

Impact of Working Capital Efficiency on Firms' Profitability: A Study on Manufacturing Sector in India

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Abstract

The study highlights the efficiency of manufacturing companies in India in managing their day to day requirements for capital which may have an impact on the profitability of a concern. The concept has been studied before by many academicians. However, the set of study has not been performed for the selected time period and with the sample companies. S&P BSE Stocks as per their market capitalization have been taken from 2009-16. The conversions of sale into cash and profit margins have been incorporated in the study. Using Panel data regression analysis in STATA, results have been interpreted showing significant impact of efficiency in management of operating capital vis-a-vis profits in the firm. The cash conversion cycle of sample companies has significantly affected their net profit margin. It may be deduced from the results that the short term capital managerial efficiency is an important variable and has the capacity to influence profit margins in case of manufacturing units.

Keywords: Gross Operating Cycle, Net Operating Cycle, Net Profit Margin, Profitability, Working Capital Management

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Editorial Board Excerpt: *Initially at the Time of Submission (ToS) submitted paper had a 38% plagiarism and after alteration and modification it was reduced to 30%, to end with after a rigorous effort of author (Parul and Priya) it was narrow-down at 08% which is an accepted percentage for publication. The author is of outlook that dissimilarity in percentages was due to the similar kind of research work. The editorial board is of a surveillance that manuscript had a succeeding close watch by the blind reviewer's which at a later stages had been set accurate and make improvements by an author in various phases as and when essential to take action so. The reviewer's had in a preliminary stages mention with minor revision with a following remark which at a short degree cut down by a creator. The annotations related to this script is extremely noticeable both subject-wise and investigate wise by the reviewers during assessment and further at blind review procedure too. All the comments had been shared at a multiplicity of dates by the authors' in due course of time and alike had been built-in by the author in calculation. By and large all the standpoint and reviewer's observations had been incorporated in a paper at the closing stages and further the article had been earmarked and decided under "Empirical research Paper" set as its highlights and heighten the effort in relation to Working Capital Efficiency on Firms' Profitability of Indian manufacturing Sector.*

1. Introduction

Working Capital is required by a firm for meeting its day to day requirements. The efficiency in managing this capital may impact the liquidity position thereby also profitability of a concern. The day to day requirements for capital varies from firm to firm due to the size of the company, business context, length related to operations, offering credit to customers along with pricing policy among many others. The present paper focuses upon a common issue which may be faced by all the manufacturing companies in managing their operations. Thus, the study aims to locate the influence of efficiency in managing day to day funds by the firms on their profit segments. In other words, the study intends to analyze the relationship between the operating cycle of these

companies and their profitability. This phenomenon in the present paper has been extended to manufacturing sector of India which operates majorly on credit basis.

One of the most significant contributors to India's growth chart is its manufacturing sector. The combined Compounded Annual Growth Rate (CAGR) of these sectors has been reported at 7.32% by Central Statistics Office during the years 2012-2017. This is majorly due to the policy initiatives like "Make in India" initiated by existing set up which has led to a gain in the importance of these sectors for the overall development of the economy. By 2020, India is expected to become the fifth largest manufacturer in the world in an attempt to place India as a manufacturing hub and gain global recognition in the world economy. The current contribution to GDP of these sectors is 16% which is expected to expand to 25% by 2022.

The bubbling effect by the latest revolution in taxation system of the country (Goods and Services Tax) may further enhance the growth of this sector. The foreign direct investment is on the rise due to liberalized norms adopted by the Government. Business conditions may continue to be favourable as the popular giants like Siemens, GE, Toshiba, Apple Inc., Dabur India, Volvo India; Coca Cola are in the process of expanding their plants in India.

Thus, the study investigates management of day to day funds with profit proportion of sample firms. On one hand, the investment made in the form of receivables, inventory and such other current assets to maintain working capital of an organization is a necessity for survival. On the other hand, it is a cost of liquidity which may have a bearing with profits. Theoretically also it is said, "more the liquidity, lesser would be the profits".

The gross operating cycle is the basis to examine the short term funds which may be blocked in financing working capital. In addition to this, the credit which is allowed by suppliers to the firm also acts as an important determinant in computing working capital requirements.

