discounts allowed. The sales number reported on a company's financial statements is a net sales number, reflecting these deductions. The cash balance is the closing balance of cash.
Working capital turnover ratio(WCTR)	Net Sales / Net Working Capital	Net sales is the amount of sales generated by a company after the deduction of sales returns, allowances for damaged or missing goods and any discounts allowed. A company uses working capital (current assets - current liabilities) to fund operations and purchase inventory
Return on investment (ROI)	PAT / Average Total Assets	PAT is the net profit earned by the company after deducting all expenses like interest, depreciation and tax. Average total assets is the average of the aggregate assets during a two year period, i.e., Total Assets (current year) + Total Assets (previous year) / 2. Total assets include all gross investments, cash and equivalents, receivables, land and building, plant and machinery, furniture and fittings and intangible assets.

REGRESSION ANALYSIS

$ROI = b_0 + b_1CR + b_2QR + b_3WCTR + b_4DTR + b_5CTR + b_6INV$ (1)

Where b_0 = constant

$b_{1......} b_6$ = estimated coefficients

CR = Current Ratio

QR = Quick Ratio

WCTR = Working Capital Turnover Ratio

DTR = Debtors Turnover Ratio

CTR = Creditors Turnover Ratio

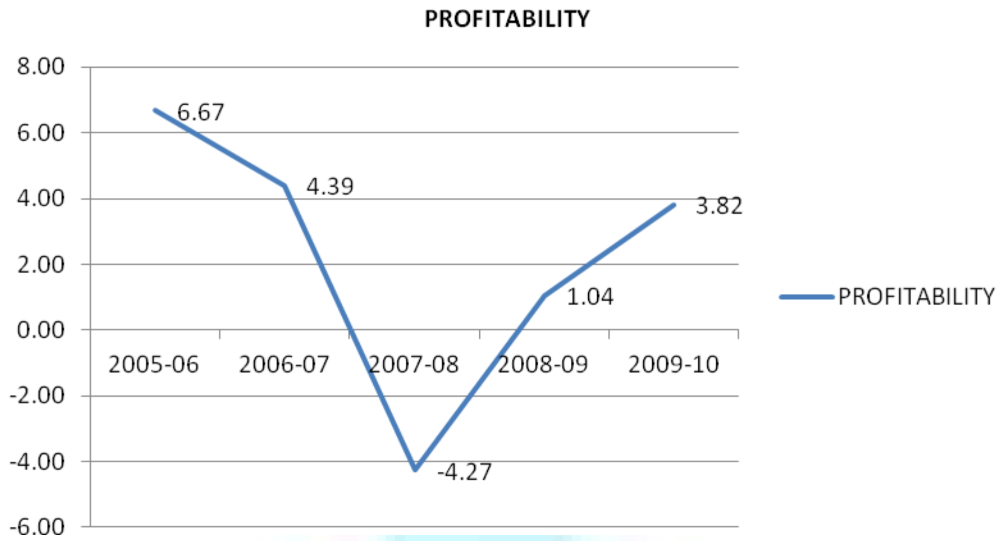
INV = Inventory Turnover Ratio

LIMITATIONS OF THE STUDY

- The analysis is limited to five years only (i.e. from 2005- 2010), hence a detailed trend covering a lengthy period could not be made.
- The study is based on secondary data collected from CMIE prowess, therefore the quality of the study depends purely on the accuracy, reliability and quality of secondary data source.
- The study is limited to 63 corporate firms of sugar industry in India, hence the accuracy of results is purely based on the data of sample firms for the study.

