Working Capital Management and Profitability: Evidence from Listed Sugar Companies of India

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Abstract: *Working capital management is the most important for any business concern because it dealt with day-to-day functions. The aim of the current study is to investigate relationship between working capital management and profitability of listed sugar companies in India. For this purpose, a sample of 21 sugar companies listed on National Stock Exchange is used. The study covers period of five year (2012-13 to 2016-17). To investigate relation between working capital management and profitability, data has been collected from companies' annual reports. Ratio analysis is used to evaluate the profitability and working capital management. Pearson correlation and regression analysis has been used to find out relation between working capital management and profitability. The results of study show significant positive relation of profitability with cash conversion cycle, inventory conversion period and current ratio. The result also shows that there is no significant relation of profitability with average collection period and average payable period.*

Key Words: *Working Capital Management, Profitability, Listed Sugar Companies in India, National Stock Exchange.*

1. INTRODUCTION:

Working capital is considered as the life-blood of the business. The importance of working capital management in any business concern can never be overemphasized. Every business concern requires adequate working capital to carry on its day-to-day operations. Lack of adequate working capital not only impairs firm's profitability but also results in stoppage in payment of its current obligation.

Working capital has two components: 1. current assets and 2. current liabilities. Working capital can be adjusted by increasing or decreasing that two components. Management can enact a number of policies to maintain working capital like cash management, inventory management, debtor managements and payment management. The efficient working capital management is essential for the profitability and overall financial health of any business concern. Many past research reported that working capital has a significant impact on profitability. However, the effect is various for various sectors.

India is the acknowledge original home of both sugarcane cultivation and sugar manufacture. The modern sugar India is one of the largest exporters of sugar worldwide. India is the 2nd largest producer of sugar, next to Brazil with total production of 3369 lakh tonnes in 2015-16. Sugar industry is also second largest industry among the processing and agriculture-based industries in the India followed by cotton textiles. The number of sugar factories increased from 138 in 1950-51 to 526 in 2015-16. Uttar Pradesh alone account for 40 percent of all India sugar production.

It's important for sugar companies to maintain efficient working capital management because supplier and sugar production expenses frequently require payment several months before produce sugar and other final goods are sold to customers.

2. LITERATURE REVIEW:

2.1 Relationship between Cash Conversion Cycle and Profitability.

According to some past research there is significant negative relation between cash conversion cycle and profitability (1,3,4,5,6,7,8,9,11,12) which means as cash conversion cycle period increase profitability will decrease and vice versa. But some past research also recorded opposite result which indicate that there is significant positive relationship between cash conversion cycle and profitability (2,10)

2.2 Relationship between Average Collection Period and Profitability.

Some past research reported that there is significant negative relation between average collection period and profitability which indicates that as average collection period increase, profitability will be decrease (2,6,8,12) and some past research found opposite result which reported that there is significant positive relation between average collection period and profitability which means firm can maximize their profit by maximizing average collection period. (13)

2.3 Relationship between Inventory Conversion Period and Profitability.

There is significant and negative relation between inventory conversion period in days and profitability of concern. Minimizing the inventory conversion period can maximize the profitability. (6,12)

2.4 Relationship between Average Payable Period and Profitability.

There is a significant and positive relationship between profitability and average payable period. It specifies that maximizing the number of days payable period can the maximize the concern profitability. (2,6,9)

3. OBJECTIVES:

3.1 To analyse relationship between working capital management components and profitability of listed Indian sugar companies.

3.2 To analyse relation between liquidity and profitability of listed Indian sugar companies.

4. RESEARCH AND METHODILOGY:

4.1 Data collection

The present research is a quantitative research which is based secondary data. The data for this research is collected from annual reports of the companies which help in getting the authentic results.

4.2 Sample

The sample size is 103 company years which include 21 listed sugar companies' five-year data covering 2012-13 to 2016-17. The sample size is 103 because, in this sample, two companies publish their annual report for period of 18 months. So, sample size is reduced to 103 from 105. All other companies from sugar sector are excluded from this study.

