# Interaction with Liquidity and Working Capital Management Efficiency: A study on Indian Pharmaceutical Firms

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*Abstract:* **Liquidity measures the power of paying short term liability of the firm. The volume of liquidity has great impact on the profitability. High volume of liquid fund increased its cost of maintenance on the other hand its low volume creates a problem for running and maintaining day to day activities. The decision maker faces a problem of determining the actual volume of liquid fund. They have to consider the different factors that effect on liquidity. Cash conversion cycle (CCC) is one of these factors. This study has considered the current ratio and quick ratio as the proxies to measure the liquidity of the sample companies. The main objectives of this study are to measure the association between quick ratio and CCC as well as current ratio and CCC. This study also tries to find out the impact of working capital management efficiency on liquidity position of the sample companies. The study, as a sample, has selected the 17 pharmaceutical firms under S & P BSE 500 indexed companies listed on Bombay Stock Exchange, India. The result reveals that there exists statistically insignificant positive correlation between CR and CCC as well as QR and CCC. The regression result also reveals that DCP is positively related with CR and QR at a 1 percent significant level. CPP is inversely related with CR and QR at a 1 percent significant level. CCC has positive effect on liquidity at a 1 percent significant level. In all situations CFO is significantly and positively related where as D/E is negatively and significantly related with liquidity.**

*Keywords*: **Management of Liquidity, Cash Conversion Cycle, Factors of Liquidity Management, Efficiency of Working Capital Management**

## 1 Introduction

Profitability, liquidity and current assets investment and financing portfolio are influenced by working capital management (Das and Kuiry, 2018). Liquidity is estimated by the volume of current assets. Larger amount of investment in current assets indicates the better liquidity position. In this circumstances a part of current assets remain idle and would not earn sufficient profit. Here we found a negative relationship between liquidity and profitability. Smaller investment in current assets would mean the low liquidity position. Due to very poor level of liquidity firm's production and sales are interrupted as the firm faces shortage of stock of raw material and its inability to pay to creditors in time. Therefore, poor liquidity is not a sign for good health of the firm. It offers a poor return on investment. The firm cannot avoid the minimum requirement of current assets. The maintenance of sound liquidity that maximizes the profitability of the firm is one of the important tasks of finance manager. The relationship between liquidity and profitability may not be continuously positive. But it has the shape of an inverted tea cup: up to certain level, increase in liquidity leads to increase in profitability, beyond that profitability remains constant with the increase in liquidity up to a certain point. Thereafter, any further attempt to increase liquidity will lead to decline in profitability (Gentry; 1981). The determinants of liquidity are current ratio, quick ratio and debt equity ratio. A study on Indian textile sector identify that quick ratio has direct impact on net profit margin on the other hand current ratio and debt equity ratio have negative impact on profitability (Das and Dhar, 2018).

It is clear from the above discussion that settlement of liquidity of a firm is one of the key factors. In determining the liquidity cash conversion cycle (CCC) plays a great role. The sources of working capital financing may be influenced by the cash conversion cycle. The length of the cash conversion cycle is an important determinant that justified what extent the firm must rely on the resource of external financing (Soenen, 1993).

The length of cash conversion cycle is also an important determinant of the liquidity of a firm. In that scene cash conversion cycle is an important tool to maintain the proper liquidity. The shortest cash conversion cycle shows the smaller its value. The firm can recover its cash from the sales of its products with in very short period, the firm will have more cash, and hence the more liquid it will be. The longest cash conversion cycle indicates that the company is taking more time to recover cash. Thus, a longest cash conversion cycle would indicate a liquidity problem.

### Objectives of the study-

The first and most important objective of this study is to analyze the impact of CCC on liquidity. The following supplementary objectives are required to be achieved to attain this main objective.

 i. To review the empirical study done on this context.
 ii. To examine the trend of CCC of the selected companies.
 iii. To examine the trend of liquidity of the selected companies.
 iv. To identify the effect of working capital management efficiency on liquidity.
 v. To provide valuable suggestion and recommendation for practicing manager.

