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# AN ASSESSMENT OF WORKING CAPITAL MANAGEMENT EFFICIENCY AND ITS IMPACT ON PROFITABILITY OF SOME SELECTED PHARMACEUTICAL COMPANIES IN INDIA:

## *A STUDY BASED ON NIFTY PHARMA COMPANIES*

**Dr. Basab Kumar Sil,**
Assistant Professor, Commerce
Susil Kar College, Champahati, 24 Parganas (South)
*Affiliated to University of Calcutta, Kolkata*

***Abstract***

*Efficient working capital management is the key to financial soundness of a firm portrayed by its liquidity, profitability and solvency. The present paper is an attempt to assess how efficiently a group of ten selected Nifty Pharma companies have managed their working capital over a period of five years and how this practice leaves an impact on their profitability during the said period. Performance Index, Utilization Index and Efficiency Index are used to assess the efficiency of working capital management of the selected companies. Panel Data Regression Analysis has been employed to assess whether efficient management of working capital components viz. Trade Receivable Velocity, Inventory Velocity and Trade Payable Velocity have any impact on the profitability of the firms. The study comes up with the conclusion that the selected companies have managed their working capital efficiently over the study period and efficient management of working capital components leaves significant impact on the profitability of these companies.*

**Keywords: Efficient Working Capital Management, Profitability, Performance Index, Utilization Index, Efficiency Index, Panel Data Regression Analysis**

**Subject: Financial Management**

## I. Introduction

In this modern competitive world, remaining financially sound has really become a challenge to each and every entrepreneur. Liquidity, profitability and solvency can be identified as three broad areas that can define financial soundness of a firm. In fact, the proper balancing of these three financial attributes is to be made in order to be regarded as a financially sound firm. One of the key parameters of maintaining this balance is managing the working capital of the business efficiently.

The term working capital refers to the amount of capital which is readily available to an organization for meeting its day-to-day operations. Actually organizations need two types of capital – fixed capital – to invest in assets such as building, equipment, machinery etc. which are locked in business for a long period of time to earn profit and working capital – to pay for stock and to cover the amount of credit extended to customers. Fixed capital, as the name implies, tends not to vary in the short term but will move up or down when major investment decisions are made. Working capital, on the other hand, is much more fluid and fluctuates with the level of business. It is the difference between organizational resources in cash or readily convertible into cash (i.e. current assets) and organisational commitments for which cash will soon be required (i.e. current liabilities). In other words, Working capital comprises of short term net assets such as stock, debtors, cash less creditors, bills payable, bank overdraft etc.

Working capital management deals with the management of all aspects of both current assets and current liabilities, so as to minimise the risk of insolvency while maximizing return on assets. The basic goal of working capital management is to manage the firm's current assets and liabilities in such a way that exactly the requisite level of working capital is maintained – neither in excess nor in short of its requirement. Excessive working capital means idle funds which earn no profits for the firm. Paucity of working capital, on the other hand, not only impairs the firm's profitability but also results in production interruptions and inefficiencies.

The dangers of maintaining excessive working capital are as follows:

- It results in unnecessary accumulation of inventories. Thus, chances of inventory mishandling, waste, theft, losses and obsolescence increase.
- It is an indication of defective credit policy and slack collection period. Consequently, higher incidence of bad debt losses results, which adversely affects profits.
- Excessive working capital makes management complacent, which degenerates into managerial inefficiency.

Maintaining inadequate working capital is also bad and has the following dangers:

- It stagnates growth as it becomes difficult for the firm to undertake profitable projects for non-availability of working capital funds and attractive credit opportunities.
- Operating inefficiencies creep in when it becomes difficult even to meet day-to-day commitments
- Fixed assets are not efficiently utilized for the lack of working capital funds. Thus the firm's profitability would deteriorate.
- The firm loses its reputation when it is not in a position to honour its short term obligations. As a result the firm faces tight credit terms.

In this backdrop, the present paper is a humble attempt to assess how efficiently a group of ten selected Nifty Pharma companies have managed their working capital over a period of five years and how this practice leaves an impact on their profitability during the said period. This paper may be considered to be a new contribution to the existing literature in this regard.

The rest of the paper is designed in the following manner:

II. Review of Literature

III. Objective of the Study

IV. Research Methodology

V. Data Analysis and Interpretation

VI. Overall Conclusion

VII. Limitations of the Study

VII. References

## II. Review of Literature

**Shin and Soenen (1998)** studied a sample of 58,985 firms for the period 1975 to 1994 in order to investigate the relation between net trade cycle (as a proxy of the efficiency of working capital management) and corporate profitability. In all the cases, negative relation between the length of a firm's net trade cycle and its profitability was found.

