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A Study of Managing Liquidity

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Abstract

The main purpose of this paper is to identify the effectiveness of working capital in terms of short-term liquidity of the private sector steel companies in India. Since LPG, to ensure swift economic development it was deemed essential that a sound steel production program with private sector on a formidable basis must be formulated. To some extent the priority given by the country failed to flourish due to poor capacity, under-utilisation and poor consumption. Working capital in terms of liquidity is accountable for poor capacity, under-utilisation and

poor consumption. There exists a relationship between liquidity and profitability indicators.

Keywords: Working capital, Private sector, Indian steel companies, Liquidity indicators, Multiple regressions

1. Introduction

Working capital management is vital fraction in firm financial management decision. Management of working capital has profitability and liquidity implications. That is why; working capital proposes a familiar front for profitability and liquidity management. To reach optimal working capital management firm manager should control the trade off between profitability and liquidity accurately. An optimal working capital management is expected to contribute positively to the creation of firm value.

The crucial part in managing working capital is required maintaining its liquidity in day-to-day operation to ensure its smooth running and meets its obligation (Eljelly, 2004). Liquidity plays a significant role in the successful functioning of a business firm. A firm should ensure that it does not suffer from lack-of or excess liquidity to meet its short-term compulsions. A study of liquidity is of major importance to both the internal and the external analysts because of its close relationship with day-to-day operations of a business (Bhunia, 2010). Dilemma in liquidity management is to achieve desired trade off between liquidity and profitability (Raheman et all, 2007). Referring to theory of risk and return, investment with more risk will result to more return. Thus, firms with high liquidity of working capital may have low risk then low profitability. Conversely, firm that has low liquidity of working capital, facing high risk results to high profitability. The issue here is in managing working capital, firm must take into consideration all the items in both accounts and try to balance the risk and return (Lee et all, 2008).

Since privatisation, the private sector investment in India was increased rapidly. But the production capacity and growth rate in the private sector did not increase promptly due to under-utilisation and poor financial management in terms of liquidity, solvency, operating efficiency and profitability especially in case of Indian steel industry. This call for a full diagnosis of the malady, that is identification, analysis and quantification of the interfering constraints in achieving full utilisation of the capacities, thus opens a vast field for research and enquiry. In the present study, therefore; an attempt has been made to examine and evaluate the management of liquidity of the private sector companies as a factor accountable for poor performance in the steel Industry in India.

2. Review of Related Literatures

In spite of such a greatcoat of liquidity management, it is strange that so long it could not draw towards as much mindfulness of the researchers in India as it desires. A brief review of the different pains of research in the field is attempted in the following paragraphs.

Agarwal (1988) devised the working capital decision as a goal programming problem, giving primary importance to liquidity, by targeting the current ratio and quick ratio. The model

included three liquidity goals, two profitability goals, and, at a lower priority level, four current asset sub-goals and a current liability sub-goal (for each component of working capital). In particular, the profitability constraints were designed to capture the opportunity cost of excess liquidity (in terms of reduced profitability).

Rafuse (1996) quarreled that attempts to improve working capital by delaying payment to creditors are counter-productive, and that altering debtor and creditor levels for individual tiers within a value system will rarely produce any net benefit. He proposed that stock reduction generates system-wide financial improvements and other important benefits, and suggested that, to achieve this, companies should focus on stock management strategies based on “lean supply- chain” techniques.

Sur (2006) studied the efficiency of the working capital management in the National Thermal Power Corporation (NTPC), and showed that the company achieved a higher level of efficiency in managing its working capital during the post-liberalization era by adapting itself to the new environment which had emanated from liberalization, globalization and competitiveness. They pointed out that, while many of the public enterprises are learning to survive and grow by adapting themselves to the new situation, a large group of public sector undertakings, significant both in number and investment, have been beset with serious problems like slow growth, low productivity, inadequate emphasis on research and development, inefficient working capital management, and so on.

Garcia-Teruel and Martinez-Solano (2007) studied the effects of working capital management on the profitability of a sample of small and medium-sized Spanish firms. They found that managers can create value by reducing their inventories and the number of days for which their accounts are outstanding. Moreover, shortening the cash conversion cycle also improves the firm's profitability.

Chakraborty (2008) evaluated the relationship between working capital and profitability of Indian pharmaceutical companies. He pointed out that there were two distinct schools of thought on this issue: according to one school of thought, working capital is not a factor of improving profitability and there may be a negative relationship between them, while according to the other school of thought, investment in working capital plays a vital role to improve corporate profitability, and unless there is a minimum level of investment of working capital, output and sales cannot be maintained - in fact, the inadequacy of working capital would keep fixed asset inoperative.

Singh (2008) found that the size of inventory directly affects working capital and its management. He suggested that inventory was the major component of working capital, and needed to be carefully controlled.

Singh and Pandey (2008) suggested that, for the successful working of any business organization, fixed and current assets play a vital role, and that the management of working capital is essential as it has a direct impact on profitability and liquidity. They studied the working capital components and found a significant impact of working capital management on profitability for Hindalco Industries Limited.

The conclusive sum of this retrospective review of relevant literature produced till date on the offered subject reveals wide room for the validity and originates of this work and reflects some decisive evidences that affirm its viability, as may be marked here it. Nor has any previous research examined the liquidity position and the existence of liquidity and profitability relationship of private sector steel companies in India.

