

IMPACT OF LIQUIDITY AND MANAGEMENT EFFICIENCY ON PROFITABILITY: AN EMPIRICAL STUDY OF SELECTED POWER DISTRIBUTION UTILITIES IN INDIA

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Abstracts

This study investigated the impact of liquidity and management efficiency on profitability of select power distribution utilities in India. The study consist a sample of 23 power distribution utilities operating in India for the period of 2004-05 until 2013-14. Therefore the total panel (balanced) observations are 230. The return on capital employed is used as a measure for profitability explaining dependent variable, whereas a current ratio, quick ratio, absolute cash ratio, debtor turnover ratio, creditor turnover ratio, collection efficiency, interest coverage ratio are representing independent variable. Statistical tools such as Generalized Least Squares (GLS) regression are applied. The study found that debtor's turnover ratio, collection efficiency and interest coverage ratio are showing a significant impact while quick ratio, absolute liquid ratio and creditor's turnover ratio show an insignificant impact on the profitability of select sample utilities.

Research paper

Keywords: Working capital Management, Liquidity, Management Efficiency, Profitability, Power distribution

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Introduction

Liquidity is very important for sustainability and growth of a firm. It is the amount of cash a company on hand or can generate quickly, reveals that how far the company is financially healthy in short term. Thus, it relates to the ability of a firm to repay its short term debt or obligations. According to Bhunia (2010), 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. Many firms ignore its liquidity, to earn higher profits in the short run, which in turn worsens the business performance. This can lead to business failure or financial crisis in spite of earning high profits. Therefore the firms should maintain a tradeoff between liquidity and profitability to strengthen the business and increase the efficiency. If a firm maintain high levels of available liquid assets, it indicates that the business can pay off its debt easily when due dates occur. Therefore an efficient business is one which is able to repay its debts in the normal course and continue to do so within the next year. It is believed that the firms that lack liquidity can be forced to enter bankruptcy even if it is solvent or vice-versa. Hence liquidity plays an important role in sustaining business in short run and long run.

Power Distribution Utilities

Power distribution utilities are mainly controlled by state government as distribution of electricity is listed in concurrent list of the Indian constitution. After privatization few states have opted to unbundle power sector and privatize power distribution utilities. It is the most critical link in the electricity market, which interfaces with the end customers and provides revenue for the entire value chain and catering to nearly 200 million consumers with a connected load of about 400 GW that places the country among the largest electricity consumer bases in the world.

Literature Review

Greg Filbeck (2005), in a research study has analyzed the working capital management results across industries for a period of 4 years i.e. 1996-2000. The study found that there is significant difference that exists between industries in working capital management across time and the measures for working capital change significantly within industries over a period of time. The changes in working capital management may be due to the macroeconomic factors such as change in interest charges, rate of innovation and competition.

Shukla (2002), have focused on the state of working capital management in 8 cotton textile units for the period of 1977-78 to 1986-87. The correlation analysis shows that there exists a moderate positive correlation between cash holding and output and sales. The liquidity position is poor for most of the firms and profitability is either low or negative in most of the firms.

Deloof (2003), in an empirical study has attempted to know the relationship between working capital management and profitability for a sample of 1009 large non-financial Belgian firms for the period of 1922 to 1996. The author found that there is a significant negative relationship between gross operating income and the number of day's accounts receivable, number of day's inventories and the number of days account payable.

Further Karaduman, Akbas, Ozsozgun, & Durer (2010), have found that a company can increase its return on assets by shortening the number of days account receivable, account payable in days and the number of days of inventory. Further reducing cash conversion cycle will have a positive impact on return on assets. Charitou, Elfani, & Lois, (2010) indicated that the firm's financial health is inversely related to the components of the cash conversion cycle and leverage. In contrast to previous studies Danuletiu

(2010), found that there is a weak negative correlation between working capital management indicators and profitability ratios.

