

Management of Materials across industries in India-An Empirical Study

D.P.Singh

Prof- GNIBM GREATER NOIDA-INDIA

prof.d.p.singh@gmail.com

Abstract

In the present study attempt has been made to investigate whether management of working capital changes across industries in India. We have taken financials from different companies belonging to seven Industries such as automobile, cement, steel, IT, telecom, fertilizer and chemicals and petrochemicals. We have taken different measures of working capital components such as return on capital employed (ROCE), working capital turnover ratio (WCTR), current ratio (CR), inventory turnover (ITO), days inventory outstanding (DIO), days payable outstanding (DPO), days sales outstanding (DSO) and cash Conversion cycle (CCC). We have made an attempt to find out whether the above mentioned components of working capital changes across different industries. We have used descriptive analysis to find out the characteristics of various measures of working capital components. Based on descriptive statistics we hypothesized that working capital components vary across different industries. To fulfill our objectives we have taken 63 companies from seven industries chosen randomly. Financials of all companies has been taken from EMIS (Emerging market information services). We have used ANOVA to investigate if working capital management practices vary across industries.

Key words: Working capital management practices , industries, working capital components, Descriptive statistics, ANOVA.

Theoretical Framework

In the theoretical framework of our research study a discussion will be carried out about various working capital management areas keeping in view our research objectives. These areas are receivables, inventories, payables, working capital cycle, working capital needs, determinants of working capital, working capital components, working capital efficiency, profitability, liquidity etc. Concept of working capital is very important in the field of financial management. For growth and profitability of a firm working capital management is vital. Working capital can be expressed as the difference between firms' current assets and current liabilities. (Claes-Goran Larson and Lars F. Hammerlund, 2005: 14)

Net Working Capital=Current Asset-Current Liabilities

Shin and Soenen have defined working capital as "Time lag between the expenditure for the purchase of materials and the collection for the sale of finished goods" (Hyun-Han Shin and Luc Soenen, 1998). But working capital management is a wider subject covering inventory and work-in-progress combining operations, production and financial management. Current assets are expected to generate cash within one year and in balance sheet they are usually grouped under cash and cash equivalents, short term investment, receivables, prepaid expenses and inventories. Different kind of current liabilities include trade payables, short-term debt and accrued liabilities. (Stephen H. Penman, 2007, 724). Great variations across the industries can also be found while comparing working capital structure. (Garcia-Teruel and Martinez-Solano, 2007: 164). So working capital investments keep on revolving fast and are constantly converted in to cash. Working capital is also known as revolving, or circulating, or short term capital. Concluding it can be stated that working capital is the life blood and controlling nerve center of a business. Inadequate planning and

control of working capital are often causes of business failure (Christopher Pike and Richard Pass 1987: 18). Companies led to financial distress because of mismanagement of working capital and often realize the importance of working capital management at that stage (Kolay, 1991: 46).

Working capital cycle is the time between firm's starts investing in a product or service and the firm receives payment for the product or services. Firms often invest money when people are hired to produce goods or when raw material is bought. To optimize working capital it is required to optimize working capital cycle which balances incoming and outgoing payments.

Smaller working capital free up cash for firms' future growth. Several cost associated with different stage of working capital cycle needs to be identified and computed. The objective of working capital management is to balance these costs and maintain the optimum level of working capital (Arnold, 2008, 529). Objectives of working capital management are matching of asset and liability movement over time which takes us to the two main purposes of working capital management; liquidity and profitability (Pass and Pike 1984: 1). Profitability refers to the share holders wealth maximization and liquidity to fulfilling short-term financial obligations. Trade-off between these two goals often referred to as working capital management. These two components of working capital are to manage company's financial status (Shin and Soenen 1998, 37).

Working capital policy of companies is to have small working capital balance and some companies follow zero working capital strategies (Zeitlow, 2005: 17). Why company have working capital when some can do without it. For determinant policies (Arnold: 2008), suggested three working capital policies, determined by levels of working capital policies. (Glen Arnold 2008, 535). Relaxed working capital policy has large levels of cash or near cash balance with generous credit customer terms and larger inventories. Such policy suits to companies working in uncertain areas. Companies with certain cash flows follow aggressive working capital policy. Moderate policy falls in between relaxed and aggressive policies (Arnold, 2008: 535). With economic downturn the importance of working capital management has been realized. Across the industries working capital policies vary between relaxed and aggressive.