4.3 Ratio Analysis

Ratio analysis has been used to analyse profitability and working capital management of companies. Net Profit Margin ratio is used to measure profitability and to analyse working capital management, average collection period, inventory conversion period, average payable period and cash conversation cycle are used. Current ratio is used to measure financial liquidity. Formulas for calculate above ratio are shown in table:1

Table:1 Variables description with Measurement

Description	Measurement
Indicator of Profitability (dependent variable)	
Net Profit Margin (NPM)	(Net Profit) / (Net Sales) ×100
Indicators of Working Capital Management (independent variables)	
Average Collection Period (ACP)	(Trade Receivables) / (Net Sales) × 365
Inventory Conversion Period (ICP)	(Inventory) / (Cost of Goods Sold) × 365
Average Payable Period (APP)	(Trade Payables) / (Purchase) × 365
Cash Conversation Cycle (CCC)	ACP + ICP – APP
Indicator of Liquidity (independent variable)	
Current Ratio (CR)	Current Assets / Current Liabilities

4.4 Statistical techniques

To describe and summarize the behaviour of the variables, descriptive statistics are used in a research. Correlation analysis and Regression analysis are used to investigate relationship of working capital management with profitability and liquidity of companies.

5.HYPOTHESIS:

H01: There is no significant relationship between average collection period and profitability of sugar companies.
H11: There is significant relationship between average collection period and profitability of sugar companies.
H02: There is no significant relationship between inventory conversion period and profitability of sugar companies.
H12: There is significant relationship between inventory conversion period and profitability of sugar companies.
H03: There is no significant relationship between average payable period and profitability of sugar companies.
H13: There is significant relationship between average payable period and profitability of sugar companies.
H04: There is no significant relationship between cash conversion cycle and profitability of sugar companies.
H14: There is significant relationship between cash conversion cycle and profitability of sugar companies.
H05: There is no significant relationship between liquidity and profitability of sugar companies.
H15: There is no significant relationship between liquidity and profitability of sugar companies.

6. DATA ANALYSIS AND RESULTS:

6.1 Descriptive Statistics Analysis

Table:2 Descriptive Statistics

Variables	Obs.	Minimum	Maximum	Mean	Std. Deviation
NPM	103	-231.23	38.72	-5.6932	32.37347

ACP	103	1.76	126.90	28.8324	19.82415
ICP	103	29.66	757.60	245.7042	132.52918
APP	103	8.36	559.85	125.2557	84.87002
CCC	103	-114.96	735.88	149.2809	155.45177
CR	103	0.13	2.30	0.9316	0.42207

6.1.1 Net Profit Margin (NPM)

The mean value of NPM is -5.69 percent which depicts that the on an average, sugar companies are facing low profitability. The maximum and minimum value of NPM are 38.72 percent and -231.23 percent respectively. Standard deviation value of NPM is 32.37 percent which indicates that value of NPM are 32.37 percent bunched around the mean value.

6.1.2 Average Collection Period (ACP)

The average collection period is the average number of days taken by concern to collect invoiced amounts from customers. The average value of ACP is 28.83 days which means on an average, sugar companies are taken 29 days to convert receivables into cash. The minimum ACP is 1.76 days and maximum ACP is 126.90 days. The value of standard deviation is 19.82 days which shows that the value of ACP can deviate from the mean to both sides by 19.82 days.

6.1.3 Inventory Conversion Period (ICP)

The inventory conversion period is the average time taken for clearing the stock of goods. Sugar companies take average 246 days to convert inventories into sales with standard deviation of 133 days. Minimum time taken by companies to convert its inventories into sales is 30 days where maximum time is for this purpose is 758 days.

6.1.4 Average Payable Period (APP)

The average payable period is the numbers of days a concern takes to pay off credit purchases. Companies take average 125 days to pay its creditors against purchase with standard deviation of 85 days. Maximum time is taken by companies to pay its creditors is 560 days and the minimum time taken by companies to pay its creditors is 8 days.