3. Objectives of the Study

The main object of the present study is to examine the overall efficiency of the management of liquidity in selected private sector steel companies. More specifically it seeks to dwells upon mainly the following issues:

(i) To observe the liquidity position on the basis of financial ratio and area of weaknesses, if any, of the selected companies under the study;

(ii) To explore the liquidity-profitability association;

(iii) To make some suggestions and specific recommendations for improvement of the liquidity management.

4. Hypotheses of the Study

The following hypotheses were taken for the study:

Hypothesis-1

H_0: Liquidity position has no impact on profitability.

H_1: Liquidity position has a significant impact on profitability.

Hypothesis-2

H_0: Solvency position has no impact on profitability.

H_1: Solvency position has a significant impact on profitability.

Hypothesis-3

H_0: There is no relationship exists between liquidity and profitability.

H_1: There is a significant relationship exists between liquidity and profitability.

5. Methodology of the Study

The data utilized in this study is extracted from the income statements, balance sheets, and cash flow statements of sampled firms attained from the Companies Annual Report accessible from the India Stock Exchange and CMIE database. The purposive sample design method was applied in this analysis. Preferred samples of private sector steel companies from the year of 1997 to 2006 were utilized in this analysis. The definitions of “private” are: (i) part of the economy that is not state controlled, (ii) run by individuals and companies for profit, (ii) encompasses all for-profit businesses that are not owned or operated by the government and (ii) in most free-market economies, the private sector is the sector where most jobs are held.

The used of a preferred sample of private sector might introduce a potential firm's success bias (Bhunia, 2009). It is claimed that the potential for success is overstated using this technique. However, it is worried that the bias may or may not be important depending on the usage of the model. If the model is used to rank the firms for the potential success in order to perform a more detailed analysis, then the bias is not important. However, if the model is used to identify investment portfolio selection, then the bias is significant.

A total of four successful companies were identified during the year of determination. Table 1, below, disclosed the name of successful firms.

Table 1. Name of Successful Firms

No.	Name of the Companies
1.	Tata Steel Ltd.
2.	Lloyds Steel Inds Ltd.
3.	Kalyani Steels Ltd.
4.	JSW Steel Ltd.

The sample firms used in this study came from same industries. Due to the controlled sample volume for steel industry, the research focuses on the private sector industry sector. After some investigation, steel Industry has been singled out for research in the present study. This is definitely the backbone of economic growth in any industrial country. A thick relationship has been found between the level of economic growth and the quantum of steel consumption in developed as well as developing countries.

The dependent variable is defined as the profitability of the sample firms. The independent variable is interpreted as the commonly used financial ratios. The ratios used are chosen from those utilized by Bhunia (2009), Refuse (1996) and Singh et all (2008). An itemized listing of the variables is accessible in table 2.

Table 2. List of Ratios Examined

	Independent variables		Dependent variables
V1.	Current ratio	1.	Return on Investment Ratio
V2.	Liquid ratio		
V3.	Absolute Liquid ratio		
V4.	Short-term Debt-Equity ratio		
V5.	Age of inventory		
V6.	Age of Debtors		
V7.	Age of Creditors		

5.1 Normality Tests

Before the multiple regression analysis, normality test was carried out to all independent variables. Two generally utilized tests are the Shapiro-Wilks' test and Lillifors test. The Shapiro-Wilks test shows better tools in many statistical conditions correlated to other tests of normality. Anyhow, the Shapiro-Wilks' test is well suited to small-size samples.

The null hypothesis will be rejected for large values of Kolgomorov Smirnov D statistics.

According to Norusis (1993), "it is almost impossible to find data that are exactly normally distributed", he advised that for most statistic tests, it is adequate that the data are approximately normally distributed.

Table 3. Raw Data of Normality Tests

Variables	Details	Shape		Normality Test	
		Skewness	Kurtosis	Stat.	Sig.
V1.	Current ratio	0.74	0.39	0.24	0
V2.	Liquid ratio	0.44	0.59	0.15	0
V3.	Absolute Liquid ratio	0.03	0.21	0.21	0
V4.	Short-term Debt-Equity ratio	1.26	1.27	0.11	0
V5.	Age of inventory	0.36	0.17	0.24	0
V6.	Age of Debtors	0.17	0.16	0.38	0
V7.	Age of Creditors	0.68	0.83	0.20	0

Table 3 above, disclosed the Kolgomorov Smirnov tests (altered for Lillifors). All the variables are almost normal out of seven variables were tested. Accordingly, we exclude the hypothesis null that all of the financial ratios examined are normally distributed. In order to enhance the normality, data transformation processes (natural Log, Square Root, Square and Inverse. Natural logs and square roots) may be implemented. But in this study, only descriptive statistics and multiple regression analysis were utilized.

5.2 Descriptive Statistics

For measuring liquidity position, seven liquidity indicators/independent variables were tested with comparison of grand industry average/industry averages. The results of various independent variables have been used for making descriptive statistical analysis. To make the analysis and interpretation more precise and accurate, the values of A.M., S.D., C.V., maximum, minimum, Skewness and Kurtosis have been computed from the ratios.

5.3 Multiple Regression Tests

In this section an attempt has been made to examine composite impact of liquidity indicators on profitability through the sophisticated statistical techniques. Accordingly, multiple regression techniques have been applied to study the joint influence of the selected ratios indicating company's liquidity position and performance on the profitability and the regression coefficients have been tested with the help of the most popular 't' test. In this study, current ratio (CR), liquid ratio (LR), absolute liquid ratio (ALR), short-term debt-equity ratio (DER), age of inventory (AOI), age of debtors (AOD), age of creditors (AOC) have been taken as the explanatory variables and ROIR has been used as the dependent variable.