**Deloof (2003)** examined the relation between working capital management and corporate profitability for a group of 1,009 large Belgian non-financial firms for the period 1992-1996. The results showed that there was a negative relation between profitability (measured by gross operating income) and cash conversion cycle as well as number of day's accounts receivable and inventories. He suggested that managers can increase corporate profitability by reducing the number of day's accounts receivable and inventories. It was also revealed that less profitable firms usually have to wait longer to pay off their bills.

**Eljelly (2004)** in his study empirically examined the relation between profitability and liquidity, as measured by current ratio and cash gap (cash conversion cycle) of a sample of 929 Saudi Arabian joint stock companies spread across three industries using correlation and regression analysis. Significant negative relation between the firms' profitability and their liquidity level, as measured by current ratio was observed. It was also found that, the cash conversion cycle or the

cash gap is more important as a measure of liquidity than current ratio at the industry level that affects profitability. The firm size was also found to have some significant impact on profitability at the industry level.

**Lazaridis and Tryfonidis (2006)** investigated the relationship of corporate profitability and working capital management by taking a sample of 131 companies listed in the Athens Stock Exchange for the period of 2001-2004. The results showed that there is statistical significance between profitability, measured through gross operating profit, and the cash conversion cycle. They argued that managers can create profits for their companies by keeping cash conversion cycle and its components (viz. accounts receivables, accounts payables and inventory) to an optimum level.

**Padachi (2006)** examined the trends in working capital management of 58 Mauritian small manufacturing firms during 1998 to 2003 and its impact on firms' performance. He argued that a well-planned working capital management system and its proper implementation is expected to contribute positively towards creation of shareholders' wealth. He showed that high investment in inventories and receivables results into low profitability and vice-versa.

**Raheman and Nasr (2007)** studied the impact of different working capital management variables including average collection period, inventory turnover in days, average payment period, cash conversion cycle and current ratio on the net operating profitability of 94 Pakistani firms listed on Karachi Stock Exchange for a period of 6 years from 1999-2004. They have used debt ratio, size of the firm (measured in terms of natural logarithm of sales) and financial assets to total assets ratio have been used as control variables. Pearson's correlation, and regression analysis were used for analysis. A negative relationship between cash conversion cycle and profitability of the firms was found. A negative relationship between liquidity and profitability, a positive relationship between size of the firm and its profitability and a negative relationship between debt used by the firm and its profitability were also revealed.

**Singh and Pandey (2008)** had an attempt to study the working capital components and the impact of working capital management on profitability of Hindalco Industries Limited for period from 1990 to 2007. Results of the study showed that current ratio, liquid ratio, receivables turnover ratio and working capital to total assets ratio had statistically significant impact on the profitability of the company.

**Nazir and Afza (2009)** investigated the impact of aggressive working capital investment and financing policies of 204 non-financial firms listed in the Karachi Stock Exchange on their profitability (in terms of return on assets as well as Tobin's q) using the panel data set for the period 1998-2005. The study revealed that the managers can create value for the shareholders if they adopt a conservative approach towards working capital investment and working capital

financing policies. They also found that investors prefer stocks of those companies which adopt an aggressive approach towards managing their short term liabilities.

**Falope and Ajilore (2009)** assessed the impact of working capital management on the profitability of 50 quoted non-financial Nigerian firms from 1996-2005. Using panel data methodology, they found a significant negative relationship between net operating profit and working capital management variables viz. average collection period, inventory days and cash conversion cycle. However, the study does not reveal any significant variation in the effects of working capital management on profitability between large and small firms. Therefore, they concluded that prudent working capital management is critical for the profitability of all the firms irrespective of their sizes.

**Ramachandran and Janakiraman (2009)** analysed the relationship between working capital management efficiency and earnings before interest and taxes of the paper industry in India during 1997–1998 to 2005–2006. They have used three indices viz. performance index, utilization index and efficiency index to measure working capital management efficiency. Different explanatory variables, viz. cash conversion cycle, accounts payable days, accounts receivables days, inventory days were considered to study the effect of these variables on earnings before interest and taxes. Further, fixed financial assets ratio, financial debt ratio and size (natural log of sales) were also taken as control variables for the analysis. The study came up with the result that the paper industry has managed its working capital satisfactorily over the study period. The accounts payable days was found to have a significant positive relationship with earnings before interest and taxes, which indicates that by delaying payment to suppliers the firms enhanced their earnings before interest and taxes.

**Gill et. al. (2010)** examined the relationship between working capital management and profitability based on a sample of 88 American firms listed in New York Stock Exchange for a period of 3 years from 2005 to 2007. They found statistically significant relationship between the cash conversion cycle and profitability, measured through gross operating profit. It follows that managers can earn profits for their companies by efficiently handling the cash conversion cycle and keeping accounts receivables at an optimal level.

