International Journal of Innovative Research in Management Studies (IJIRMS)
ISSN (Online): 2455-7188
Volume 1 | Issue 2 | March 2016

THE IMPACT OF WORKING CAPITAL MANAGEMENT AND PROFITABILITY: A CASE STUDY OF MANUFACTURING COMPANIES IN INDIA

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ABSTRACT

Present study empirically examines the impact of working capital management o firms' profitability by using data of 158 companies in manufacturing industry in India. The study is primarily based on secondary data collected from financial reports which is listed in Bombay Stock Exchange for the period of six years from 2008- 2013. The data has been analyzed using the correlation coefficient and multiple regression models. All the results were tested at 0.01 and 0.05 level of significance. The study concludes that there is a moderate relationship between working capital management and profitability in the specific context of manufacturing industry in India.

Keywords: Working Capital, Profitability, Financial Ratios, Multiple Regression, Manufacturing Industry.

INTRODUCTION

Working capital management is a very significant part of corporate finance because it directly affects the liquidity and profitability of a company. The corporate finance literature has traditionally paid attention on the study of long-term financial behavior. Researchers have mainly conducted studies analyzing investments decisions, capital structure practices, dividends policies or share valuation, among other issues. But the investment that firms make in short-term assets, and the resources used with maturities of under one year, represent the main share of items on a firm's balance sheet (Pedro and Pedro, 2007).

A firm needs to maintain a balance between liquidity and profitability. Liquidity is an ability to meet its short-term obligations and its constant flow can be assured from a profitable venture. Cash is a life blood of a business as well as indicator of continuing financial strength, should not be surprising in view of its vital role within the business. This needs that business must run efficiently with profitability. In the process, an asset-liability disparity may take place which may increase firm’s profitability in the short run but at a risk of its insolvency. On the other hand,

too much stress on liquidity will loose profitability and it is common to find finance textbooks (Gitman, 1984 and Bhattacharya, 2001) begin their working capital sections with a discussion of the risk and return tradeoffs inherent in alternative working capital policies. Thus, the manager of a company remains in a dilemma of achieving desired tradeoff between liquidity and profitability in order to maximize the value of a firm.

Manufacturing Industry is one of the major industries of India. India has huge potential for export of manufactured products to various countries. Manufacturing industry has been successful to capture export markets of various African countries which are new markets for the Country other than the conventional export markets of Afghanistan and Iraq (Pakistan cement industry report, 2008).

REVIEW OF LITERATURE

Moss and Stine (1993) revealed that firm size was a factor in the length of the CCC and the study indicated that larger firms have shorter CCC. Further the study revealed that when the CCC was compared to the current and quick ratios, a significant positive relationship was found.

While **Jose et al. (1996)** examined the relationship between aggressive working capital management and profitability of US firms using Cash Conversion Cycle (CCC) as a measure of working capital management where a shorter CCC represents the aggressiveness of working capital management. The results indicated a significant negative relationship between the cash conversion cycle and profitability indicating that more aggressive working capital management is associated with higher profitability.

Chiou and Cheng (2006) analyzed the determinants of working capital management and depicted consistent results of leverage and operating cash flow for both net liquid balance and working capital requirements while variables like business indicator, industry effect, growth opportunities, performance of firm, and size of firm were unable to produce consistent conclusions for net liquid balance and working capital requirements of firms.

While **Rehman (2006)** calculated the impact of the different variables of working capital management including Average Collection Period, Inventory Turnover in Days, Average Payment Period and Cash Conversion Cycle on the Net Operating Profitability of firms and revealed that there was a strong negative relationship between above working capital ratios and profitability of

firms. Furthermore the study stated that managers can create a positive value for the shareholders by reducing the cash conversion cycle up to an optimal level.

Padachi (2006) examined the trend in working capital requirements and profitability of firms to spot the causes for any significant differences between the industries. The results indicated that high investment in inventories and receivables was linked with lower profitability. The findings also exposed that an increasing trend in the short-term component of trend in the short-term component of working capital financing.