Larsson and Hammarlund (2005:12), defined different items included in this area as payables, receivables, management of liquid funds, currency management and risks, short-term financing. Improvement in cash management of a firm can result in better profit margins and higher turnover ratio which can lead to higher profitability (Larsson and Hammarlund 2005: 16).

Why working capital management is significant for a company answers for investigating relationship between working capital management and profitability. Planning and controlling of current asset and current liabilities is the method for managing efficiency of working capital.

Corporate managers have to avoid the situations of insufficient or excessive inventory. The importance of working capital management efficiency is indisputable. Effort of corporate manager is to achieve optimum working capital level. Optimum working capital level means to strike a balance between the risk and working capital management efficiency. There are many corporate strategies to maximize the share holders' wealth. One very important strategy is efficient working capital management. Time lag between purchase and collection leads to possessing working capital. Cash conversion cycle is continuous flow of cash from supplier to inventory to account receivable and back in to cash. The way working capital is managed makes a significant impact on liquidity and profitability of a firm. Smith 1980 first pointed out a tradeoff between liquidity and profitability to achieve dual goal for a firm. If we maximize the profitability, it will tend not to maximize the adequate liquidity. Also on focusing on liquidity to maximize will tend to reduce the potential of profitability. Our study investigates the relationship between working capital management and profitability for the companies from various industries both private and public sectors. We will also investigate the relationship among various industry between working capital management efficiency and profitability. We will investigate the firms working capital efficiency trends and for industry. For the sake of simplicity We have considered cash conversion cycle of the firm as the measure of efficiency as our study is confined to various manufacturing firms. We have not taken day's working capital (DWC) as the measure of working capital management efficiency (Ganesan Vedavinayagam,

2007), since our research work is limited to industry sectors. A negative relationship was concluded between profitability of the firm and their cash conversion cycle (Shin and Soenen 1998, Deloof 2003, Rahman and Nasr 2003, and Teruel and Solano 2007). Thus it is possible to increase the firm's profitability by effectively managing working capital efficiency. Through efficient working capital management healthier cash flow will be available which will reduce the cost of financing leading to growth opportunities and returns of share holders. Working capital management efficiency changes from one industry to other as a result of their working capital policy (Filbeck and Krueger (2005)). Ganesan 2007 investigated that firms with different competition follow different working capital policy focusing on different working capital components. Lazaridis and Tryfonidis (2005) stated that small firms focus on inventory management.

Working capital requirement varies according to the nature of the business, production, sales policies, turnover, credit period, collection period, of a company. We have undertaken this study because of the fact that a firm can not copy working capital requirements of another company from the same industry. This is because all firms are competing with other firms in the same industry. What varies is the working capital management efficiency to maximize the share holder's wealth for a firm. We have extended our research to find out the trend in the industry because it will help any company to have indicator of working capital requirement and formulate its working capital policies. By this method any firm will be able to benchmark their working capital levels. Researcher's 25 years of experience suggest that any firm take indication from the industry in which it is operating and then it optimizes the working capital requirements by their efficiency of working capital management. One of the most important areas in day to day management of a company is management of liquidity. Liquidity implies conversion of current asset in to cash during the normal course of business and to have regular uninterrupted flow of cash to meet outside current liabilities as and when due and also ensure availability of money for day to day business operations. Liquidity management is the functional area of corporate finance. It is required to maintain adequacy of current assets to take care of risk posed by current liabilities. The firm policies for managing liquidity should be designed to achieve three goals, viz. adequate liquidity, minimization of risk, and maximizing profitability. A firm can adopt three types of liquidity policies in connection with the trade-off between liquidity, risk and profitability (Saini R. D. and Sharma Prakash, 2009). Efficient management of liquidity by planning and controlling of current assets and liabilities is very important for a firm because it runs a risk of not meeting short-term obligations and on the other hand it avoids the excessive investment in current assets. In the balance sheet all items shown under current asset are working capital. Net working capital is derived by reducing current liabilities from current assets. Many academicians use current ratio and quick ratio as measure of liquidity, because it has the advantage of making cross sectional comparison possible. Our study is planned to investigate various relationship between liquidity and profitability for a firm and industry it belongs to. Further our study will find the trends of liquidity management in different firms and different industries. This helps companies to adopt best management practices and then optimize the same. Liquidity management is important in good times and become critical in difficult times. As Fraser 1988, "There may be no more financial discipline that is more important, more misunderstood, and more often overlooked than cash management". Nicolas (1991) argued that a company does not take the issue of liquidity management seriously until it is not on the verge of bankruptcy. More practical approach on liquidity management is focused on working capital requirement and liquidity level as measured by current ratio and its variants. For this it is required to manage working capital and its components and arrive at optimum level of working capital and its components. Finnerty (1997), points out that traditional liquidity ratio, such as current ratio or quick ratio include both financial asset and operating asset in the computation. Shin and Soenen (1998) investigated the relation between the firm's net trading cycle and its profitability. The study found strong negative relationship between length of net trading cycle and various measures of profitability.