Thus, the difference between these two variables (gross operating cycle and average payment period which together constitute Cash Conversion Cycle (CCC)) may impact margins for a firm. It may be a case of various indicators for evaluating profitability of a company e.g. ROA, RONW, NPM, OPR. The study has limited its scope to net profit margin as it may be regarded as the most important among all these indicators.

Remaining text has been presented in further sections; second segment in the paper narrates earlier empirical work, third segment explains methodology adopted whereas the fourth section depicts the statistics followed by conclusion last segment.

2. Empirical Work (Prior Literature)

2.1 Managing Operating Funds and Profitability

Found effect of managing day to day funds on profits^{1,3,6,9,11}. The relationship between ICP, ACP, APP, CCC and ROA has been established with correlation and regression analysis thereby applying t-test and ANOVA. An insignificant positive relationship had been found between ICP and profits along with ACP. But, the relationship with APP and CCC has been found to be negative. These studies concluded a significant impact of managing day to day funds on profits. A study also depicted a weak opposite correlation.

2.2 Return on Total Assets as an Indicator of Profitability

In study^{2,4,13,16} have seen impact of variables from Indian FMCG companies (age of debtors, inventory, creditors) on return on total assets from 2000-2009 using Pooled OLS as well as fixed

effect model. The later studied from 2001-2006 selected 2628 companies in Tehran stock exchange by making use of regression. These studies concluded opposite effects.

2.3 CCC: An Estimator for Operating Cycle

Examined business^{8,11} cycles and managing of day to day funds for 18 years with sample of registered firms. The study documented that CCC may be a significant indicator in evaluating managing of day to day funds relationship with profitability. It also concluded that business cycles play a significant role in influencing portability of companies. Both studies used CCC and concluded strong association between variables.

2.4 Using Instruments for Day to Day Funding

Studied^{12,15} 58 firms with small capitalization in Mauritius using Panel Data Analysis. It documented a rising scenario towards funding regular capital in an aggressive manner. It also reflected using regression that there has been lower profitability for firms which had high investments in stocks and debtors. Both studies used Panel Data and narrated importance of managing operating capital *vis-a-vis* their impact on profit margins.

2.5 Day to Day Funding Strategy (Aggressive/ Conservative)

Tested¹⁴ relationship of managing regular funds in an aggressive set up with its profits from 1998-2005 using Panel Data Analysis and Tobin's q ratio. 204 firms were used as a sample and from regression input it was indicated that a negative association between aggressiveness of variables.

3. Research Design

3.1 Selection of Sample

The initial sample of 141 S&P BSE listed manufacturing companies had been taken from www.moneycontrol.com. However, during observation it was found that a classification of companies as per their market capitalization may give better results. Thus the firms streamlined into three segments: large, mid and small as per their capitalization. This stratification helped to collect the data giving equal weight-age to all three groups of companies.

Final sample after the stratification comprised of 65 companies sub-divided into 23 from large cap, 20 from mid-cap and 22 from small cap. The annual reports of these companies were taken from their official websites from 2009-2016 (leaving the recession year 2008 as it may not depict normal data). The data collected was uniformly available for 22 companies out of 65 selected during grouping data into different strata. The data obtained was used to compute the variables explained in the next segment.

3.2 Variables Used for the Study

The indicators for liquidity and profitability may be divided into various categories. Liquidity may be elucidated by the short term funds which have been invested by firms to arrange for day to day transactions. It may be observed from the investment in inventory, receivables etc. The time which represents the blockage in inventory may be classified further into RMSP, WIPCP and FGSP. It can be a relevant indicator in the analysis of cycle of operations because of which profit margin may change.

Another component of cycle is the money parked in debtors/receivables which takes credit period allowed to customers to convert them into liquid assets. Arrangement of liquidity during such time period becomes a necessity for a firm due to which it may have to bear the opportunity cost of earning somewhere else. On the other hand, the factor which carries a negative impact on operating cycle is the time allowed by suppliers to firm for making payments. This reduces the liquidity requirements of a company thereby allowing it time to delay the payments. The sum of inventory conversion and debtor's collection period is known as gross operating cycle. The deduction of creditor's payment period results into net operating cycle i.e. CCC (assumed to be independent variable in the study).

On the other hand, profitability indicators could be ROA, RONW, ROCE, NPM etc. However, NPM may be the core of explaining profit shifts in a firm. This acts as a relevant indicator of profitability for firms.

The relationship between the above two mentioned variables have been established in the present study. The data of 22 firms from manufacturing sector in India is involved to compute CCC and NPM from 2009-2016.

