

Working Capital Management In Selected Indian Steel Companies

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ABSTRACT

Working capital is the backbone of an organization. It refers to a portion of the total fund which finances the day to day working expenses during the operating cycle. Management of working capital is one of the most important functions of corporate management. It is rightly said, "Inadequate working capital is advantageous, whereas redundant working capital is a criminal waste". As a large manufacturing industry, working capital management in the steel industry involves a large portion of the company's total assets. The optimum working capital ensures the success of the business, while its inefficient management will lead to the down fall of the company. Hence, this paper analyses the working capital management of selected steel companies in India. Further, to measure the effective utilization of the working capital, Operating Cycle and Cash Conversion Cycle were used. To measure the determinants of Cash Conversion Cycle, the Kieschnick model has been used. Finally, it was concluded that the size of a company plays a vital role in determining the efficiency of its working capital management.

Keywords: Working Capital, Operating Cycle, Cash Conversion Cycle, Accounts Receivable, Accounts Payables and Inventory Conversion Period

INTRODUCTION

Steel is significant for the progress of any economy, and it is considered as the backbone of economic development. Per capita consumption of steel is treated as an indicator of socio-economic development of any country. It is a product of a large and technologically complex industry having strong forward and backward linkages in terms of material flow and income generation. All major industrial economies are characterized by the existence of a strong steel industry and the growth of many of these economies has largely been shaped by the strength of their steel industries in the initial stages of their development.

Working capital is the backbone of an organization. It refers to the portion of the total fund which finances the day to day working expenses during the operating cycle. Management of working capital is one of the most important functions of corporate management. Efficient working capital management is the most crucial factor for its survival. Working capital management is of paramount significance for all businesses. In general, financial soundness and profitability of a company largely depend upon the working capital management of the company. Simply stating, the working capital denotes excess, not inadequate working capital. It is rightly said, "adequate working capital is advantageous, whereas redundant working capital is a criminal waste." As a large manufacturing industry, working capital management in the steel industry involves a large portion of the company's total assets. The optimum working capital ensures the success of the business, while its inefficient management will lead to the downfall of the company. Therefore, it is very important for the steel industry that the investment in working capital is carefully controlled. Hence, this paper analyses the working capital management of selected steel companies in India.

REVIEW OF LITERATURE

Padachi et al. (2008) examined the structural differences in working capital and the financing pattern of 58 small manufacturing firms for the period from 1998-2003. It was found that the working capital position of the sample firms revealed a disproportionate increase in current asset investment in relation to sales, resulting in a sharp decline in the working capital turnover. It was also found that short-term bank credit plays a significant role as a major external source of financing working capital requirements of the sample firms. Khatik and Jain (2009) analysed the working capital position of State Electricity Board in Madhya Pradesh from 1995-96 to 2004-05 by three important techniques

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like Ratio Analysis, Funds Flow analysis and Working Capital Analysis technique. It was found that the position of current ratios and turnover ratios was not satisfactory because they were not up to the standard bench mark.

Mathuva (2009) examined the influence of working capital management components on corporate profitability of 30 firms listed on the Nairobi Stock Exchange for the period from 1993-2008. He concluded that there exists a highly significant negative relationship between the time it takes for firms to collect cash from their customers and profitability, and there exists a highly significant positive relationship between the period taken to convert inventories to sales and profitability, and there exists a highly significant positive relationship between the time it takes for firms to pay its creditors and profitability.

Bhunia and Brahma (2011) examined the effectiveness of working capital in terms of short term liquidity of the top private sector Indian steel companies like Tata Steel Ltd., Lloyds Steel Ltd., Kalyani Steel Ltd. and JSW Steel Ltd. The period covered 9 years from 1997-98 to 2005-06. The researchers used accounting techniques like Ratio Analysis and statistical techniques like Mean, Standard Deviation, Coefficient of Variation, 't' test, Multiple Correlation, Multiple Regression Analysis, Coefficient of Determination and Linear Regression Equation. It was found that liquidity and receivable management of the selected private steel companies were not satisfactory. It was suggested that the overall inventory management needed to be improved, and composition of net current assets needed to be sustained. It was also suggested that effective coordination between sales, profit and finance is necessary and the payment policy of the selected companies should be pre-planned.

OBJECTIVES OF THE STUDY AND METHODOLOGY

The objective of the present study is to analyze the working capital management of selected steel companies in India. The period of study is confined to ten years, from 2000-01 to 2009-2010. The sample was drawn from the list of steel companies listed on the Bombay Stock Exchange. Out of 118 companies quoted on the list, 38 steel companies (which constituted 32.2 per cent of the total listed companies) were selected for the analysis.

This study is a modest attempt to analyze the working capital management with the help of various Ratios : Inventory Turnover Ratio, Assets Turnover Ratio, Fixed Asset Turnover Ratio, Accounts Receivable Turnover Ratio, Accounts Payable Turnover Ratio, Inventory Conversion Period Ratio, Average Collection Period Ratio and Average Payment Period Ratio. To measure the effective utilization of working capital, Operating Cycle and Cash Conversion Cycle were used. Further, tools like Mean, Standard Deviation, Coefficient of Variation, Compound Annual Growth Rate and Linear Growth Rate were also used. To measure the determinants of Cash Conversion Cycle, the Kieschnick model had been used.