Ratio analysis helps to know the profitability and efficiency of a company or compare the performance of two companies in the industry. As past performance determines the future of a

company it is possible to forecast the future performance and manage the performance of a company by planning and control. Hence ratio calculated on historical data may be good indicator of the future. Working capital ratios are the ratios related with working capital management i.e. current asset, current liabilities, liquidity, profitability, and risk return tradeoff. Various ratios of firms which can be compared with another company are working capital turnover ratio, inventory turnover ratio, receivable turnover ratio, current asset turnover ratio, current ratio, and quick ratio. Our research will investigate the relationship of various working capital ratios and liquidity and profitability of the company in the industry. Basically these ratios are the working capital management efficiency ratio.

There is general belief that private sector is more efficient than public sector. It is supposed that since public sector is under the control of bureaucracies with politicians at the helms usually underperforms. But achieving private sector performance is an objective in itself. Policy makers and academicians have written a lot for government owned sector of Indian industry (policy makers, Bhutalingam, 1993; Jalan, 1991; Marathe, 1989), (academician Bardhan, 1984; Bhagwati, 1993). Evidence points to no significant differences between private and public sector (Bhaya, 1990, Jha and Sahani 1992, Ramaswami and Renforth 1994). The truth has to be investigated. If there is no performance difference between private and public sector then why privatize. Conversely we can say that contemporary empirical research could be flawed. The results of such a debate have to be based on evidential research. The research should be carried out to evaluate comparative efficiency, liquidity and profitability based on ratio analysis. Our research is more significant and extended to liquidity and profitability (Sumit K. Majumdar 1996). Research shows that evolution of modern industry, the capabilities achieved in the industry, the efficiency of organizations and sectors to develop nations in to modern country (Chandler, 1993). In developing nations public sector is dominant part to provide employment. Therefore it is important to be investigated whether state-owned sector perform better or worse than private sector enterprises. Indian experiences with public sector provide rich insights to compare them with private sectors. Public choice theory studies the effect of politics on public sector. As per this theory public sector organizations are controlled by politician and bureaucrats and they in tern use them for their personnel benefits which led deterioration of their performances (Shelifer and Vishney, 1994). Sources of funding differ for both private and public sector. Private organization funding depends on market sources while for those in public sector depend on political forces. In private organization only motive is to be competitive, dynamic and to maximize wealth. In the process private organizations make strategies to achieve the set goals as their corporate strategies. But managers in public sectors follow status-quo and have no competing and ambitious goals (Reiny, Backoff and Levine, 1978). In this process the efficiency of public sector is less than those in private sectors counter parts. Agency issue also affect as this is dominant in private sector (Broadman and Vining, 1992). But in case of public sector agency issue is prevalent between bureaucrat and politician because of lack of accountability (Whitehead 1998). Job security is another big factor which affects the performance of public and private sector both. It is less likely that employee having secured jobs will involve in corruption than employee in temporary jobs (Landes and Posner 1975). Competition is another factor which affects the performance of both private and public sector. Public organizations perform poor than private organizations in competitive market (example of BSNL a PSU and other private competitors in the telecom industry). Competition just moderates the relationship between ownership and performance (Broadman and Viking 1992). While evaluating alternatives to poor performance of public sector let us revisit the objectives of both private and public sector. Private sector goal is earning profit only. Objectives of public sector are development and social. The goals of public sector are the reasons for poor performances (Stiglitz 1994). It means that public sector is must to cater for the objectives (Shliefer 1998). Hence the discussion supports the inferior performance of public sector to private sector.