3.2.1 Gross Operating Cycle

The gross operating cycle for the study in particular has been defined as the combination of RMSP, WIPCP, FGSP and ACP. In short, the formula applied for computing gross operating cycle is given below:

$$GOC = ICP + ACP \quad (1)$$

where,

ICP = RMSP+WIPCP+FGSP

GOC = Gross Operating Cycle

RMSP = Raw Material Storage Period

WIPCP = Work in Progress Conversion Period

FGSP = Finished Goods Storage Period

ICP = Inventory Conversion Period

ACP = Average Collection Period

3.2.2 Raw Material Storage Period

The RMSP means time period blocked in the store where it may not be put to production and thus blocking of material takes place. The formula to compute RMSP is given below:

$$RMSP = \frac{\text{Average Raw Material}}{\text{Consumption of Raw Material (Annual)}} \times N \quad (2)$$

where,

Average Raw Material = Average of Opening and Closing Raw Material

Consumption of Raw Material = (Opening Stock of Raw Material + Purchases - Closing Stock of Raw Material)

N = Number of days in a year taken as 360

3.2.3 Work in Progress Conversion Period

The work in progress conversion period refers to the time involved in converting raw material to finished goods. It has been calculated with the following formula:

$$WIPCP = \frac{\text{Average Work in Progress}}{\text{Cost of Production}} \times N \quad (3)$$

where,

Average Work in Progress = Average of Opening and Closing Work in Progress

Cost of Production = (Opening stock of WIP + Consumption of Raw Material + Manufacturing Expenses + Depreciation - Closing Stock of WIP)

N = Number of Days in a year taken as 360

3.2.4 Finished Goods Storage Period

FGSP refers to time lag between actual sale and ready production for sale. This may be expressed with the following formula:

$$FGSP = \frac{\text{Average Finished Goods}}{\text{Cost of Sales}} \times N \quad (4)$$

where,

Average Finished Goods = Average of Opening and Closing Finished Goods

Cost of Sales = (Opening Stock of Finished Goods + Cost of Production + Selling, Distribution & Administrative Expenses + Excise

Duties - Purchases - Closing Stock of Finished Goods)

N = Number of Days in a year taken as 360

3.2.5 Inventory Conversion Period

ICP may be defined as the time period involved in conversion of stock into sold out goods. This lag can be calculated with the formula mentioned below:

$$ICP = \frac{\text{Average Inventory}}{\text{Cost of Goods Sold}} \times N \quad (5)$$

where,

Average Inventory = Average of Opening and Closing Stock

Cost of Goods Sold = Opening Stock + Purchases + Manufacturing Expenses - Closing Stock

N = Number of Days in a year taken as 360

3.2.6 Average Collection Period

This period may be explained as the time period allowed to receivables in order to make payment after sale takes place. It can be calculated by the formula below:

$$ACP = \frac{\text{Average Receivables}}{\text{Credits Sales}} \times N \quad (6)$$

where,

Average Receivables= Average of Opening and Closing receivables

Credit Sales= All sales assumed to be on credit

N= Number of days in a year taken as 360

3.2.7 Average Payment Period

This period refers to the time allowed by vendors/suppliers for payment of dues related to raw materials. This can be computed with following formula:

$$APP = \frac{\text{Average Payables}}{\text{Credit Purchases}} \times N \quad (7)$$

where,

Average Payables= Average of Opening and closing payables

Credit Purchases= Total purchases assumed on credit

N= Number of days in a year taken as 360

3.2.8 Cash Conversion Cycle

Cash conversion cycle in the present study has been taken to be the net operating cycle calculated with an adjustment of average payment period in the gross operating cycle. The following formula has been used to compute this cycle:

$$CCC = GOC - APP \quad (8)$$

where,

GOC= Gross Operating Cycle

APP= Average Payment Period

Net Profit Margin has been taken as an indicator of profitability in an attempt to investigate day to day funds management efficiency *vis-a-vis* profit of different manufacturing companies. Its computation process has been discussed below:

NPM refers to a key indicator for a company to assess its profitability. This has been used as one of the measures in the study. It has been computed with the help of following formula:

$$NPM = \frac{PAT}{NS} \times 100 \quad (9)$$

where,

NPM = Net Profit Margin

PAT = Profit after tax

NS = Net Sales

3.3 Statistical Software

STATA software (ver.12.0) is used for studying effect of day to day fund management by companies and its bearing on profits of firms.

