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Management of Cash Conversion Cycle and Firms' Profitability: A Panel Data Analysis

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Abstract: The focus of this paper is to examine the trend and interrelation with the various components of cash conversion cycle and profitability of the firms except financial and service sectors' firm listed in the Bombay stock Exchange. This study has considered the cash conversion cycle (CCC), key to working capital management. The several elements of CCC are Inventory Conversion Period (ICP), Debtors' collection period (DCP) and Creditors' payment period (CPP).

This Inventory conversion period (ICP) formed by the collection of Material Storage Period (MSP), Material Conversion Period (MCP), Finished Goods storage Period (FGP). This study tries to investigate the trend of sub-component of Inventory Conversion Period (ICP) and other elements cash conversion cycle as well as the impact of these components on profitability.

Using panel data analysis and taking the data of 203 sample companies for five years this study reveals that MSP, MCP and FGP have positive effect but the result is not statistically significant. It inferred that there is an inverse relationship between Profitability and components of Inventory Conversion Period (ICP).

The result of Hausman test found that null hypothesis i.e. "Random effect model is appropriate for regression of Profitability (ROA) estimation" is significant at 5% level of significance and is rejected as p-value is less than 0.05. Therefore, alternative hypothesis i.e. "*Fixed effect model is appropriate for regression of Profitability (ROA) estimation*" is accepted. The multiple co-efficient of determination (R Square) is 11 % in case of ROA estimation under fixed effect regression analysis. It implies that 11% variation in ROA is explained by the predictor variables selected in this study.

Keywords: Components of Inventory Conversion Period; Working Capital Management; Cash Conversion Cycle; Profitability

JEL Classification: G30, G32, L25, O16

1. Introduction:

The efficient working capital management has a significant impact on liquidity and profitability of the firm. Working capital management ensures the best utilization of a business's current assets and liabilities for the firm's effective operation. The main aim of managing working capital is to monitor a company's current assets and liabilities to maintain adequate cash flow and meet short-term business goals. An investment with more risk will result in more return. Thus, a firm with high liquidity of working capital will have low risk

and therefore low profitability. The other way when a firm has low liquidity of working capital, that result in high risk but have high profitability. Working capital management decisions tend to maximize profitability but may not to maximize liquidity position of the firm. Equally, focusing entirely on liquidity tends to reduce potential profitability of the firm. This study is focused on cash conversion cycle in working capital management. Cash conversion cycle (CCC), firstly introduced by Gitman (1974,p.81), is the most important tool of working capital management. It is the time interval between cash purchase and cash receipts from customers (Richards and Laughlin, 1980,p.34). The cash conversion cycle (CCC) is one of several measures of management effectiveness. It measures how fast a company can convert cash on hand into even more cash on hand. The CCC does this by following the cash as it is first converted into inventory and accounts payable (AP), through sales and accounts receivable (AR), and then back into cash. Generally, the lower this number is the better for the company. The cash conversion cycle can be especially useful for comparing close competitors because the company with the lowest CCC is often the one with better management.

Objective of this study:

This study has conducted taking the following as its objectives:

To analyze the conceptual aspect of cash conversion cycle and its components.

To assess the literature related with this determinant of working capital management.

To measure the trends of different elements concerned with cash conversion cycle.

To analyze the year wise position of several components of cash conversion cycle.

To measure the impact of different elements of cash conversion cycle on profitability.

3. Methodology:

This part of the study covers Sample Selection, Empirical Model, Methodology for Empirical Analysis, and Variable Selection.

3.1 Sample Selection

This study limits with in Non-financial corporate sectors. Therefore, most of the corporate sectors engaged in banking, finance, stock brokerage, insurance, suppliers of consumer finance etc. are excluded from this study. Samples are comprises with 203 companies. Some important norms have taken as standard for selecting the sample. First, Companies are under continuous operation during study period. Second, companies are not concerned with the operation of investment, financing and leasing. Third, firms having missing data for above mentioned time period were excluded from the sample. Fourth, no public company is considered as these sectors are run for social welfare not for profit motive. Finally the length of cash conversion cycle is very short in service and financial sector due to non existence of raw material and work-in-Progress. Therefore, the companies under these two sectors are excluded from this study.