ANALYSIS AND DISCUSSION

❖ **Inventory Turnover Ratio (ITR)** : ITR indicates the number of times the stock has been turned over during the period and evaluates how efficiently the inventory is being managed in a company. The level of inventory should neither be too high nor too low. Higher inventory blocks the capital unnecessarily and reduces the profitability of a business. Lower inventory leads to slow recovery of cash, which in turn adversely affects liquidity. So, every company has to maintain a reasonable level of inventory to meet the requirements of the business. The higher the ITR ratio, the better is the performance of a company. The calculated ITR of the selected steel companies is shown in the Table 1.

It is evident from the Table 1 that the ITR registered an increasing trend during the study period for small sized companies. The maximum ITR was 7.7765 in the year 2008-09, and the minimum was 4.27 in the year 2000-01, registering a growth rate of 73.41%. In the case of medium-sized companies, the ITR showed an increasing trend up to 2004-05, and thereafter, it showed a decreasing trend and its value was 4.4301 in 2009-2010, with a growth rate of 26.34%. The ratio gradually increased for both large and pooled companies throughout the study period, with a growth rate of 83.16% for large and 78.48% for pooled companies. The average of ITR is 6.0181, 4.4665, 4.6250 and 4.6267 for small, medium, large and pooled steel companies respectively.

The CV of ITR for small, medium, large and pooled companies is 20.79%, 19.54%, 19.92% and 19.61% respectively. It is clear that the fluctuating trend of ITR in all the selected steel companies points towards their inconsistent performance in inventory management. The CAGR and LGR of ITR is positive and significant at the 5% level for small [(CAGR:7.54;('t' : 8.84) and (LGR:0.3881);('t' : 7.74)] companies, while it is positive and considerably significant for medium [(CAGR:2.63);('t' : 1.68) and (LGR:0.1044);('t' : 1.10)] companies. It is positive and

Table 1 : Inventory Turnover Ratio Of Selected Steel Companies												
Size	Small			Medium			Large			Pooled		
Year	COG	INV	ITO	COG	INV	ITO	COG	INV	ITO	COG	INV	ITO
2000-01	388.19	90.90	4.2705	1559.16	444.65	3.5065	20459.99	7877.56	2.5973	22407.34	8413.10	2.6634
2001-02	340.81	71.62	4.7589	1618.77	452.90	3.5742	24074.79	6632.27	3.6299	26034.37	7156.79	3.6377
2002-03	319.20	59.21	5.3914	1556.20	422.45	3.6838	26127.78	6383.47	4.0930	28003.18	6865.12	4.0791
2003-04	339.59	67.03	5.0666	1701.17	379.80	4.4791	29150.50	6312.88	4.6176	31191.26	6759.71	4.6143
2004-05	418.91	85.42	4.9041	2379.00	387.55	6.1386	35530.16	6401.14	5.5506	38328.07	6874.11	5.5757
2005-06	550.83	95.53	5.7663	2909.46	505.27	5.7582	45082.96	7839.37	5.7508	48543.25	8440.17	5.7515
2006-07	552.32	86.30	6.4000	3070.26	681.35	4.5061	51803.22	10701.25	4.8409	55425.80	11468.90	4.8327
2007-08	652.73	88.70	7.3589	4085.37	892.10	4.5795	61636.21	12865.89	4.7907	66374.31	13846.68	4.7935
2008-09	762.10	98.00	7.7765	4562.86	1073.75	4.2495	73312.81	14906.01	4.9183	78637.77	16077.76	4.8911
2009-10	773.37	104.44	7.4053	4705.38	1062.14	4.4301	88046.68	18507.92	4.7572	93525.43	19674.49	4.7536
Mean	509.81	84.71	6.0181	2814.76	630.19	4.4665	45522.51	9842.77	4.6250	48847.08	10557.68	4.6267
SD	174.47	14.43	1.2510	1262.27	279.03	0.8725	22881.52	4282.42	0.9212	24291.15	4564.51	0.9073
CV	34.22	17.04	20.79	44.84	44.28	19.54	50.26	43.51	19.92	49.73	43.23	19.61
GR	99.22	14.89	73.41	201.79	138.87	26.34	330.33	134.94	83.16	317.39	133.86	78.48
CAGR	8.89 **	3.91*	7.54**	15.04**	12.64**	2.63	17.91**	11.96**	5.31*	17.69**	11.94**	5.14*
t-Value	7.69	2.36	8.84	10.99	4.95	1.68	31.22	4.80	2.60	28.69	4.83	2.58
LGR	53.66 **	3.16*	0.3881**	401.26**	80.45**	0.1044	7321.2**	1215.79**	0.1989*	7776.13**	1299.40**	0.1939*
t-Value	7.22	2.51	7.74	10.03	5.06	1.10	11.04	4.76	2.44	11.13	4.81	2.40
Note: Both Cost Goods Sold (COG) and Inventory (INV) are ₹ in Crores; Inventory Turnover Ratio (ITR); t-Table value for 8 d.f @5% = 2.30 @1% = 3.35;												
** Significant at 5% level; *Significant at 1% level. Source: Prowess Database.												

significant at 1% level for large companies [(CAGR:5.31);(t':2.60) and (LGR:0.1989); (t':2.44)] and pooled steel companies [(CAGR: 5.14);(t': 2.58) and (LGR: .1939);(t': 2.40)].