3.4 Hypotheses Testing

H_0 : "The efficiency with which companies manage their working capital does not have a significant impact on the net profit margin of the firms".

3.5 Technique Used

Panel data analysis was used to investigate influence of managing operating capital on profits of firms⁵ which is a group of individuals for whom the observations are made over multiple time periods. It is also known as longitudinal data.

"A panel dataset is considered a better model than a traditional pure cross section or time series datasets. It is because of the econometric benefits that a panel dataset offers, that is being widely used by researchers in the field of finance and economics to study the cross country issues. The large of observations that are contained in a panel data is the biggest advantage that this dataset holds. Due to large number of observations more accurate and reliable estimates are produced, thus enabling us to test whether the linear regression results are robust or not. Panel data also alleviates the problem of multi-collinearity by making the explanatory variables vary in two dimensions (cross-section and time series), thus making it less likely for the variables to be highly correlated".

In this paper all three techniques of Panel Data Analysis have been applied. Along with "the common constant model (OLS regression), both Fixed Effects (FE) model and Random Effects (RE) model have also been used for exploring the impact of working capital management efficiency on profitability in the context of manufacturing concerns because the OLS regressions takes into account the country -specific effects and the FE and RE models check for the time effect".

3.5.1 The Common Constant Model

H_0 : there is no difference between the constants (homogeneity), and thus, the pooled OLS technique is applied.

$$H_0: \alpha_1 = \alpha_2 = \alpha_N \quad (10)$$

But it is practically not possible. Therefore, may have it own limitations. Thus, it is important to include the fixed and random effects in the method for estimations.

3.5.2 The Fixed Effects Model

This model assumes that C is fixed over time for each group and that every group has a different constant.

This model is given as below:

$$y_{it} = \alpha_i + \sum_{k=1}^k x_{itk} \beta_k + \varepsilon_{it} \quad (11)$$

where,

$i = 1, 2, \dots, N$

$t = 1, 2, \dots, T$

where y_{it} represents the value of the dependent variable, i.e. net profit margin in cross-section i (twenty- two companies in our case); T is the length of time series, i.e. 2009-2016 for twenty two manufacturing companies; k is the number of independent determinants explaining the dependent variable. The term α_i denotes unobserved company- specific effects which are assumed to be fixed over time and different across companies i . x_{it} and β represent the vectors of explanatory determinants and their parameters respectively. “The subscript i indicate individual companies, while t shows different time periods. ε_{it} represents the vector of the error component which is assumed to be independently distributed across i and over t with mean zero and variance σ^2 ”.

3.5.3 Random Effects (RE) Model

Random parameter is the assumption for constants in this model. Therefore, constants tend to vary and do not remain fixed over time.

In this, the model is given as below:

$$y_{it} = \mu + \sum_{k=1}^k x_{itk} \beta_k + v_{it} \quad (12)$$

where,

$i = 1, 2, \dots, N$

$t = 1, 2, \dots, T$

$v_{it} = \alpha_i + \varepsilon_{it}$, $t = 1, \dots, T$ is the composite errors

For each t , v_{it} is the sum of the unobserved effect and an idiosyncratic error. α_i is assumed to be independently distributed across i , with mean zero and variance σ_α^2 and uncorrelated with X_{it} . The error term ε_{it} is assumed to be independently distributed across i and over t with mean zero and variance σ^2 .

Through the excerpts from panel data analysis, when it comes to fixed effects model, it is the intercept terms for the companies that differ, however in case of random effects model the difference can be seen in the error terms of the companies.

3.6 Hausman Specification Test

If the Panel is found to be balanced, in general FE model works out well. Contrary to this, if it is found disturbed, RE shall work in a better manner. Hausman specification test (1978) provides guidance in locating the right model. Under such situation, H_0 shall be:

- Null Hypothesis: $H_0: \text{Cov}(\alpha_i, X_{it}) = 0$ i.e. Random Effect model is suitable, if Null Hypothesis is accepted.
- Alternate Hypothesis: $H_a: \text{Cov}(\alpha_i, X_{it}) \neq 0$ i.e. Fixed Effect model is suitable, if alternate hypothesis is accepted.