INDUSTRY ANALYSIS

CHART – B: TREND OF PROFITABILITY OF SUGAR INDUSTRY IN INDIA DURING 2005-06 – 2009-10



Source: *Computed results based on compiled data collected from CMIE prowess Pvt. Ltd*

There is a steep fall in profitability (*see chart – B*) during the year 2007-08; afterwards there is a rise in profitability during the following years. Some corporate firms have negative value in the year 2007 and 2008 due to sugar price increase over the years. In 2008-2009, particularly, a large part of sugarcane was used for making gur than in earlier years so, the world sugar production was down when compared to the previous season. The reason for the world sugar balance for the period from October 2008 to September 2009 puts world production at 16-16.5 million tons, which is lower than the world consumption (20-22 million tons). Thus, the distinctive global surplus phase has ended and the market has moved into a deficit phase during the period.

The descriptive statistics *(see table 1)* shows that Cash Turnover Ratio (***CTR***) has the highest mean value. The deviation from the mean value is also high. Cash Turnover Ratio (***CTR***) also has higher standard deviation due to wider range of fluctuation over the period of study. Debtors Turnover Ratio (***DTR***) also has high standard deviation, indicating that the debt collection period varies highly within the industry. Current Ratio (***CR***) and Quick Ratio (***QR***) have low standard deviation from the mean value, revealing that there is not much of variation in the level of Current Assets and Quick Assets.

The correlation matrix (see table 2) of WC variables of selected sugar corporate firms reveals that there is a significant positive association between ROI and CR (0.302); ROI and INV(0.290) and CR and INV (0.254); and significant negative association between ROI and DTR (-0.259) at 5 % level. Also there is a highly positive correlation between CR and QR (0.789); QR and INV (0.512) at 1% level of significance.

TABLE 1: DESCRIPTIVE STATISTICS OF VARIABLES OF WC OF SELECTED SUGAR MILLS IN INDIA

Variables	N	Minimum	Maximum	Mean	SD
ROI	63	-11.05	13.51	2.3332	3.89877
CR	63	.45	3.77	1.2816	.52573
QR	63	.07	2.56	.3955	.40058
WCTR	63	-87.75	232.89	5.6099	39.81483
DTR	63	1.23	1864.58	104.7427	249.85805
CTR	63	.00	13239.95	2312.8493	2683.97006
INV	63	.98	13.07	3.6718	2.42596

Source*: Computed results based on compiled data collected from CMIE prowess Pvt. Ltd.*

TABLE 2: CORRELATION MATRIX OF *WC* VARIABLES OF SELECTED SUGAR MILLS IN INDIA

VARIABLES	ROI	CR	QR	WCTR	DTR	CTR	INV
ROI	1						
CR	0.302* (0.016)	1					
QR	0.162 (0.205)	0.789** (0.000)	1				
WCTR	-0.013 (0.917)	0.044 (0.734)	0.063 (0.623)	1			
DTR	-0.259* (0.041)	-0.126 (0.324)	-0.188 (0.140)	-0.037 (0.772)	1		
CTR	0.136 (0.288)	0.010 (0.937)	-0.069 (0.593)	0.007 (0.954)	-0.071 (0.582)	1	
INV	0.290* (0.021)	0.254* (0.044)	0.512** (0.000)	0.122 (0.340)	-0.175 (0.169)	0.034 (0.790)	1

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

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

Table 3 shows that CR has highly significant positive coefficient (4.562) at 1% level with ROI, indicating that the higher CR increases the ROI and vice versa. Hence, maintaining a good CA in relation to CL helps the firms in improving the ROI of the sugar industry, hence there is a significant positive impact of CR enhancing on ROI. **H_0^1: "**There is no significant relationship between CR and ROI" is rejected ($4.562_{0.01}$). However, QR has significant negative coefficient (-5.378) at 5% level with ROI, indicating that maintaining assets in terms of ready cash doesn't help the firms in increasing ROI. So, it is better for the industry to maintain a lesser amount of ready cash and to invest the money in convertible securities, which ultimately increases the profitability. There is a significant negative relationship between QR and ROI, hence **H_0^2: "**There is no significant relationship between QR and ROI" is rejected ($-5.378_{0.05}$).