Data of the sample companies are collected during the period of 1012-13 to 2016-17 using PROWSS data base.

3.2 Empirical Model

This study has examined the ROA of 203 sample companies (cross-sectional unit) for five years and also analyzed the impact of several components of cash conversion cycle on ROA. This study has considered panel regression model. Using panel data analysis the actual relation between the components related with cash conversion cycle and ROA is estimated. Panel data supply the large number of data point, minimize the colinearity and maximize the degree of freedom. These features of panel data help to improve the efficiency of estimation. The panel regression model selected in this study is as follow:

$$\textbf{Profitability}_{it} = \alpha + \sum_{i=1}^{n} \beta_k b X_{kit} + \omega_{it}$$

$\text{Profitability}_{it}$ is the return on assets (ROA) for the i-th sample unit at t-time.

α is the constant

i(index of sample companies) = 1,2,3,……203

β is the coefficient of the components of cash conversion cycle.

$X_k$is the k-th independent variable in this study X denotes the components of cash conversion cycle

K is the number of independent variables that is components of cash conversion cycle.

The composite error term ω_{it} consists of three components ε_i , λ_t and μ_{it}. Therefore, $\omega_{it} = \varepsilon_i + \lambda_t + \mu_{it}$. The ε_i is the cross-section or individual sample specific component. It includes the ability of management of the sample companies to mobilize the short term finance from appropriate source and to invest it in profitable short term assets. The GDP, inflationary rate, time value of money and economic condition of the country is measured by the time specific component of λ_t. The μ_{it} is the combined time series and cross section error component.

To estimate the more accurate result, this study accepts the fixed effect model and random effect model of panel data analysis. The selected samples are heterogeneous in their activities, management and policy making. Therefore, firm specific characters are not same. It is a hard job to measure the impact of firm specific character on profitability. Panel data model helps to provide the unbiased results by controlling unobservable heterogeneity. This model also helps to control the problem of endogeneity (Gujrati, 2007). Lastly Hausman test is applied to select the more consistent estimation results between fixed effect model and random effect model.

3.3 Methodology for Empirical Analysis

The objective of this study is to analyze the impact of the components of cash conversion cycle on profitability. It is the ability of firm to earn from investment **(**Harward and Upton, 1961). For this purpose this study has considered one proxy of profitability measurement. It is Return on Assets (ROA). Therefore, this study focused the impact of different components of cash conversion cycle on ROA.

3.4. Variable Selection

It is assume that profitability is influenced by certain variables of working capital management. These are working capital financing policy, working capital investment policy, inventory conversion period, debtors collection period, creditors payment period, cash conversion cycle, and quick ratio.

In this part of the study profitability is measured by Return on Assets (ROA). This selection is consistent with the study of Uyar (2009), Raheman et al. (2007).

Before going to the empirical analysis, this study tries to cite the appropriate variables and model specification. The variables are selected on the basis of earlier studies (Deloof, 2003; Eljelly, 2004; Raheman et al., 2007; Zariyawati et al., 2016; and Amarjit Gill el at., 2010).

This study has considered eight independent variables and one dependent variable Out of theses eight variables five variables are components of cash conversion cycle and remaining three are control variables. The variables related with cash conversion cycle are Material Storage Period (MSP), Material Conversion Period (MCP), Finished Goods Storage Period (FSP), Debtor's Collection Period (DCP), Creditors' payment period (CPP),

Inventory conversion period (ICP), Debtor's Collection Period (DCP), Creditors Payment Period (CPP) are consistent with existing studies made by Shin and Soenen (1998), Lazaridis and Tryfonidis (2006). The other control variables like log natural of total assets (SIZE), Debt equity ratio (D/E) and change of sales (GROWTH) are included as explanatory variables.

This study has used panel data regression analysis with the help of Stata12 software. The model is as follows.

$$ROA_{it} = \alpha + \beta_1 GROWTH_{it} + \beta_2 SIZE_{it} + \beta_3 D/E_{it} + \beta_4 MSP_{it} + \beta_5 MCP_{it} + \beta_6 FSP_{it} + \beta_7 DCP_{it} + \beta_8 CPP_{it} + \omega_{it}$$

4. Literature Review:

The cash conversion cycle has been used as significant tool to measure the efficiency of working capital management (Raheman, Afza, Qayyum and Bodla, 2010; Iftikhar, 2013).