**Chatterjee (2010)** studied the impact of working capital management on the profitability of a group of 30 UK companies enlisted in the London Stock Exchange for a period of three years from 2006-2008. Working capital management variables include average collection period or the receivable days, Inventory turnover in days, average payment period or the payable days, cash conversion cycle, current ratio and quick ratio. Debt ratio and the size of the firm (measured in terms of natural logarithm of sales) have also been used as a comprehensive measure of the working capital management. He had used Pearson's correlation for this analysis. The results showed that, there is a negative relationship between cash conversion cycle and profitability of

the firms. Significant negative relationship was also found between liquidity and profitability. However, the relationship between size of the firm and profitability was found to be positive. The results conclude that, corporate profitability can be increased by reducing the number of day's accounts receivable and inventories. A negative relation between average payment period or the payable days and profitability reveals the fact that less profitable firms wait longer to pay their bills.

**Dong and Su (2010)** examined the impact of working capital management (in terms of cash conversion cycle and its components viz. inventory days, accounts receivable days and accounts payable days) on the profitability of listed Vietnamese companies for a period of three years from 2006-2008. The results revealed a negative relationship of inventory days and accounts receivable days with profitability of the firms. However, a positive association was observed between accounts payable days and profitability. They concluded that the managers can create value for the shareholders by keeping the cash conversion cycle and its components to an optimum level.

**Panigrahi (2012)** examined the impact of working capital management on profitability of ACC Cement Company, during the period 1999-2000 to 2009-10 by using Pearson's simple correlation coefficients, multiple correlation analysis and multiple regression analysis. To adjudge whether the computed correlation and regression coefficients are significant or not, t-test has been conducted. The results showed existence of a relationship between the efficiency of working capital management and the profitability, but the relationship is not statistically significant.

**Arunkumar and Radharamanan (2013)** analysed the effect of working capital management on profitability of 1198 manufacturing firms listed in Centre for Monitoring Indian Economy for a period of 5 years from 2005-2006 to 2009-10. Using correlation and group wise weighted least squares regression analysis, the impact of debtor's days, inventory days, creditor's days, current ratio, current liability to total assets ratio, assets turnover ratio, financial assets to total assets ratio and size on return on assets employed was studied. The correlation analysis showed that the firms' profitability is highly influenced by the variables relating to working capital management. They found a positive relationship of profitability with debtors' days and inventory days and a negative relationship between profitability and creditor's days.

## III. Objective of the Study

The primary objective of the study is to assess whether the selected companies have managed their working capital components efficiently or not over the study period and the secondary objective is to assess whether the profitability of the companies, which are found to have managed their working capital components efficiently over the study period, are influenced significantly by the components of working capital or not.

## IV. Research Methodology

**A. Data Collection:** 10 Nifty Pharma Companies viz. Aurobindo Pharma, Biocon, Dr. Reddy's Laboratories, Cipla, Sun Pharmaceuticals, Lupin, Cadila Healthcare, Divis Laboratories, Piramal Enterprise Limited and Glenmark Pharmaceuticals have been selected for this study. Financial statement data on these companies are then collected from respective income statement and balance sheet available at www.moneycontrol.com over the study period 2013-14 to 2018-19.

**B. Assessment of Working Capital Management Efficiency:** For this purpose, year-wise Performance Index, Utilization Index and Efficiency Index have been calculated for each the selected companies over the study period and then averaged as suggested by Hrishikes Bhattacharya in his book "Total Management by Ratios: An Analytic Approach to Management Control and Stock Market Valuations". As per his suggestion "If there is a more than proportionate rise in current assets with the increase in sales, the costs of an enterprise also increase, both in terms of blockage of additional funds and the interest thereon. A firm cannot be said to have an efficient working capital management if it is registering a more than proportionate rise in current assets. Modern day financial management aims at reducing the level of current assets without, of course, ignoring the risk of stock outs etc. This is similar to that of cost management, where quality cannot be sacrificed at the expense of reducing costs."

The model for measuring the efficiency of working capital management is as follows:

**Performance Index:** Performance Index represents average of the performance indices of various components of current assets.

$$\boldsymbol{Performance\ Index\ (PI_{wcm}) = \frac{I_S\ *\ \sum_{i=1}^{N} \frac{W_{i,t-1}}{W_{i,t}}}{N}}$$

Where, $I_S$ = Sales Index = $\frac{S_t}{S_{t-1}}$

$S_t$ = Sales for period '$t$'

$S_{t-1}$ = Sales for period '$t-1$'

$W_{i,t}$ = $i^{th}$ item of current assets for period '$t$', $i = 1,2, \ldots \ldots, N$

$W_{i,t-1}$ = $i^{th}$ item of current assets for period '$t-1$', $i = 1,2, \ldots \ldots, N$

N = Number of items of current assets

Control and monitoring of individual item of current assets can be done through their respective indices by multiplying them with the sales index of the given year.

If performance index of a firm for a given year is more than 1, it indicates that the firm has managed its working capital efficiently in that year.