## 2 Review of Literature

Lyroudi and McCarty (1993) have empirically analyzed the conflicting area of current ratio, quick ratio and cash conversion cycle. The data required for this study was collected for 66 industries for the period from 1984-1988. The data set are classified into four industry groups like manufacturing, retail, wholesale and service industries. This study has considered the parametric test, t-test, and the Pearson correlation coefficient. In respect of overall data the findings of this study specify the negative relationship between the cash conversion cycle and current ratio which is not statistically significant but there find a significant and positive relationship between cash conversion cycle and the quick ratio. Industry wise there found different result of cash conversion cycle and other two liquidity ratio (current ratio and quick ratio). After classifying the sample industries into two groups the manufacturing, retail and wholesale industries in one and the service industries in the other the results indicated that the CCC for services industries was statistically higher than for the other group.

Murugesu (2013) analyzed the role of cash conversion cycle in the variations of the profitability. She has selected ten listed plantation companies in Sri Lanka. The secondary data were collected from Colombo Stock Exchange Sri Lanka for the period of five years from 2008 to 2012. This study has considered the cash conversion cycle (CCC) as independent variable and Return on equity (ROE), Return on assets (ROA) and Net profit (NP) as dependent variable. The study explored that 48.5 percent variation of ROE, 61.6 percent variation of ROA and 60.2 percent variation of net profit is explained by CCC. The study also revealed that there is a negative relationship between profitability measurement factors and CCC.

Uyar (2009) investigated the relationship between CCC and the size of the firms and its profitability. The study has considered food, paper, metal, metalware, cement, chemical and textile industries and selected the sample of 166 merchandising and manufacturing companies under these seven industries. The secondary data were collected using official website of Istanbul Stock Exchange for the year 2007. To attain the objectives of this study total assets and sales revenue has been considered as the size of the firm and return on assets (ROA) and return on equity (ROE) is selected as the indicator of profitability. The study has considered the descriptive statistics, one way ANOVA, Duncan test and correlation. The result of this study revealed that there is a significant negative correlation between CCC and firm size. Though, there exist a significant negative correlation between CCC and ROA but no significant correlation is found with ROE and CCC. The limitation of this study is that the result is confined within merchandising and manufacturing companies under the selected industries but not generalizes to non-listed companies. Same result has been found form the study of Dong and Su (2010) which revealed the negative relationship between CCC and corporate performance.

These findings are in affirmation with Shin and Soenen (1998), Eljelly (2004), Garcia et al. (2007), Nobanee et al. (2011) and Karaduman et al. (2011).

Warrad (2015) investigated the impact of CCC on the liquidity of the service firm. This study has considered the Health Care Services, Educational Services, Hotels and Tourism Sector, Transportation Sector, Technology and Communication, Media Sector, Utilities and Energy, and Commercial Services as a sample. Population of this study consisted of all service firm listed at Amman Stock Exchange (ASE). The secondary data based on annual report were collected from database of ASE during the period of four years from 2009 to 2012. The liquidity is measured by firms' current ratio and quick ratio. The study has been used Correlation and Simple Regression analysis as a tool. The overall result of this study confirmed that there is no significant impact of cash conversion cycle on firms' liquidity, firms' current ratio and firms' quick ratio.

Though several study have done in respect of liquidity management but very few studies are found that have considered the cash conversion cycle (CCC) as factor of liquidity management. No other studies are found on the pharmaceutical sectors in this context. Moreover this study is based on the current data. In this respect this study is distinctive in nature.

## 3 Research Methodologies

The main focus of this study is to analyze the interaction within cash conversion cycle and liquidity of the Indian pharmaceutical company of BSE 500.The study population consisted of all pharmaceutical company of BSE 500 listed on Bombay Stock Exchange, India.