Anand and Gupta's (2001) taking the sample of 427 companies of the S&P-500 companies in the year 1998-99 to 2000-01 observed that cash conversion efficiency (CCE), days of working capital (DWC), and days operating cycle (DOC) are the key variables that chief financial officers need to keep in mind when making decisions regarding higher profitability.

Ukaegbu (2014) using manufacturing firms of four African countries using balanced paneldata found that there is a significant negative relationship between profitability measures and CCC in all these countries.

Garcia-Teruel and Martinez-Solano (2007), took a study on 8,872 Spanish small and medium size companies for the period 1996 to 2002. In their study They found a significant negative relation between profitability and receivable days and inventory days that is profitable firms are collecting their receivables early, take less time to convert their inventories into finished goods, pay their dues early, and have a short CCC.

Deloof (2003) in the year 1992-96 completed a study on 1,009 non-financial firms in Belgium. This study found that the gross operating income moves in an opposite direction to average days receivable (DR), average days in inventory (DI), average days payable (DP), and CCC. The analysis also revealed a negative relationship between accounts payable and profitability, which is consistent with the view that less-profitable firms wait longer to pay their bills. The study also established that bills receivable have a highly significant negative relationship with profitability.

Khan, Shah, and Hijazi (2006) had undertaken a study on 30 listed nonfinancial firms in Pakistan. In their study they established a significant negative relationship between firms' gross profit and the average number of days of inventory (DI), date of payments (DP) and CCC.

Gill et al.(2010) in his study on US manufacturing firms found a negative relationship between profitability and receivable days but a positive relationship between CCC and profitability.

5. Concept of Different Determinants:

Cash conversion cycle (CCC) is the key elements of working capital management. This study is fully based on the components of CCC. Therefore before going to the empirical analysis it is obvious to gather the knowledge about the different elements considered in this study.

5.1 Cash Conversion Cycle (CCC)

This variable is a useful tool to measure the efficiency of working capital management. Cash conversion cycle, the most important tool of working capital management, first initiated by Gitman (1974). Since the decade of the '80s this variable has been recommended as the most appropriate liquidity measure (Richards and Laughlin, 1980; Kamath, 1989; Lyroudi and McCarty, 1993). It is the key factor for augmentation of corporate profitability and acts as an important apparatus to measure the liquidity (Das et al.; 2018). Cash conversion cycle is the time lag between cash outflow for purchase of raw materials and collection from debtors (Padachi, 2006). The main instrument for measuring liquidity is cash conversion cycle (Uyar, 2009). It may be negative or positive. The firms' objective is to maintain short cash conversion cycle. The negative CCC depicts the number of days for which a firm has received cash in advance for future sales to customer (Hutchison, 2007). The profitability also influenced by the length of CCC. The result of the several studies substantiates that there exists a significant and indirect relationship between profitability and CCC (Uyar, 2009; Moss Stine, 1993; Jose et al., 1996; Hutchison et al., 2007; Lyroudi and McCarty, 1993; Soenen, 1993; Wang, 2002). The other studies showed the opposite result. A good number of studies confirms that CCC and profitability significantly and positively related (Katerina Lyroudi and Lazoridis, 2000;Akinlo, 2011;Mansoori and Muhammad, 2012; Niskanen and Niskanen, 2006;Petersen and Rajan, 1997;Kamath, 1989; Gill et al., 2010).

5.2 Inventory Conversion Period (ICP)

Inventory conversion period is a fundamental element of cash conversion cycle. It represents the time period in which raw material, work-in-progress and finished goods remain blocked in godown, factory and stores respectively. Its components are material storage period (MSP), Material conversion period (MCP) and Finished Goods Storage Period (FSP). The following formulas have been considered in this study to measure the different components of inventory conversion period.

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)

5.3 Debtor's Collection Period (DCP)

This is also an important component of cash conversion cycle. The firm may sell its output in credit. The time period for which credit facilities is allowed to the purchaser is the Debtors' collection period (DCP). This variable has ultimate effect on liquidity.

