Working Capital Management: A Case Study of Nalco

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Abstract

The investment decision of any business is concerned with the investment in the fixed as well as in the current assets. The amount of finance required for fixed and current assets are called fixed capital and working capital respectively. Fixed capital is required for the establishment of the business and helps in the revenue generation process whereas working capital is required to utilise the fixed assets. Management of working capital is an important task as it has impact on the profitability of the firm. It is evident in the past that many firms have gone into liquidation due to dearth of fund i.e. working capital. The present study is an attempt to analyse the working capital management at NALCO.

Keywords: *Working Capital, Liquidity, Risk, Profitability, Correlation, T-test.*

Introduction

The study of working capital management occupies an important place in the field of financial management because without working capital it is difficult to continue the day-to-day operations of the business and hence it is considered as the life blood of any business. Basically, it is the management of firm's short term financial requirement. In the present day scenario, the survivability and sustainability of the firm depend upon the so called vitamin 'M' i.e. money or cash flow. It is evident from history that when many firms have gone into liquidation over the years as a result of running short of cash flow for operation. For the successful working of any business organisation, fixed as well as current assets play a vital role (Singh and Pandey, 2008). But the management of current assets or the as working capital is more important as it has impact on the profitability of the firm. The optimum working capital ensures the success of the business, while its inefficient management leads to the downfall of the company (Chandra and Selvaraj, 2012). Apart from the above, economic crisis also has its impact on the working capital position of any firm. Liquidity crunch puts pressure on the working capital position, causing it to cut back on investment. Therefore, careful evaluation of each component of working capital and its interrelationship is needed. The main objective of the working capital management is to arrange the needed funds at the right time from the right source and for the right period, so that a trade off between liquidity and profitability may be achieved (Jain and Dhing). In this context, the present paper is an attempt to study the practice in working capital management with special reference to NALCO. This paper includes a brief profile of the company, review of literature, research methodology, data analysis, findings and conclusions.

A brief profile of NALCO

National Aluminium Company Limited (NALCO) was incorporated in the year 1981 as a public sector enterprise by the Govt. of India. The company is established to produce aluminium from the bauxite available in the state of Orissa. Its major production units located in Koraput and Angul districts of the state have actively explored the ways and means to success. Commissioned during 1985-87, Nalco has emerged as a star performer in production and export of alumina and aluminium, and more significantly, in propelling a self-sustained growth.

The issued and fully paid up capital of the company consist of 2,577,238,512 ordinary shares having a face value of Rs.5 each .Out of this amount, 2,245,998,540 shares equivalent to 87.15% are held by Govt. of India, while the rest are held by the general public, financial institutions etc. as on 31st March2011. During 2010-11, the Company put up record performance in all its operations. The Bauxite Mines achieved a lower production of 4824000 mt in the current year, against 4879000 mt in 2009-10. The alumina refinery also produced a record quantity of 1556000mt of alumina in the current year. Similarly, aluminium metal production at 444000mt was also an all-time high, compared to 431000mt in 2009-10. NALCO added 525000 tonnes of alumina refining capacity in September 2011, which has increased its total alumina capacity to 2.1 million tonnes a year. The company is also planning to increase its aluminium production in India and Indonesia. Following the increased production and sales, the company achieved the net profit of Rs.1069.3crore, an increase of 31.32% over the previous year figure of Rs814crore. The company also achieved a record sales turnover of Rs.5959 crores, surpassing the previous best of Rs5055 crores in 2009-10.

Review of Literature

The problems of working capital management have drawn a great deal of research in the recent past. Extensive research work has been carried out by the researchers in various areas of working capital management. However, only those studies which are pertinent to the objective of the current study are selected for review.

Shin and Soenen (1998) studied the relation of efficiency of working capital management and corporate profitability by taking 58985 firms covering the period 1975-1994. The study discloses a strong negative relation between the length of the firm's net trade cycle and its profitability. However, shorter net trade cycles are associated with higher risk adjusted stock return.