It can be seen that the ITR is comparatively high for small-sized steel companies, which indicates that the more frequent is the sale of the stocks, the lesser amount of money is required to finance the inventory. The ITR is comparatively low in other companies, implying high investment in inventories.

❖ **Accounts Receivable /Debtors Turnover Ratio (ARTR) :** ARTR indicates the velocity of debt collection of a company. It indicates the number of times the debtors are turned over during a year. The analysis of accounts receivable consists of two components viz., credit annual sales and average trade debtors and accounts receivable. Generally, the higher is the value of the debtors turnover, the more efficient is the management of the debtors. Low debtors turnover implies inefficient management of debtors and fewer liquid debtors. The calculated ARTR of the selected steel companies is shown in the Table 2.

Table 2 reveals that the ARTR for small and medium-sized companies gradually increased from 2.7417 and 3.0015 in 2000-01 to 3.8458 and 5.1990 in 2009-2010, with a growth rate of 40.27% and 73.21%. For large and pooled steel companies, it increased from 4.0156 and 3.9029 in 2000-01 to 9.0758 and 8.6632 in 2009-2010, with a growth rate of 126.01% and 121.97% respectively. The average of ARTR ratio is 3.1989, 4.1619, 7.4022 and 7.0059 for small, medium, large and pooled steel companies respectively. The CV of ARTR is 18.77%, 24.25%, 29.67%, and 28.88% for small, medium, large and pooled companies respectively. From the CV, it is apparent that the volatility in ARTR of small sized companies is less than the other companies, which indicates their consistent performance in managing the accounts receivables. The CAGR and LGR of ARTR is positive and significant at 1% level for small [(CAGR: 5.86);(t': 5.23) and (LGR:0.1764);(t' : 5.50)] ; medium [(CAGR:7.08);(t' : 5.19) and (LGR:0.3001);(t' : 5.39)] ; large [(CAGR:10.37);(t' : 6.13) and (LGR:0.6525);(t' : 6.28)] and pooled steel companies [(CAGR:10.19);(t' : 6.33) and (LGR:0.6114);(t' : 6.48)].

Table 2 : Accounts Receivables Turnover Ratio Of Selected Steel Companies												
Size	Small			Medium			Large			Pooled		
Year	NS	AR	ARTR	NS	AR	ARTR	NS	AR	ARTR	NS	AR	ARTR
2000-01	438.56	159.96	2.7417	1975.16	658.07	3.0015	27758.70	6912.72	4.0156	30172.42	7730.75	3.9029
2001-02	373.79	164.01	2.2791	2009.21	670.77	2.9954	30611.61	6447.23	4.7480	32994.61	7282.00	4.5310
2002-03	391.44	157.35	2.4877	2056.16	690.39	2.9783	30627.38	6201.89	4.9384	33074.98	7049.62	4.6917
2003-04	419.73	155.73	2.6952	2430.75	714.09	3.4040	39872.58	6079.66	6.5584	42723.06	6949.48	6.1477
2004-05	522.43	159.24	3.2808	2810.91	708.35	3.9683	50072.21	6383.51	7.8440	53405.55	7251.10	7.3652
2005-06	679.30	177.82	3.8203	3635.25	758.16	4.7948	70827.91	7348.52	9.6384	75142.46	8284.49	9.0703
2006-07	654.51	194.02	3.3735	4587.94	886.24	5.1769	72170.16	8579.17	8.4123	77412.61	9659.42	8.0142
2007-08	745.52	205.00	3.6368	6612.32	1174.83	5.6283	90246.31	9580.86	9.4194	97604.15	10960.69	8.9049
2008-09	866.62	226.36	3.8285	5930.13	1326.00	4.4722	105913.40	11301.77	9.3714	112710.15	12854.13	8.7684
2009-10	885.30	230.20	3.8458	6474.01	1245.25	5.1990	119300.88	13145.02	9.0758	126660.19	14620.46	8.6632
Mean	597.72	182.97	3.1989	3852.18	883.21	4.1619	63740.11	8198.03	7.4022	68190.02	9264.21	7.0059
SD	194.97	29.05	0.6004	1904.64	262.47	1.0260	33224.07	2435.09	2.1669	35250.93	2711.43	2.0197
C V	32.62	15.88	18.77	49.44	29.72	24.65	52.12	29.70	29.27	51.70	29.27	28.83
GR	101.87	43.91	40.27	227.77	89.23	73.21	329.78	90.16	126.01	319.79	89.12	121.97
CAGR	10.87*	4.73*	5.86*	17.25*	8.63*	7.08*	19.46*	8.24*	10.37*	19.25*	8.22*	10.19*
t-Value	8.29	6.26	5.23	10.84	5.70	5.19	17.81	5.23	6.13	17.71	5.45	6.33
LGR	61.22*	8.73*	0.1764*	594.02*	77.94*	0.3001*	10707.49*	699.58*	0.6525*	11362.73*	786.25*	0.6114*
t-Value	8.68	6.19	5.50	8.11	5.81	5.39	12.61	4.99	6.28	12.66	5.19	6.48
Note: Both Net Sales (NS) and Accounts Receivable (AR) are ₹ in Crores; Accounts Receivable Turnover Ratio (ARTO); t-Table value for 8 d.f @1% = 3.35; *Significant % level, Source:Prowess database.												