6.1.5 Cash Conversion Cycle

The cash conversion cycle is a ratio which measures the number of days for which concern's cash is tied up in inventories and accounts receivables. Companies averagely takes 149 days to convert cash into inventory and account payable, through sales and account receivables and then back into cash. The value of standard deviation is 155 days. Maximum and minimum time for this purpose are 735 days and -115 days respectively.

6.1.6 Current Ratio (CR)

Current ratio shows short-term solvency position of business. CR is also known as working capital ratio. The average value of CR is 0.93. The average value of CR is lower than 1 which indicate that averagely sugar companies maintain less current assets in compare of current liabilities. The maximum and minimum value for same variable is 0.13 and 2.3 respectively with standard deviation value of 0.42.

6.2 PEARSON CORRELATION ANALYSIS

Table:3 Correlations Analysis

	NPM	ACP	ICP	APP	CCC	CR
NPM	1	-0.066	0.275	-0.044	0.250	0.369
ACP	-0.066	1	-0.038	-0.099	0.149	0.129
ICP	0.275	-0.038	1	0.050	0.820	0.539
APP	-0.044	-0.099	-0.050	1	-0.516	-0.320
CCC	0.250	0.149	0.820	-0.516	1	0.651
CR	0.369	0.129	0.539	-0.320	0.651	1

The correlation matrix (Table:3) shows relationship of NPM with working capital management components and liquidity of companies. The result shows the positive relation of NPM with ICP, CCC and CR, and negative relation of NPM with ACP and APP.

There is low negative relation between NPM and ACP which means as average collection period increase, profitability will decrease and vice versa. The positive relation between ICP and NPM indicate that as inventory conversion period increase, profitability will also increase and vice versa.

The result shows low negative relation between NPM and APP which means as days of APP increase, profitability of concern will be decrease and vice versa. The positive relation of NPM and CCC indicate that increase in days CCC have positive impact on profitability. Relation between NPM and CR is positive which indicates that as CR is increased NPM decrease.

6.3 REGRESSION ANALYSIS
6.3.1 Regression Analysis of ACP with NPM

Table:4.0 Model Summary

Regression Statistics	
Multiple R	0.066
R Square	0.004
Adjusted R Square	-0.006
Standard Error	32.463
Observations	103

Table:4.1 ANOVA

	d.f.	Sum of Squares	Mean Square	F
Regression	1	463.914	463.914	0.440
Residual	101	106436.343	1053.825	
Total	102	106900.258		

Table:4.2 Coefficients

	Coeff.	Std. Error	T	P-value
Constant	-2.591	5.664	-0.457	0.648
ACP	-0.108	0.162	-0.663	0.509

Table 4.2 shows coefficient value -0.108 which indicates negative relation between ACP and NPM. P-value (0.509) is more than significance level 0.05. Thus, we accept the null hypothesis and reject the alternative hypothesis. So, our final conclusion is that there is no significant relationship between profitability and ACP.

6.3.2 Regression Analysis of ICP with NPM

Table:5.0 Model Summary

Regression Statistics	
Multiple R	0.275
R Square	0.075
Adjusted R Square	0.066
Standard Error	31.283
Observations	103

Table:5.1 ANOVA

	d.f.	Sum of Squares	Mean Square	F
Regression	1	8058.148	8058.148	8.234
Residual	101	98842.109	978.635	
Total	102	106900.258		

Table:5.2 Coefficients

	Coeff.	Std. Error	T	P-value
Constant	-22.172	6.518	-3.402	0.001
ICP	0.067	0.023	2.870	0.005

Table 5.2 shows that ICP is positively related with profitability. P-value (0.005) is less than significance level of 0.05. So, we will reject the null hypothesis and accept the alternative hypothesis that there is significant positive relation between ICP and profitability.