The regression model used in this analysis is:

$$ROIR = £ + ß_1 CR + ß_2 LR + ß_3 ALR + ß_4 DER + ß_5 AOI + ß_6 AOD + ß_7 AOC$$

Where £, $ß_1$, $ß_2$, $ß_3$, $ß_4$, $ß_5$, $ß_6$, $ß_7$, $ß_8$, ß9, $ß_{10}$ and $ß_{11}$ are the parameters of the ROIR line.

5.4 Empirical Analysis and Interpretations

5.4.1 Liquidity Position based on Current Ratio

Current ratio is a measure of general liquidity and is most widely used to make the analysis of short-term liquidity of firm. A relatively high current ratio is an indication that the firm has liquidity and has the ability to pay the current obligation as and when they become due. Descriptive statistics are depicted in Table 4.

Table 4. Descriptive Statistics based on Current Ratio

Year	Tata Steel Ltd.	Lloyds Steel Inds Ltd.	Kalyani Steel Ltd.	J S W Steel Ltd.	Inds Avg.
A.M.	1.06	0.49	1.37	0.54	0.96
S.D.	0.20	0.23	0.41	0.31	0.22
C.V. (%)	18.87	46.94	29.93	57.41	22.92
Maximum	1.47	1.01	2.06	1.08	1.33
Minimum	0.83	0.32	0.84	0.27	0.71
Skewness	1.05	1.91	0.45	0.94	0.91
Kurtosis	1.27	3.54	-0.82	-0.78	-0.55

Source: CMIE database

Table 4 shows that current ratio of Tata Steel Ltd. during the period of study is satisfactory as its average are 1.06 which is slightly higher than 0.96, grand industry average, which is taken as yardstick. Satisfactory current ratio is also observed in Kalyani Steel Ltd. (1.37). This indicates the company is able to meet their matured current obligations in every year under the study period. This ratio in case of J S W Steel Ltd. (0.54) and Lloyds Steel Inds Ltd. (0.49) is very poor because the ratio is lower than industry average through out the study period. This indicates that they have not been able to meet their matured current obligations in every year under the study period.

Coefficient of variation of current ratio of industry as a whole is 22.92%. Coefficient of variation of current ratio is 18.87% in case of Tata Steel Ltd., which is lower than industry average. In the matter of the management of liquidity, it also shows consistency during the study period of these companies. In case of J S W Steel Ltd., Lloyds Steel Inds Ltd. and Kalyani Steel Ltd. coefficient of variation of current ratio is higher than industry average and as follows 57.41%, 46.94% and 29.93% respectively, which shows less consistency during the study period of this companies. Greater variability in the current ratio indicates improper or less efficient management of fund inasmuch as the excess liquidity could have otherwise been used for investment purposes thereby enabling the company to lead a path of growth.

5.4.2 Liquidity Position based on Liquid Ratio:

Liquid ratio is more rigorous test of liquidity than current ratio. A high liquid ratio is an indication that the company has liquidity and ability to meet its current liabilities in time. But a low liquid ratio represents that liquidity position of the company is not good. Descriptive statistics are portrayed in Table 5.

As per Table 5, a very unsatisfactory liquidity position is seen in case of J S W Steel Ltd. and Lloyds Steel Inds Ltd. with an average of 0.12 and 0.07 and it is lower than industry average throughout the study period except only 2003-04 in J S W Steel Ltd. and 1997-98 in Lloyds Steel Inds Ltd. It is notable that negative liquid ratio is also seen in J S W Steel Ltd. Liquid ratio of Tata Steel Ltd. is satisfactory with averages of 0.47 under the study period; because it is more than grand industry average of 0.32, which is taken as yardstick. Liquid ratio in case of Kalyani Steel Ltd. is very satisfactory and it is more the industry average throughout the study period. This indicates that they have been able to meet their matured current obligations in every year under the study period.

Table 5. Descriptive Statistics based on Liquid Ratio

Year	Tata Steel Ltd.	Lloyds Steel Inds Ltd.	Kalyani Steel Ltd.	J S W Steel Ltd.	Inds Avg.
A.M.	0.47	0.07	0.64	0.12	0.32
S.D.	0.11	0.09	0.24	0.11	0.16
C.V. (%)	23.40	128.57	37.50	91.67	50.00
S.E. of mean	0.04	0.03	0.08	0.04	0.05
Maximum	0.68	0.29	1.14	0.36	0.60
Minimum	0.34	0.01	0.34	-0.02	0.20
Skewness	0.68	1.85	1.16	1.08	1.37
Kurtosis	0.54	3.43	1.76	2.09	0.24

Source: CMIE database

Coefficient of variation liquid ratio of J S W Steel Ltd. and Lloyds Steel Inds Ltd. is 91.67% and 128.57% is higher than whole industry average of 50.00%. It indicates less consistency during the study period in these companies. Again in case of Tata Steel Ltd. and Kalyani Steel Ltd., coefficient of variation of liquid ratio is 23.40% and 37.50% respectively, which is lower than whole industry average. In the matter of the management of liquidity, it indicates consistency in these companies during the study period because it is lower than the industry, as a whole, coefficient of variation is 50%. It is clear from the above study; greater variability in the liquid ratio indicates improper or less efficient management of fund inasmuch as the excess liquidity could have otherwise been used for investment purposes thereby enabling the company to lead a path of growth.