**Utilization Index:** The purpose of calculating this index is to measure to what degree the working capital of the firm has been utilized to generate sales. If proportionate increase in sales is greater than proportionate rise in current assets in that year, index will be greater than 1, which is a sign of efficient utilization of working capital components for generating sales.

$$\boldsymbol{Utilization\ Index\ (UI_{wcm})} = \frac{\boldsymbol{A_{t-1}}}{\boldsymbol{A_t}}$$

Where, $A_t$ = Current Assets to Sales Ratio for period '$t$'

$A_{t-1}$ = Current Assets to Sales Ratio for period '$t-1$'

**Efficiency Index:** Efficiency Index is the measure of ultimate efficiency in working capital management which is the product of Performance Index and Utilization Index. An index of more than 1 indicates efficient management of working capital and vice-versa.

$$\boldsymbol{Efficiency\ Index\ (EI_{wcm})} = \boldsymbol{(PI_{wcm})} * \boldsymbol{(UI_{wcm})}$$

**C. Calculation of Various Ratios relating to Working Capital Management and Profitability:** In order to assess the impact of different working capital components on profitability of the selected companies, five measures viz. Velocity of Trade Receivables, Velocity of Inventory, Velocity of Trade Payables, Return on Assets and Size of the Firm (represented by natural logarithm of sales value) are calculated using the collected data. A brief description of these measures and how they are calculated is given in Table: 1.

**Table: 1 A Brief Description of the Variables Used in the Analysis**

| Variables | Abbreviated as | Brief Description | How Calculated |
|---|---|---|---|
| 1. Velocity of Trade Receivables (in days) | $TRV$ | This measure represents average collection period from debtors from the point of credit sales | $TRV = \frac{365\ days}{\frac{Credit\ Sales}{Average\ Debtors}}$ |
| 2. Velocity of Inventories (in days) | $IV$ | This measure represents the time period beginning with the receipt of raw material and ending with the sale of the resulting finished goods | $IV = \frac{365\ days}{\frac{Cost\ of\ Goods\ Sold}{Average\ Inventory}}$ |
| 3. Velocity of Trade Payables (in days) | $TPV$ | This measure represents average repayment period to suppliers from the point of credit purchases of inventories | $TPV = \frac{365\ days}{\frac{Credit\ Purchases}{Average\ Creditors}}$ |
| 4. Return on Assets | $ROA$ | This measure represents the profit a firm can generate using its total asset base. | $ROA = \frac{Net\ Profit}{Total\ Assets}$ |
| 5. Size of the firm (represented by natural logarithm of sales value) | $LnS$ | This measure can be used as a proxy for the firm size | $LnS = \ln(Sales\ Value)$ |

**D. Calculation of Various Descriptive Statistics on these Variables:** Various descriptive statistics measures viz. Maximum, Minimum, Mean Value, Standard Deviation and Coefficient of Variation have been calculated for each of the above stated variables viz. Velocity of Trade Receivables, Velocity of Inventory, Velocity of Trade Payables, Return on Assets and Size of the Firm (represented by natural logarithm of sales value) using IBM SPSS package. Results so obtained have been analysed.

**E. Panel Data Regression Analysis:** Panel data regression analysis for estimating fixed effects with common intercept and $(n-1)$ binary regressors (using dummies), where $n$ is the number of companies, has been employed to achieve the second objective of the study. This methodology involves combining cross-sectional observations over several time points and produces more accurate estimates than employing cross-sectional or time-series estimation alone (Baltagi, 2005). The advantage is obvious as several data points are combined on each variable, which increases the accuracy of the economic estimates.

This study employed data on the selected Nifty Pharma companies covering the period from 2014-2015 to 2018-2019. To examine the effects of working capital management practices on profitability of the selected companies, the following regression equations has been modelled and coefficients have been estimated using the ordinary least square (OLS) method. Results are obtained using IBM SPSS package.

General form of the equation: $Y_{it} = \alpha + \beta * X_{it} + \varepsilon_{it}$

Where, $Y_{it}$ = dependent Variable of firm $i$ at time $t$

$\alpha$ = the constant

$\beta$ = regression coefficient of independent variable

$X_{it}$ = independent Variable of firm $i$ at time $t$

$\varepsilon_{it}$ = error term

More specifically the following regression equations will be used:

Model 1: $ROA_{it} = \alpha + \beta_1 * LnS_{it} + \beta_2 * TRV_{it} + \varepsilon_{it}$

Model 2: $ROA_{it} = \alpha + \beta_1 * LnS_{it} + \beta_2 * IV_{it} + \varepsilon_{it}$

Model 3: $ROA_{it} = \alpha + \beta_1 * LnS_{it} + \beta_2 * TPV_{it} + \varepsilon_{it}$

Where, $\alpha$ is a constant and $\beta_1$ and $\beta_2$ are the regression coefficients of the respective variables. Two subscripts $i$ and $t$ are used to identify the specific firm and specified time point respectively. $\varepsilon_{it}$ is the error term in regression equations.