6.3.3 Regression Analysis of APP with NPM

Table:6.0 Model Summary

Regression Statistics	
Multiple R	0.044
R Square	0.002
Adjusted R Square	-0.008
Standard Error	32.502
Observations	103

Table:6.1 ANOVA

	d.f.	Sum of Squares	Mean Square	F
Regression	1	205.837	205.837	0.195
Residual	101	106694.421	1056.380	
Total	102	106900.258		

Table:6.2 Coefficients

	Coeff.	Std. Error	t	P-value
Constant	-3.597	5.728	-0.628	0.532

APP	-0.017	0.038	-0.441	0.660

Table 6.2 shows that APP is negatively related with profitability of companies. P-value is 0.660 which more than significance level 0.05. Thus, we accept the null hypothesis and reject the alternative hypothesis. So, there is no significant relation between APP and profitability.

6.3.4 Regression Analysis of CCC with NPM

Table:7.0 Model Summary

Regression Statistics	
Multiple R	0.250
R Square	0.062
Adjusted R Square	0.053
Standard Error	31.503
Observations	103

Table:7.1 ANOVA

	d.f.	Sum of Squares	Mean Square	F
Regression	1	6661.215	6661.215	6.712
Residual	101	100239.043	992.466	
Total	102	106900.258		

Table:7.2 Coefficients

	Coeff.	Std. Error	t	P-value
Constant	-13.454	4.314	-3.119	0.002
CCC	0.052	0.020	2.591	0.011

Table 7.2 shows coefficient value between ROA and CCC is 0.052 which indicates positive relation between both variables. P-value (0.011) is less than significance level 0.05. so, we reject the null hypothesis and accept the alternative hypothesis. Thus, there is significant positive relation between CCC and profitability.

6.3.5 Regression Analysis of CR with NPM

Table:8.0 Model Summary

Regression Statistics	
Multiple R	0.369
R Square	0.136
Adjusted R Square	0.127
Standard Error	30.243
Observations	103

Table:8.1 ANOVA

	d.f.	Sum of Squares	Mean Square	F
Regression	1	14523.332	14523.332	15.879
Residual	101	92376.926	914.623	
Total	102	106900.258		

Table:8.2 Coefficients

	Coeff.	Std. Error	t	P-value
Constant	-32.031	7.250	-4.418	0.000
CCC	28.272	7.095	3.985	0.000

Table 8.2 shows positive coefficient value between NPM and CR which indicates positive relationship between NPM and CR. P-value is 0.000 which gives us strong reason to accept alternative hypothesis and reject the null hypothesis. Thus, there is significant positive relation between CR and profitability.

7. CONCLUSION:

7.1 ACP and Profitability

The correlation value between ACP and NPM is negative which shows negative relation between ACP and profitability which is in line with some past research (2,6,8,12). But, as per regression analysis, there is no strong evidence for accept relation of ACP and NPM because, for this two variables p-value is more than significance level. So, our final result is there is no significant relation between ACP and profitability.

7.2 ICP and Profitability

The correlation value of ICP with NPM shows positive impact of ICP on profitability and regression analysis provide strong evidence for accept the significant positive relation of ICP with profitability which means as ICP increase profitability also increase and vies a versa. Thus, there is significant positive relation between ICP and NPM.

7.3 APP and Profitability

The negative value of correlation between APP and NPM indicates negative relation between APP and profitability. But, as per regression analysis APP has no control over profitability. Thus, there is no significant relation between APP and profitability.

7.4 CCC and Profitability

The present study found positive relation of CCC with profitability which is opposite from some past researches [1,3,4,5,6,7,8,9,11,12]. Sugar companies can maximize their profit by maximizing the CCC on certain level.

7.5 CR and Profitability

The present found that there is significant positive relation between CR and profitability which means sugar company can maximize their profit by maximizing current ration. Sugar company can increase current assets or decrease current liabilities to increase current ration.

The purpose of this study is an attempt to investigate the relationship between working capital management and profitability of listed Indian sugar companies. For maximizing their profit, sugar companies have to concentrate on inventory management, cash conversion cycle and liquidity management. Sugar companies don't have to put more emphasis on debtors and creditors management because these two variables have no significant impact on profitability. By doing that, sugar companies can take advantages of management by exception and companies can maximize their profit.

8. LIMITATION OF THE STUDY:

- The study based on secondary data which is taken from the annual reports of the companies.
- The study covers only 21 listed sugar companies in India.
- The study covers only 5 years data.

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