

Working capital and profitability - An empirical analysis

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This study focuses on the working capital management and profitability. It also examines the interrelationship between profitability and working capital, with the assistance of ratio analysis.

In Conventional production function approach for determination of relationship between output and profit, fixed capital is taken in to account as explanatory variable amongst others, the role of working capital is ignored¹. It is therefor felt that there is the need to study the important role of working capital in profit generating process. If a company desires to take a greater risk for bigger profits and losses, it reduces the size of its working capital in relation to its sales. If it is interested in improving its liquidity, it increases the level of its working capital. However, this policy is likely to result in a reduction of the sale volume, therefore of profitability. Hence, a company should choose between liquidity and profitability and decide about its working capital requirements².

In this paper an effort has been made to make empirical study of NFL,

a fertilizer producing company for assessing the impact of working capital on its profitability during the period 1990-91 to 1999-2000. The impact of working capital on profitability has been examined by computing co-efficient of correlation and regression between profitability ratio and working capital ratio.

About the company

Of the different companies operating in the field of fertilizer industry of India. National Fertilizer Ltd., is one of the largest company producing and marketing fertilizer products. Kisan Khad and Kisan Urea are NFL's two main brand products, Widely popular in most of the states. NFL also produces and markets various industrial products like liquid oxygen, liquid Nitrogen, Nitric Acid and Ammonium Nitrate. The bio-fertilizer products, produced by the company are being marketed in Madhya Pradesh through State agencies. The company's annual sales turn over is Rs. 1400 Crores net worth of the company stands at Rs. 1326.17 crore with a paid up capital of Rs. 490.58 crore. NFL having four

fully owned units namely Nangal Unit, Panipat Unit, Bhatinda Unit and Vijaypur Units, the productive plants of the National Fertilizer Ltd.

Objectives of the study

The present study is envisaged with the following objectives.

- To assess the impact of working capital on profitability.
- To examine the combine effect of the ratios relating to working capital management and profitability with the assistance of multiple correlation coefficient and multiple regression equation and to test the significance of the regression coefficients.
- To determine the working capital leverage for examining the sensitivity of ROI to changes in the level of gross working capital of the company.

Data Base and Methodology

The data of National Fertilizer Ltd., for the years 1991 to 2000 used in this study have been taken from

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mainly secondary sources. The necessary secondary data have been collected from the financial statements published in the Annual Reports of the National Fertilizer Ltd. Apart from these some of the data has been collected through visits and personal observation. Editing, classification and tabulation of the financial data collection from the above-mentioned source have been done as per the requirements of the study. For assessing the performances of the financial data collected from the above-mentioned source have been done as per the requirements of the study. For analyzing data simple mathematical tools like ratios, percentage and various statistical tools have been used.

The ratios relating to working capital management which have been selected and computed for the study are: (i) Working Capital Ratio (WCR) (ii) Acid Test Ratio (ATR) (iii) Current Assets to Total Assets Ratio (CTTR) (iv) Current Assets to Sales Ratio (CTSR) (v) Working Capital Turnover Ratio (WTR), (vi) Inventory Turnover Ratio (ITR) (vii) Debtors Turnover Ratio (DTR) (viii) Cash Turnover Ratio (CTR) and (ix) Misc. Current Assets Turnover Ratio (MCTR). For determining the sensitivity of ROI to change in the level of working capital, the working capital leverage has been computed. All statistical computations have been done through SPSS.

Working Capital and Profitability - Correlation Analysis

The co-efficient of correlation between selected ratios relating to working capital management and ROI are presented in Table 1. It is evident from the table the correlation coefficient between ROI and WCR is (+) 0.34. It indicated that there is a lower degree of positive association between the profitability and the

working capital ratio of the company. The value of the correlation coefficient is found to be significant at 5 percent level. Similarly, the correlation coefficient between ROI and ATR is (+) 0.40 which is found to be significant at 0.05 level. It reveals that there is also a lower degree of positive correlation between the two variables. It is evident from these two ratios that the amount of current and liquid assets increases risk as well as profitability.

Thirdly, the coefficient of correlation between ROI and CTTR is (+) 0.27. It implies that there is a positive correlation between the two variables, at 5 percent level, the value of the correlation coefficient is found to be significant. Fourthly, the coefficient of correlation between CTSR and ROI is (–) 0.40 which is found to be significant at 5 percent level. It reflected a lower degree of negative association between the two variables. Simply, the lower the current assets to sales ratio, the greater the efficiency of the working capital and the wide scope of profitability. Fifthly, the correlation coefficient between ROI and WTR is (–) 0.34, which indicates a lower degree of, negative correlation between these two variables. This value is found to be significant at 0.05 level. The steady movement of working capital turnover, the higher investment and greater is the profitability conforms to principle. Sixthly, the co-efficient of correlation between ROI and ITR is found to be (+) 0.53 it viewing a moderate degree of positive correlation between the variables. Seventhly, the co-efficient of correlation between ROI and DTR shows negative association of (–) 0.04. It is found to be insignificant at both 0.05 and 0.10 levels but significant at 0.5 level.

Lastly, the co-efficient of correlation between ROI and CTR and between ROI and MCTR viewing

assorted low degree of positive association. This correlation is very insignificant. Hence, the study of the impact of working capital ratios on profitability viewed both negative and positive impacts. The study of the relationship between the profitability and working capital, ratios conform with accepted rule that larger the turnover increases the profitability of the company.

Impact of working Capital Ratios on Profitability-Multiple Regression Analysis.

