

WORKING CAPITAL MANAGEMENT IN SELECTED PUBLIC SECTOR COMPANIES: A COMPARATIVE STUDY IN WEST BENGAL

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Abstract: Working capital is life blood of any business irrespective of size, efficient and proper management of working capital increases value to shareholders. The purpose of this study is to analyze efficiency of working capital management of the selected public iron and steel companies in the West Bengal. Secondary data of continuous 12 years i.e. from 2001-02 to 2012-13 was collected via firms annual reports and analyzed by well known methods such as ratio analysis. Relationship between working capital management efficiency and profitability is examined by Pearson's correlation analysis. Based on the collected data and its analyses the relevant conclusions have been drawn.

Keywords: working capital, profitability, ANOVA, Pearson correlation, cash conversion cycle.

Background:

Working capital is the life blood of any business irrespective of its nature and size. Efficient working capital management increases value to shareholders. A firm needs to give attention or focus in the proper management of working capital elements such as accounts collection policy, accounts payable, inventory conversion, and cash conversion cycle that lead to higher profitability and credibility. Inefficient handle of working capital could affect liquidity as well as earnings of the organization. It is the management of current assets and current liabilities in such a way that maximizes the earnings and minimizes the obligation of the organization.

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Literature Review

Gelda (2013) enlightened the performance and working capital management of ICICI and HDFC banks for the study period of five years. Secondary data for the study was collected from audited annual reports and from various other sources such as library. Objective of the study is to compare the working capital management of the selected sample. Well known financial ratios were used to analysis and interpret the collected data. The study concluded that liquidity position of both the banks were not maintained properly.

Sharma (2013) made a comparative study on working capital management of two major steel industries - SAIL and Tata Steel Ltd. The primary objective of the study was to investigate the effect of working capital management on the profitability and liquidity. To attain the objective, secondary data as financial statements collected for the period 2008-2012. Financial ratios were used to determine the effectiveness of working capital management by finding current assets, fixed assets & sales. The study finds that negative relationship exists between profitability and liquidity.

Kovelskiy (2015) undertook a study on working capital management on MSMEs; the study was conducted on five samples each from micro, small, and medium enterprises in the industrial state Ludhiana. Primary data was collected through a well-structured questionnaire by personally visiting these enterprises. The study revealed that majority of micro enterprises used bank overdraft facility to finance the working capital requirements. Working capital requirement not be neglected in MSME's. To avoid shortage of working capital and poor profitability, estimation of working capital should be made in advance.

Dimple & Jain (2013) made an investigation to know the comparative study of the impact of working capital management on liquidity and profitability by selecting two giant IT sectors - Infosys & TCS. The study entirely depended on the secondary data collected from published annual reports for the period 2002-2012. To analyze the data, statistical tools like Spearman correlation and financial ratio analyses were implemented in the study. The authors found in the comparative study that there was a positive relationship between liquidity, profitability and risk of the companies.

Prajapati & Patel (2012) conducted a study to know the comparative position in working capital management of steel industries. Five major players in steel industries viz. SAIL, Tata steel ltd., JSW steel ltd., Jindal steel & power ltd., and Essar steel ltd. were selected as samples. Secondary data was collected from audited published annual reports for the period

2006-2011. The study applied mean, standard deviation, ANOVA & ratio analysis to analyze the collected data. The study revealed that selected sample units maintained the current ratio below 2:1 except in Tata Steel Ltd.

Sivaranjani & Kishori (2016) analyzed the relationship between working capital management and firm's profitability by selecting top five NSE listed Indian steel companies. For the comparative analysis of working capital management among the selected companies, secondary data was collected from published annual reports for the period 2011-2015. Researchers used statistical techniques like ratio analysis, chi-square, regression analysis, and correlation to determine the comparative position. The results showed that linear relationship existed between operating cycle and profitability. Proper handling of inventory, accounts receivable, and accounts payable could increase the profitability of the firms.