Debtors' Collection Period (DCP) = Accounts Receivables / (Sales/365)

5.4 Creditors Payment Period (CPP)

Sometimes firms may get credit facilities from their suppliers or others. The time period for which credit facilities is allowed by the outsiders is entitled as the creditors' payment period. It is the proxy for payment policy and it has also ultimate effect on liquidity. The existing empirical findings showed the positive relationship between profitability and CPP (Raheman & Nasr, 2007; Tryfonidis & Lazaridis, 2006). The result of the study of Deloof (2003), Karadumanetal.(2010) depicted that profitability and CPP is negatively related.

Creditors' Payment Period (CPP) = Accounts Payables / (Costs of Goods Sold/365)

5.5 Size (Size)

The firm's size is defined as the natural logarithm of total assets at the end of the specified period. In this study natural logarithm of total assets of the sample companies is considered as firms' size

5.6 Debt Equity (D/E)

It is measured by the ratio of total debt to total equity. A debt to equity ratio of 1.5 means a company uses Rs.1.50 in debt for every Rs.1 of equity i.e. debt level is 150% of equity. The value of this ratio of 1 (one) means that investors and creditors have contributed equally to the assets of the business.

5.7 Sales growth (SG)

It is the ratio of change in sales

5.8 Return on Assets (ROA)

It measures the efficiency of a firm in utilizing its assets and to generate profit from per rupee sales. Different studies in the context of Indian and foreign level (Nazir and Afza, 2009; Pouraghajan et al., 2012; Forghani et al., 2013; Alavinasab, 2013; Das et al., 2018; Goel et al., 2015; Gaur and Kaur, 2017; Padachi, 2006) have considered this variable as a proxy of profitability.

6. Empirical Analysis:

This part of the study contains Trend of Cash Conversion Cycle and its Components, Year wise Components of Cash Conversion Cycle and Pannel Data Analysis.

6.1 Trend of Cash Conversion Cycle and its Components

Table-4.7 specifies the trend of cash conversion cycle and its different components of sample companies. The material storage period (MSP) shows an increasing trend from the year 2013-14 to 2016-17. Initially in the year 2012-13 its mean value is 76.49 days and higher than any other year. Material conversion period (MCP) shows a steady trend over the study period and its mean value 16 days. Finished Goods Storage Period (FSP) shows a steady trend during the first three years of the study period. It is around 30days. Thereafter, in the year 2015-16 this ratio is slightly increased to 33 days.

Debtor's Collection Period (DCP) has an increasing trend from the mean value of 49.70 days in 2012-13 and then increased to 50.26 days in 2013-14, and further increased to 51.02 days, 54.09 days 55.41 days in the year 2014-15, 2015-16 and 2016-17 respectively. Operating cycle (OC) also has an increasing trend after the first year of the study period. In the year 2012-13 it is 171.85 days. From the year 2013-14 to 2016-17 this ratio shows an increasing trend. Creditors' payment period (CPP) shows the decreasing trend from 90.07

days in 2012-13 and then decreased to 87days in 2013-14 and 87.98 days in 2014-15. From year 2015-16 an increased trend is found in the Creditors' payment period. The cash conversion cycle (CCC) is steady all over the study period. It value is around 83.16 days.

Table-4.7: Trend of Cash Conversion Cycle and its components of Sample Companies

(in Days)

Year	Mean						
	MSP	**MCP**	**FSP**	**DCP**	**OC***	**CPP**	**CCC#**
2012-13	76.49	15.27	30.39	49.70	171.85	90.07	81.78
2013-14	71.84	15.55	30.00	50.26	167.65	87.00	80.65
2014-15	72.37	15.25	30.94	51.02	169.58	87.98	81.60
2015-16	74.09	15.82	32.52	54.09	176.52	93.36	83.16
2016-17	74.13	15.91	32.40	55.41	177.85	97.10	80.75

Source: CMIE Prowess Database, Results Computed.