5.4.2 Liquidity Position based on Absolute Liquid Ratio:

Cash and near cash is the most liquid asset. Absolute liquid ratio is more accurate test of liquidity than current and liquid ratio. The ratio of cash and near cash to current liabilities is taken as absolute liquid ratio, which is considered as most effective indicator to test the absolute liquidity position of any enterprise. In determining the cash, inventories and accounts receivable are deducted from current assets. Descriptive statistics is shown in Table 6.

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Table 6. Descriptive Statistics based on Absolute Liquid Ratio

Year	Tata Steel Ltd.	Lloyds Steel Inds Ltd.	Kalyani Steel Ltd.	J S W Steel Ltd.	Inds Avg.
A.M.	0.23	0.01	0.13	- 0.01	0.13
S.D.	0.11	0.01	0.16	0.06	0.15
C.V. (%)	47.83	100.00	123.08	- 600.00	115.38
S.E. of mean	0.04	0.004	0.05	0.02	0.05
Maximum	0.41	0.03	0.55	0.06	0.41
Minimum	0.08	0.00	0.03	-0.11	0.01
Skewness	0.36	1.29	2.73	-0.42	1.40
Kurtosis	-0.28	0.77	7.79	-1.27	0.44

Source: CMIE database

It is interesting to seen from Table 6 that average of absolute liquid ratio in case of J S W Steel Ltd. is (-) 0.01, not just only poor, it is also negative. This indicates that the above three company does not maintained any liquid cash (taken short-term borrowings as a spontaneous source for which interest is to be paid, erosion of profits is the ultimatum) to meeting short-term matured obligations and day to day expenditures. Again, a very poor liquidity position is found in case of Lloyds Steel Inds Ltd. with an average of 0.01 and also five years of the study period it belong zero. From the viewpoint of short-term liquidity it is observed that this ratio is satisfactory in the case of Tata Steel Ltd. and Kalyani Steels Ltd. is 0.23 and 0.13 respectively.

Coefficient of variation of absolute liquid ratio of industry as a whole is 115.38%. Coefficient of variation of absolute liquid ratio is 47.83%, (-) 600.00% and 100.00% in case of Tata Steel Ltd., J S W Steel Ltd. and Lloyds Steel Inds Ltd. which is lower than industry average. In the matter of the management of liquidity, it also shows perfect consistency during the study period of these companies. In case of Kalyani Steel Ltd. coefficient of variation of current ratio is higher than industry average and as follows 123.08%, which shows less consistency during the study period of this companies. However, greater variability in the cash position ratio indicates improper or less efficient management of cash inasmuch as the excess liquidity could have otherwise been used for investment purposes thereby enabling the company to lead a path of growth.

5.4.3 Liquidity Position based on Short-term Debt-Equity Ratio:

Short-term debt-equity ratio is an indicator of liquidity position and also important for soundness of financial position as well as financial policies in a short period of the firm. It is measures the direct proportion of debt to equity capital. It is a proportion of outside liabilities and tangible net worth relating to short period of the company. It also indicates the proportion of owners' stake in the business. In other words, this indicates the extent to which the firm depends upon outsiders for its existence. The ratio provides a margin of safety to the creditors.

If the ratio is over 100%, it is indicates a highly geared company and any prudent lender will not be will to extend loan finance to such business. Descriptive statistics are depicted in Table 7.

Table 7. Descriptive Statistics based on Short-term Debt-Equity Ratio

Year	Tata Steel Ltd.	Lloyds Steel Inds Ltd.	Kalyani Steel Ltd.	J S W Steel Ltd.	Inds Avg.
A.M.	1.06	1.28	0.53	9.68	2.02
S.D.	0.46	2.43	0.19	11.91	0.79
C.V. (%)	43.40	189.84	35.85	123.04	39.11
S.E. of mean	0.15	0.81	0.06	3.97	0.26
Maximum	1.51	7.24	0.76	34.90	3.02
Minimum	0.26	0.00	0.29	1.03	0.87
Skewness	-1.02	2.27	-0.08	1.62	-0.32
Kurtosis	-0.62	5.31	-2.18	1.62	-0.92

Source: CMIE database

Table 7 shows that debt-equity ratio of JSW Steel Ltd. is 9.68, which is higher than 2.02, grand industry average, which is taken as yardstick. This indicates the company is able to meet their matured current obligations in every year under the study period. Again, a very underprivileged debt-equity ratio is found in case of Lloyds Steel Inds Ltd. with an average of 1.28. In the case of Tata Steel Ltd. (1.06) and Kalyani Steels Ltd. (0.53) it is very poor because the ratio is lower than industry average through out the study period. This indicates an unfavourable condition to assemble their matured obligations in time.

Coefficient of variation of debt-equity ratio of Tata Steel Ltd., JSW Steel Ltd. and Lloyds Steel Inds Ltd., is 43.40%, 123.04%, 189.84% respectively. This indicates less consistency and thus, the companies under study not only depends upon short-term outsiders but also very dependent on the long-term sources. While perfect consistency is seen for the remaining companies during the study period because the industry, as a whole, coefficient of variation is 39.11.