### 3.1 Sources of Data

The data used for this study is collected and compiled from "PROWESS" database of Centre for Monitoring Indian Economy (CMIE) for the period from 2012-13 to 2016-17. Other necessary and supportive data is collected from books, journals, annual reports and various news-papers.

### 3.2 Sample Design

The present study has considered the pharmaceutical companies of BSE 500 listed on Bombay Stock Exchange, India. Among the companies listed with Bombay stock exchange of India namely, 17 companies with consistent financial data are selected. Certain companies are excluded owing to irregular and/or inconsistent financial data support.

### 3.3 Techniques of Analysis

Ratio analysis is a technique adapted to analysis and interprets general financial statements to assess the liquidity position. Further a comprehensive analysis is carried by applying statistical techniques namely mean, standard deviation, t-Test, Pearson's correlation and regression under ordinary least square method. The Statistical Package for Social Sciences (SPSS v. 20) is used to analyze the data.

### 3.4 Variables of the Study

#### 3.4.1 Dependent Variable

In this study liquidity is taken as dependent variable. The current ratio and quick ratio are considered as liquidity measurement factors.

**Current Ratio**: This ratio indicates the ability of the firm to meet its liabilities and measures the adequacy of current assets to meet the short-term liabilities. The current ratio is calculated as follow:

$$Current\ Ratio = \frac{Current\ Assets}{Current\ liabilities}$$

**Quick Ratio:** This ratio is also known as the acid test ratio. By eliminating inventory from current assets it provides whether the company has sufficient liquid resources (receivables and cash) to settle its liabilities. This ratio is calculated as follow:

$$Quick\ Ratio = \frac{Current\ Assets - Inventory}{Current\ liabilities}$$

The reviews of the literature suggest that current ratio (CR) and the quick ratio (QR) are the main indicators of liquidity. Higher the current ratio and quick ratio indicate the higher liquidity and vice versa.

### 3.4.2 Independent variable

In this study cash conversion cycle (CCC) is taken as independent variable. This cycle is measured by the number of days while the funds are invested in inventories and accounts receivable minus the number of days that payment to suppliers (Gentry et al., 1990, Keown et al., 2003). Same type of definition is given about CCC by Kim et al. (1998). It is the continuing cash flow from suppliers to inventory to accounts receivable and back into cash (Shin & Soenen, 1998). Jordan (2003) has mentioned that the number of days that pass before collection of cash from debtors, measured from when we actually pay for the inventory. It is the number of days within the date of paying cash to its suppliers and the date of collecting cash from its customers (Bodie and Merton, 2000). The length of time between actual cash expenditures on productive resources and actual cash receipts from the sale of products or services is the CCC (Eljelly, 2004).

Material Storage Period (MSP) = Average stock of material / (Consumption of raw material/365)
Material Conversion Period (MCP) = Average stock of WIP / (Cost of production/365)
Finished Goods Storage Period (FSP) = Average Finished Goods / (Cost of production/365)
Debtors' Collection Period (DCP) = Accounts Receivables / (Sales/365)
Creditors' Payment Period (CPP) = Accounts Payables / (Costs of Goods Sold/365)
Cash conversion cycle (CCC) = MSP + MCP + FSP + DCP - CPP

### 3.4.3 Control variable

This study also considers some firm specific control variables. These are debt equity (D/E), cash from operation, sales growth and SIZE of the firm. Debt equity (D/E) is measured by the ratio of total debt to total equity. Cash from operation is the ratio of cash to cost of sales per day. Sales growth (SG) is the ratio of change in sales and SIZE is the natural logarithm of total assets of the sample companies.

### 3.5 Hypothesis

The following hypotheses are formed to attain the objectives of the study:

$H_{01}$**:** There is no linear relationship between the current ratio and the cash conversion cycle.