Barot (2016) undertook a comparative study of working capital management in textile industry. The author selected two textile companies i.e., Vardhaman and Raymond for the study. The objective of the study was to analyze and compare working capital management of the selected companies. Secondary data was gathered from investment sites and published annual reports for ten years i.e., 2006-2015. The researcher applied ratio analysis to interpret the data and found that Raymond Ltd. maintained a sound level of working capital in comparison to Vardhaman; optimal level of working capital management increased the profitability of the companies.

Balaputhiran, & Nimalathasan (2011) highlighted the working capital management of listed Manufacturing and Chemical & Pharmaceuticals sectors in Colombo Stock Exchange. The researchers selected ten manufacturing, chemical, and pharmaceuticals companies for the study, extracted secondary data from company's websites and annual financial statements for the period of five years, 2003-2007. The researchers used ratio analysis (inventory conversion period, debtors' conversion period, creditors' conversion period, cash conversion period) in the study. The study revealed that chemical and pharmaceuticals companies were good in inventory conversion period and cash conversion period in comparison to manufacturing sector companies. As to debtors' conversion and creditors conversion periods, manufacturing sector companies were better.

Panigrahi (2014) attempted a case study on the relationship between working capital with liquidity, profitability and risk of bankruptcy of ACC Ltd. The study collected secondary data from annual reports available from moneycontrol.com for the period of ten years 2001-2010.

To conduct the case study statistical tools like financial ratios, Spearman's rank correlation, "t" test, and Altman's Z score test were applied and found negative working capital during the study period but the ACC Ltd. was able to generate profits due to aggressive working capital management policy.

Yarshad & Gondal (2013) undertook a case study on the impact of working capital management on profitability of companies in Pakistan cement industry. The objective of the study was to determine the relationship between working capital and profitability. For the study, the researchers gathered secondary financial statements of 21 listed cement companies from Karachi Stock Exchange for the period of 2004-2010. Researchers used ratio analysis and regression analysis to test the hypothesis in the study. The study found significant negative relationship between working capital management and profitability of selected firms.

Objectives of the study:

The main objective of this study is to find out the efficiency and effectiveness of working capital management of selected public companies in iron and steel industry in West Bengal. To attain the main objective, the following specific subsidiary objectives have been developed.

1. To find the overall ranking of the selected public iron and steel companies with respect to working capital management efficiency.
2. To find the relationship between working capital management efficiency and profitability of the selected units.

On the basis of the above objectives, we have framed the following hypotheses and tested them applying statistical methods.

Hypotheses

H₁: There is significant difference existing in the composition of working capital components in the selected companies.

H₂: Working capital management components (Accounts Conversion Period, Inventory Conversion Period, Accounts Payable Period, and Cash Conversion Cycle) have significant relationship with profitability.

Methodology: For this study, three iron and steel manufacturing units located in West Bengal, all of which are subsidiaries of SAIL have been chosen. Data for a continuous period

of 12 years i.e. from 2001-02 to 2012-13 have been collected from annual reports including income statement and balance sheet. To analyze the collected financial data, the most powerful tool, ratio analysis and statistical tools like ANOVA and Pearson's correlation have been used in view of the objectives of the study.

Type of Ratios	Calculation
Accounts Collection Period (ACP)	Average Debtors / Net credit sales * 365
Inventory Conversion Period (ICP)	Average Inventory / Cost of sales *365
Accounts Payable Period (APP)	Average Creditors / Net credit purchase *365
Cash Conversion Cycle (CCC)	CCC = ACP+ ICP-APP
Return On Assets	Earnings before Tax /Total Assets *100

Working Capital Management and Profitability Ratios

Results and Discussion

Table I
Accounts Collection Period (in days) of Selected Iron and Steel Companies in West Bengal