Raheman, Qayyum, Afza, & Bodla (2010), in a empirical study, estimated and compared sector-wise impact of working capital management on performance of manufacturing firms in terms of collection policy, inventory policy, payment policy, cash conversion cycle and net trading cycle. The study used financial data of 204 sample firms listed on the Karachi stock exchange for the period of 1998 to 2007. The study found that there is a variation in sectoral performance in terms of different measures of working capital management. Further Kequan & Lvliwei (2011), indicated a significant difference in performance of working capital between firms in different industries and different geographical areas, rather than differences in operational history.

Sharma & Kumar (2011), examined the effect of working capital management on profitability of Indian firms. The sample of 263 non-financial has been collected from firms listed on the BSE for the period of 2000 to 2008. The study found a positive correlation between working capital management and profitability.

Data and Methodology

The study attempts to understand and measure the impact of liquidity on profitability of select power distribution utilities in India. This study is empirical in nature. The study selected 23 power distribution utilities operating in India. The period of the study is ten years, i.e, 2004-05 to 2013-14. The work type structured is balanced with the annual frequency. The data has been extracted from the annual report and PFC reports. Hence, the total panel (balanced) observations are 230.

Method

Panel data has space for both cross sections as well as time series dimensions. According to Baltagi (2001), Panel data provides more information, reduce multi collinearity among variables, offer more degrees of freedom and more efficiency, and substantially reduce the problems that arise from omitted or ignored variables, lessen risk of obtaining biased results. Therefore, it is suitable for the present study.

The study used Generalized Least Squares (GLS) regression using Eviews software. This method is preferred over the Ordinary Least Squares (OLS) system because under certain assumptions, GLS will turn out to be asymptotically more efficient than OLS system and hence GLS is preferred for this specific study.

Data Interpretation and Analysis

This part of the paper deals with data analysis and interpretation using generalized least square regression model. Before running this model, stationarity was tested using ADF-Fisher unit root test. Further, Hausman test was run to identifying whether fixed effect model is appropriate or random effect model is appropriate for the present study.

Panel Unit Roots Test

Non-stationary data are volatile and cannot be modeled or fore-casted. The results obtained by using raw data testing stationary may be spurious. It is a well known fact that time series data are non-stationary. The presence of non-stationary variables might produce spurious regression results (Tafri & et al, 2009). Standard unit root test is performed to check for the stationarity of the data before the panel data regression analysis. Therefore each variable of the study is subjected to panel unit root tests of ADF-Fisher unit root test. It assumes individual unit root process and uses chi square test statistics. Stationary test is performed for the selected sample distribution utilities in India. Eviews software by default uses the Schwartz info criterion using maximum lags length selected by the method proposed by ADF Method. It

is found that variables were having unit root in level, meaning that the data is not stationary.

In order to obtain consistent, reliable results, the non-stationary data needs to be converted into stationary form. Hence the variables are differenced at first level to check for stationary at difference. It is found that the variables are stationary at first difference. The process can be shown through running a hypothesis. The Table 1 shows summary of stationary test of all the variables used in the study. The research hypothesis tests the stationarity of variables individually. The results are indicated that all the variables are found to be stationary at 5% level of significance at first difference. The research hypothesis is as following for testing Stationarity of variables.

Hypotheses:

H₁: Variables has no unit root (Stationary)

Table 1: ADF stationary test

Series	Level		1st Difference		Result
	Statistic	Prob.**	Statistic	Prob.**	
CR	55.9092	0.1075	92.2584	0.0000	Accepted
QR	39.1846	0.6778	91.4197	0.0000	Accepted
ALR	67.2219	0.0136	80.8638	0.0000	Accepted
DTR	92.628	0.0001	72.7643	0.0000	Accepted
CTR	50.0888	0.0906	84.6577	0.0000	Accepted
CE	104.975	0.0000	179.719	0.0000	Accepted
DER	111.165	0.0000	100.959	0.0000	Accepted
ICR	38.0464	0.7916	83.7744	0.0000	Accepted
ROCE	96.1027	0.0000	0.2811	0.0001	Accepted

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution.

All other tests assume asymptotic normality.

Hausman Test

Panel data allows you to control for variables. It is observed that many factors which we cannot observe in our study are omitted, and those variables change over time but not across utilities. The variables such as government policy and regulations, business practices, business agreements are not observed but change over time. These variables accounts for individual heterogeneity.