DESCRIPTIVE STATISTICS

Table-1 presents the descriptive statistics of the variables used in our study. Mean return on capital employed for all companies from all industries in India is 13.8. Lowest mean value of ROCE for telecommunications is -0.31 which is negative and is highly unprofitable. It coincides with the fact that there are very few organizations which are operative in telecommunication manufacturing as it is unprofitable. Highest ROCE is for IT industry followed by automobiles. Other industries performance such as cement, steel, fertilizer and chemicals and petrochemicals has been average ranging from 12.82 to 14.23. Working capital turnover ratio is highest for automobile industry and is lowest for cement industry. In fact lowest working capital turnover ratio is observed in the cases of cement, telecom, and fertilizer and chemicals. Working capital turnover ratio is the measure of how effectively a company is using its working capital to generate sales. We therefore can say that cement, steel, IT, telecom and fertilizer and chemicals have not been able to use the funds available for operations as effectively as automobile and fertilizer chemicals. In other words we can say that other than automobile and petrochemicals funds for operations are not effectively used to generate sales. It is observed that current ratio across the industry ranges between 1.51 and 2.83. This shows that current ratio across industry is healthy. Inventory turnover ratio across industry ranges from 3.82 and 12.74. Lowest inventory turnover ratio is observed for telecommunications. Information and technology operates on highest turnover ratio which is 12.74. It is observed that accept telecommunications all other industries manage their inventories efficiently.

It is observed that day's inventory outstanding is highest for telecom which possibly makes the industry unprofitable. Telecom industry on average takes 114 day to sale their inventory. Lowest DIO is for IT industry. It is observed that automobile, cement, fertilizer and chemicals and petrochemicals take almost similar days to sale their inventory.

Days sales outstanding is lowest for petrochemical industry. DSO means days taken to collect sales receivables. That means petrochemical industry sales their products against the cash and we find this system actually in practice where all dealers get their requirements against cash only. Telecom industry takes highest to collect its sales receivables and possibly is the reason for being unprofitable. Fertilizer and chemicals takes 71 days to collect its sales while other industries such as auto, cement, and steel takes 32, 29 and 39 days each. IT and fertilizer take 61 and 70 days each.

Days payable is highest in case of cement and telecommunications and is 241 and 249 days each. Petrochemical and IT industry is lowest as their day's payable outstanding and that is 41 and 44 days each. All other industries taken for the study are modest so far as day's payable outstanding is concerned.

Cash conversion cycle is negative in the cases of auto, cement and steel and is highest negative in the case of cement. In all other cases cash conversion cycle is positive and is highest for telecom. Petrochemical industry has lowest CCC.

Table-1

INDUSTRY	ROCE	WCTR	CR	ITO	DIO	DSO	DPO	CCC
AUTO	19.56	31.97	1.51	9.9	40.04	32.37	78.23	-5.84
CEMENT	12.82	3.69	2.6	8.04	46.3	28.43	249.17	-174.45
STEEL	14.08	7.73	2.18	5.18	78.82	39.1	138.48	-20.55
IT	22.69	7.37	2.13	12.74	34.55	60.83	44.4	50.98
TELECOM	-0.31	3.7	2.83	3.82	114.37	221.04	241.11	94.3
FERTI/CHEM	13.51	3.76	2.63	6.66	58.87	70.67	99.5	30.04
PETRO	14.23	17.72	1.58	10.54	36.48	10.35	41.42	5.4
AVERAGE	13.8	10.85	2.21	8.13	58.49	66.11	127.47	-2.87

ANOVA

Further we will examine whether various measures of working capital management and profitability varies across the industry or not. For this we will make a hypothesis based on descriptive results that various measures of working capital management and profitability vary across industries. Based on this we will have a set of **testable null and alternative hypotheses** as follows Ho: Working capital management and profitability do not change across industries. H1: Working capital management and profitability changes across industries. Since we have seven groups/industries will have to make many comparisons and therefore we will use ANOVA in our study. ANOVA will compare the differences among the means of all the industries simultaneously. Our data set will be as follows Table-2