($H_{01:}$ $r_{CR,\ CCC}$ <0)

$H_{a1}$**:** There is a positive relationship between the current ratio and the cash conversion cycle. ($H_{a1}$: $r_{CR,\ CCC}$ >0)

$H_{02}$**:** There is no linear relationship between the quick ratio and the cash conversion cycle

($H_{02:}$ $r_{QR,\ CCC}$ <0)

$H_{a2}$**:** There is a positive relationship between the quick ratio and the cash conversion cycle

($H_{a2}$: $r_{QR,\ CCC}$ >0)

## 4 Empirical Analysis and Findings

### 4.1 Trend Analysis of CCC

Table -1 depicts the descriptive statistics of CCC used in this study. The mean value of the CCC for all sample companies during the study period is 132.59 days. The highest mean value of the CCC is found in the Sun Pharmaceutical Inds. Ltd., with an average 232.37 days. Piramal Enterprises Ltd. shows the lowest mean value of CCC within an average of 48.26 days. This is because this company maintains stores in raw material, work-in-Progress and finished goods for short period and credit allowed by creditors for long period. On the other side Sun Pharmaceutical Inds. Ltd., takes more time to collect its payments from debtors and maintains stores in raw material, work-in-Progress and finished goods for long period.

**Table-1:** Cash conversion cycle of Sample Companies

(In Days)

| Sample Companies | Mean | Max | Min | SD |
|---|---|---|---|---|
| Abbott India | 131.79 | 166.54 | 112.52 | 22.1 |
| Ajanta Pharma | 68.84 | 84.32 | 51.52 | 12.75 |
| Alembic Pharm. | 60.42 | 80.62 | 35.87 | 18.92 |
| Alkem | 110.98 | 121.64 | 100.29 | 9.29 |
| Aurobindo | 202.49 | 237.28 | 165.88 | 33.57 |
| Biocon | 96.28 | 106.46 | 87.94 | 7.45 |
| Bliss G V S | 139.99 | 185.24 | 89.01 | 41.56 |
| Dr. Reddy | 216.5 | 240.08 | 177.45 | 25.24 |
| Glaxosmithkline | 74.87 | 87.73 | 55.6 | 12.92 |
| Indoco | 96.77 | 103.58 | 87.62 | 6.77 |
| Ipca | 186.05 | 199.04 | 178.73 | 8.96 |
| Lupin | 167.94 | 186.73 | 149.08 | 17.67 |
| Marksans | 206.73 | 283.92 | 133.37 | 70.58 |
| Piramal | 48.26 | 74.86 | 18.7 | 20.63 |
| Sanofi | 109.1 | 138.31 | 89.94 | 19.03 |
| Sun Pharma | 232.37 | 329.71 | 164.33 | 84.08 |
| Unichem | 104.62 | 117.89 | 78.09 | 15.37 |
| Total | 132.59 | 329.71 | 18.7 | 64.7 |

**Source:** CMIE Prowess Database, Results Computed.

Table-2 reveals that finished goods cycle is very high in case of Alembic Pharmaceuticals Ltd., with 65.24 days. This time period is very lowest in case of Aurobindo Pharma Ltd., it is 9.57 days. The maximum range of CCC is 329.71 days in case of Sun Pharmaceutical Inds. Ltd but minimum range is 18.71 days in case of Piramal Enterprises Ltd. In pharmaceutical industry this time period is very important. This is because medicine has date of expiry and particular life time. If finished goods remain in stores for long time it will be risky for the company due to damage. In that sense risk of damage is minimum in case Aurobindo Pharma Ltd., and this risk is very high Alembic Pharmaceuticals Ltd.