Years	DSP	ASP	IISCO	Average	Standard Deviation
2001-02	4.71	41.38	37.09	27.72	20.04
2002-03	5.69	27.86	32.90	22.15	14.47
2003-04	4.98	33.81	27.21	22.00	15.10
2004-05	3.90	51.33	13.09	22.77	25.15
2005-06	0.98	40.45	17.29	19.57	19.83
2006-07	1.03	35.35	2.36	12.91	19.44
2007-08	1.30	39.28	0.85	13.81	22.05
2008-09	2.29	29.29	0.19	10.59	16.22
2009-10	2.37	19.47	0.19	7.34	10.55
2010-11	0.77	13.50	0.13	4.80	7.54
2011-12	1.99	29.63	0.07	10.56	16.54
2012-13	1.98	78.85	0.12	26.98	44.92
Average	2.67	36.68	10.96	16.77	17.73
Std.Dev.	1.71	16.68	14.25		
Max.	5.70	78.85	37.09		
Min.	.77	13.50	.07		

Source: Author's computation from annual reports

From the table I, it is found that the industry average of accounts conversion period is 16.77 days; based upon industrial average the data in table I, manifest that two of the three selected firms i.e., ASP and IISCO held their debtors collection period for more than the yearly industrial average .Specifically, IISCO took more time to collect accounts receivable from debtors above the average collection period viz. 37 days, 33 days, and 27days in the years 2001-02 to 2003-04 respectively. Whereas ASP took hold of its accounts conversion period above the yearly industrial average almost for the entire study period 2001-02 to 2012-13

excepting in 2010-11 when they could keep it at 13 days which is below the average holding period. Interesting about DSP, the firm maintained its credit collection period in less than industrial average holding period throughout the study period 2001-02 to 2012-13 (05 days, 06 days, 05 days, 04days, 01day, 01day, 01day, 02 days ,02 days, 01day, 02 days, and 02 days) respectively. The firm DSP was competent enough in respect of credit collection policy. On the yearly industrial average basis, we could say that the firm DSP was efficient by holding the debtors by lesser number of days than that of aggregate accounts holding period of 16.77 or 17 days approximately.

Table II: Multiple Comparisons

Dependent Variable: ACP (Games-Howell)

(I) COMPANY	(J) COMPANY	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
DSP	ASP	- 34.01744(*)	4.84129	.000	-47.0531	-20.9818
	IISCO	-8.29230	4.14374	.157	-19.4375	2.8528
ASP	DSP	34.01744(*)	4.84129	.000	20.9818	47.0531
	IISCO	25.72513(*)	6.33389	.002	9.7864	41.6638
IISCO	DSP	8.29230	4.14374	.157	-2.8528	19.4375
	ASP	- 25.72513(*)	6.33389	.002	-41.6638	-9.7864

Source: SPSS 15.0 Analysis

Table II presents multiple comparisons using Games-Howell test pointing out that there was significant difference between ASP and DSP, p value is .000, the company ASP took an average of 34 days more in collecting its accounts receivable than DSP. There was also statistically significant difference between ASP and IISCO, p value is .002 means accounts conversion or collection period of the unit ASP on average 25.72 days higher or more than the firm IISCO. However, no significant mean difference found between the firms DSP and IISCO as p (equals to .157) is greater than .05 level. Taken together, the results indicate that the firm DSP (mean 2.67 and standard deviation 1.71) was efficient in collecting its accounts receivable in lesser number of days in comparison to the firms ASP and IISCO whose mean scores and standard deviations are: (36.68 &16.68) and (10.96 &14.25) respectively.

Table III : Inventory Holding Period (in Days) of Selected Iron & Steel Companies in West Bengal

Years	DSP	ASP	IISCO	Average	Standard Deviation
2001-02	81.48	164.60	56.36	100.81	56.65
2002-03	77.58	138.41	42.87	86.28	48.36
2003-04	65.52	116.43	48.65	76.86	35.28
2004-05	69.39	156.37	56.22	93.99	54.41
2005-06	74.19	173.68	83.21	110.36	55.02
2006-07	87.06	243.00	82.97	137.67	91.23
2007-08	78.56	187.24	76.01	113.93	63.49
2008-09	86.42	154.26	65.33	102.00	46.46
2009-10	118.15	124.30	50.96	97.80	40.68
2010-11	56.38	104.05	42.66	67.69	32.22
2011-12	55.65	119.38	38.44	71.15	42.63
2012-13	62.59	167.06	66.31	98.65	59.27
Average	76.08	154.07	59.17	96.44	50.62
Std.Dev.	17.00	38.05	15.60		
Max.	118.15	243.01	83.22		
Min.	55.66	104.06	38.44		