***OC= MSP + MCP+FSP+DCP, #CCC = MSP + MCP+FSP+DCP-CPP.**

MSP: Material Storage Period, **MCP:** Material Conversion Period, **FSP:** Finished Goods Storage Period, **DCP:** Debtor's Collection Period, **CPP:** Creditors' payment period, **CCC:** Cash Conversion Cycle

6.2 Year wise Components of Cash Conversion Cycle

Table-4.8 displays the status of different components of cash conversion cycle for the year 2012-13. The mean value of material storage period is 76.49 days with a higher range between 701.62 days to one day and it is higher than material conversion period, finished goods storage period and debtors' collection period.

Table-4.8: Component of Cash Conversion Cycle of Sample Companies for the year 2012-13
(in Days)

Components	Mean	Range		S.D.
		Max.	**Min.**	
Material Storage Period	76.49	701.62	0.13	80.50
Material Conversion Period	15.27	133.79	0.02	19.86
Finished Goods Storage Period	30.39	282.63	0.01	34.55
Debtors' Collection Period	49.70	289.77	0.91	43.80
Creditors' Payment Period	90.07	984.12	3.68	99.34

Source: CMIE Prowess Database, Results Computed.

The Table-4.8 also shows that finished goods remain in stores for one month that is two times more than material conversion period. The mean value of creditors' payment period is 90.07 days with a long gap between 984.12 days to 3.68 days. It is seen that near about three months credit facilities is available from the suppliers. Standard deviation of creditors' payment period is 99.34 days that means its values in the data set are farther away from the mean.

Table-4.9: Component of Cash Conversion Cycle of Sample Companies for the year 2013-14
(In Days)

Components	Mean	Range		S.D.
		Max.	**Min.**	
Material Storage Period	71.84	615.20	0.25	70.99
Material Conversion Period	15.55	169.90	0.04	21.23
Finished Goods Storage Period	30.00	247.67	0.01	35.11
Debtors' Collection Period	50.26	383.34	0.70	48.04
Creditors' Payment Period	87.00	596.71	4.14	78.20

Source: CMIE Prowess Database, Results Computed.

From Table-4.9 it has been found the status of different components of cash conversion cycle for the year 2013-14 of the sample companies. In this year the mean value of material storage period is 71.84 days with a range of 701.62 days to one day and it is higher than material conversion period, finished goods storage period and debtors' collection period. In this year it is also found that finished goods remain in stores for one month that is two times more than material conversion period. The Creditors' Payment Period is 87 days with a range between 596.71 days to 4.14 days. Standard deviation of creditors' payment period is 78.20 days that means its values in the data set are farther away from the mean.

Table-4.10 provides us the nature of different components of cash conversion cycle of sample companies for the year 2014-15.The mean value of material storage period during this year is 72.37 days with a maximum range between 550.66 days to one day and it is higher than material conversion period, finished goods storage period and debtors' collection period. Finished Goods holding period is doubled than material conversion period. The debtors' collection period is 51.02 days with a standard deviation of 54.43 days. This period is varied between 495.39 days to one day. The Creditors' Payment Period is 87.98 days with a range between 629.94 days to 3.7 days. Standard deviation of creditors' payment period is 81.51days.

Table-4.10: Component of Cash Conversion Cycle of Sample Companies for the year 2014-15
(in Days)

Components	Mean	Range		S.D.
		Max.	Min.	
Material Storage Period	72.37	550.66	0.34	70.75
Material Conversion Period	15.25	193.07	0.02	22.28
Finished Goods Storage Period	30.94	258.28	0.01	35.59
Debtors' Collection Period	51.02	495.39	0.02	54.43
Creditors' Payment Period	87.98	629.94	3.70	81.51

Source: CMIE Prowess Database, Results Computed.

Table-4.11 depicts the different components of cash conversion cycle for the year 2015-16 of the sample companies. In this year the mean value of material storage period is 74.09 days with a range of 644.73 days to one day and it is higher than material conversion period, finished goods storage period and debtors' collection period. The working is blocked in the finished goods for 32.52 days, more than one month. Sample companies are taking 54.09 days to collect their receivable from the debtors with a range between 576.07 days to two days. The standard deviation of the debtors' collection period is 59.74 days. The Creditors' Payment Period is 93.36 days with a range between 686.96 days to 3.23 days. Standard deviation of creditors' payment period is higher than standard deviation of other component. It inferred that extreme high value and extreme low value of creditors' payment period in the data set are far away from its mean than other components. In case of material conversion period the standard deviation is 25.28 days, lower than other components. It inferred that statistical data set are close to the mean of material conversion period.