TABLE 3 REGRESSION RESULTS OF EXPLAINING VARIABLES ON PROFITABILITY OF SELECTED SUGAR CORPORATE FIRMS

Variables	B	T	Sig
INTERCEPT	-3.484	-2.091	0.041
CR	4.562**	3.151	0.003
QR	-5.378*	-2.491	0.016
WCTR	-0.006	-.530	0.598
DTR	-0.003	-1.840	0.071
CTR	9.257	0.549	0.585
INV	0.618**	2.735	0.008
R^2	0.273		
Adjusted R^2	0.195		
F statistics	3.505** (0.005)		

**Significant at the 0.01 level (2-tailed);

*Significant at the 0.05 level (2-tailed).

As WCTR has insignificant negative coefficient (-0.006) with ROI the **H_0^3: "**There is no significant relationship between WCTR and ROI" is accepted (-0.006).DTR has also insignificant negative coefficient (-0.003) with ROI, hence **H_0^4: "**There is no significant relationship between DTR and ROI" is accepted (-0.003). CTR has insignificant positive coefficient (9.257) with ROI, hence **H_0^5: "**There is no significant relationship between CTR and ROI" is accepted (9.257). Whereas, INV has highly significant positive coefficient (0.618*)* at 1% level with ROI, which implies that as the inventory decreases the profitability of the industry will increase. Therefore, a lower inventory level is profitable for sugar industry, thereby leading to infer that there is a significant positive relationship between INV and ROI. **H_0^6: "**There is no significant relationship between INV and ROI" is rejected ($0.618_{0.01}$*)*. The overall regression model fit, which is represented by **R^2**, is 27% which shows that the explaining variables determine to the extent of 27% of the changes in profitability. F stat (3.505*) is significant @ 5% level, indicating that the variance in the dependent variable is explained by the variance in the independent variable.

CONCLUDING REMARKS

The analysis has brought out interesting results, the important highlights of the results are:

There is a significant positive association between ***ROI*** and ***CR*** (0.302); ***ROI*** and ***INV*** (0.290) and ***CR*** and ***INV*** (0.254); and significant negative association between ***ROI*** and ***DTR*** (-0.259) at 5 % level. Also there is a highly positive correlation between ***CR*** and ***QR*** (0.789); ***QR*** and ***INV*** (0.512) at 1% level of significance. The overall regression model fit shows that the explaining variables determine to the extent of 27% of the changes in profitability. After the downtrend in the last two years, the sugar industry in India is poised to reap a rich harvest in the season beginning October 2010. The sugar production in the country is experienced an increase in 2010-11 against 19 million tons in 2009-10. The production of sugarcane is cyclical in nature. Hence, the sugar production is also cyclical as it depends on the sugarcane production in the country. Dual pricing system is adopted in sugar industry in India, which includes sugar price in Public Distribution System and the free sale sugar price. The sugar corporate firms are overburdened with surplus inventories that most of them do not have adequate storage facilities, capacities and cash flows, which have led them to resort to distress sale of sugar, which only brings down the prices. There are more by-products produced by sugarcane like ethanol, molasses – used by breweries, biogases – used by co-generation plants and the remaining is utilized by the gur and khandsari sectors. They are traditional alternate sweeteners, with all these distinguishing characteristics the industry profitability is influenced by current ratio (***CR***) and inventory (***INV***).

SCOPE FOR FURTHER STUDIES

WCM is an important component of corporate financial management but it has not been recognized in financial literature unlike capital structure, capital budgeting and dividend policies. Because of this reason the valid research relating to WCM is found to be scanty in India. So, there is much to be done about WCM in India, hence the following is the scope for further studies:

- Further researches could be carried out on the same area with large number of sample companies, lengthening the years of the study.
- Study on small and medium sized companies could be undertaken by taking large sample, covering and more number of years.
- Further research may also be done on the working capital components including cash, marketable securities, receivables and inventory management.
- Also studies of WCM in different sectors and companies between sectors and cross sectors would add to the existing literature.

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