The Hausman test uses the following test statistic:

$$H = \left(\hat{\beta}^{FE} - \hat{\beta}^{RE} \right) \left[\text{Var}(\hat{\beta}^{FE}) - \text{Var}(\hat{\beta}^{RE}) \right]^{-1} \left(\hat{\beta}^{FE} - \hat{\beta}^{RE} \right) \sim \chi^2 \quad (13)$$

with k degrees of freedom

where,

H = Hausman Test Statistic

$\hat{\beta}^{FE}$ = Fixed Effects estimates (Vector)

$\hat{\beta}^{RE}$ = Random Effects estimates (Vector)

χ^2 = Chi- Square distribution Statistic

If p value is less than 0.05, FE shall work out.

If it is greater than 0.05, RE shall be a better model.

p = probability value of the test statistic.

In case, p -value > significance level, H_0 may not be turned down. Thus, RE is a better model. But, if opposite is the case, H_0 shall stand to be rejected and thus, FE shall be a better model.

3.7 Choosing the Best Model

After applying the three estimations of panel data analysis, one needs to find out which model out of the three is a model of best fit. This is done by applying various statistical tests.

First, the study checks which model among the OLS regression and FE should be used. In order to check the fixed effects, F-test is applied.

If F -statistic > F -critical value H_0 may be rejected, i.e., the constants are homogeneous and hence there is no difference between the constants in both the groups and therefore FE model can be used for estimation.

Checking at the bottom of fixed effect regression (result shown in appendix), there is an F -test just below the table: “ F test that all $u_i = 0$.”

This test is for the null that all coefficients for fixed effects are zero, i.e. a test between fixed vs. Pooled OLS. In case H_0 stands rejected, FE becomes significant, so one should use them. Otherwise, just go for the Pooled OLS.

The next step is to make a comparison between FE and RE model to find out which of the two should be used. This can be done by using Hausman specification test. If p value < level of significance i.e. H_0 stands rejected and the FE model can be used. Contrary to this, if p -value is more than the level of significance, there may not be enough evidence against the null hypothesis and thus it may be concluded that RE model is more suitable (Results in appendix).

Then, next is to decide among common constant model and RE model,

Breusch–Pagan Lagrange Multiplier (LM) test (1980) is computed. If statistic shows a significant difference across countries then RE model should be used. Else, general OLS model may be run.

4. Results and Analysis

Table 1 shows the maximum and minimum values obtained for variables X (Cash Conversion Cycle) and Y (Net Profit Margin). It has been observed that maximum value was for Procter and Gamble and minimum was obtained for Hindustan Unilever Limited.

Once the preliminary investigations are done, as a first step to the regression analysis, to test the stationary of both the data sets, Levin- Lin- Chu test has been applied (Table 2). Overall panel here is balanced because for all the 22 companies, i.e. 'i= 22', the time period for the selected variables under study is uniform, i.e. for all the 22 companies 't' is from 2009-2016 (8 years).

Following hypothesis is tested under the Fisher Panel test for all data sets among independent determinants and dependent variable:

- Null Hypothesis: H_0 : Panels are not stationary
- Alternate Hypothesis: H_a : Panels do not have a unit root problem

4.1 Regression Analysis

After testing the stationary, in order to capture the distribution of NPM across all 22 companies over eight years period, the estimates of following equation are formed by below given model:

1. Pooled Ordinary Least Square (OLS Model),
2. FE Model, and
3. RE Model.

Table 3 analysis, it is clear that CCC is found significant at 5% level of significance. The F-statistic in above model is also significant at five per cent significance level meaning that the independent determinant is able to influence the dependent variable i.e. Net Profit Margin significantly and also that this model is of best fit. The R-square of the model is though quite low which means that this determinant is able to explain only 3.46% variation in Net Profit Margin, however, in panel data even this is well enough to explain the variations.

Once the Pooled OLS regression model is run, regression diagnostics needs to be conducted to check the problems of multi-collinearity and heteroskedasticity and then arriving at the model of best fit by removing these problems if they exist. However, since in this study, only one independent variable is included, thus there is no problem of multi-collinearity.

Breusch-Pagan/ Cook-Weisberg (test) is used H_0 of constant variance in the model. Based on the p-values of B-P test, i.e. 0.0518 with the Chi- square value of 3.78, null hypothesis cannot be rejected as the p- value > 0.05. Thus, it can be said that heteroscedasticity problem is not there.