The researchers also found that extending credit to the customers by all the selected steel companies increased significantly during the study period. The high DTR in large and pooled companies together implies the prompt payments made by the debtors. It signifies the goods collection efforts and efficient credit policy followed by them. Further, it was found that there is a direct relationship between duration of credit given to customers and the size of the steel firms.

❖ **Accounts Payable /Creditors Turnover Ratio (APTR) :** The APTR is a short term liquidity ratio that represents the average number of days taken by the company to pay its creditors. This ratio gives an indication of how well a company is able to repay its trade creditors. A higher payment period implies a greater credit period enjoyed by the company and larger benefits reaped from the suppliers. However, sometimes, it may result in lesser discounts and higher prices paid for the credit purchase. The calculated APTR of the selected steel companies is depicted in the Table 3.

The Table 3 depicts that the APTR of small sized companies gradually increased from 5.3473 in 2000-01 to 8.9412 in 2009-2010 by registering a growth rate of 67.21%. In medium-sized companies, the APTR ranged from 3.5446 in 2000-01 to 4.1874 in 2009-2010, with the growth rate of 18.13%. For large and pooled companies, the APTR was in a positive trend and moved upto 6.9926 and 6.7764 in 2009-2010 with a growth rate of 67.85% and 64.02% respectively. The average APTR is 5.99, 4.04, 6.22, 6.02 for small, medium, large and pooled steel companies respectively. The CV of APTR is 31.57%, 15.49%, 20.08% and 19.58% for small, medium, large and pooled companies respectively. This indicates that making payment to the creditors was less consistent in small sized companies as compared to that of other companies. The CAGR and LGR of APTR is positive and significant at 1% level for small [(CAGR:9.07);('t' : 4.41) and (LGR:0.5401);('t' : 4.85)] ; positive and considerably significant at 5% level for medium [(CAGR:2.40);('t' : 2.30) and (LGR:0.1343);('t' : 2.41)] companies. It is positive and significant at 1% level for large [(CAGR:6.68);('t' : 5.81) and (LGR:0.3730);('t' : 5.94)] and pooled steel companies [(CAGR:6.47);('t' : 5.94) and (LGR:0.3526);('t' : 6.00)]. It was found that frequency of making payment to the trade creditors was more for large-sized companies than that of small and medium-sized companies. An increase in ARTR

Table 3 : Accounts Payable Turnover Ratio Of Selected Steel Companies												
Size	Small			Medium			Large			Pooled		
Year	COG	AP	APTR	COG	AP	APTR	COG	AP	APTR	COG	AP	APTR
2000-01	388.19	72.60	5.3473	1559.16	439.87	3.5446	20459.99	4911.19	4.1660	22407.34	5423.65	4.1314
2001-02	340.81	76.11	4.4782	1618.77	439.50	3.6832	24074.79	5272.78	4.5659	26034.37	5788.39	4.4977
2002-03	319.20	80.51	3.9647	1556.20	475.23	3.2747	26127.78	5243.90	4.9825	28003.18	5799.64	4.8284
2003-04	339.59	87.86	3.8651	1701.17	550.47	3.0904	29150.50	5059.42	5.7616	31191.26	5697.75	5.4743
2004-05	418.91	90.73	4.6174	2379.00	550.30	4.3231	35530.16	5324.36	6.6731	38328.07	5965.38	6.4251
2005-06	550.83	93.64	5.8824	2909.46	583.18	4.9890	45082.96	6176.04	7.2997	48543.25	6852.85	7.0837
2006-07	552.32	86.58	6.3793	3070.26	716.17	4.2871	51803.22	7267.91	7.1277	55425.80	8070.66	6.8676
2007-08	652.73	80.37	8.1216	4085.37	857.59	4.7638	61636.21	8352.91	7.3790	66374.31	9290.87	7.1440
2008-09	762.10	91.15	8.3614	4562.86	1048.97	4.3499	73312.81	9992.98	7.3364	78637.77	11133.09	7.0634
2009-10	773.37	86.50	8.9412	4705.38	1123.70	4.1874	88046.68	12591.44	6.9926	93525.43	13801.63	6.7764
Mean	509.81	84.60	5.9959	2814.76	678.50	4.0493	45522.51	7019.29	6.2285	48847.08	7782.39	6.0292
SD	174.47	6.92	1.8927	1262.27	250.83	0.6274	22881.52	2577.75	1.2507	24291.15	2824.48	1.1804
CV	34.22	8.18	31.57	44.84	36.97	15.49	50.26	36.72	20.08	49.73	36.29	19.58
GR	100	19.15	67.21	202	155.46	18.13	330.33	156.38	67.85	317.39	154.47	64.02
CAGR	10.95*	1.72***	9.07*	15.65*	11.69*	2.40**	17.91*	10.52**	6.68*	17.69*	10.53*	6.47*
t-Value	6.90	2.23	4.41	11.59	9.64	2.30	31.22	6.90	5.81	28.69	7.30	5.94
LGR	53.66*	1.39***	0.5401*	401.26*	77.95*	0.1343**	7321.21*	758.70*	0.3730*	7776.13*	838.04*	0.3526*
t-Value	7.22	2.16	4.85	10.03	7.86	2.41	11.04	5.55	5.94	11.13	5.78	6.00
Note: Both Cost of Goods sold (COG) and Accounts Payable (AP) are ₹ in Crore; Accounts Payable Turnover Ratio (APTR); t-Table value for 8 d.f @10% = 1.85 @5% = 2.30 @1% = 3.35; ** Significant at 5% level; *Significant at 1% level; ***10%Significant level ,												
Source: Prowess Database												