## V. Data Analysis and Interpretation

### A. Assessment of Working Capital Management Efficiency of the Selected Companies

Table: 2 below depicts year-wise Performance Index, Utilization Index and Efficiency index and their averages for each of the selected companies over the entire study period.

**Table: 2 Performance Index, Utilization Index and Efficiency Index of the Selected Companies**

| Selected Companies | Indices | Years under Study | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2014-2015 | 2015-2016 | 2016-2017 | 2017-2018 | 2018-2019 | Average |
| Cadila Healthcare | $(PI_{wcm})$ | 1.10 | 3.99 | 1.07 | 1.17 | 1.13 | 1.69 |
| | $(UI_{wcm})$ | 1.01 | 1.23 | 0.63 | 1.08 | 0.96 | 0.98 |
| | $(EI_{wcm})$ | 1.11 | 4.91 | 0.67 | 1.26 | 1.08 | 1.66 |
| Aurobindo Pharma | $(PI_{wcm})$ | 0.79 | 193.66 | 2.60 | 0.84 | 1.50 | 39.88 |
| | $(UI_{wcm})$ | 0.91 | 0.93 | 1.18 | 0.82 | 1.03 | 0.97 |
| | $(EI_{wcm})$ | 0.72 | 180.10 | 3.07 | 0.69 | 1.55 | 38.84 |
| Cipla | $(PI_{wcm})$ | 0.71 | 11.69 | 0.89 | 0.69 | 1.48 | 3.09 |
| | $(UI_{wcm})$ | 0.84 | 1.21 | 0.91 | 0.85 | 0.91 | 0.94 |
| | $(EI_{wcm})$ | 0.60 | 14.14 | 0.81 | 0.59 | 1.35 | 2.92 |
| Piramal Enterprises | $(PI_{wcm})$ | 4.12 | 1.58 | 0.88 | 1.09 | 2.77 | 2.09 |
| | $(UI_{wcm})$ | 0.96 | 2.13 | 0.96 | 0.69 | 1.89 | 1.33 |
| | $(EI_{wcm})$ | 3.96 | 3.37 | 0.84 | 0.75 | 5.24 | 2.77 |
| Glenmark Pharmaceuticals | $(PI_{wcm})$ | 1.33 | 0.45 | 0.60 | 0.58 | 0.68 | 0.73 |
| | $(UI_{wcm})$ | 0.99 | 0.93 | 1.03 | 0.80 | 1.12 | 0.97 |
| | $(EI_{wcm})$ | 1.32 | 0.42 | 0.62 | 0.46 | 0.76 | 0.71 |
| Divis Laboratories | $(PI_{wcm})$ | 1.00 | 1.18 | 4.66 | 0.68 | 29.79 | 7.46 |
| | $(UI_{wcm})$ | 1.01 | 1.08 | 0.84 | 0.84 | 1.25 | 1.00 |
| | $(EI_{wcm})$ | 1.01 | 1.27 | 3.91 | 0.57 | 37.24 | 7.49 |
| Sun Pharmaceuticals | $(PI_{wcm})$ | 9.70 | 1.22 | 9.87 | 0.87 | 0.65 | 4.46 |
| | $(UI_{wcm})$ | 2.69 | 0.97 | 0.84 | 0.78 | 0.98 | 1.25 |
| | $(EI_{wcm})$ | 26.09 | 1.18 | 8.29 | 0.68 | 0.64 | 5.59 |
| Biocon | $(PI_{wcm})$ | 1.30 | 0.54 | 0.99 | 1.00 | 1.32 | 1.03 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | $(UI_{wcm})$ | 0.86 | 0.75 | 1.12 | 1.08 | 1.00 | 0.96 |
| | $(EI_{wcm})$ | 1.12 | 0.41 | 1.11 | 1.08 | 1.32 | 1.00 |
| **Lupin** | $(PI_{wcm})$ | 1.20 | 5.33 | 0.73 | 1.86 | 1.11 | 2.05 |
| | $(UI_{wcm})$ | 0.85 | 1.02 | 0.88 | 0.85 | 1.04 | 0.93 |
| | $(EI_{wcm})$ | 1.02 | 5.44 | 0.64 | 1.58 | 1.15 | 1.90 |
| **Dr. Reddy's Laboratories** | $(PI_{wcm})$ | 1.04 | 0.73 | 3.61 | 0.68 | 0.97 | 1.41 |
| | $(UI_{wcm})$ | 0.88 | 1.05 | 1.12 | 0.92 | 1.15 | 1.02 |
| | $(EI_{wcm})$ | 0.92 | 0.77 | 4.04 | 0.63 | 1.12 | 1.44 |
| **Average of the Companies** | $(PI_{wcm})$ | 2.23 | 22.04 | 2.59 | 0.95 | 4.14 | 6.39 |
| | $(UI_{wcm})$ | 1.10 | 1.13 | 0.95 | 0.87 | 1.13 | 1.04 |
| | $(EI_{wcm})$ | 2.45 | 24.90 | 2.46 | 0.82 | 4.69 | 7.06 |