The study of Mallik and Sur (1999) on working capital management in Hindustan Leaver Ltd. disclosed a very high degree of positive relationship between liquidity and profitability.

The paper of Padachi (2006), examines the trends in working capital management and its impact on firms' performance. The corporate profitability is investigated for a sample of 58 small manufacturing firms, using panel data analysis for the period 1998 – 2003. The regression result shows that high investment in inventories and receivables is associated with lower profitability. The dependent variable, return on total assets is used as a measure of profitability. The independent variables used in the analysis are inventories days, accounts receivables days, accounts payable days and cash conversion cycle. A strong significant relationship between working capital management and profitability has been found in the empirical work.

Bhunia(2007) carried out a study on liquidity management of two public sector iron and steel enterprises such as Steel Authority of India Limited and Indian Iron and Steel Company Ltd..

Considering the study period of 12 years from 1991-92 to 2002-03 the study concluded that both the companies have a poor liquidity position and working capital position. Inefficiency in receivable was found in case of both the companies.

Chakraborty (2008) carried out a study on the relationship between working capital and profitability in the Indian pharmaceutical industry with a sample size of 25 companies covering the period from 1996-97 to2007-08. The variables such as current ratio, inventory turnover ratio, and debtor turnover ratio were selected as the components of the working capital whereas profit before interest and tax margin (PBITM) and return on capital employed (ROCE) were selected as the measure of profitability. The result of the study disclosed the positive association of current ratio with PBITM and ROCE. Similarly, inventory turnover ratio and debtor turnover ratio showed positive relation with profitability in most of the cases under study.

Singh and Pandey (2008) carried out a study on the impact of working capital management in the profitability of Hindalco Industries Ltd. The coefficient of correlation between two variables such as profitability ratio and working capital turnover ratio indicates negative correlation whereas current ratio, receivable turnover ratio, inventory turnover ratio, turnover of cash and working capital to total assets have shown positive correlation with profitability.

Ramudu(2009) conducted an empirical study on Working Capital Structure and Liquidity position of Indian Commercial Vehicles Industry. The author has attempted to study the effectiveness of structuring the working capital and concluded that inventories formed the highest percentage in the working capital structure followed by trade receivables and loans and advances whereas cash and bank balances formed very negligible part. Further, the study revealed the variation between current assets turnover ratio and working capital turnover ratio which was very high across the industry, which in turn, implies that the sample companies achieved higher sales with less working capital.

Gill, Biger and Mathur (2010) researched on the relationship between working capital management and profitability of eighty eight USA firms. The findings of the study indicate that slow collection of accounts receivables is correlated with low profitability. There is a positive correlation between cash conversion cycle and gross operating profit established. However, no significant relation is found between the firm size and its gross operating profit ratio.

Saini and Saini (2010) proposed to study the trade-off between liquidity, risk and profitability of Infosys Technologies. The result of the study reveals that there exists negative relationship between the liquidity and profitability of the company which is found to be significant at 5 percent level of significance. However, there exists no significant relationship between risk and profitability. They are mildly related to each other.

Agarwal (2011) carried out an empirical study on the management of working capital in Maruti Suzuki India Limited. Considering the data for a period of 9 years, the author focuses on the relationship between liquidity and profitability and risk. The result of the study discloses that there is no relation between profitability and liquidity while profitability has a positive relationship with risk. This indicates that the firm gives little importance to the liquidity issues related with working capital management.

The study of Jain and Dhing (2011) on working capital management of Reliance Industries Ltd. reveals negative relation between efficiency of working capital and the profitability. The

correlation between efficiency ratio and profitability ratio is found to be positive but is not statistically significant. There is negative correlation between efficiency ratio and market ratio. However, a mixed response is seen with respect to the relation between market ratio and profitability ratio

Jain,Singh and Kapoor(2011) carried out a study on the working capital management practices in Reliance Industries Limited. Covering the period of ten years i.e. from 2001-2009 they sought to analyse the significance of debtor, cash, loans & advances, inventory and their Turnover Ratios in the management of working capital. The study result concluded that RIL has maintained satisfactory liquidity ratio, and at the same time, the components of current assets have not occupied substantial share, vis-à-vis, its total sales which may be an indication of its efficiency in managing its working capital.