increases the liquidity, whereas an increase in APTR decreases the liquidity. From the comparison results of ARTR and APTR, it is apparent that the steel companies had well managed the balance between credit sale and purchase of goods.

OPERATING AND CASH CONVERSION CYCLE

The operating cycle and cash conversion cycle are the important components in working capital management. While the operating cycle is made up of two components viz., days in receivables and days in inventory, the cash conversion cycle requires one more component, i.e., days in accounts payable. Operating cycle is obtained by adding days in inventory and days in accounts receivable, whereas cash conversion cycle is calculated by subtracting accounts payable days from the operating cycle.

❖ **Operating Cycle (OC)** : Operating cycle is an important element as it determines the amount of working capital in a business. It denotes the length of time between the company's outflow of raw materials, wages and other expenditures and the inflow of cash from the sale of goods. The operating cycle reveals how long the cash is tied up in the receivables and inventory. The time that elapses between the purchase of raw materials and the collection of cash for sales is referred as the Operating Cycle. A long OC indicates that only a lesser amount is available to meet the short term obligations of a business. Operating Cycle is expressed as an indicator (days) of management of performance efficiency. The OC is a "twin" of the Cash Conversion Cycle (CCC). Regular and uninterrupted operating cycle helps a company to determine the correct amount of capital requirement. If the turnover period for inventories and accounts receivables is lengthened or the payment period of accounts payable is shortened, then the operating cycle will be prolonged and the investment in working capital will be increased. The formula for calculating OC is :

$$\text{Operating Cycle} = \text{Days In Inventory} + \text{Days In Accounts Receivable}$$

❖ **Cash Conversion Cycle (CCC)** : Static ratios are inadequate and sometimes will not show the proper evaluation of a

company's liquidity position. Though the receivables and inventory are the important measures of an operating cycle, the analysis will be incomplete if all relevant flows are not considered. This concept introduces the consideration of another important aspect of financial flow. Cash Conversion Cycle adds a new dimension and provides a complete insight into the working capital management and liquidity analysis. CCC is a liquidity metric and expresses the length of time (in days) that a company uses to sell inventory, collect receivables and pay its accounts payable. The CCC measures the number of days a company's cash is tied up in the production, sales and the benefit it gets from payment terms from its creditors. The time length between the payment for raw material purchases and the collection of cash from credit sales is referred to as the cash cycle. In manufacturing companies, CCC includes the average time the raw materials remain in stock, the time taken for the sale of finished goods, the period of time during which the finished goods are stored in the form of inventory and the time taken by the debtors to pay their dues. From the total of the above components, the credit period granted by the suppliers is to be deducted in order to derive the CCC. The shorter this cycle, the more liquid is a company's working capital position is.

$$\text{Cash Conversion Cycle (CCC)} = \text{Operating Cycle} - \text{Accounts Payable Days}$$

❖ **Inventory Conversion Period / Days In Inventory (INVDAYS)** : Days in inventory denote the average time taken for clearing the stock. This ratio may be unfavorable if it is either too high or too low. All other things being equal, the lesser the days goods spend in the inventory, the more efficient a company is. Calculation of days in inventory is the first step in measuring the cash conversion cycle, followed by days in sales outstanding and days in payable outstanding. This period is calculated by dividing the number of days by inventory turnover ratio.