S.No Variable Industry

1	ROCE:	19.56	1
2	WCTR:	31.97	1
3	CR:	1.51	1
4	ITO:	9.9	1
5	DIO:	40.04	1
6	DSO:	32.37	1
7	DPO:	78.23	1
8	CCC:	-5.84	1
9	ROCE:	12.82	2
10	WCTR:	3.69	2
11	CR:	2.6	2
12	ITO:	8.04	2
13	DIO:	46.3	2
14	DSO:	28.43	2
15	DPO:	249.17	2
16	CCC:	-174.45	2
17	ROCE:	14.08	3
18	WCTR:	7.73	3
19	CR:	2.18	3
20	ITO:	5.18	3
21	DIO:	78.82	3
22	DSO:	39.1	3
23	DPO:	138.48	3
24	CCC:	-20.55	3
25	ROCE:	22.69	4
26	WCTR:	7.37	4
27	CR:	2.13	4
28	ITO:	12.74	4
29	DIO:	34.55	4
30	DSO:	60.83	4
31	DPO:	44.4	4
32	CCC:	50.98	4
33	ROCE:	-0.31	5
34	WCTR:	3.7	5
35	CR:	2.83	5
36	ITO:	3.82	5
37	DIO:	114.37	5

38 DSO:221.04 5
 39 DPO:241.11 5
 40 CCC:94.3 5
 41 ROCE:13.51 6
 42 WCTR:3.76 6
 43 CR:2.63 6
 44 ITO:6.66 6
 45 DIO:58.87 6
 46 DSO:70.67 6
 47 DPO:99.5 6
 48 CCC:30.04 6
 49 ROCE:14.23 7
 50 WCTR:17.72 7
 51 CR:1.58 7
 52 ITO:10.54 7
 53 DIO:36.48 7
 54 DSO:10.35 7
 55 DPO:41.42 7
 56 CCC:5.4 7

Using SPSS we get following ANOVA table

Table-3

ANOVA

	Sum of Squares	Mean Square	F	Sig.
Between Groups	24867.825	6.4144	6.638	1.012
Within Groups	200653.487	49.4094	9.969	
Total	225521.312	55		

As the computed (SPSS output) value of F is less than the table value we will accept null hypothesis as we do not have sufficient evidence to reject the null hypothesis.

In ANOVA total variation can be broken in to two parts one which can be attributed to some specific causes such as various measures of working capital management and profitability in our study and other that may be attributed to chance within industry i.e among the companies in the industry in case of our study. Therefore major variation is from within the industry from among the companies and is attributed to chance only. Actually there is no significant variations for various measures of working capital management and profitability across the industries as the variations are as a result of chance within the industry only.

References

1. Autocorrelation Notes_3, GEOS 585A, spring 2009.
2. Ashish K. Bhattacharya, "Financial Accounting for business managers," Prentice Hall of India Private Limited. Cannaught circus, New Delhi, 2007.
3. Appuhami B. A Rajnith, 2008, "The impact of firms' capital expenditure on working capital management: an empirical studies across industries in Malaysia." International management review, Vol. 4 No. 1.
4. Charles T. Horngren, Gary L Sudem, John A Elliot, "Introduction to financial accounting," Eighth edition Pearson Education (Singapore) Pte. Limited.
5. Uyar Ali (2009) "The Relationship of cash conversion cycle with firm size and profitability: An empirical investigation in Turkey" International research Journal of finance and economics. ISSN 1450-2887 Issue 24. Euro Journal Publishing Inc.
6. Dong Huynh Phuong and Su Jyh-Tay, "The relationship between working capital management and profitability: A Vietnam case" International research journal of finance