5.4.4 Liquidity Position based on Age of Inventory:

Age of inventory establishes relationship between the costs of goods sold and average stock. This ratio measures the velocity of conversion of stock into sales. Usually, a high inventory turnover indicates efficient management of inventory because more frequently the stock is sold, the lesser amount of money is required to finance inventory. A low inventory turnover ratio indicates inefficient management of inventory, over investment in inventories, sluggish business, and poor quality of goods that lead to lower profit as compared to total investment.

Age of inventory indicates duration of inventory in organisation. It shows moving position of inventory during the year. If age of inventory is minimum it means companies activity position are satisfactory, they are able to sell their product within shorter period of time which

indicate sound liquidity position of organisation. On the contrary, if age of inventory is too high, it indicates slow moving of stock due to lower demand of product or excessive production by company, due to stocking policy, which affected directly liquidity position of company. Inventory is one of the major items in current assets, which shows investment of working capital in stock. Descriptive statistics is tabulated in Table 8.

Table 8. Descriptive Statistics based on Age of Inventory

Year	Tata Steel Ltd.	Lloyds Steel Inds Ltd.	Kalyani Steel Ltd.	J S W Steel Ltd.	Inds Avg.
A.M.	32.53	5.88	27.24	10.37	42.48
S.D.	7.00	2.15	15.86	5.66	19.69
C.V. (%)	21.52	36.56	58.22	54.58	46.35
S.E. of mean	2.33	0.72	5.29	1.89	6.56
Maximum	42.59	10.77	62.39	17.43	71.99
Minimum	23.78	3.40	10.68	3.19	21.40
Skewness	0.25	1.51	1.34	-0.13	0.62
Kurtosis	-1.25	3.27	2.58	-2.09	-1.14

Source: CMIE database

As per Table 8, age of inventory shows very satisfactory trend in case of all the companies under the study as compared to grand industry average of 42.48. Age of inventory in case of JSW Steel Ltd., Lloyds Steel Industries Ltd. is less than industry average throughout the study period and for remaining companies under the study it is more or less than industry average due to inefficient inventory control policy.

Coefficient of variation of the age of inventory of J S W Steel Ltd. and Kalyani Steel Ltd. is 54.58% and 58.22% respectively, which shows less consistency in the case of liquidity management because in the industry, as a whole, coefficient of variation is 46.35%. While coefficient of variation in case of remaining companies under the study is less variable that indicates more consistency from the viewpoint of liquidity. It is clear from the study, greater variability in the age of inventory indicates improper or less efficient management of inventory policy inasmuch as low inventory indicates unnecessary recurring expenditure in respect of order placing and receiving whereas high inventory results in unnecessary blockage of money that could otherwise have been invested.

5.4.5 Liquidity Position based on Age of Debtors:

Age of debtors' ratio gives an indication of the efficiency of the credit and collection policy

of the firm and it will directly affect the liquidity position of the company. It is a test of speed in which debtors are converted into cash. Lower the debtors to sales ratio, better is the liquidity of debtors and it means prompt payment by the customers. Descriptive statistics is shown in Table 9.

Table 9. Descriptive Statistics based on Age of Debtors

Year	Tata Steel Ltd.	Lloyds Steel Inds Ltd.	Kalyani Steel Ltd.	J S W Steel Ltd.	Inds Avg.
A.M.	50.15	149.19	131.90	1546.60	47.04
S.D.	29.18	102.33	86.92	4010.10	16.96
C.V. (%)	58.19	68.59	65.90	259.28	36.05
S.E. of mean	9.73	34.11	28.97	1336.00	5.65
Maximum	91.25	299.18	328.83	12166.67	67.59
Minimum	11.94	19.66	40.92	13.62	24.68
Skewness	-0.08	0.32	1.49	2.93	-0.14
Kurtosis	-1.58	-1.29	3.09	8.64	-1.84

Source: CMIE database

It is observed from Table 9 that the age of debtors during the period of study fluctuate between 13.62 days to 12166.67 days with an average of 1546.60 days in the case of J S W Steel Ltd. This indicates unsatisfactory and very poor situation. This ratio is also not satisfactory in case of Lloyds Steel Inds Ltd. and Kalyani Steel Ltd. because its average during period of study comes to 149.19, and 131.90 days, which is too high. This ratio is not satisfactory in case of Tata Steel Ltd. as disclosed by Table 3.6. But it is shows that in coming Years Company will be able to control their debtors and collection period because trend of this ratio is decreased.

Table 9 shows perfect consistency in case of these companies because in the industry, as a whole, coefficient of variation is 36.05%. While coefficient of variation of the age of debtors of Tata Steel Ltd., J S W Steel Ltd., Lloyds Steel Inds Ltd., Kalyani Steel Ltd. is 58.19%, 259.28%, 68.595, 65.90% respectively. This indicates less consistency in case of these companies. It is clear from the study that there is greater variability in the age of debtors indicating improper or less efficient management of fund inasmuch as the fund for working capital shall not be available according to pre-determined plans. Moreover, there is a consequent increase in the bad debt risk.

5.4.5 Liquidity Position based on Age of Creditors:

Age of creditors gives an indication of efficiency of the credit and payment policy of the firm and liquidity position directly depends on this period. Higher the credit payment period the longer is the age of creditors as well as better is the management of liquidity whereas shorter the age of creditors shows inefficient and poor payment policy that is accountable to decrease current liabilities (credit) burden and suffering condition of liquidity position. Age of creditors of operating four private sector steel companies is furnished in Table 10.