❖ **Average Collection Period / Days In Accounts Receivable (ARDDAYS)** : Average collection period indicates the efficiency of the credit and collection policy of the company, and it directly affects the liquidity position of the company. This ratio represents the average number of days for which a company has to wait before its receivables are converted into cash. It measures the quality of the debtors. The shorter the average collection period, the better is the

Table 4 : Operating And Cash Conversion Cycle For Small Companies					
YEAR	INVDAYS	ARDDAYS	OC	APDAYS	CCC
2000-01	85	133	219	68	151
2001-02	77	160	237	82	155
2002-03	68	147	214	92	122
2003-04	72	135	207	94	113
2004-05	74	111	186	79	107
2005-06	63	96	159	62	97
2006-07	57	108	165	57	108
2007-08	50	100	150	45	105
2008-09	47	95	142	44	99
2009-10	49	95	144	41	103
Mean	64	118	182	66	116
SD	13.22	23.89	34.82	19.92	20.76
CV	20.57	20.23	19.09	30.00	17.90
CAGR	-6.61*	-5.54*	-5.85*	-8.32*	-4.47*
t-Value	-8.52	-5.23	-9.56	-4.41	-4.26
LGR	-4.12*	-6.83*	-10.95*	-5.31*	-5.64*
t-Value	-8.15	-4.89	-8.85	-3.87	-4.10
Note: INVDAYS - Days in Inventory; ARDDAYS - Days in Accounts Receivable, OC - Operating Cycle; APDAYS - Days in Accounts Payables, CCC - Cash Conversion Cycle; t-Table value for 8 d.f @10% =1.85; @5% = 2.30 @1% = 3.35; *Significant at 1% level. Source: Prowess Database.					

quality of the debtors. A higher collection period implies an inefficient collection performance, which in turn adversely affects the short term paying capacity of a company.

❖ **Average Payment Period of Creditors / Days In Accounts Payable (APDAYS)** : Average payment period denotes the average number of days taken by the company to pay its creditors. It indicates the efficiency of the credit and payment policy of the company and the liquidity position directly depends on this period. The lower the ratio, the better is the liquidity position of the company and the higher the ratio, the lower is the liquidity position of the company. A higher payment period also implies greater credit period enjoyed by the company and the larger is the benefit reaped from credit suppliers. The results of the analysis of trend and growth in INVDAYS, APDAYS, OC, ARDAYS, OC and CCC for small sized companies are displayed in the Tables 4 to 7. The Table 4 shows that on an average, small sized companies took 64 days to convert the inventory into sales and 118 days to collect the receivables against the goods sold on credit during the study period. The small sized companies took an average of 182 days to convert the inventory and receivables into cash. While making payment to the creditors, they took an average of 66 days in one cycle. From the average CCC of 116 days, it is clear that the small sized companies needed 116 days to release the cash tied up in inventory and credit sales and credit purchase after making payment to the suppliers. The CV of ARDAYS (20.23) is higher than the CV of CCC (17.90), which indicates the lack of consistency in converting the receivable into cash. The CV of APDAYS (30) is higher as compared to the CV of other component of CCC (17.90). It is evident that the number of days taken for making the payment to creditors was less consistent for small sized steel companies. The CAGR and LGR values are insignificant and negative for INVDAYS and other components of the cash conversion cycle. The results of the analysis of trend and growth in INVDAYS, APDAYS, OC, ARDAYS, OC and CCC for medium-sized steel companies are shown in the Table 5.

Table 5 : Operating And Cash Conversion Cycle For Medium Sized Companies					
YEAR	INVDAYS	ARDAYS	OC	APDAYS	CCC
2000-01	104	122	226	103	123
2001-02	102	122	224	99	125
2002-03	99	123	222	111	110
2003-04	81	107	189	118	71
2004-05	59	92	151	84	67
2005-06	63	76	140	73	66
2006-07	81	71	152	85	66
2007-08	80	65	145	77	68
2008-09	86	82	168	84	84
2009-10	82	70	153	87	65
Mean	84	93	177	92	85
SD	15.01	23.48	35.20	14.96	24.83
CV	17.89	25.28	19.92	16.23	29.38
CAGR	-2.28	-7.23*	-4.98*	-3.37**	-6.50**
t-Value	-1.05	-5.79	-3.77	-2.44	-3.18
LGR	-2.44	-7.02*	-9.47*	-3.23**	-6.24**
t-Value	-1.60	-6.05	-3.97	-2.44	-3.31
Note: t-Table value for 8 d.f @10% = 1.85; @5% = 2.30 @1% = 3.35; **Significant at 5% level; *Significant at 1% level. Source: Prowess Database.					

The Table 5 reveals that the medium-sized companies took 84 days to convert the inventory into sales, 93 days for converting the receivables against the goods sold on credit on an average during the study period. The medium-sized companies took an average of 177 days to convert the inventory and receivables into cash. While making payment to the creditors, they took an average of 92 days in one cycle. From the average CCC of 85 days, it is clear that the

medium-sized companies needed 85 days to release the cash tied up in inventory and credit sales and credit purchase after making the payment to the suppliers. The CV of ARDAYS (25.28) is lower than the CV of CCC (29.38), which indicates their consistency in converting the receivables into cash and also displays their consistency in the CCC. The CV of APDAYS (16.23) is lower as compared to the CV of CCC. It is evident from the data that the number of days taken for making the payment to the creditors was more consistent for medium-sized companies. The CAGR and LGR values are insignificant for INV DAYS, whereas they are significant and negative for other components of the Cash Conversion Cycle. This reveals the fact that there was a significant decline in the operating as well as the cash conversion cycle of medium-sized companies. It indicates a significant improvement in the efficiency of working capital management. The results of the analysis of trend and growth in INV DAYS, APDAYS, OC, ARDAYS, OC and CCC for large-sized steel companies are shown in the Table 6.