Lazaridis and Tryfonidis (2006) examined the relationship of profitability and working capital management. The results told that there was a negative relationship between profitability and the cash conversion cycle which was used as a measure of working capital management worth. Thus managers can increase profits by handling properly the cash conversion cycle and maintaining each component like accounts receivables, accounts payables, inventory to an optimal level.

Ganesan (2007) explored that the working capital management effectiveness was negatively connected to the profitability and liquidity. The study discovered that when the working capital management efficiency was enhanced by decreasing days of working capital, there was improvement in profitability of the companies in telecommunication firms in terms of profitability.

Raheman and Nasr (2007) studied the impact of Working Capital Management on liquidity and profitability of the firm and a negative relationship between variables of the working capital management and profitability of the firm was found. Further the study also discovered a negative relationship between liquidity and profitability and a positive relationship between size of the firm and its profitability and negative relationship between debt used by the company and its profit masrgin.

Afza and Nazir (2007a) found the inverse relationship between working capital management and profitability of a firm. In line with the research Afza and Nazir (2007b) further examined the relationship between the aggressive/conservative working capital approach as well as risk of firm. They originate a negative relationship between the profitability parameters and degree of aggression in working capital investment. The firms give negative returns if they adopt an aggressive working capital approach.

Nazir and Afza (2008) took into account both factors- external and internal to discover the determinants of working capital needs of a firm. Internal factors were taken as operating cycle, operating cash flows, leverage, size, Return on Assets, Tobin's q and growth while industry dummy and level of production as external macroeconomic variables. Research found that operating cycle, leverage, ROA and q had an impact on the working capital necessities significantly.

Samiloglu and Demiraunes (2008) investigated the influence of working capital management on the profitability of the companies. The study showed the accounts receivable period, inventory period and leverage both have the negative impact on the profitability of the firm while growth affects it positively.

Uyar (2009) studied the industry benchmarks for cash conversion cycle of trading and manufacturing companies and found that trading companies have shorter CCC than manufacturing companies. He further analysed the relationship between the longetivity of the CCC and the size of the firm and found a significant negative association between both. The study further indicated significant negative link between the length of CCC and the profit margin.

Ramachandran and Janakiraman (2009) explored negative association between EBIT and the cash conversion cycle (CCC). The study exposed that operational EBIT shows how to deal with the working capital of the firm. Further, it was originated that lower gross EBIT was connected with an increase in the accounts payable days. Thus the research concluded that less profitable firms wait longer to disburse their bills, taking benefit of credit period given by their suppliers. The positive relationship between average receivable days and firms EBIT recommended that less profitable firms will chase a decrease of their accounts receivable days in an effort to reduce their cash gap in the CCC.

Barot Haresh (2012) observed association between working capital management and firm's profitability in Indian context. Study explored the negative relationship between accounts receivables and company's profitability and a positive link between accounts payable period and profitability. Thus, the results of this study recommend that managers can produce wealth for their shareholders by sinking the period for accounts receivables.

Khalid Ashraf Chisti (2012) showed the strong negative correlation between various variables of the working capital efficiency and profitability of the company except Size of the

company. Study also found that there is a positive correlation between size of the firm and its profitability. A significant negative correlation was also found between debt of firm and its profitability.

Ms. Ankita Rajdev (2013) analyzed the relationship between the liquidity and profitability of Makson Group using accounting ratios and statistical tools like measures of central tendency, dispersion, Pearson correlation, and Spearman's rank correlation. The students' t test tested the significance of rank correlation coefficient. The outcomes of the study recommended that there is no significant correlation between liquidity and profitability.

C. Srinivas Yadav and Sai Shiva Kumar S.B (2014) showed the relationship between working capital management determinants on profitability. Profitability has been taken as dependent variable whereas constituents of working capital are independent variables such as Average Collection Period, Inventory Turnover in days, Average Payment Period, Cash Conversion Cycle, and Net Trading Cycle were used to assess working capital management, and Return on Total Assets. The study has considered sample of the size of ten large scale steel manufacturing companies in India over a ten year period from 2003 to 2013. The analysis was done with the help of ordinary Least Square Regression which explored the significant relationship between working capital variables and profitability.