Source: Author's computation from annual reports

From table III, industry average of inventory conversion period was 96 days. On the base of this, it appears that the firm ASP held its inventory in stores for higher number of days than the industrial average number of days. Other two firms i.e., DSP and IISCO retained their inventories for lesser number of days than yearly industrial average of 96 days during the study period. However, inventory conversion period of the firm DSP was comparatively lesser than the firm IISCO. In respect of holding inventories, both the selected firms DSP and IISCO were efficient in inventory management in terms of inventory conversion period by holding inventory for lesser number of days - means these firms grasped less number of days in a year to convert their stocks.

Table IV - Multiple Comparisons
Dependent Variable: ICP (Games-Howell)

(I) COMPANY	(J)COMPANY	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
DSP	ASP	- 77.98517(*)	12.03370	.000	-109.1932	-46.7772
	IISCO	16.91437(*)	6.66441	.048	.1642	33.6645
ASP	DSP	77.98517(*)	12.03370	.000	46.7772	109.1932
	IISCO	94.89954(*)	11.87448	.000	63.9658	125.8333

IISCO	DSP	- 16.91437(*)	6.66441	.048	-33.6645	-.1642
	ASP	- 94.89954(*)	11.87448	.000	-125.8333	-63.9658

Source: SPSS 15.0 Analysis

Multiple comparisons of companies with other units on mean difference of inventory conversion period has been presented in above table IV. The mean differences between units DSP and ASP, also between units DSP and IISCO are statistically significant at 5 percent level where p values are .000 and .048 respectively, both of which are less than the value 0.05. It is also found that mean difference between units ASP and IISCO is also statistically significant as p value is .000 which is less than the value 0.05. Overall, the results suggest that all the selected iron and steel firms have significant mean differences between each other. The firm ASP had retained its inventories for higher number of days 77.98 than the unit DSP. Also, the firm DSP kept the stock for more number of 16.91 days than the IISCO. The result concludes that the firm IISCO was more efficient in inventory management in holding the inventory conversion period for lesser number of days in comparisons with the two other selected units.

Table V - Accounts Payable Period (in Days) of Selected Iron & Steel Companies in West Bengal

Years	DSP	ASP	IISCO	Average	Standard Deviation
2001-02	11.48	136.39	217.65	121.84	103.85
2002-03	7.47	86.08	278.18	123.91	139.26
2003-04	4.36	62.73	256.15	107.74	131.79
2004-05	39.23	48.56	93.27	60.35	28.88
2005-06	28.63	50.78	84.77	54.72	28.27
2006-07	36.44	57.62	65.16	53.07	14.89
2007-08	31.03	37.10	80.58	49.57	27.02
2008-09	21.97	36.17	62.39	40.17	20.50
2009-10	56.68	52.98	156.25	88.63	58.58
2010-11	40.17	37.67	62.48	46.77	13.65
2011-12	17.38	16.63	27.75	20.58	6.21
2012-13	20.99	17.52	25.69	21.40	4.10
Average	26.32	53.35	117.53	65.73	46.84
Std.Dev.	15.35	32.39	87.84		
Max.	56.68	136.39	278.19		
Min.	4.37	16.63	25.70		

Source: Author's computation from annual reports

Data in table V imply that the firm IISCO held accounts payable period for higher number of days than the industrial average accounts payable period during the entire study period. The firm took longer time to pay off its accounts payable outstanding. Whereas the other two selected firms i.e., DSP and ASP took lesser number of days in paying off its suppliers outstanding than the average accounts payable period of 66 days approximately.

Particularly, DSP paid off accounts outstanding to suppliers at a faster rate than the firm ASP during the study period. The firm DSP was able to clear its outstanding payables to suppliers in 11 days, 07 days, 04 days, 39 days, 29 days, 36 days, 31days, 22 days, 57 days, 40 days, 17 days, and 21days respectively as found for the study period of 2001-02 to 2012-13.