Table 6 : Operating And Cash Conversion Cycle For Large Sized Companies					
YEAR	INVDAYS	ARDAYS	OC	APDAYS	CCC
2000-01	141	91	231	88	144
2001-02	101	77	177	80	97
2002-03	89	74	163	73	90
2003-04	79	56	135	63	71
2004-05	66	47	112	55	58
2005-06	63	38	101	50	51
2006-07	75	43	119	51	68
2007-08	76	39	115	49	65
2008-09	74	39	113	50	63
2009-10	77	40	117	52	65
Mean	84	54	138	61	77
SD	22.51	19.32	40.67	14.21	27.23
CV	26.76	35.58	29.39	23.23	35.24
CAGR	-5.52**	-9.40*	-6.74*	-6.26*	-7.04**
t-Value	-2.57	-6.13	-3.93	-5.81	-3.05
LGR	-5.07**	-5.71*	-10.79*	-4.18*	-6.60**
t-Value	-2.64	-5.69	-3.81	-5.56	-3.06
Note: t-Table value for 8 d.f @10%=1.85; @5% = 2.30 @1% = 3.35; **Significant at 5% level; *Significant at 1% level. Source: Prowess Database					

It is clear from the Table 6 that on an average, large-sized companies took 84 days to convert the inventory into sales, 54 days to collect the receivables against the goods sold on credit and 138 days to convert the inventory and receivables into cash. While making payment to the creditors, the large-sized companies took an average of 61 days in one cycle. From the average CCC of 77 days, it is clear that the large-sized companies needed 77 days to release the cash tied up in inventory and credit sales and credit purchase after making the payment to the suppliers.

The CV of ARDAYS (35.58) and CCC (35.24) indicates the lack of consistency in converting the receivables into cash as well as in the CCC. The CV of APDAYS (23.23) is lower than the CV of CCC (35.24). It is evident that the number of days taken for making the payment to the creditors was more consistent for large-sized steel companies. Further, the average CCC reveals that during the study period, there was a notable improvement in the operating and cash conversion cycle of large-sized companies. It indicates the significant improvement in the working capital management efficiency of large-sized companies in India.

The results of the analysis of trend and growth in INV DAYS, APDAYS, OC, ARDAYS, OC and CCC for pooled steel companies are shown in the Table 7. The Table 7 reveals that the steel companies (all together), irrespective of their size, took 84 days to convert the inventory into sales, 57 days for converting the receivables into cash and 141 days for converting the inventory and receivables into cash on an average from 2000-2001 to 2009-2010. The selected steel

Table 7 : Operating And Cash Conversion Cycle For Pooled Companies					
YEAR	INVDAYS	ARDDAYS	OC	APDAYS	CCC
2000-01	137	94	231	88	142
2001-02	100	81	181	81	100
2002-03	89	78	167	76	92
2003-04	79	59	138	67	72
2004-05	65	50	115	57	58
2005-06	63	40	104	52	52
2006-07	76	46	121	53	68
2007-08	76	41	117	51	66
2008-09	75	42	116	52	65
2009-10	77	42	119	54	65
Mean	84	57	141	63	78
SD	21.53	19.74	40.06	14.00	26.82
CV	25.70	34.55	28.43	22.23	34.41
CAGR	-5.31**	-9.24*	-6.64*	-6.08*	-7.01**
t-Value	-2.52	-6.33	-4.02	-5.94	-3.11
LGR	-4.86**	-5.88*	-10.74*	-4.15*	-6.58**
t-Value	-2.65	-5.89	-3.93	-5.76	-3.14
Note: t-Table value for 8 d.f @10% = 1.85; @5% = 2.30 @1% = 3.35. **Significant at 5% level; *Significant at 1% level. Source: Prowess Database.					

companies, on an average, took 63 days from the date of purchase of the raw materials to make the payment to the creditors. From the average CCC of 78 days, it is clear that the steel companies altogether needed 78 days to release the cash tied up in inventory and credit sales and credit purchase after making the payment to the suppliers.

The CV of ARDDAYS (34.55) and the CCC (34.41) indicates towards the lack of consistency in converting the receivables into cash, as well as the inconsistency in the CCC. The CV of APDAYS (22.23) is lower as compared to the CV of CCC (34.41). It is evident that the number of days taken for making the payment to the creditors is more consistent. Further, both CAGR and LGR are significant and negative in sign. It reveals that there was a notable improvement in the operating and cash conversion cycle. It indicates that a significant improvement took place in the working capital management efficiency of all the selected steel companies. From the above results, it is inferred that there was a significant decline in operating and cash conversion cycle, in turn revealing the fact that there had been a remarkable improvement in the efficiency of working capital management of large and pooled steel companies together in India during the study period from 2000-01 to 2009-2010.