Karaduman et. al.(2011) studied on the relationship between working capital management and profitability of the selected companies of Istanbul Stock Exchange. Using Cash conversion cycle (CCC) and Return on assets (ROA) as the proxy for the working capital and profitability respectively, the study discloses positive association between them.

Scholleova (2012) studied the impact of economic crises on the working capital management of firms in Czech Republic. The study found that the Czech firms suffered from decreased demand and shortage of capital. Companies that survived during the crises have optimised their assets and increased the efficiency of financing through active management.

Chandra and Selvaraj (2012) carried out a study on determinants of working capital management in selected Indian steel companies. The study disclosed that the size of a company plays a vital role in determining the efficiency of its working capital management.

The study of Ramudu and Parasuraman (2012) on Indian pharmaceutical industry revealed that the growth rate in profit was disproportional to the sales and working capital components like inventory and debtors.

RESEARCH METHODOLOGY

Objectives of the Study

The present study has been undertaken to achieve the following objectives:

- To study the variability in various components of working capital management of NALCO.
- To know the impact of economic recession on working capital.
- To find out the relationship between liquidity and profitability.
- To determine the relationship between working capital and sales.
- To determine the relationship between risk and profitability.

Data Collection and Study Period

This study is carried out by considering NALCO as the sample unit which is the largest aluminium producer in India. The study is completely based on the data collected from the secondary sources which include Annual Reports of the Company and Moneycontrol . com database covering a period of ten years i.e., from 2001-02 to 2010-11. At the first stage, the collected data are processed to make them suitable for analysis and then statistical tools such as Mean, Standard Deviation, Correlation analysis and t-test are used to get the findings from the study. The data were processed and analysed using MS Excel.

Hypotheses of the Study

The study was undertaken with the following hypotheses:-

H01 :   There is no significant effect of recession on the Working Capital position.

H02 :   There is no relationship between Liquidity and Profitability.

H03 :   There is no relationship between Risk and Profitability

H04:   There is no relationship exists between Working Capital and Sales

Limitations

In the course of research certain problems were encountered which are likely to have effect on the work. One of such constraints is sample unit. As this study is based on one company only, the findings might not be representative of what obtains in the whole sector. The study is based on the data collected from the secondary sources. So it contains all the inherent limitations of the secondary data. Finally, the conclusions are based on the data analysed, hence they are valid only to the extent of the validity of the data.

ANALYSIS AND DISCUSSION OF THE RESULT

The analysis and interpretation of the study are based on the parameters mentioned in the methodology of the study. This section is divided into two parts. The first one makes the component wise analysis of Gross Working Capital and the second part discusses the hypothesis testing.

Component Wise Analysis of Gross Working Capital

Table 1: Individual Components of Current Assets as Percentage of Total Assets of NALCO, 2001-02 to 2010-11

Year	Cash (Rs. in Crore)	Debtor (Rs.in Crore)	Inventory (Rs. in crore)	Loans & Advances (Rs. in Crore)	Total (Rs. in Crore)
2001-02	114.23 (10.033)	257.83 (22.647)	484.32 (42.542)	282.07 (24.776)	1138.45 (100)
2002-03	49.56 (4.923)	101.83 (10.117)	489.25 (48.609)	365.86 (36.349)	1006.5 (100)
2003-04	98.36 (9.93)	102.24 (10.321)	480.48 (48.508)	309.43 (31.239)	990.51 (100)
2004-05	755.21 (41.7)	92.81 (5.124)	529.06 (29.213)	433.96 (23.961)	1811.04 (100)
2005-06	2193.71 (66.534)	29.42 (0.892)	590.78 (17.918)	483.17 (14.654)	3297.08 (100)
2006-07	3686.53 (74.114)	34.13 (0.686)	634.96 (12.765)	618.46 (12.433)	4974.08 (100)
2007-08	3516.46 (69.752)	60.65 (1.203)	686.65 (13.62)	777.57 (15.423)	5041.33 (100)
2008-09	2869.04 (62.911)	26.5 (0.581)	873.5 (19.153)	791.37 (17.353)	4560.41 (100)