OBJECTIVES OF THE STUDY

Present study is an empirical study of manufacturing industry of India for evaluating the impact of working capital management on profitability during the period of 2008 to 2013. The more specific objectives are:

1. To analyze the Operating profit margin of Indian manufacturing industry.
2. To analyze the Working Capital management of Indian manufacturing industry.
3. To investigate the impact of Working Capital Management on profitability of Indian manufacturing Companies.

DATA SOURCE AND METHODOLOGICAL FRAMEWORK

The secondary data set covers a 5-year period from 2008 to 2013, with a sample of 158 manufacturing companies selected on the basis of deliberate sampling from BSE. The data has

been taken from the financial statements of the stated companies. The following variables have been taken for the purpose of study.

Table 1: showing the Variables, their computations and Abbreviations

S. No.	Variables	Formula	Abbreviation
1	**Independent**:		
	Debt ratio	Debt/ Equity	DR
	Assets Turnover Ratio	Sales /total assts	ATR
	Current Ratio	Current assets/ Current Liabilities	CR
	Debtors Turnover ratio	Net Credit Sales / Average (Debtors + Accounts Receivables)	DTR
	Inventory turnover ratio	Cost of Goods Sold / Average Inventory	ITR
	Cash Conversion Cycle	Receivable Period (RP) plus Inventory Period (IP) minus Payable Period (PP).	CCC
2	**Dependent:**		
	Operating profit margin	Gross Profit – Operating Expenses	OPM
3	**Control:**		
	Firm's Size	Natural Logarithm of Sales	Size

Modeling Framework:

After reviewing existing literature, the following best suited variables have been determined to assess the impact of working capital management on profitability, and the equation to investigate the relationship between working capital management and profitability is as follows:

$OPM_{it} = \beta o + \beta 1 Size_{it} + \beta\ 2DR_{it} + \beta 3ATR_{it} + \beta 4CR_{it} + \beta 5DTR_{it} + \beta 6ITR_{it} + \beta 7CTR_{it} + \beta 78CCC_{it} + E_{it}$

Results and Discussion

This head analyses the data as a whole which can be further divided into following parts as

a) Descriptive Statistics

b) Correlation Analysis

c) Regression Analysis

1. Descriptive statistics

Descriptive analysis consists of mean, median, maximum value, minimum value and standard deviation. Table presents the descriptive statistics for the 158 sample firms for the period of 5 years i.e. 2009-2013. 9 variables have been taken for analytical purpose. Furthermore, all selected variables have been divided into three categories i.e. one dependent, four explanatory independent and three control variables. Explanatory independent variables are proxies to the profitability of the company whereas control variables are current ratio to measure the short term liquidity of the company, size to keep its impact neutral to profitability, assets turnover ratio to measure the assets turnover impact and debt ratio to keep the leverage effect constant.

Table 2: Overall Descriptive Statistics **N= 158**

Variables		**Mean**	**Median**	**Maximum**	**Minimum**	**S.D.**
Dependent	OPM	13.83	12.95	79.25	-72.54	11.74
Explanatory Independent	DTR	15.23	7.71	265.55	0.02	23.04
	ITR	9.90	6.81	127.79	0.01	12.67
	CTR	7.06	4.98	56.34	0.22	7.09
	CCC	116.84	70.32	2651.51	425.33	204.06
Control	Size	6302.67	2975.87	213465.00	4.49	11901.03
	DR	1.12	0.57	46.69	0.01	2.36
	ATR	1.89	1.34	10.69	0.01	1.63
	CR	1.60	1.04	40.23	0.24	2.87

The Above table provides the descriptive statistics for all the variables and it has been found that

i. The minimum and maximum assets turnover ratio are 0.01 and 10.69 respectively with average assets turnover ratio to be 1.80 such that 50% of the data have ATR less than 1.34 (Median=1.34) and a dispersion of 1.63 around mean.