Table VI : Multiple Comparisons
Dependent Variable: APP (Games-Howell)

(I) COMPANY	(J) COMPANY	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
DSP	ASP	-27.03315(*)	10.34825	.047	-53.7841	-.2822
	IISCO	-91.20905(*)	25.74322	.011	-160.1493	-22.2688
ASP	DSP	27.03315(*)	10.34825	.047	.2822	53.7841
	IISCO	-64.17590	27.02738	.078	-134.9508	6.5990
IISCO	DSP	91.20905(*)	25.74322	.011	22.2688	160.1493
	ASP	64.17590	27.02738	.078	-6.5990	134.9508

Source: SPSS 15.0 Analysis

Post hoc comparisons using Games-Howell test indicates that there is statistically significant difference between companies DSP and ASP and between DSP and IISCO. It denotes that (from table V) mean of accounts payable period for IISCO (mean equals to 117.53 days and standard deviation equals to 87.84) was significantly different from other two companies –for DSP: mean 26.32days, standard deviation 15.35 and for ASP: mean 53.35days, standard deviation 32.39. Again, there were statistically significant difference in mean scores between DSP (mean 26.32days, standard deviation 15.35) and ASP (mean 53.35 days, standard deviation 32.39). The results suggest that among the selected iron and steel companies, IISCO held its accounts payable period for higher number of days in the study period in comparisons to other two units where as DSP took lesser number of days (26 days) in paying off its accounts payable followed by the unit ASP 53 days

Table VII : Cash Conversion Cycle (in Days) of Selected Iron & Steel Companies in West Bengal

Years	DSP	ASP	IISCO	Average	Standard Deviation
2001-02	74.72	69.58	-124.17	6.71	113.37
2002-03	75.80	80.19	-202.40	-15.47	161.90
2003-04	66.14	87.51	-180.28	-8.87	148.82
2004-05	34.06	159.15	-23.95	56.42	93.57
2005-06	46.54	163.35	15.73	75.20	77.87
2006-07	51.65	220.74	20.18	97.52	107.86
2007-08	48.83	189.42	-3.71	78.18	99.85
2008-09	66.75	147.38	3.13	72.42	72.29
2009-10	63.85	90.79	-105.09	16.51	106.17
2010-11	16.97	79.88	-19.67	25.72	50.34
2011-12	40.26	132.38	10.75	61.13	63.44
2012-13	43.58	228.38	40.74	104.23	107.52
Average	52.43	137.40	-47.39	47.48	92.49
Std.Dev.	17.67	56.44	83.33		
Max.	75.81	228.39	40.75		
Min.	16.98	69.59	-202.40		

Source: Author's computation from annual reports

As against an aggregate average cash conversion period of 47days, the firms DSP and ASP took more time in terms of number of days in conversion of stock into sale realization. Particularly, in cash conversion periods were longer than the average cash conversion period of 47 days in 7 out of 12 years i.e., in years 2001-02 to 2003-04 and 2006-07 to 2009-10 respectively. On the other hand, the firm ASP held its cash conversion cycle above the yearly industrial average throughout the entire study period. More specifically, it blocked up cash for 70 days, 80 days, 88 days, 159 days, 163 days, 221 days, 189 days, 147 days, 91 days, 80 day, 132 days, and 228 days throughout the period. It is evident that the cash conversion period went up to as high as approximately 5 times (actually 4.8 times) the average conversion period in the last year of the study period. Thus, is an easy saying that the two firms, DSP and ASP, were inefficient in managing cash conversion cycle by holding it for more number of days. Whereas the firm IISCO showed negative cash conversion cycle in 7 out of 12 years. Moreover, though the cash conversion cycle was positive in rest of the 5 years in IISCO, it was less than half of the average cycle of 47 days in 4 years. On the aggregate, IISCO was dynamic in holding the cash for lesser time compared to other two firms.