First, an evaluation of working capital management efficiency of the selected pharmaceutical companies has been done on the basis of calculated indices in Table: 2. It can be observed that there are occurrences of the average $PI_{wcm}$, $UI_{wcm}$ and $EI_{wcm}$ above 1 respectively in 4, 3 and 4 years out of the study period of 5 years. For individual companies, in many cases, these indices are less than 1. For instance, for Cadila Healthcare, $UI_{wcm}$ is less than 1 in 2016-2017 and 2018-19 whereas $EI_{wcm}$ is less than 1 only in 2016-17. Likewise, for Aurobindo Pharma, $PI_{wcm}$ is less than 1 in 2014-2015 and 2017-2018, $UI_{wcm}$ is less than 1 in 2014-2015, 2015-2016 and 2017-2018 and $EI_{wcm}$ is less than 1 in 2014-2015 and 2017-2018. But, the mean values of $PI_{wcm}$, $UI_{wcm}$ and $EI_{wcm}$, considering all these companies, are found to be 6.39, 1.04 and 7.06 respectively, which mean that the selected pharmaceutical companies, as a group has satisfactorily managed its working capital components for generating sales.

Individual company-wise, except Glenmark Pharmaceuticals, all other companies are found to have managed their working capital efficiently over the study period, as the average $EI_{wcm}$ values are equal to or greater than 1. For Glenmark Pharmaceuticals, the average $EI_{wcm}$ is less than 1.

**B. Assessment of Impact of Working Capital Components on Profitability of the Efficiently Managed Working Capital Companies**

In the previous section we have found that among the selected 10 Nifty Pharma Companies, Glenmark Pharmaceuticals didn't prove to have managed its working capital efficiently. For this reason, in this section all the analysis are done on the basis of remaining 9 efficiently managed working capital companies (i.e. excluding Glenmark Pharmaceuticals).

Table: 3 below depicts the descriptive statistics of the variables used in the study. It embodies number of observations, minimum, maximum, mean, standard deviation and coefficient of variation of the variables used.

**Table: 3 Descriptive Summary Statistics of the Variables**

| Variables | Type | $N$ | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|---|---|
| $TRV$ | Independent | 45 | 35 | 182 | 105.27 | 41.297 |
| $IV$ | Independent | 45 | 38 | 178 | 95.69 | 34.833 |
| $TPV$ | Independent | 45 | 45 | 267 | 126.27 | 47.365 |
| $LnS$ | Independent | 45 | 7.41 | 9.44 | 8.7339 | 0.58210 |
| $ROA$ | Dependent | 45 | -3.94 | 22.83 | 9.0142 | 6.79232 |
| Valid $N$ (list wise) | | 45 | | | | |

The above table shows that average $ROA$ is 9.0142% with a minimum of -3.94% and maximum of 22.83%. The standard deviation is 6.79232%, suggesting a moderate variation in $ROA$ of the selected 9 pharmaceutical companies over the study period.

$TRV$ has an overall mean value of 105 days with a minimum of 35 days and a maximum of 182 days. This means that on an average the selected companies do not extend credit to their customers beyond 3.5 months. A standard deviation of 41.297% suggests that there is wide variability in collection period from debtors among the selected firms.

The mean $IV$ is 96 days. This means that selected firms need on an average 96 days from the receipt of raw material to sell inventory. The minimum and maximum $IV$ range between 38 days and 178 days respectively with a standard deviation of 34.833% which indicates wide variability in inventory conversion period among the selected firms.

$TPV$ has an overall mean value of 126 days with a minimum of 45 days and maximum of 267 days. . This means that on an average the selected companies take 126 days to repay their suppliers or creditors. A high standard deviation of 47.365% suggests that there is wide variability in repayment period to suppliers or creditors among the selected firms.

The mean value of $LnS$, which is used as a proxy for firm size, is 8.74 with minimum and maximum of 7.41 and 9.44. It has a very nominal standard deviation of 0.58210%, which suggests that there is not much variability among the selected 9 firms as far as their size, as represented by the natural logarithm of sales, is concerned.

**Results of Panel Data Analysis**

In this section all the panel data regression models are framed considering Cadila Healthcare as the reference category. Size of the firm (as represented by the natural logarithm of sales) is taken as the control variable and used as a predictor in all the regression models.