**Table-2:** Inventory Conversion Cycle of Sample Companies

(in Days)

| Sample Companies | RMC | WIPC | FGC | Total |
|---|---|---|---|---|
| Abbott India | 87.61 | 5.69 | 62.84 | 156.14 |
| Ajanta Pharma | 65.34 | 7.77 | 41.64 | 114.75 |
| Alembic Pharm. | 65.77 | 6.40 | 65.24 | 137.41 |
| Alkem | 82.44 | 5.50 | 60.99 | 148.93 |
| Aurobindo | 98.96 | 41.24 | 9.57 | 149.77 |
| Biocon | 40.95 | 41.29 | 29.07 | 111.31 |
| Bliss G V S | 23.06 | 2.39 | 16.80 | 42.25 |
| Dr. Reddy | 96.19 | 41.19 | 22.11 | 159.49 |
| Glaxosmithkline | 63.84 | 12.86 | 54.47 | 131.17 |
| Indoco | 81.51 | 14.33 | 36.93 | 132.77 |
| Ipca | 138.98 | 31.35 | 54.77 | 225.10 |
| Lupin | 95.85 | 23.01 | 34.96 | 153.82 |
| Marksans | 109.12 | 10.71 | 11.04 | 130.87 |
| Piramal | 67.98 | 29.31 | 15.46 | 112.75 |
| Sanofi | 93.55 | 13.30 | 55.01 | 161.86 |
| Sun Pharma | 185.94 | 50.03 | 29.21 | **265.18** |
| Unichem | 95.70 | 23.53 | 32.18 | 151.41 |

**Source:** CMIE Prowess Database, Results Computed.

Table-3 gives the trend of CCC by the year basis and t-statistic on the difference of mean. The result depict that the CCC is highest in the year 2017 and it is 136.01 days. The variable is lowest in the year 2014 and 2015. It is near about same value i.e. 129 days. The investment in working capital not fluctuates in these two years. This study is carrying out to test the null hypothesis that CCC has equal mean in the study period of sample companies. The p-value in respect of t-Test of each year and during the study period is greater than the Significance level (0.05), therefore, the result is not significant then null hypothesis is accepted. This result signify that the pharmaceutical sector have not changed their volume of investment in working capital during the study period. This result does not confirm the result found from the study on Spanish SMEs (Sonia Banos-Caballero et al., 2012).

**Table-3:** Trend of Cash Conversion Cycle of Sample Companies

(In Days)

| Year | Mean | Range | | S.D. | t | p-value |
| | | Max. | Min. | | | (2-tailed) |
|------|------|-------|------|------|------|---------|
| 2013 | 134.44 | 318.24 | 40.49 | 75.96 | -.002 | .999 |
| 2014 | 129.92 | 329.71 | 51.52 | 69.07 | -.270 | .790 |
| 2015 | 129.69 | 240.08 | 55.6 | 51 | -.384 | .706 |
| 2016 | 132.88 | 237.28 | 46.4 | 60.47 | -.107 | .916 |
| 2017 | 136.01 | 280.5 | 18.7 | 71.73 | .090 | .929 |
| 2013-2017 | 132.59 | 329.71 | 18.7 | 64.7 | -.264 | .792 |

**Source:** CMIE Prowess Database, Results Computed.

## 4.2 Trend Analysis of Liquidity

The focus of the finance manager is to maintain optimum liquidity within the firm. This study has considered current ratio and quick ratio as the indicator of liquidity. The Table-4 shows the result of central tendency (mean, maximum value, minimum value and standard deviation) for current ratio and quick ratio of Pharmaceutical Company during the study period. The minimum value of current ratio is 0.24 in the year 2014, and this is for Piramal Enterprises Ltd. The quick ratio of this company is also minimum (0.15) in the year 2016.

**Table-4:** Trend of Liquidity Ratio of Sample Companies

| | Current Ratio | | | | Quick Ratio | | | |
| | Mean | Range | | S.D. | Mean | Range | | S.D. |
| Year | | Max. | Min. | | | Max. | Min. | |
|------|------|------|------|------|------|------|------|------|
| 2013 | 1.73 | 3.12 | 0.74 | 0.66 | 1.18 | 2.73 | 0.48 | 0.61 |
| 2014 | 1.77 | 3.46 | **0.24** | 0.76 | 1.20 | 2.49 | 0.18 | 0.64 |
| 2015 | 1.88 | **3.88** | 0.44 | 0.82 | 1.27 | **2.78** | 0.24 | 0.70 |
| 2016 | 2.05 | 3.69 | 0.34 | 0.94 | 1.39 | 2.72 | **0.15** | 0.80 |
| 2017 | 2.05 | 3.46 | 0.45 | 0.96 | 1.38 | 2.66 | 0.28 | 0.82 |