Table-4.11: Component of Cash Conversion Cycle of Sample Companies for the year 2015-16 (in Days)

Components	Mean	Range		S.D.
		Max.	Min.	
Material Storage Period	74.09	644.73	0.32	73.39
Material Conversion Period	15.82	225.76	0.02	25.28
Finished Goods Storage Period	32.52	308.80	0.00	37.23
Debtors' Collection Period	54.09	576.07	1.04	59.74
Creditors' Payment Period	93.36	686.96	3.23	84.32

Source: CMIE Prowess Database, Results Computed.

Table-4.12 provides us the nature of different components of Cash Conversion Cycle of Sample Companies for the year 2016-17. The mean value of material storage period during this year is 74.13 days with a maximum range between 738.23 days to one day and it is higher than material conversion period, finished goods storage period and debtors' collection period. Sample companies are taking on an average 15.91days to convert the raw material into finished product. The working capital is blocked in this stage for 16 days. Its value is varied between 260.58 days to one day. The working is blocked in the storage of finished goods for 32.40 days. Sample companies are taking 55.41 days to collect their receivable from the debtors with a range between 517.85 days to two days. The standard deviation of the debtors' collection period is 59.70 days. The creditors' payment period is 97.10 days with a range between 796.61 days to 2.95 days. In case of material conversion period the standard deviation is 26.47 days, lower than other components. It inferred that statistical data set of this components are close to its mean.

Table-4.12: Component of Cash Conversion Cycle of Sample Companies for the year 2016-17 (in Days)

Components	Mean	Range		S.D.
		Max.	Min.	
Material Storage Period	74.13	738.23	0.38	75.83
Material Conversion Period	15.91	260.58	0.02	26.47
Finished Goods Storage Period	32.40	269.93	0.00	35.73
Debtors' Collection Period	55.41	517.85	1.16	59.70
Creditors' Payment Period	97.10	796.61	2.95	96.36

Source: CMIE Prowess Database, Results Computed.

OC= MSP + MCP+FSP+DCP, #CCC = MSP + MCP+FSP+DCP-CPP.

MSP: Material Storage Period, **MCP:** Material Conversion Period, **FSP:** Finished Goods Storage Period, **DCP:** Debtor's Collection Period, **CPP:** Creditors' payment period, **CCC:** Cash Conversion Cycle

6.3 Pannel Data Analysis

To measure the impact of different factors of cash conversion cycle (CCC) on profitability (ROA), this study considers a set of alternative hypothesis:

H_1: Material Storage Period (MSP) has significant effect on profitability.

H_2: Material Conversion Period (MCP) has significant effect on profitability.

H_3: Finished Goods storage Period (FSP) has significant effect on profitability.

H_4: Debtors' collection period (DCP) has significant effect on profitability.

H_5: Creditors' payment period (CPP) has significant effect on profitability.

H_6: Size (Size) has significant effect on profitability

H_7: Debt Equity (D/E) has significant effect on profitability.

H_8: Sales growth (SG) has significant effect on profitability.

Hausman Test for selecting the fittest Model of ROA Estimation

The result of Hausman Test which is given in Table-4.13 is used to select the best model of ROA estimation under panel data analysis. Null hypothesis of this test is *Random effect model is appropriate for regression of ROA estimation*

The impact of different components of cash conversion cycle on return on assets (ROA) may analyze under fixed effect model (FEM) or random effect model (REM). Under both the model the results of empirical analysis are not resemblance. It is better to choose the best model of ROA estimation prior going to inference.

In this study Hausman test p-value is less than 0.05. Therefore, the result is significant at 5% level of significance. For this reason, null hypothesis i.e. "Random effect model is appropriate for regression of ROA estimation" is rejected and alternative hypothesis i.e. "*Fixed effect model is appropriate for regression of ROA estimation*" is accepted. It is inferred that in estimating ROA fixed effect model under panel data analysis is more appropriate. Table 4.13 shows the result of Hausman Test.