The Hausman test is used to identify appropriate model to be carried out for estimation. It helps in identifying whether fixed effect model is appropriate or random effect model is appropriate. The following hypothesis is tested to verify which model is efficient.

Table 2. Hausman Test Cross-section random effects

Test Summary	Chi- Sq. Statistic	Chi-Sq. d:f.	Prob.
Cross- section random	2.63	6	0.8527

H₀: Random Effect Model is Appropriate.

H₂: Fixed Effect Model is Appropriate.

The Table 2 shows the results of the Hausman test. The null hypothesis both estimators are consistent. Since the p-value is more than .05, we cannot reject null hypothesis. In this specific case, it can be concluded that the random effects estimator is the more efficient model against fixed effect model.

Regression

Regression analysis is a statistical tool for studying the relationships between variables. In the regression model summary table, the capital “R-Squared” in this table explains how close the data are to the fitted to the regression line. If there is a strong positive linear relationship between the

variables, the value of “R-squared” will be close to +1. If there is a strong negative linear relationship between the variables, the value of “R-squared” will be close to -1. In case there is no linear relationship between the variables or only a weak relationship, the value of “R-squared” will be close to 0.

Variables for the study

The variables in the study can be classified into dependent and the independent variables, and will be discussed in the next paragraph. The dependent variable is explained by profitability. Liquidity can be explained with the independent variable such as current ratio, liquid ratio, absolute cash ratio, debtor’s turnover ratio and creditor turnover ratio, collection efficiency, debt equity ratio and interest coverage ratio.

Models estimated

Multiple regression models are estimated for each of the dependent variable.

The models are as follows:

$$\text{ROCE}_{it} = \text{C}_{it} + \beta_1 \text{QR}_{it} + \beta_2 \text{ACR}_{it} + \beta_3 \text{DTR}_{it} + \beta_4 \text{CTR}_{it} + \beta_5 \text{CE}_{it} + \beta_6 \text{ICR}_{it}$$

Where

ROCE= Return on capital employed; CR= Current Ratio; QR=Quick Ratio; ACR=absolute cash ratio; DTR= Debtors Turnover ra-tio; CTR= Creditors Turnover ratio; CE=collection efficiency; ICR=Interest coverage ratio; $i =$ cross sectional, here $i=1, 2, 3, 4, \dots$ Uit; $t =$ time, here, $t=1, 2, 3, \dots, 9$

The “Table 3” shows the results of the coefficient of regression estimates. Each variable can be interpreted using research hypothesis to understand whether there is significant impact of each independent variable on dependent variable.

H₃: There is a significant impact of quick ratio on profitability of selected power distribution utilities in India.

The t-statistic is 1.01 with a p- value of 0.31 at 5% level of significance. The coefficient is showing a positive sign with a value of 20.12 with a standard error of 1.01. The increase in quick ratio by one unit will lead to increase in profitability by 20.12 units, holding all the other independent variables constant and vice-versa. It indicates that there is an insignificant impact of quick ratio on profitability of the sample utilities and hence research hypothesis is rejected.

H₄: There is a significant impact of absolute cash ratio on profitability of power distribution utilities in India.

The “Fig.4” shows that the t-statistics is 0.44 with a p-value of 0.65. The coefficient indicates that one unit increase in absolute liquid ratio, increase in profitability by 11.40 units. The research hypothesis is rejected at 5% level of significance. Therefore there is no significant impact of quick ratio on profitability.

H₅: There is a significant impact of debtor turnover ratio on profit-ability of selected power distribution utilities in India.

The “Table 3” indicates that the t-statistic is 1.69 with a p-value of 0.09. The coefficient of regression indicates that one unit increase in debtor turnover ratio will lead to increase in profitability by 5.07 units. The research hypothesis is accepted at 10% level of significance. Therefore the study found a significant impact of debtor turnover ratio on profitability of selected utilities.

H₆: There is a significant impact of creditors’ turnover ratio on profitability of selected distribution utilities in India.