**Relationship between *TRV* and *ROA***

**Table: 4a Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of Estimate |
|---|---|---|---|---|
| 1 | 0.864[a] | 0.747 | 0.673 | 3.88559 |

a. Predictors: (Constant), TRV, BIOCON, SUNPHARMA, DIVISLAB, LUPIN, CIPLA, AUROBINDO, PIRAMAL, DR.REDDYS, LnS

**Table: 4b ANOVA[a]**

| Model 1 | Sum of Squares | d. f. | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 1516.639 | 10 | 151.664 | 10.045 | 0.000[b] |
| Residual | 513.326 | 34 | 15.098 | | |
| Total | 2029.965 | 44 | | | |

a. Dependent Variable: ROA

b. Predictors: (Constant), TRV, BIOCON, SUNPHARMA, DIVISLAB, LUPIN, CIPLA, AUROBINDO, PIRAMAL, DR.REDDYS, Ln

**Table: 4c Coefficients[a]**

| Model 1 | Unstandardized Coefficients | | Standardized Coefficients Beta | $t-stat.$ | $p-value$ |
|---|---|---|---|---|---|
| | B | Std. Error | | | |
| (Constant) | -2.164 | 29.074 | | -0.074 | 0.941 |
| AUROBINDO | 0.369 | 3.377 | 0.017 | 0.109 | 0.914 |
| CIPLA | -7.409 | 3.497 | -0.347 | -2.119 | 0.042 |
| PIRAMAL | -12.384 | 3.236 | -0.579 | -3.827 | 0.001 |
| DIVISLAB | 4.958 | 2.696 | 0.232 | 1.839 | 0.075 |
| SUNPHARMA | -13.976 | 3.044 | -0.654 | -4.590 | 0.000 |
| BIOCON | -4.803 | 3.731 | -0.225 | -1.287 | 0.207 |
| LUPIN | 1.448 | 3.638 | 0.068 | 0.398 | 0.693 |
| DR.REDDYS | -4.485 | 3.779 | -0.210 | -1.187 | 0.244 |
| LnS | 2.238 | 3.341 | 0.192 | 0.670 | 0.508 |
| TRV | -0.041 | 0.027 | -0.250 | -1.519 | 0.138 |

a. Dependent Variable: ROA

The above regression result shows that there is negative relation between $TRV$ and $ROA$. The $p-value$ is more than 0.05. This means that the relationship is not statistically significant. R-square is 0.747 which implies that 74.7% of variation in $ROA$ can be jointly explained by $LnS$ and $TRV$. The result indicates that if collection from debtors can be expedited i.e. $TRV$ can be reduced, the profitability of the company will increase and vice-versa.

**Relationship between $IV$ and $ROA$**

**Table: 5a Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of Estimate |
|---|---|---|---|---|
| 2 | 0.877[a] | 0.770 | 0.702 | 3.70868 |

a. Predictors: (Constant), IV, BIOCON, SUNPHARMA, DIVISLAB, LUPIN, CIPLA, AUROBINDO, PIRAMAL, DR.REDDYS, LnS

**Table: 5b ANOVA[a]**

| Model 2 | Sum of Squares | d. f. | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 1562.319 | 10 | 156.232 | 11.359 | 0.000[b] |
| Residual | 467.647 | 34 | 13.754 | | |
| Total | 2029.965 | 44 | | | |

a. Dependent Variable: ROA

b. Predictors: (Constant), IV, BIOCON, SUNPHARMA, DIVISLAB, LUPIN, CIPLA, AUROBINDO, PIRAMAL, DR.REDDYS, LnS

**Table: 5c Coefficients[a]**

| Model 2 | Unstandardized Coefficients | | Standardized Coefficients Beta | $t-stat.$ | $p-value$ |
|---|---|---|---|---|---|
| | B | Std. Error | | | |
| (Constant) | 1.389 | 27.724 | | 0.050 | 0.960 |
| AUROBINDO | 3.088 | 3.537 | 0.145 | 0.873 | 0.389 |
| CIPLA | -3.476 | 3.610 | -0.163 | -0.963 | 0.343 |

| | | | | | |
|---|---|---|---|---|---|
| PIRAMAL | -16.771 | 3.864 | -0.785 | -4.341 | 0.000 |
| DIVISLAB | 18.055 | 5.996 | 0.845 | 3.011 | 0.005 |
| SUNPHARMA | -15.459 | 2.755 | -0.723 | -5.612 | 0.000 |
| BIOCON | -4.467 | 3.562 | -0.209 | -1.254 | 0.218 |
| LUPIN | -0.093 | 3.263 | -0.004 | -0.029 | 0.977 |
| DR.REDDYS | -9.308 | 3.138 | -0.436 | -2.967 | 0.005 |
| LnS | 2.914 | 3.178 | 0.250 | 0.917 | 0.366 |
| IV | -0.153 | 0.063 | -0.786 | -2.419 | 0.021 |

a. Dependent Variable: ROA

The above regression result shows that there is negative relation between $IV$ and $ROA$. The $p-value$ is less than 0.05. This means that the relationship is statistically significant. R-square is 0.770 which implies that 77% of variation in $ROA$ can be jointly explained by $LnS$ and $IV$. The result indicates that if raw material to finished stock conversion period can be shortened i.e. $IV$ can be reduced, the profitability of the company will increase and vice-versa.