Year	Cash (Rs. in Crore)	Debtor (Rs.in Crore)	Inventory (Rs. in crore)	Loans & Advances (Rs. in Crore)	Total (Rs. in Crore)
2009-10	3152.35 (60.509)	181.78 (3.489)	944.92 (18.137)	930.59 (17.862)	5209.64 (100)
2010-11	3795.23 (64.53)	112.4 (1.911)	1058.47 (17.997)	915.23 (15.561)	5881.33 (100)
Mean	2023.068 (59.659)	99.959 (2.947)	677.239 (19.971)	590.771 (17.421)	3391.037 (100)
SD	1598.899	73.0929	210.3142	248.9651	

(Figures in the brackets indicate the percentage share of individual component)

To gain further understanding of the working capital management of NALCO, the individual components of the current assets, viz., inventories, cash & bank, sundry debtors and loans & advances are studied. The percentage share of each individual component in the total current asset value for each year of the time period under study is calculated and placed in the above table. The table also contains the mean value of each component of the gross working capital i.e. current assets for the entire period of study. It is found from the table that the percentage share of cash in total assets has increased from 10 percent to 64 percent during the period of study. The debtor has decreased from 22.64 percent in the year 2001-02 to 1.91 percent in the year 2010-11. The share of inventory has varied from 12.76 percent to 48.6 percent during the same period. Similarly, the component of loans & advances has varied from 12.43 percent to 36.34 percent. It is evident from the mean value of each component that cash occupies a major share amounting to 59.66 percent followed by inventory.

Testing the Hypotheses

The hypotheses of the study have been tested by applying student's *t*- test which is normally used to determine if two sets of data are significantly different from each other with an assumption that the test statistics would follow normal distribution. The *t*- test results are depicted in the tables given below and suitable interpretations are made accordingly.

Effect of Global Economic Recession on NALCO's Working Capital Position

The following null hypothesis has been considered for testing the effect of Global Economic Recession on Nalco's Working Capital Position. The *t*-test for dependant samples is used for this purpose and the results are given in Table: 2.

$H01$: There is no significant effect of recession on the working capital position.

Table 2: *t*-Test for Paired Two Sample for Means

	Before Recession	After Recession
Mean	1648.716	5133.358
Variance	962375.2193	231847.2753
Observations	5	5
Hypothesized Mean Difference	0	
df	4	
t Stat	-13.93145186*	
P(T<=t) one-tail	0.00007	
t Critical one-tail	2.131846782	
P(T<=t) two-tail	0.000153955	
t Critical two-tail	2.776445105	

* 95% level of significance

Inference: Since t_{cal} is greater than, we reject the null hypothesis and conclude that economic recession has impact on the working capital position. The working capital position remained almost stagnant during the year 2006-07 and 2007-08. In the year 2008-09 the gross working capital came down due to global recession.

Relationship between Liquidity and Profitability

The following null hypothesis has been considered for testing the Liquidity and Profitability positions in NALCO. The significance of an observed Correlation Coefficient is used for this purpose, the results of which are given in Table: 3.

$H02$: There is no relationship between Liquidity and Profitability.

Table 3: *t*-Test for Significance of an Observed Correlation Coefficient

	Liquidity	Profitability
Mean	2.374143	26.545
Variance	1.009685	169.5982722
Observations	10	10
Hypothesized Mean Difference	0	
Correlation Coefficient (r)	0.6512	
df	8	
t Stat	2.427*	
P(T<=t) one-tail	0.0206	
t Critical one-tail	1.8595	
P(T<=t) two-tail	0.0413	
t Critical two-tail	2.3060	

* 95% level of significance.