**Source:** CMIE Prowess Database, Results Computed.

The maximum value for current ratio during the study period is 3.88 for the year of 2015, and the maximum value for quick ratio is 2.78 for the same year, with the standard deviation (0.82; 0.7) respectively. This state of current and quick ratio is visible for Lupin Ltd. (Table-5).

The maximum mean for current ratio during the study period is 2.05. This result is same for the year 2016 and 2017. The minimum mean value for this ratio is 1.73 for the year of 2013, with the standard deviation (0.96; 0.66) respectively. The maximum mean value for quick ratio is 1.39 for the year 2016, and the minimum mean value for this ratio during the study period is 1.18 for the year 2013.

**Table-5:** Liquidity Ratio of Sample Companies

| Sample Company | QR | | | | CR | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Max | Min | SD | Mean | Max | Min | SD |
| Abbott India | 1.85 | 2.72 | 1.44 | 0.56 | 2.53 | 3.69 | 1.97 | 0.77 |
| Ajanta Pharma | 1.56 | 2.62 | 0.73 | 0.75 | 2.28 | 3.46 | 1.42 | 0.83 |
| Alembic Pharm. | 0.81 | 1.17 | 0.58 | 0.25 | 1.74 | 2.31 | 1.28 | 0.52 |
| Alkem | 0.64 | 0.72 | 0.55 | 0.08 | 1.09 | 1.33 | 0.92 | 0.17 |
| Aurobindo | 0.92 | 1.02 | 0.75 | 0.11 | 1.46 | 1.59 | 1.29 | 0.12 |
| Biocon | 2.11 | 2.57 | 1.7 | 0.37 | 2.78 | 3.33 | 2.3 | 0.44 |
| Bliss G V S | 2.05 | 2.66 | 1.61 | 0.49 | 2.4 | 3.42 | 1.75 | 0.7 |
| Dr. Reddy | 1.48 | 1.71 | 1.04 | 0.28 | 1.91 | 2.17 | 1.44 | 0.29 |
| Glaxosmithkline | 2.12 | 2.73 | 1.44 | 0.54 | 2.61 | 3.12 | 1.97 | 0.55 |
| Indoco | 0.74 | 0.77 | 0.67 | 0.05 | 1.28 | 1.32 | 1.2 | 0.05 |
| Ipca | 0.79 | 0.97 | 0.64 | 0.14 | 1.82 | 2.17 | 1.51 | 0.28 |
| Lupin | 2.27 | **2.78** | 1.24 | 0.6 | 3.22 | **3.88** | 2.01 | 0.71 |
| Marksans | 1.12 | 1.73 | 0.48 | 0.5 | 1.61 | 2.19 | 0.89 | 0.53 |
| Piramal | 0.36 | 0.7 | **0.15** | 0.23 | 0.53 | 0.86 | **0.24** | 0.27 |
| Sanofi | 1.08 | 1.38 | 0.83 | 0.23 | 1.85 | 2.11 | 1.58 | 0.23 |
| Sun Pharma | 0.75 | 1.89 | 0.24 | 0.73 | 1.09 | 2.67 | 0.44 | 0.95 |
| Unichem | 1.2 | 1.35 | 1.09 | 0.11 | 2.03 | 2.38 | 1.71 | 0.29 |

**Source:** CMIE Prowess Database, Results Computed.

### 4.3 Test of Hypothesis

$H_{01}$: There is no linear relationship between the current ratio and the cash conversion cycle

($H_{01}$: $r_{CR, CCC} < 0$)

The relationship between current ratio, quick ratio and cash conversion cycle is measured using Pearson Correlation test. Table-6 reports the relationship of the CR, QR ratios and CCC for the sample company. The relationship of the CCC with the current ratio is positive, but not statistically significant, in similarity with study of Richards-Laughlin (1980). Therefore, the null hypothesis is accepted and rejects the hypothesis that the CR and CCC are positively correlated.