Table 10. Descriptive Statistics based on Age of Creditors

Year	Tata Steel Ltd.	Lloyds Steel Inds Ltd.	Kalyani Steel Ltd.	J S W Steel Ltd.	Inds Avg.
A.M.	89.66	116.62	104.40	271.59	69.97
S.D.	9.40	46.18	56.28	214.82	12.51
C.V. (%)	10.48	39.60	53.91	79.10	17.88
S.E. of mean	3.13	15.39	18.76	71.61	4.17
Maximum	102.82	202.78	238.76	715.69	84.31
Minimum	76.84	61.97	55.56	73.15	51.34
Skewness	-0.02	0.62	1.95	1.20	-0.25
Kurtosis	-1.48	-0.24	4.38	0.92	-1.82

Source: CMIE database

Table 10 shows that average age of creditors in case of JSW Steel Ltd. it is very high, which indicate better management of the liquidity. Table 7 also exposed that Tata Steel Ltd., Lloyds Steel Inds Ltd., Kalyani Steel Ltd. have lengthened period. It gives a clear indication of very satisfactory short-term liquidity.

Coefficient of variation of age of creditors of J S W Steel Ltd., Lloyds Steel Inds Ltd., Kalyani Steel Ltd., is 79.10%, 39.60% and 53.91% respectively, is higher than whole industry average of 17.88%. It indicates less consistency during the study period in these companies. Again in case of Tata Steel Ltd., coefficient of variation liquid ratio is 10.48% respectively, which is lower than whole industry average. In the matter of the management of liquidity, it indicates more consistency in these companies during the study period because it is lower than the industry, as a whole, coefficient of variation is 17.88%. It is obvious that there is a lower variability in the age of creditors indicating efficient management of payment policy.

6. Liquidity and Profitability Analysis

Liquidity-profitability relationship is linked with the continuance of the appropriate intensity of working capital. This concept tries to strike a level of liquidity that offers a relaxed balance of liquidity and profitability, that is to say, the investment of the company in working capital must be sufficient. It may generally be assumed that there is always a negative relationship between the two. But it is not true in all the cases. The existence of a linear relationship, though not continuous, between profitability and liquidity corresponding to the holding of

current assets at least up to a certain level by firms, is not an impracticable proposition**.**

To assess the liquidity-profitability relationship of selected steel companies under the study, it is important to study liquidity indicators, namely, current ratio (CR), liquid ratio (LR), absolute liquid ratio (ALR), debt-equity ratio (DER), age of inventory (AOI), age of debtors (AOD) and age of creditors (AOC) and the most popular profitability ratio, return on capital employed (ROCE). To study the mutual disparities of these relationships, multiple correlation and multiple regression analysis have been taking up.

In order to evaluate the association between the liquidity and profitability of selected steel companies in India in detail with the help of above-mentioned measures at a time, we sketched them in the paragraphs that follow.

6.1 Joint Impact of Liquidity Indicators on Profitability of Tata Steel Ltd.

Multiple correlation and multiple regression analysis of Tata Steel Ltd. have been tabulated in Table 11.

Table 11. Multiple Correlation and Multiple Regression Analysis of Tata Steel Ltd.

Variable	β	Std. Error	t value	Significance	
Constant	368.747	56.443	6.533	0.097	R = 0.999
CR	55.506	25.772	2.154	0.277	
LR	(-) 230.482	83.460	(-) 2.762	0.221	R^2 = 0.998
ALR	40.476	47.959	0.844	0.554	
DER	(-) 94.083	16.771	(-) 5.610	0.112	Adj. R^2 = 0.985
AOI	3.143	0.666	4.717	0.133	
AOD	1.066	0.394	2.709	0.225	Std. Error Of the
AOC	(-) 4.017	0.722	(-) 5.565	0.113	R = 2.55793

Source: Statistical results computed from Annual Reports of the selected enterprises

The strength of the relationship between the dependent variable, ROCE and all the independent variables taken together and the impact of these independent variables on the profitability are given in Table 11. It was observed from the above that an increase in CR by one unit; the ROCE increased by 55.506 units that were statistically significant at 1 per cent level. When LR increased by one unit, the ROCE decreased by 230.482 units, which was statistically significant at 1 per cent level. However, when ALR increased by one unit, the ROCE of the company increased by 40.476 units though the influence of ALR on ROCE was very significant. However, when DER increased by one unit, the ROCE of the company decreased by 94.083 units though the influence of DER on ROCE was very significant. Again, three important indicators of liquidity, AOI, AOD and AOC, increased by one unit, ROCE increased by 3.143 units and 1.066 units in case of AOI and AOD and decreased by 4.017 units in case of AOC respectively which was statistically at 1 per cent level.

The Multiple correlation coefficient between the dependent variable ROCE and the independent variables CR, LR, ALR, DER, AOI, AOD and AOC taken together was 0.999. It indicates that the profitability was highly responded by its CR, LR, ALR, DER, AOI, AOD

and AOC. It is also evident from the value of R^2 that 99.8 per cent of variation in ROCE was accounted by the joint variation in CR, LR, ALR, DER, AOI, AOD and AOC.

6.2 Joint Impact of Liquidity Indicators on Profitability of Lloyds Steel Inds Ltd.

Multiple correlation and multiple regression analysis of Lloyds Steel Inds Ltd. have been depicted in Table 12.