Inference: The hypothesis of having relationship between liquidity and profitability is tested using *t*-test which discloses the significance of an observed correlation coefficient. Current Ratio (CR) and Return on Capital Employed (ROCE) are used as proxy for liquidity and profitability respectively. The results of the study are presented in Table-3. The correlation coefficient is found to be positive and significant at 95% level. Since is greater than, we reject the null hypothesis and conclude that liquidity has significant relationship with operating profitability. The result supports the study of Mallik and Sur(1999) and Chakraborty(2008).

Relationship between Risk and Profitability

The following null hypothesis has been considered for testing the relationship of Risk Factor of working capital management in NALCO and profitability. The *t*-test for significance of an observed Correlation Coefficient is used for this purpose the results of which are given in the Table: 4.

*H*03 : There is no relationship between Risk and Profitability

Table 4: t-Test for Significance of an Observed Correlation Coefficient

	Risk	*Profitability*
Mean	0.911940673	26.545
Variance	0.153073096	169.5982722
Observations	10	10
Correlation Coefficient (r)	-0.652040418	
Hypothesized Mean Difference	0	
df	8	
t Stat	-2.432449327*	
P(T<=t) one-tail	0.02053	
t Critical one-tail	1.8595	
P(T<=t) two-tail	0.041061	
t Critical two-tail	2.3060	

*95% level of significance.

Inference: The null hypothesis that there is no relationship between risk and profitability is tested using t-test. The results of the study are presented in Table-4. Return on capital employed (ROCE) has been used to measure profitability and the risk factor of the working capital is calculated by using the following formula

$$R_k = \frac{E + L_j - A_j}{C_j}$$

Where,

R_k = Risk factor

E_j = Equity + Reserve & Surplus

L_j = Long term Loans

A_i = Fixed Assets

C_i = Current Assets.

Since t_{cal} is greater than, we reject the null hypothesis and conclude that risk has relationship with profitability.

Relationship between Working Capital and Sales

The following null hypothesis has been considered for testing the working capital and sales in NALCO.The t-test for significance of an observed Correlation Coefficient is used for this purpose, the results of which are given in the Table: 5.

$H04$: There is no relationship between working capital and Sales

Table:5 t-Test for Significance of an Observed Correlation Coefficient

	Working Capital	Sales
Mean	3391.037	4386.114
Variance	3903746.072	1780228.722
Observations	10	10
Hypothesized Mean Difference	0	
Correlation Coefficient (r)	0.9191	
df	8	
t Stat	6.598*	
P(T<=t) one-tail	0.0001	
t Critical one-tail	1.8595	
P(T<=t) two-tail	0.00017	
t Critical two-tail	2.3060	

* 95% level of significance

Inference: Table-5 presents the relationship between working capital and sales. The t-test is used to determine the significance of Correlation Coefficient (r). Total of current assets i.e. gross working capital is used in the study. The r-value is 0.91 which conveys a positive association between working capital and sales and it is found to be significant at 95 percent level. Since is greater than, we reject the null hypothesis and conclude that working capital has significant relationship with sales. The result supports the study of Ramudu and Parasuraman(2012).

CONCLUSION

Working capital management is an exceedingly significant issue in a firm's corporate financial decision making process and it should be designed to generate higher profit. A comprehensive study is carried out to understand and test certain hypotheses relating to NALCO. In the current study, it is found that NALCO's working capital position was affected by the global recession. Nevertheless, it has tried to maintain a good liquidity position even in those days. The relationship between liquidity and profitability is found to be positive. Minimum level of liquidity is required to maintain a certain level of out put and sales. Hence, in the study, the

relationship between working capital and sales indicates strong positive association with each other.   However, the correlation between risk factor and profitability shows that these two are negatively related to each other.

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