$H_{02}$: There is no linear relationship between the quick ratio and the cash conversion cycle

($H_{02}$: $r_{QR, CCC} < 0$)

The co-efficient of correlation between QR and CCC is .053 with positive sign but this coefficient is not statistically significant since p-value is .631, greater than significant level (.05). In this respect, the null hypothesis is accepted and there found no linear relationship within quick ratio and cash conversion cycle. This finding of the study is agreed with the study done by Kamath (1989) but not confirm the result of the study done by Richards-Laughlin (1980) and Lyroudi et.al. (1993).

**Table-6:** Pearson Correlation Coefficients

| Correlations | | | | |
|---|---|---|---|---|
| | | CCC | QR | CR |
| CCC | Pearson Correlation | 1 | | |
| | Sig. (2-tailed) | | | |
| QR | Pearson Correlation | .053 | 1 | |
| | Sig. (2-tailed) | .631 | | |
| CR | Pearson Correlation | .039 | .948** | 1 |
| | Sig. (2-tailed) | .722 | .000 | |
| **. Correlation is significant at the 0.01 level (2-tailed). | | | | |

**Source:** CMIE Prowess Database, Results Computed.

### 4.3 Regression analysis

The ordinary least square method is used to measure the effect of working capital management efficiency on liquidity position of the business. The main components of liquidity are current ratio (CR) and quick ratio (QR). The efficiency of management regarding working capital management is measured by inventory conversion period (ICP), debtors' collection period (DCP), creditors' payment period (CPP) and cash conversion cycle (CCC). In maintaining liquidity these efficiency measurement factors have a great role. Table-7depicts the result of four regression model of sample companies. Through these models the impact of ICP, DCP, CPP and CCC on CR and QR is assessed. In the model-1 and model-2 current ratio and in model-3 and model-4 quick ratio is indicated

as the liquidity estimation factor. The results signify that DCP is positively related with CR and QR at a 1 percent significant level. CPP is inversely related with CR and QR at a 1 percent significant level. It is observed, from the model-2 and model-4, that CCC has positive effect on liquidity at a 1 percent significant level. In all models CFO is significantly and positively related where as D/E is negatively and significantly related with liquidity. From model-1 and model-3 it is identify that ICP is negatively related with liquidity but result is not statistically significant at 5% level of significance.

**Table-7:** Coefficient of Regression

| | CR | | QR | |
|---|---|---|---|---|
| | Model-1 | Model-2 | Model-3 | Model-4 |
| (Constant) | 2.304* (0.000) | 2.397* (0.000) | 0.941** (0.036) | 1.290* (0.009) |
| ICP | -0.001 (0.620) | - | -0.002 (0.128) | - |
| DCP | 0.005* (0.001) | - | 0.006* (0.000) | - |
| CPP | -0.006* (0.018) | - | -0.005* (0.010) | - |
| CCC | - | 0.003* (0.018) | - | 0.002* (0.011) |
| D/E | -2.063* (0.000) | -1.909* (0.000) | -1.566* (0.000) | -1.314* (0.000) |
| CFO | 0.002*** (0.059) | 0.002* (0.013) | 0.003* (0.000) | 0.004* (0.000) |
| SG | 0.137 (0.778) | 0.013 (0.979) | 0.285 (0.434) | -0.024 (0.953) |
| SIZE | 0.019 (0.736) | -0.054 (0.320) | 0.068*** (0.100) | -0.022 (0.627) |

\* significant at 1percent, ** significant at 5%, ***significant at 10%, Parentheses are p-value
**Source:** CMIE Prowess Database, Results Computed.