Table 1. Summarizing the data of dependent and independent variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Y	176	-15.56388	1031.459	-12732.9	1597.43
X	176	18.50385	29.24509	-100.1682	284

Table 2. Panel unit root test applying Levin-Lin-Chu Unit-root test on balanced panel

Variable	Adjusted t* Statistic	Null Hypothesis (Accepted/ Rejected)	Inference about the data series (stationary/ non- stationary)
NPM	-10.2287	Rejected	Stationary
p-value	0.0000		
CCC	-5.7203	Rejected	Stationary
p-value	0.0000		

Table 3. Pooled OLS regression model (Results)

Dependent Variable: NPM	
Independent Variable	Coefficients with their t-statistics
Intercept	-136.9494 (-1.51)
CCC	6.5600 (2.50)**

** denote the significance at 5% significance levels. Figures in parenthesis () represent the t- statistic.

Source: Compiled by authors

Table 4. Results of FE and RE models

Dependent Variable: NPM		
Independent Variable	Fixed Effects Model	Random Effects Model
Intercept	-89.59364 (-0.85)	-124.702 [-1.08]
CCC	4.000776 (0.97)	5.89813 [1.97]**
F- Test	{1.88}**	-
Wald χ^2	-	(3.88)**
R ² within	0.0061	0.0061
R ² between	0.1443	0.1443
R ² overall	0.0346	0.0346
Hausman Test (p- value)	0.45 (0.5010)	
Breusch-Pagan Lagrange multiplier (LM) test: Var(u) = 0	-	$\chi^2 = 4.94$ Prob> $\chi^2 = 0.0131$

Note: Parentheses () and [] show the *t*-value and *Z*-statistics, respectively. ** denotes the significance at the 5% level. The above table is author's own compilation based on computations done on STATA (ver. 12.0).

The estimation results of both the models, i.e. FE and RE are presented in Table 4.

Table 4 analysis, it is indicated FE is a better model than constant model because F test ($u_i=0$): where $F(21, 153) = 1.88$ which is found significant at 5% level of significance and therefore shows H_0 (OLS) may be rejected. Hence, FE shall be suitable as compared to constant model.

The next concern is the choice between FE and RE models. To select appropriate model for the empirical analysis, Hausman specification test is conducted. The Chi-square value as per this test (0.45) is not found to be significant at 5% level of significance, suggesting that RE model is the preferred one.

Lastly, "when the RE Model is compared with the pooled OLS Model with the help of Breusch-Pagan Lagrange Multiplier (LM) test, it is observed that the Prob> χ^2 is less than 0.05. Hence, we can reject the null and conclude that random effects is appropriate, i.e. there is sufficient evidence of significant differences across companies, therefore RE model is the most appropriate model".

Therefore, the result of RE model is discussed here in the study. It is found that CCC (proxy used for working capital management efficiency) is found as a significant determinant in explaining the variation in NPM (proxy used for profitability) of manufacturing companies. The findings are well supported by the literature that exists in this context.

The between R² is "How much of the variance between separate panel units i.e. 22 companies in the present case does this model account for" which in this case means that only 14.43% variance between these 22 companies is explained by the determinant in this model. The within R² is "How much of the variance

within the panel units does this model account for", i.e. 0.61% variance within each company in this case is explained with the help of RE Model which is the model of best fit and the R² overall is a weighted average of these two, i.e. 3.46% variation in totality between the companies and within each company together is explained by this model. The Wald Chi- square statistic is also significant at 5% level of significance making it a model of best fit.

5. Conclusion

Day to day capital is a constituent among many other important components on balance sheet for any company. It becomes all the more relevant when it is extended to manufacturing sector which operates purely on credit basis even for its routine business transactions. Hence, the flow of short term funds is very crucial for this sector of economy. It is needed by firms for regular payments, day to day transactions, settlement of dues etc. Thus, manufacturing sector has been taken to be studied for working capital efficiency in the present study.

Increasing profit and maintaining liquidity at the same time may be a challenge in tracking operating capital changes. Thus, it may be a tedious task to balance between these two parameters. Theoretically, it has been mentioned that liquidity and profitability have got an inverse relationship with each other. The empirical investigation supports this phenomenon when it was tested with varied industries and companies^{1,3,6,10,12}. It may be interpreted from these studies that the blockage of funds in various current assets like inventory and receivables led to low profitability for firms.