❖ **Determinants of The Cash Conversion Cycle - Kieschnick Model** : CCC is an important tool of analysis that enables the researchers to establish more easily why and how the business needs more cash to operate and when and how it will be in a position to refund the negotiated resources. A business can generate losses during a number of different periods, but it cannot go on indefinitely with poor CCC management. The activities that are directly related to CCC management are the following:

- ❖ Determining the effective number of days to collect the receivables;
- ❖ Determining the inventory needs;
- ❖ Determining the future growth of sales.

It is important to identify which factors could have an effect on the Cash Conversion Cycle (CCC). To accomplish this goal, the model specified by Kieschnick et al. (2006) was used to identify the factors affecting the company's working capital. In this case, the dependent variable is the Cash Conversion Cycle (CCC). The specification of the model is:

$$CCC = \alpha + \beta_1 ACCC_{it} + \beta_2 SIZE_{it} + \beta_3 PTA_{it} + \beta_4 FSG_{it} + \beta_5 HHI_{it} + e$$

Where,

- CCC = Cash Conversion Cycle;
 ACCC = Average of CCC of the companies belonging to the industry;
 SIZE = Firm size /Logarithm of sales;
 PTA = Ratio of tangible Fixed Assets to Total Assets;
 FGS = Percentage growth in sales for two years;
 HHI = Herfindahl Hirschman Index (Ratio of the firm's sales / industries' total sales)

The above model was applied for the entire sample, irrespective of the size classes because firm size is one of the explanatory variables and running size, and the results would be biased. Before running the regression using the above model, correlation analysis was carried out in order to ascertain the one to one relationship between dependent and independent variables. The results of the correlation analysis are reported in the Table 8.

Table 8 : Correlation Among Variables In The Regression Model For CCC						
VARIABLE	CCC	ACCC	SIZE	PTA	FGS	HHI
CCC	1.0000					
ACCC	0.7705	1.0000				
SIZE	-0.6428	-0.1673	1.0000			
PTA	-0.2280	0.3444	0.6627	1.0000		
FGS	-0.6140	-0.5468	0.3366	0.0775	1.0000	
HHI	-0.4004	-0.0001	0.9130	0.6361	0.2456	1.0000
Source: Prowess Database						

From the Table 8, it is clear that all explanatory variables except PTA have sufficient correlation with CCC, whereas variables like CCC, Size, PTA, FGS and HHI have a negative relationship with CCC except ACCC. To ascertain the unique explanatory power variable out of the five variables, the above-mentioned model is run. The Table 9 depicts the results of the Regression Model.

Table 9 : Operating And Cash Conversion Cycle For Pooled Companies			
Independent Variable	Co-efficient	't'-value	'p'- Value
Intercept	128.3668*	6.46	0.0000
ACCC	0.8756*	8.28	0.0000
SIZE	-12.0082*	-5.10	0.0000
PTA	-0.5446*	-2.79	0.0101
FGS	-0.1567NS	-1.24	0.2257
HHI	0.3489*	3.84	0.0008
R Square	0.9405		
Adjusted R Square	0.9281		
F value	75.90*		
Degrees of freedom	5, 24		
Note: *Significant at 1% level. NS - Not significant Source: Prowess Database			

The Table 9 depicts that the fit of the overall model with all explanatory variables is significant at 1% level with explained variation of 94.05% in the dependent CCC. The estimated coefficient for all variables except that of FGS are significant at 1% level. Among the explanatory variables with significant coefficient, the sign of the coefficient is negative for SIZE and PTA, while it is positive for ACCC. From positive significant coefficient of ACCC, it is understood that the selected steel companies had tried to stay close to the working capital policy of the entire industry.

From negative and significant coefficient of SIZE, it is evident that the large-sized companies (firms with large assets size) were subjected to less financial restrictions since they had a greater access to the financial market at lower financial costs than the small and medium sized companies, which in turn led the larger firms to convert their inventory into cash in lesser time periods. A negative and significant coefficient of PTA (ratio of net fixed assets to total assets) revealed that the companies which were more intensive in tangible assets were likely to reduce the investment in working capital. This denotes that their CCC will decrease. From positive and significant coefficient of HHI, it is understood that the companies with greater market power were likely to have a lower CCC. Finally, it is concluded that for the working capital management ratios across the small, medium and large-sized companies, the size of the companies played a vital role in determining the efficiency of the working capital management.

On the basis of the findings and analysis of the present study, the following suggestions are offered:

- ❖ It is suggested that all the selected steel companies, especially the small and medium sized companies have to adopt an appropriate credit policy to keep them financially sound so as to fulfill their short term obligations.
- ❖ It is also suggested that the small and medium sized companies can install a better management information system that measures and reports stock holdings in terms of the next few weeks' supply based on current sales rates, maintain close debtor relationship and so speed up the response to overdue bills by phone and email to improve their operating and cash conversion cycle.

CONCLUSION

Hence, it can be concluded that the working capital ratios across the small, medium and large sized steel companies have played a vital role in determining the working capital management of the selected Indian steel companies.

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