**Relationship between $TPV$ and $ROA$**

**Table: 6a Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of Estimate |
|---|---|---|---|---|
| 3 | 0.877[a] | 0.769 | 0.701 | 3.71252 |

a. Predictors: (Constant), TPV, BIOCON, SUNPHARMA, DIVISLAB, LUPIN, CIPLA, AUROBINDO, PIRAMAL, DR.REDDYS, LnS

**Table: 6b ANOVA[a]**

| Model 3 | Sum of Squares | d. f. | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 1561.349 | 10 | 156.135 | 11.328 | .000[b] |
| Residual | 468.616 | 34 | 13.783 | | |
| Total | 2029.965 | 44 | | | |

a. Dependent Variable: ROA

b. Predictors: (Constant), TPV, BIOCON, SUNPHARMA, DIVISLAB, LUPIN, CIPLA, AUROBINDO, PIRAMAL, DR.REDDYS, LnS

**Table: 6c Coefficients[a]**

| Model 3 | Unstandardized Coefficients | | Standardized Coefficients | $t-stat.$ | $p-value$ |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | 1.610 | 27.773 | | 0.058 | 0.954 |
| AUROBINDO | -5.038 | 2.932 | -0.236 | -1.718 | 0.095 |
| CIPLA | -9.009 | 3.440 | -0.422 | -2.619 | 0.013 |
| PIRAMAL | -10.633 | 2.826 | -0.498 | -3.763 | 0.001 |
| DIVISLAB | 0.651 | 3.137 | 0.030 | 0.207 | 0.837 |
| SUNPHARMA | -14.709 | 2.774 | -0.688 | -5.302 | 0.000 |
| BIOCON | -6.182 | 3.616 | -0.289 | -1.709 | 0.096 |
| LUPIN | -2.254 | 3.348 | -0.105 | -0.673 | 0.505 |
| DR.REDDYS | -10.194 | 3.248 | -0.477 | -3.139 | 0.003 |
| LnS | 2.201 | 3.186 | 0.189 | 0.691 | 0.494 |
| TPV | -0.043 | 0.018 | -0.301 | -2.402 | 0.022 |

a. Dependent Variable: ROA

The above regression result shows that there is negative relation between $TPV$ and $ROA$. The $p-value$ is less than 0.05. This means that the relationship is statistically significant. R-square is 0.769 which implies that 76.9% of variation in $ROA$ can be jointly explained by $LnS$ and $TPV$. The result indicates that longer number of days of trade payables led the firm to a lower level of profitability and vice-versa. Putting it in another way we can argue that less profitable firms wait longer to pay off their debts.

## VI. Conclusion

In the first section, an assessment of working capital management efficiency has been made using Performance Index, Utilization Index and Efficiency Index. It is observed that the selected Nifty Pharma Companies, as a group, have managed their working capital efficiently over the study period of 5 years from 2014-15 to 2018-19 as the average Performance, Utilization and Efficiency Indices are found to be more than 1 (6.39, 1.04 and 7.06 respectively). Individual

company wise, Glenmark Pharmaceuticals only is found to be inefficiently managed its working capital during the study period as the average Performance, Utilization and Efficiency Indices calculated for this company are all less than 1 (0.73, 0.97 and 0.71 respectively). For this reason, in the second part of the analysis i.e. for the assessment of impact of efficiently managing working capital on profitability of the firms, Glenmark Pharmaceuticals has not been considered.

As mentioned, in the second section an assessment of whether the profitability of the companies, which are found to have managed their working capital components efficiently over the study period in the first section, are influenced significantly by the components of working capital or not, has been made. It is observed that Trade Receivable Velocity, which represents the average collection period from the credit customers, is negatively associated with profitability (measured by Return on Assets). The result indicates that if collection from debtors can be expedited i.e. average collection period can be reduced, the profitability of the company will increase and vice-versa. Also a negative statistically significant relation is found between Inventory Velocity and profitability. The result is obvious as longer period is required to convert raw materials into finished stock, lesser will be the inventory turnovers and profitability will also be lower. Finally, a statistically significant negative association between Trade Payable Velocity and profitability is also established revealing that longer number of days of trade payables led the firm to a lower level of profitability and vice-versa. An alternative explanation to this situation may be that less profitable firms normally wait longer to pay off their debts. Therefore, overall it may be argued that efficient management of working capital is most pertinent to the companies in improving the profitability.

## VII. Limitations of the Study

The study is based on five years data only from 2014-15 to 2018-19. A detailed analysis covering a longer period might have produced slightly different results.

The study is based on secondary data collected from www.moneycontrol.com and hence the quality of the study depends on the accuracy, reliability and quality of the secondary data source. Any manipulation and approximation with respect to data source might have impacted the results.

The study is based only on the pharmaceutical sector of India. Inclusion of other sectors simultaneously in the study could have produced more comprehensive analysis.

The study is based only on 10 Nifty Pharma companies in India. More accurate results might have been obtained by including more number of sample companies in the list.

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