- and economics, ISSN-1450-2887 Issue 49 (2010), Euro journals Publishing Inc. 2010.
7. E W Walker, "Essentials of fundamental management", Prentice Hall Inc. New Delhi 1935.
 8. Eljelly Abuzar M. A. 2004, "Liquidity-profitability tradeoff: An empirical investigation in an emerging market" IJCM VOL 14, NO. 2 2004, 48
 9. Falope OI, Ajilore OT, 2009. "Working capital management and corporate profitability: Evidence from panel data analysis of selected quoted companies in Nigeria." Research journal of business management, 3: 73-84.
 10. Ghosh Kumar Santanu and Maji Santi Gopal, "Working capital management efficiency: A study on Indian Cement Industry."
 11. Ganesan Vedavinayagam (2007) "An analysis of working capital management efficiency in telecommunication industry" River academic journal, volume 3, number 2.
 12. Gill Amarjit, Biger Nahum, Mathur Neil (2010) "The relationship between working capital management and profitability: Evidence from the United States" Business and Economic Journal, Volume 2010:BEJ-10.
 13. J E L classification: G30, G31, G32., "How does working capital management affect SMEs profitability?"
 14. James C Van Horne Horne and John M. Wachowicz, Jr., "Fundamentals of financial management", Pearson Education (Singapore) Pvt Ltd., Indian Branch, 2005.
 15. Lazaridis Ioannis and Tryfondis Dimitrios "the relationship between working capital management and profitability of listed companies in Athens Stock Exchange" University of Macedonia, Department of Accounting and Finance, 156 N. Egnatia Str. 54006 Thessaloniki, Greece
 16. Mukhopadhyay D., "Working capital management in heavy engineering firms-A case study." Finance.
 17. M Y Khan and P K Jain, "Financial management text and problems" Tata McGraw Hill Publishing company Limited. New Delhi 2003.
 18. Narvare P. C. "Working capital and profitability-an empirical analysis" finance
 19. Nasr Mohamed and Rehman Abdul, 2007, "Working capital management and profitability-case of Pakistani firms" International Review of Business review papers, Vol 3 No. 1. March 2007, Pp. 279-300.
 20. I. M. Pandey, "Financial management" 2002, Vikash Publishig House Pvt Limited New Delhi.
 21. Oruc Eda and Sen Mehmet, (2009), "Relationship between Efficiency level of Working Capital Management and Return on Total Assets in ISE" International Journal of Business and Management, Vol. 4, No. 10, October 2009.
 22. Poule, Roy A " Practical financial statement analysis", Tata McGraw Hill Publishing company Limited, New Delhi Edition 1972.
 23. Prassana Chandra, "Financial management theory and practice", Tata McGraw Hill Publishing company Limited, New Delhi 2002.
 24. Padachi Kesseven, "Trends in working capital management and its impact on firms' performance: An analysis of Mauritius small manufacturing firms." International Review of business research papers. Vol. 2 No. 2 October 2006 pp 45-58.
 25. Ramachadran Azhagaiah and Janakiraman Murlidharan, "The relationship between working capital management efficiency and EBIT." JEL classification : G30, G32. Volume - 7 Number-1 Spring 2009.
 26. S. C. Kuchhal, Financial management-An Analytical and Conceptual approach", Chaitanya publishing house, house, Allahabad, 1993.
 27. Dr. S.N. Maheshwari, "Principle of management accounting," Sultan Chand 7 Sons, New Delhi. 2001.
 28. Singh J. P. Pandey Sishir. (2008), "Impact of working capital management in the profitability of Hindalco Industries Limited." The ICAI University press.

29. Sayaduzzaman Md., "working capital management: A study on British American Tobacco Bangladesh company Ltd." The Journal of Nepalese Studies VIII No. 1 Dec 2006.
30. Sen Mehmet, Koksal Can Deniz, and Oruc Eda, "Relationship between the efficiency of working capital management and company size" JEL codes : G 30, G31, G 39.
31. Sazid Nazir Mian and Talat Afza, "On the factors determining working capital requirement" proceeding ASBBS, VOL 15, No, 1, Feb 2008.
32. Sazid Nazir Mian and Talat Afza, 2009, "Impact of aggressive working capital management policy on firms' management profitability" The IUP journal of applied finance, VOL 15, NO 8, 2009.
33. Yucel Tulay and Kurt Guluz, 2002, "Cash conversion cycle, cash management and profitability: An empirical study on the ISE Traded companies" The ISE Review Volume:22 April/May/June 2002
34. Zaryawati , M.A., Annuar, M. N., Abdul Rahim A. S., "working capital management and corporate performance: case of Malaysia" University Putra Malaysia, Malaysia. Journal of modern accounting and auditing, ISSN 1548-6583, USA. Nov 2009 vol.5, no.11 (serial no.54)