Table 4.13: Hausman Test for selecting the best Model of ROA Estimation

	---- Coefficients ---		(b-B)	sqrt(diag(V_b-V_B))
	fe(b)	re(B)	Difference	S.E.
SG	.4338837	.5679886	-.134105	.
SIZE	2.390009	-.0381106	2.42812	..3964969
D/E	-.0318198	-.0466701	.0148503	.0235905
MSP	.0002574	-.0016955	.001953	.0018134
MCP	.0055515	.0125251	-.0069736	.0114704
FGP	.0280762	.0326732	.0045971	.0122344
DCP	-.0165488	-.0150679	-.001481	.0045919
CPP	.0024061	.0043419	-.0019357	.0003315
cons |	16.81003	8.625322	-25.43535	4.026412

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg
Test: Ho: difference in coefficients not systematic
chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 112.77
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Source: STATA output.

Table-4.14 exhibits the result of the empirical analysis regarding the interaction with components of working cycle and profitability measured by return on assets (ROA).

The result of fixed effect model that is a proper model as per Hausman Test, shows that variables MSP, MCP, FGP and CPP have positive effect on ROA. Whereas, DCP have negative impact on profitability measurement factors of ROA.

After critical interpretation it is also found that the effect of CPP is significant at 1% significance level. The effect of DCP and FGP is significant at 5% significance level.

The impact of MSP and MCP are not significant at any level.

The other explanatory variables selected in this study are SG, SIZE and D/E. It is observed that D/E has negative effect on ROA but SG and SIZE have positive effect on profitability. It is also found that the effect of Size is significant at 1% significance level and SG at 5% significance level. But the effect of D/E is not significant at any statistical level.

Table-4.14 also shows the variation of profitability of the sample companies due to variation of components of cash conversion cycle. The **multiple coefficient of determination** (R Square) is 11 % in case of ROA estimation under fixed effect regression analysis. It implies that 11% variation in ROA is explained by the predictor variables selected in this study.

The overall model is statistically significant as p-value of F-test is less than .05 (p<.05).

Table-4.14: Result of Fixed Effects Model for Regression of ROA Estimation

Fixed-effects (within) regression Number of obs = 1015
Group variable (i): code Number of groups = 203

R-sq: within = 0.1094 Obs per group: min = 5
between = 0.0334 avg = 5.0
overall = 0.0139 max = 5
F(8,804) = 12.34
corr(u_i, Xb) = -0.5611 Prob > F = 0.0000

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
SG	.4338837	.1979607	2.19	0.029	.0453029	.8224645
SIZE	2.390009	.467792	5.11	0.000	1.471771	3.308247
D/E	-.0318198	.0759117	-0.42	0.675	-.1808284	.1171888
MSP	.0002574	.0036602	0.07	0.944	-.0069272	.0074421
MCP	.0055515	.0186815	0.30	0.766	-.0311188	.0422218
FGP	.0280762	.0160537	1.75	0.041	-.0034359	.0595883
DCP	-.0165488	.007531	-2.20	0.028	-.0313317	-.001766
CPP	.0024061	.0007963	3.02	0.003	.0008432	.0039691
cons |	16.81003	4.814797	3.49	0.001	-26.26109	-7.358976

sigma_u | 8.9768494
sigma_e | 3.7152454
rho | .85376093 (fraction of variance due to u_i)

F test that all u_i=0: F(202, 804) = 16.35 Prob > F = 0.0000

The details observation on fixed effect model for regression of ROA estimation has helped to accept or to reject the hypotheses considered in this study. The result of the selected alternative hypotheses on the subject of association amongst different components of Cash conversion cycle and ROA are specified in the Table-4.15.