Table 12. Multiple Correlation and Multiple Regression Analysis of Lloyds Steel Inds Ltd.

Variable	β	Std. Error	t value	Significance	
Constant	274.092	575.876	0.476	0.717	R = 0.814
CR	(-) 588.346	1336.659	(-) 0.440	0.736	
LR	881.221	2346.157	0.376	0.771	R^2 = 0.662
ALR	5803.831	9840.534	0.590	0.661	
DER	22.861	44.725	0.511	0.699	Adj. R^2 = (-) 1.701
AOI	(-) 24.842	44.579	(-) 0.557	0.676	
AOD	(-) 0.077	0.326	(-) 0.237	0.852	Std. Error Of the
AOC	0.180	0.726	0.248	0.845	R = 24.42945

Source: Statistical results computed from Annual Reports of the selected enterprises

Table 12 shows the strength of relationship between the dependent variable, ROCE and all the independent variables taken together and the impact of these independent variables on the profitability. It was observed that CR increase by one unit; the ROCE decreased by 588.346 units that were statistically significant at 1 per cent level. When LR increased by one unit, the ROCE increased by 881.221 units, which was statistically significant at 1 per cent level. However, when ALR increased by one unit, 5803.831 units also increase the ROCE of the company though the influence of ALR on ROCE was very significant. However, when DER increased by one unit, 22.861 units also increase the ROCE of the company though the influence of DER on ROCE was very significant. Again, three important indicators of liquidity, AOI, AOD and AOC, increased by one unit, ROCE decreased by 24.842 units and 0.077 units in case of AOI and AOD and increased by 0.180 units in case of AOC respectively which was statistically at 1 per cent level.

The Multiple correlation coefficient between the dependent variable ROCE and the independent variables CR, LR, ALR, DER, AOI, AOD and AOC taken together was 0.814. It indicates that the profitability was almost perfectly influenced by its CR, LR, ALR, DER, AOI, AOD and AOC. It is also evident from the value of R^2 that 66.2 per cent of variation in ROCE was accounted by the joint variation in CR, LR, ALR, DER, AOI, AOD and AOC.

6.2.1 Joint Impact of Liquidity Indicators on Profitability of Kalyani Steel Ltd.

Multiple correlation and multiple regression analysis of Kalyani Steel Ltd. have been tabulated in Table 13.

Table 13. Multiple Correlation and Multiple Regression Analysis of Kalyani Steel Ltd.

Variable	β	Std. Error	t value	Significance	
Constant	63.387	102.271	0.620	0.647	R = 0.948
CR	(-) 26.881	23.150	(-) 1.161	0.453	
LR	(-) 2.707	95.079	(-) 0.028	0.982	R^2 = 0.898
ALR	18.372	120.531	0.152	0.904	
DER	(-) 30.286	51.328	(-) 0.590	0.661	Adj. R^2 = 0.183
AOI	(-) 0.135	2.244	(-) 0.060	0.962	
AOD	(-) 0.113	0.289	(-) 0.391	0.763	Std. Error Of the
AOC	0.161	0.125	1.291	0.420	R = 7.68674

Source: Statistical results computed from Annual Reports of the selected enterprises

Table 13 clears the strength of relationship between the dependent variable, ROCE and all the independent variables taken together and the impact of these independent variables on the profitability. It was observed that increase in CR by one unit; the ROCE decreased by 26.881 units that were statistically significant at 1 per cent level. When LR increased by one unit, the ROCE decreased by 2.707 units, which was statistically significant at 1 per cent level. However, when ALR increased by one unit, the ROCE of the company increased by 18.372 units though the influence of ALR on ROCE was very significant. However, when DER increased by one unit, the ROCE of the company decreased by 30.286 units though the influence of DER on ROCE was very significant. Again, three important indicators of liquidity, AOI, AOD and AOC, increased by one unit, ROCE decreased by 0.135 units and 0.113 units in case of AOI and AOD and increased by 0.161 units in case of AOC respectively which was statistically at 1 per cent level.

The Multiple correlation coefficient between the dependent variable ROCE and the independent variables CR, LR, ALR, DER, AOI, AOD and AOC taken together was 0.948. It indicates that the profitability was highly responded by its CR, LR, ALR, DER, AOI, AOD and AOC. It is also evident from the value of R^2 that 89.80 per cent of variation in ROCE was accounted by the joint variation in CR, LR, ALR, DER, AOI, AOD and AOC.

6.3 Joint Impact of Liquidity Indicators on Profitability of J S W Steel Ltd.

Multiple correlation and multiple regression analysis of JSW Steel Ltd. have been depicted in Table 14.

Table 14. Multiple Correlation and Multiple Regression Analysis of JSW Steel Ltd.