Table VIII: Multiple Comparisons

(I) COMPANY	(J) COMPANY	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound
DSP	ASP	-84.96911(*)	17.07316	.001	-129.9918	-39.9464
	IISCO	99.82917(*)	24.59221	.004	34.2112	165.4471
ASP	DSP	84.96911(*)	17.07316	.001	39.9464	129.9918
	IISCO	184.79828(*)	29.05534	.000	111.0909	258.5057
IISCO	DSP	-99.82917(*)	24.59221	.004	-165.4471	-34.2112
	ASP	-184.79828(*)	29.05534	.000	-258.5057	-111.0909

Dependent Variable: CCC (Games-Howell)

Source: SPSS 15.0 Analysis

Multiple comparisons test has been conducted by applying Games-Howell test which points out that there is statistically significant difference between DSP and ASP and between DSP and IISCO. The mean score of ASP (mean 137.40 days and standard deviation 56.44) was significantly different from both the companies i.e., DSP (mean 52.43 days and standard deviation of 17.67) and IISCO (mean -47.39 days and standard deviation of 83.33). Specifically, results suggest that ASP took longer time (more number of days) in converting sales into cash. In other words, it blocked funds in trade for longer period of time than in IISCO and DSP.

Table IX: Working Capital Management Efficiency Rank

	ACP			ICP			APP			CCC		
	DSP	ASP	IISCO	DSP	ASP	IISCO	DSP	ASP	IISCO	DSP	ASP	IISCO
Mean	2.67	36.68	10.96	76.08	154.07	59.17	26.32	53.35	117.53	52.43	137.40	-47.39
Rank	1	3	2	2	3	1	3	2	1	2	3	1

Notes: **ACP** = Accounts Collection Period (in days), **ICP** = Inventory Conversion Period (in days), **APP** = Accounts Payable Period (in days), and **CCC** = Cash Conversion Cycle (in days).

Table IX shows the ranks of the selected sample of working capital variables on the basis of average. In case of ACP, DSP collects outstanding amounts at faster rate than the other two firms. The firm IISCO the first rank in converting its finished stock into sales. Again, from APP in terms of number of days, it appears that the firm IISCO took more time to make payment of its outstanding dues to suppliers. It took advantage of credit days allowed by the suppliers. Among all the three sample firms, IISCO is ranked first in efficiently managing cash right from the point of purchasing materials till the sale of finished goods.

Table X: Pearson Correlation Matrix of Profitability and all independent variables of working capital management

Durgapur Steel Plant (DSP)						
		ROA	ACP	ICP	APP	CCC
ROA	Pearson Correlation	1	-.665(*)	.177	.694(*)	-.497
	Sig. (2-tailed)		.018	.582	.012	.100
Alloy Steel Plant (ASP)						
		ROA	ACP	ICP	APP	CCC
ROA	Pearson Correlation	1	.049	.311	-.668(*)	.608(*)
	Sig. (2-tailed)		.879	.325	.018	.036
Indian Iron & Steel Company (IISCO)						
		ROA	ACP	ICP	APP	CCC
ROA	Pearson Correlation	1	-.064	-.482	.224	-.337
	Sig. (2-tailed)		.844	.113	.484	.284

Interpretations:

Table X shows the Pearson correlation between profitability measured by return on assets and working capital management variables. In case of DSP, accounts collection period (ACP) has significant (-.665) negative relation with return on assets. There is significant strong positive correlation between ROA and APP, coefficient value is (.694) which implies early or quick payment to suppliers that would empower the firm to increase its profitability. In case of ASP, we find that CCC is significantly positively correlated with ROA with coefficient value of (.608). Accounts payable period is negatively correlated with ROA and it is significant at 5 percent level of significance with coefficient value of (-.668). In case of IISCO, we find that none of the continuous variables has significant relation with return on assets.

Conclusion: The profitability of any business depends on the planned and proper management of working capital elements. In this study, it is found that on the basis of CCC which is a compressive measure of working capital, the firm IISCO is the best in comparison with two other manufacturing firms. Again, on the basis of ICP and APP, IISCO has been found to be better in efficiently managing working capital than the other two firms i.e., DSP and ASP.

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