From the present study it may be inferred that day to day capital management efficiency may have a significant influence on profit margins of companies of manufacturing sector of India. The objective of the study called for testing association between CCC and NPM (taken as variables in the study)^{8,10}. Empirical findings described that 14.43% of variation in operating profits may be explained by CCC of firms. It may be deduced that operating cycle (CCC) which may also be capable of explaining liquidity requirements of a firm may have an impact in determining profitability of firms^{2-4,16}. Thus, it may be said managing day to day capital plays a significant part while determining profitability for a company. The firms may strategize their operating capital along with CCC and plan in accordance towards their profit margins.

The study has limited its scope to two variables i.e. cash conversion cycle and net profit margin. Its scope for time period has also been kept limited post recession. The number of companies has also been limited to 141. The area of firms has catered to manufacturing sector in particular. The same line of investigation may be carried further with broader variables taking pre and post recession comparative figures. More industries and companies could be a part of an elaborative study.

6. References

1. Agha H. Impact of working capital management on profitability, *European Scientific Journal*. 2014; 10(1):374-381.
2. Alipour M. Working capital management and corporate profitability: Evidence from Iran, *World Applied Sciences Journal*. 2011; 12(7):1093-99.
3. Babu NS, Chalam GV. Study on the working capital management efficiency in Indian Leather Industry - An empirical analysis, *International Journal of Research in Management and Technology*. 2014; 4(5):196-201.
4. Bagchi B, Chakrabarti J, Roy PB. Influence of working capital management on profitability: A Study on Indian FMCG Companies, *International Journal of Business and Management*. 2012; 7(22), 1-10. <https://doi.org/10.5539/ijbm.v7n22p1>.
5. Balestra P. Introduction to Linear Models for Panel Data. In: Mátyás, L. and Sevestre, P. (Eds.), *The Econometrics of Panel Data* (21-29), Netherlands: Springer; 1992. https://doi.org/10.1007/978-94-009-0375-3_2.
6. Danuletiu AE. Working capital management and profitability: A Case of Alba County Companies, *Annals Universities Apulensis Series Oeconomica*, 2010; 12(1):364-74.
7. Deloof M. Does Working Capital Management Affect Profitability of Belgian Firms? *Journal of Business Finance and Accounting*. 2003; 30(3):573-87. <https://doi.org/10.1111/1468-5957.00008>.
8. Enqvist J, Graham M, Nikkinen J. The Impact of working capital management on firm profitability in different business cycles: Evidence from Finland, *Research in International Business and Finance*. 2014; 32:36-49. <https://doi.org/10.1016/j.ribaf.2014.03.005>.
9. Ganesan Vedavinayagam. An analysis of working capital management efficiency in telecommunication equipment industry, *Riveur Academic Journal*. 2007; 3(2):1-10.
10. Gill Amarjit, Biger N, Mathur N. The relationship between working capital management and profitability: An evidence from the United States, *Business and Economics Journal*. 2010; 1-9.
11. Joshi LK, Ghosh S. Working capital management of Cipla Limited: An empirical study. *International Journal of Marketing, Financial Services and Management Research*. 2012; 1(8):170-86.
12. Karaduman HA, Akbas HE, Ozsozgun A, Durer S. Effects of working capital management on profitability: The case for selected companies in the Istanbul Stock Exchange (2005-2008), *International Journal of Economics and Finance Studies*. 2010; 2(2):47-54.
13. Koto RK, Vitor DA, Angmor PL. Working capital management and profitability: Evidence from Ghanainan listed manufacturing firms, *Journal of Economics and International Finance*. 2013; 5(9):373-79. <https://doi.org/10.5897/JEIF2013.0539>.
14. Nazir MS, Afza T. Impact of aggressive working capital management policy on firms' profitability, *IUP Journal of Applied Finance*. 2009; 15(8):19-30.
15. Padachi, Kesseven. Trends in working capital management and its impact on firms' performance: An analysis of mauritian small manufacturing firms, *International Review of Business Research Papers*. 2006; 2(2):45-58.
16. Raheman Abdul, Nasr Mohamed. Working capital management and profitability- A case of Pakistani firms, *International Review of Business Research Papers*. 2007; 3(1):279-300.

Annexure-I

Impact of Working Capital Efficiency on Firms' Profitability: A Study on Manufacturing Sector in India

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