Variable	β	Std. Error	t value	Significance	
Constant	37.107	49.234	0.754	0.589	R = 0.939
CR	10.367	31.431	0.330	0.797	
LR	(-) 49.069	93.699	(-) 0.524	0.693	R^2 = 0.882
ALR	(-) 20.850	376.204	(-) 0.055	0.965	
DER	(-) 0.625	0.894	(-) 0.699	0.612	Adj. R^2 = 0.056
AOI	(-) 1.187	1.498	(-) 0.792	0.574	
AOD	(-) 0.001	0.002	(-) 0.398	0.759	Std. Error Of the
AOC	(-) 0.031	0.074	(-) 0.424	0.745	R = 10.9500

Source: Statistical results computed from Annual Reports of the selected enterprises

The relationship between the dependent variable, ROCE and all the independent variables taken together and the impact of these independent variables on the profitability, which is shown in Table 5.8. It was observed that increase in CR by one unit; the ROCE increased by 10.367 units that were statistically significant at 1 per cent level. For one unit increase in LR, the profitability of the company decreased by 49.069 units, which was statistically significant at 1 per cent level. However, when ALR increased by one unit, the ROCE of the company decreased by 20.850 units though the influence of ALR on ROCE was very significant. However, when DER increased by one unit, the ROCE of the company decreased by 0.625 units, which was statistically significant at 1 per cent level. Again, three important indicators of liquidity, AOI, AOD and AOC, increased by one unit, ROCE decreased by 1.187 units, 0.001 units and 0.031 units respectively, which was statistically at 1 per cent level.

The Multiple correlation coefficient between the dependent variable ROCE and the independent variables CR, LR, ALR, DER, AOI, AOD and AOC taken together was 0.939. It indicates that the profitability was perfectly responded by its CR, LR, ALR, DER, AOI, AOD and AOC. It is also evident from the value of R^2 that 88.2 per cent of variation in ROCE was accounted by the joint variation in CR, LR, ALR, DER, AOI, AOD and AOC.

7. Test of Hypotheses

A hypothesis is an assumption to be tested. The statistical testing of hypothesis is the important technique in statistical inference. Hypothesis tests are widely used in business and industry for making decisions. The following are the hypotheses framed and tested using test of significance at 5% level of significance.

Hypothesis 1

H_0: Liquidity position has no impact on Profitability.

H_1: Liquidity position has a significant impact on Profitability.

T-test Results of Hypothesis 1

	N	Mean	Std. Deviation	Std. Error Mean
CR, LR and ALR	4	.8667	.91705	.30568
ROIR	4	37.9856	115.31928	38.4398

T-test Results

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
CR, LR and ALR	2.835	3	.022	.86667	.1618	1.5716
ROIR	.988	3	.352	37.98556	-50.657	126.629

The calculated value of t is more than the significant value, hence null hypotheses is not accepted.

Hypothesis 2

H_0: Solvency position has no impact on Profitability.

H_1: Solvency position has a significant impact on Profitability.

T-test Results of Hypothesis 2

	N	Mean	Std. Deviation	Std. Error Mean
DER	4	-.0489	.17084	.05695
ROIR	4	37.9856	115.31928	38.4398

T-test Results

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
DER	-.859	3	.416	-.04889	-.1802	.0824
ROIR	.988	3	.352	37.98556	-50.657	126.629

The calculated value of t is less than the significant value, hence null hypothesis is accepted.

Hypothesis 3

H_0: There is no relationship exists between liquidity and profitability.

H_1: There is a significant relationship exists between liquidity and profitability.

T-test Results

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
CR, LR, ALR, DER, AOI, AOD and AOC	2.943	3	.032	.8265	.2574	1.3584
ROIR	.935	3	.218	43.9885	-42.347	117.698
R=.934	R^2= 89.5					

The calculated value of t is more than the significant value, hence null hypotheses is not accepted.

7. Suggestions and Recommendations

This is the ultimate stage in which several proposals and suggestions have been offer; to overcome the noticeable problems in the study. In order to solve the problems relating to the study of short-term liquidity management, a lot of modifications are necessary.

• Overall inventory management is required to be progressed in case of all the selected steel companies by way of proper application of inventory control system, such as, EOQ, JIT, ABC analysis, etc. and improvement of their sales management so as to reduce stock piling of finished goods.

• Liquidity position is very unsatisfactory in case of all the selected steel companies except KSL. To remove poor liquidity position of the above companies, further investment is required to be bringing in the form of liquid resource for significant reduction in the weigh down of current liabilities in order to improve liquidity position.

• On the whole, receivable management is not good enough in case of the entire selected companies under the study. Solution to the enormous problem of receivables management, an effective professional co-ordination between sales, production and finance departments is called for. On time billing, timely reminders to defaulting customers and immediate action should be ensured. The investment in loans and advances should be minimised to the extent possible.

• Multiple correlation of 0.934 indicates that there is high relationship exists between liquidity and profitability of all the selected steel companies under the study.

8. Conclusion

Working capital management is important part in firm financial management decision. The optimal of working capital management is could be achieve by firm that manage the trade off between profitability and liquidity. The purpose of this study is to investigate the liquidity management efficiency and liquidity-profitability relationship. Results of this study found that correlation and regression results are significantly positive associated to the firm profitability. Thus, firm manger should concern on inventory and receivables in purpose of creation shareholder wealth.

9. Limitations of the Study

The study endures from certain limitations.

- Study solely depends on the published financial data, so it is subject to all limitations that are inherent in the condensed published financial statements. We have selected operating four private sector steel companies but not considered all the operating units as sample, which may leave some grounds of error.

- Again, our study is based on the data and information relating to the year 1997-98 to 2005-06, that is, nine years period. But, even these data and information do not appear widespread. We are fully conscious that many more data and information would have made our study more exhaustive.

- Inflation could not be taken into contemplation in the present study. It was not possible to convert the relevant financial data into their present values because of non-availability of sufficient information required for the purpose.

- Study is purely based on private sector steel companies, we could not compare with the data and information of efficiently managed public sector companies for testing of liquidity position and its efficiency.

- Special ratios used in the study are taken from CMIE data base.

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