Table-4.15: Result of Hypothesis for interaction of WCM and ROA under Fixed Effect Model

Hypothesis	Variable	Effect	p-value	Inference
H_1: Material Storage Period (MSP) has significant effect on profitability.	MSP	+ve	p>0.1	Rejected
H_2: Material Conversion Period (MCP) has significant effect on profitability.	MCP	+ve	p>0.1	Rejected
H_3: Finished Goods storage Period (FGP) has significant effect on profitability	FGP	+ve	p>0.1	Rejected
H_4: Debtors' collection period (DCP) has significant effect on profitability.	DCP	-ve	p<0.05	Confirmed
H_5: Creditors' payment period (CPP) has significant effect on profitability	CPP	+ve	p<0.01	Confirmed
H_6: Size (Size) has significant effect on profitability	Size	+ve	p<0.01	Confirmed
H_7: Debt Equity (D/E) has significant effect on profitability.	D/E	-ve	p>0.1	Rejected
H_8: Sales growth (SG) has significant effect on profitability..	SG	+ve	P<.05	confirmed

Source: STATA output.

Components of Inventory Conversion Period (ICP) and effect on profitability

The main and one of the components of cash conversion cycle is Inventory conversion period (ICP). This Inventory conversion period (ICP) contains Material Storage Period (MSP), Material Conversion Period (MCP), Finished Goods storage Period (FGP). The regression result of this study reveals that MSP, MCP and FGP have positive effect but not statistically significant. Therefore, it is justifiable that the components of Inventory conversion period (ICP) have negative impact on profitability. No such study have found after considering each components of ICP. But few studies have found that have consider only ICP as one of the component of CCC and ICP have negative effect on profitability. Numerous studies have shown the same result (Smith and Begemann, 1997; Shin & Soenen, 1998; Deloof, 2003; Howorth & Westhead, 2003; Ghosh & Maji, 2004). The study of Mathuva (2010) established that ICP has positive and significant impact on profitability.

Debtors' Collection Period (DCP) its effect on profitability

Another important component of CCC is Debtors' collection period (DCP). This study depicts that DCP has negative effect on profitability and it is statistically significant. The result of some other studies done by Eljelly (2004), Lazaridis & Tryfonidis (2006), Garcia-Teurel & Martinez (2007), Falope & Ajilore (2009), Raheman & Nasr (2007) and Narasimba and Murty (2001) are resemblance with our study. In this respect the result of the study of Sharma & Kumar (2011) is opposed to our findings.

Creditors' Payment Period (CPP) its effect on profitability

Creditors' payment period (CPP) is the important component of CCC. Longer the CPP signifies the better liquidity position. The CPP has positive and significant effect on profitability. Therefore, it is well established that firm can earns more ROA by the delay payment of their dues. But incongruous result is observed from the study done by Smith and Begemann (1997), Howorth & Westhead (2003), Deloof (2003), Ghosh & Maji (2004), Eljelly (2004) and Lazaridis & Tryfonidis (2006).The large Creditors payment period is able to reduce its investment in working capital due to its good relationship with its suppliers (Moussawi et al. ,2006).

7.Conclusion

Sound working capital management helps to protect the shareholders' interest, interest of outside credit suppliers. Proper liquidity planning improves the goodwill of the firm as well as profitability. This part of the study makes an attempt to conclude the result of overall study. To assess the result and to implement it in the field of practical arena the concluding part is explored the findings of the study, making some valuable suggestion and recommendations, limitations as well as future scope of future study.

This study highlighted the conceptual issues relating to cash conversion cycle and its components.

The different views in the context of different perspective of working capital management have been reviewed in this study. The different opinion and empirical findings of eminent researchers in the view of different aspects of working capital are extensively evaluated. From the empirical analysis of data of the sample company we have measured the year wise descriptive statistical value about component of cash conversion cycle.

The result of Hausman Test revealed that FEM is most appropriate for panel regression in respect of interaction with ROA and other selected firms' specific variables of working capital management.

The salient empirical findings of this study are:

- Debtors' collection period Debtors' collection period (DCP) has negative and significant impact on profitability.
- Material Storage Period (MSP) has no significant effect on profitability.
- Material Conversion Period (MCP) has no significant effect on profitability.
- Finished Goods storage Period (FGP) has no significant effect on profitability
- Debtors' collection period (DCP) has significant effect on profitability
- Creditors' payment period (CPP) has significant effect on profitability
- Size (Size) has significant effect on profitability

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