The t-statistic is -0.04 with a p-value is 0.96. The coefficient of regression is showing a negative sign, indicating that delaying payments to creditors will lead to increase in profits, keeping all other independent variables constant. The finding shows an insignificant impact at 5% level of significance. Therefore the research hypothesis is rejected; infer that there is insignificant impact of creditors on profitability of the sample utilities.

H₇: There is a significant impact of collection efficiency ratio on profitability of selected distribution utilities in India.

The t-statistic is 2.47 with a p-value is 0.0147. The coefficient indicates that one unit increase in collection efficiency ratio will improve the profitability by 2.06 units and vice-versa. The study found that there is a significant impact of collection efficiency on profitability at 5% level of significance. Therefore the research hypothesis is accepted.

H₈: There is a significant impact of interest coverage ratio on profitability of selected distribution utilities in India

The “Table 3” shows the model summary of the study. The t-statistic value is 11.12, with a p-value of 0.00. It shows a positive coefficient, indicating a decrease of one unit in interest coverage ratio will decrease profit-

ability by 11.12 units. The findings suggest a significant impact of interest coverage ratio on profitability of the sample utilities at 5% level of significance. Therefore the research hypothesis is accepted.

Table 3. Regression Estimates of ROCE (Random Effect Model)

Variable	Coefficient	Std Error	t-statistic	Prob.
C	1.137	5.380	0.211	0.830
DQR	20.122	19.920	1.010	0.310
DALR	11.401	25.381	0.449	0.650
DDTR	5.071	2.999	1.690	0.090
DCTR	-0.097	2.294	-0.042	0.960
DCE	2.068	0.834	2.479	0.010
DICR	11.127	2.233	4.983	0.000

a. ROCE dependent variable

Table 4. Model summary (Panel EGLS (Cross-section random effects))

R-	Adjusted R-squared	S.E. of Regression	F	Prob	Durbin-Watson stat
0.32	0.284	53.140	8.6	0.000	1.967

Dependent Variable: DROCE. Predictors: constant variable: net current assets, quick ratio, absolute liquid ratio, debtors turnover ratio, creditors turnover ratio, collection efficiency, debt equity ratio and interest coverage ratio

H₉: There is a significant impact of liquidity and management efficiency on profitability of sample utilities in India.

The model summary of the regression test shown is shown in Table 4. The R-squared is 0.32 and adjusted R-Squared is 0.28, indicating that 28.40% of variables have been explained by independent variables in this specific model. The F-statistic is used to test the overall significance of model. The Durbin–Watson test statistic is use to detect the presence of auto correlation in this model. If the value of the test statistic is closer to 2, it means that there model has no auto correlation. The statistic test value of 1.96 indicating that he specific model is free from auto correlation. The joint effect of all coefficient is significant (F=8.66 at P=0.00) which means that overall liquidity and management efficiency impact the profitability of these utilities. Therefore the research hypothesis is significant at 5% level and therefore it is accepted.

Table 5. Summary of Hypotheses

Hypotheses	Significance Level	Alternate Hypotheses
QR	5%	Rejected
ALR	5%	Rejected
DTR	10%	Accepted
CTR	5%	Rejected
CE	5%	Accepted
ICR	5%	Accepted

The “Table 5” explains the summary of hypothesis. The research hypothesis is accepted for collection efficiently and interest coverage ratio at a 5% level of significance, while debtor’s turnover ratio is found to be significant at 0% level of significance. Further the other variables such as quick ratio, absolute cash ratio and creditor’s turnover ratio are found to insignificant at 5% and 10% level of significance.

Conclusion

The study has showed both positive and negative coefficient between the selected independent variables and return on capital employed. It shows quick ratio and absolute liquid ratio are not having a significant impact but showing a positive sign, indicating increase in liquidity will increase profitability. However, there is a significant impact of liquidity and management efficiency on profitability of power distribution utilities in India. Among all the variables in the study, managing debtors and collection efficiency should be the prime objective of power distribution utilities. The managers should also improve collection efficiency to avoid bad debts. The study suggests that management should reduce collection period and improve collection efficiency to increase profits. It should focus on strategies to fasten the collection period and reduce late payments.

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