In order to understand influence on profitability, a linear multiple regression models were used. In table III multiple correlation and multiple regression techniques have been applied and impact of working capital on profitability of the company, the regression coefficients have been tested with the assistance of the most popular 't' test. In this study CTTR, ITR, DTR, CTR and MCTR have been taken as the explanatory variable and ROI has been used as the dependent variable. For the purpose of selection of variable in this analysis, the correlation matrix representing the correlation coefficients between the explanatory variables has been constructed in Table -2. This table reveals that there is a very high degree of correlation between WCR and ATR (+) 0.96 between ATR and WTR (–) (0.82) and between CTSR and WTR (–) (0.09). Due to this cause WCR, ATR, CTSR and WTR have been used for analysis. The regression model used is this analysis is hereunder. $ROI = b_0 + b_1 CTTR + b_2 ITR + b_3 DTR + b_4 CTR + b_5 MCTR$, where b_0, b_1, b_2, b_3, b_4 , and b_5 are the parameters of the ROI line to be estimated.

The pooled regression results of the models exhibiting the impact of working capital on profitability of the company are presented in Table 3.

Table exhibiting the relationship between the dependent variable ROI, and all the independent variables taken together and the impact of these independent variables on the profitability of the company. When CTTR increased by 128.085 units which was statistically significant at 50 percent level. When ITR increased by one unit, profitability of the company increased by 0.256 unit which was statistically insignificant both at 5 percent and 10 percent levels. When DTR increased by one unit, the ROI of the company stepped up by -101.474 units, which was statistically significant at 0.05 and 0.5 levels. When increase in CTR, the company's profitability increased by 1.102 unit, which was significant at 0.5 level only. For one unit increase in MCTR, the ROI of the company increased by 9.361 unit, which was significant at 0.5 level and insignificant at 0.05 level. The multiple correlation coefficient of ROI on CTTR, ITR, DTR, CTR and MCTR is 0.827. It reveals that the profitability of the company was highly influenced CTTR, ITR, DTR, CTR and MCTR. It is also evident from the value of R^2 that the independent variables CTTR, & ITR, DTR, CTR and MCTR contributed 68.50 percent of the variations in the profitability of the company.

In table 4 it has been attempted to measure the sensitivity of ROI due to variability in the level of working capital with the assistance of calculating of calculation the working capital leverage of the company. Table 4 discloses that in the year 1992-93 the WCL of the company was the highest among all the years under study which was 0.57 representing the maximum sensitivity of ROI due to changes in the level of working capital investment. In the year 1997 - 98 the WCL of the company was the lowest which was 0.39 showing the least sensitivity of ROI due to

variability in working capital investment was maximum helpful in the year 1992-93 and minimum helpful in the year 1997-98 in increasing the profitability of the company under study. This table also reveals that in all the year under study the values of the WCL were less than 1. It represents that in all the years of the study period increases in the rate of return on investment was less than proportionate to decrease in working capital investment.

Conclusion

Working capital management and profitability of the company disclosed both negative and positive association. Out of the nine ratios selected for the study three ratios, namely CTSR, WTR and DTR registered negative correlation with the selected profitability ratio, ROI. The slopes of the ROI equation depicted that positive and negative influences of variations in the independent variables on the profitability of the company. Out of the five regression coefficients of the ROI Line, only one coefficient which was associated with DTR revealed negative influence on the profitability. The coefficient of multiple determination (R^2) makes it obvious that 68.50 percent of the total variation in the profitability of the company.

WCL of the company concluded, the increase in the profitability of the company was less than the proportion to decrease in Working Capital.

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Note : Statistical computations have been done through SPSS.

TABLE-2
CORRELATION MATRIX

Particulars	WCR	ATR	CTTR	CTSR	WTR	ITR	DTR	CTR	MCTR	ROI
WCR	1.00									
ATR	0.96	1.00								
CTTR	0.65	0.62	1.00							
CTSR	-0.54	-0.61	-0.20	1.00						
WTR	-0.29	-0.82	-0.81	0.09	1.00					
ITR	0.09	0.29	0.15	-0.48	-0.05	1.00				
DTR	0.72	0.72	0.81	-0.17	-0.74	0.12	1.00			
CTR	0.54	0.65	0.38	-0.51	-0.41	0.65	0.42	1.00		
MCTR	-0.16	-0.18	-0.39	-0.45	0.46	0.17	-0.39	0.0009	1.00	
ROI	0.34	0.40	0.27	-0.40	-0.34	0.53	0.04	0.50	0.35	1.00

Source: Compiled from Annual Report of NFL.

TABLE-3
Multiple Correlation and Multiple Regression Analysis
Variables in the equation ROI = $b_0 + b_1$ CTTR + b_2 ITR + b_3 DTR + b_4 CTR + b_5 MCTR

Variable	Regression coefficient	Standard Error of regression coefficient	't'value	Sig. t
CTTR	128.085	71.020	1.803**	0.146
ITR	0.256	0.647	0.468	0.664
DTR	-101.474	64.445	-1.575	0.190
CTR	1.102	1.199	0.919**	0.410
MCTR	9.361	8.038	1.165**	0.309
Constant	-37.806	26.569	-1.423	0.228
Multiple R = 0.827	R ² = 0.685	Adj. R ² = 0.290	S.E. of R = 7.861	
* Significant at 0.05 level of significance.			** Significance at 0.5 level of significance.	
Table value of with (n-k-l) i.e. 4 degree of freedom at 0.05 and 0.5 levels of significance 2.78 and 0.74 respectively.				

Source: Compiled from Annual Report of NFL.