ii. The minimum and maximum Cash Conversion Cycle are -425.33 and 2651.51 respectively with average Cash Conversion Cycle to be 116.84 such that 50% of the data have Cash Conversion Cycle less than 70.32 (Median=70.32) and a dispersion of 204.06 around mean.

iii. The minimum and maximum Current Ratio (CR) are 0.24 and 40.23 respectively with average Current Ratio to be 1.60 such that 50% of the data have Current Ratio less than 1.04 (Median=1.04) and a dispersion of 2.87 around mean.

iv. The minimum and maximum Creditors Turnover Ratio (CTR) are 0.22 and 56.34 respectively with average Creditors Turnover Ratio to be 7.06 such that 50% of the data have Creditors Turnover Ratio less than 4.98 (Median=4.98) and a dispersion of 7.09 around mean.

v. The minimum and maximum Debt Ratio (DR) are 0.01 and 46.69 respectively with average Debt Ratio (DR) to be 1.12 such that 50% of the data have Debt Ratio (DR) less than 0.57 (Median=0.57) and a dispersion of 2.36 around mean.

vi. The minimum and maximum Debtors Turnover Ratio (DTR) are 0.02 and 265.55 respectively with average Debtors Turnover Ratio (DTR) to be 15.23 such that 50% of the data have Debtors Turnover Ratio (DTR) less than 7.71 (Median=7.71) and a dispersion of 23.04 around mean.

vii. The minimum and maximum Inventory turnover Ratio (ITR) are 0.01 and 127.79 respectively with average Inventory turnover Ratio to be 9.90 such that 50% of the data have Inventory turnover Ratio less than 6.81 (Median=6.81) and a dispersion of 12.67 around mean.

viii. The minimum and maximum size of companies are 4.49 and 213465.00 respectively with average size to be 6302.67 such that 50% of the data have size less than 2975.87 (Median=2975.87) and a dispersion of 11901.03 around mean.

ix. The minimum and maximum Operating Profit Margin are -72.54 and 79.25 respectively with average Operating Profit Margin to be 13.83 such that 50% of the

data have Operating Profit Margin less than 12.95 (Median=12.95) and a dispersion of 11.74 around mean.

2. Correlation Analysis

From the following correlation table we observe that ATR(r=0.1462, p<0.05), CCC (r=-0.2078, p<0.05), CR (r=0.0036, p<0.05), CTR (r=0. 1148, p<0.05), DR(r=-0.1401, p<0.05),

DTR (r=0.1074, p<0.05) and SIZE(r=0. 0989, p<0.05) has weak linearity but significant relationship with OPM as all correlations are less than 0.30. Also, ITR (r=0. 1360, p>0.05) has not significant relationship with OPM

Table 3: Showing Correlation between Profitability Variable and Working Capital Variable.

Profitability Variable	Working Capital Variables	Correlation	Probability
OPM	ATR	0.1462	0.0000
OPM	CCC	-0.2078	0.0000
OPM	CR	0.0036	0.0001
OPM	CTR	0.1148	0.0054
OPM	DR	-0.1401	0.0001
OPM	DTR	0.1074	0.0025
OPM	ITR	0.1360	0.9202
OPM	SIZE	0.0989	0.0012

3. Regression Analysis

Correlation analysis provides only the degree of relationship among the variables; it doesn't determine the relationship between cause and effect. So to identify the causes from consequences regression analysis has been used to investigate the exact impact of working capital components on profitability of the companies where operating profit margin is profitability measure. As we need to know the effect of Debt Ratio, Assets turnover Ratio, Current Ratio, Debtors Turnover Ratio, inventory turnover Ratio, Creditors Turnover Ratio and cash conversion

cycle on operating Profit Margin of manufacturing companies of India, so we will apply multiple linear regression analysis as operating Profit Margin is continuous scaled dependent variable.