Table-8 depicts that R Square value is .552, .486, .653 and .488 respectively for model-1, model-2, model-3 and model-4. These values indicate the suitability of regression model between the dependent variable and set of independent variables. It implies that independent variables considered in these models have explained by 55%, 49%, 65% and 49% respectively.

**Table- 8:** Model Summary

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .743[a] | .552 | .512 | .5751108 |
| 2 | .697[b] | .486 | .453 | .6086971 |
| 3 | .808[a] | .653 | .622 | .4312681 |
| 4 | .699[b] | .488 | .456 | .5171068 |

a. Predictors: (Constant), SIZE, CFO, SG, CPP, D/E, ICP, DCP
b. Predictors: (Constant), SIZE, CFO, SG, CCC, D/E

Table-9 explores the result of regression for all models. It is perceived that value of F is 13.576 for model-1, 14.915 for model-2, 20.717 for model-3 and 15.086 for model-4. All models are statistically significant at 1% significant level as p-value is less than .01. From this table it is seen that in model-1 and model-3 the regression sources of variation is 31.433 and 26.973 respectively which are higher than the residual sources of variation. Therefore, these two models are able to explain the large portion of the variation in the dependent variables (CR and QR) than the residual sources of variation.

Table- 9: ANOVA Summary

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 31.433 | 7 | 4.490 | 13.576 | .000 |
| | Residual | 25.468 | 77 | .331 | | |
| | Total | 56.901 | 84 | | | |
| 2 | Regression | 27.631 | 5 | 5.526 | 14.915 | .000 |
| | Residual | 29.270 | 79 | .371 | | |
| | Total | 56.901 | 84 | | | |
| 3 | Regression | 26.973 | 7 | 3.853 | 20.717 | .000 |
| | Residual | 14.321 | 77 | .186 | | |
| | Total | 41.294 | 84 | | | |
| 4 | Regression | 20.170 | 5 | 4.034 | 15.086 | .000 |
| | Residual | 21.125 | 79 | .267 | | |
| | Total | 41.294 | 84 | | | |

**Source:** CMIE Prowess Database, Results Computed.

## 5 Conclusions

Working capital management contains the proper planning and budgeting of current assets and current liabilities. It also includes the overall control on financing and investment activities of working capital. In working capital management the most significant indicator is cash conversion cycle (CCC). It has five components such as material storage period (MSP), material conversion period (MCP), finished goods storage period (FSP), debtors' collection period (DCP) and creditors' payment period (CPP). It is contradictory with the thought about the elements of CCC which has four elements like inventory management, cash management, accounts receivables, and account payables (Arnold, 2008).

This study presents the trend of cash conversion cycle and two important indicators of liquidity ratio of current ratio and quick ratio. The main focus of this study is to find out the impact of CCC on liquidity. The philosophy, behind the relationship between CCC and liquidity, is that in largest CCC situation firms suffer from liquidity. The firms having shortest CCC have high volume of liquidity. The empirical result of this study also affirms this philosophical view. Applying Pearson's correlation it is found that there exist an inverse relation between liquidity measurement factors (CR and QR) and CCC. Therefore, firms having longest CCC facing liquidity problem. Another important finding of this study is that during the period of study no remarkable changes have been found in CCC of the pharmaceutical sectors. It indicates that pharmaceutical sectors are maintaining static liquidity position.

This study also tries to identify the effect of working capital management efficiency on maintaining liquidity. Inventory conversion period (ICP), debtors' collection period (DCP) and creditors' payment period (CPP) are the proxies of working capital measurement efficiency. The result of the regression analysis observed that DCP is positively and significantly related with liquidity where as CPP have significant and indirect effects on liquidity. Though the ICP have indirect effect on liquidity of the sample companies but the result is not significant.

This study suffers some limitation. The first and most important limitation is that the size of the sample companies is very limited. Only few variables, amongst enormous determinants, are considered to measure the efficiency of the working capital management.

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