Table 3: Showing the Results of Least square method of Regression (N: 790)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.88260	0.894122	15.52652	0.0000
ATR	0.007399	0.264352	-6.717097	0.0000
CCC	-1.775681	0.002145	3.449809	0.0006
CR	0.017622	0.145714	1.534178	0.1254
CTR	0.134316	0.063245	2.123755	0.0340
DR	-0.725398	0.169304	-4.284593	0.0000
DTR	0.073654	0.019187	3.838640	0.0001
ITR	0.223551	0.031346	0.562190	0.5741
SIZE	0.000104	3.39E-05	3.057165	0.0023

The results of regression analysis are as follows from where estimated regression model is

OPM=13.8826 +0.0074 ATR -1.7757 CCC+ 0.0176 CR + 0.0001 CTR - 0.7254 DR

+0.0736 DTR + 0. 2235 ITR + 0. 1343 SIZE

The model explained 43.36% of the variability in Operating Profit Margin. The model as a whole is significant with F=15.05, p<0.05. Also,

i. Assets turnover Ratio (ATR) is a significant predictor of Operating Profit Margin, b=0.0074, t=-6.72, p<0.05. Controlling for other predictors, corresponding to a unit increase in Assets turnover Ratio (ATR) there is on an average an increase of 0.0074 in Operating Profit Margin.

ii. Cash Conversion Cycle (CCC) is a significant predictor of Operating Profit Margin, b= -1.7757, t=3.45, p<0.05. Controlling for other predictors, corresponding to a unit

increase in Cash Conversion Cycle (CCC) there is on an average a decrease of 1.7757 in Operating Profit Margin.

iii. Current Ratio (CR) is not a significant predictor of Operating Profit Margin, b=0.0176, t=1.53, p>0.05.

iv. Creditors Turnover Ratio (CTR) is a significant predictor of Operating Profit Margin, b=0.0001, t=2.12, p<0.05. Controlling for other predictors, corresponding to a unit increase in Creditors Turnover Ratio (CTR) there is on an average an increase of 0. 0001 in Operating Profit Margin.

v. Debt Ratio (DR) is a significant predictor of Operating Profit Margin, b=-0.7254, t=-4.28, p<0.05. Controlling for other predictors, corresponding to a unit increase in Debt Ratio (DR) there is on an average a decrease of 0.7254 in Operating Profit Margin.

vi. Debtors Turnover Ratio (DTR) is a significant predictor of Operating Profit Margin, b=0.0736, t=3.84, p<0.05. Controlling for other predictors, corresponding to a unit increase in Debtors Turnover Ratio (DTR) there is on an average an increase of 0.0736 in Operating Profit Margin.

vii. Inventory turnover Ratio (ITR) is not a significant predictor of Operating Profit Margin, b=0.2235, t=0.56, p>0.05.

viii. Size is a significant predictor of Operating Profit Margin, b=0.1343, t=3.06, p<0.05. Controlling for other predictors, corresponding to a unit increase in size of company there is on an average an increase of 0. 1343 in Operating Profit Margin.

SUMMARY AND CONCLUSION

Present study reveals that working capital management affects the profitability of the manufacturing companies in India. Cash conversion cycle plays an eminent role in maximization of shareholders' wealth in terms of increasing the profits of the company. Regression analysis furthermore clearly states that there is a negative relation explained by the negative sign between the cash conversion cycle and operating profit margin. In manufacturing sector of India assets turnover ratio has also been found the positively correlated with operating profitability of the companies which indicates the working capital efficiency of the companies and Current ratio is also positively correlated with the operating portability of the companies but at low degree of which fixed effect has not been traced in fixed effect model in various previous studies. Correlation

analysis depicted the relationship among various variables. All sectors except consumer goods (personal care) have the positive correlation between size and operating profit margin. The outcomes of all regressions model i.e. least square model suggest to finance managers of manufacturing companies that they can increase their Operating Profit margin by improving the assets turnover ratio, current ratio, and size of the firm. On the other hand profitability decreases with decrease in inventory turnover ratio, increase in Cash Conversion Cycle and debt ratio. The adjusted R-Square is around 43% and F-statistics is significant being its p-value near to zero i.e. 0.0000

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