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UNVEILING THE FINANCIAL NEXUS: EXPLORING THE RELATIONSHIP BETWEEN LIQUIDITY AND RETURNS IN THE INDIAN SUGAR INDUSTRY

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ABSTRACT

The liquidity and profitability trade-off has always been a very crucial aspect not only for the company directors but also for its other stakeholders. Managing current assets and current liabilities is the key to maintaining the highest level of profitability in the profitability and liquidity trade-off. The current study is aimed to measure and analyze the influence of liquidity on returns of the Sugar Companies listed in BSE. In the present study, secondary data from the annual statements of the selected sugar companies for the period 2018-2022 has been taken. The results of analysis showed a significant correlation between the liquidity and profitability.

Keywords: *Liquidity, Profitability, Working Capital Management, sugar industry, BSE.*

Introduction

While analyzing the company's performance in comparison to its competitors, we need to consider the financial ratios. There are numerous financial ratios to analyze the financial performance of the company viz. profitability ratios, liquidity ratios, solvency ratios, activity ratios, and valuation ratios. These ratios talk about the overall health of the company.

Profitability Ratios

Profitability ratios are a type of financial indicator that are used to evaluate a company's capacity to create earnings compared to its revenue, operational costs, balance sheet assets, or shareholders' equity over time, based on data from a certain moment in time.

Return of Assets (ROA)

Return of assets tells which company is utilizing its assets optimally. How fast any company can produce, utilizing its assets? A company producing more quantity with a faster pace will get higher returns on optimally

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utilizing its assets. There may be another company not utilizing its assets optimally, having idle assets. That company's return will eventually fall. Return on Assets (ROA) indicates the management efficiency of utilizing the company's capital which is invested in assets for generating profits (net income)(*Return on Assets- ROA*, n.d.).

The formula is calculated as:

Return on Assets = Net Income / Total Assets

Return on Equity (ROE)

Return on Equity talks about the return which the company generates by employing the equity investors' money. Return on Equity is considered the return on net assets. The ratio depicts the management's ability to optimally employ the investors' money in the firm and turn it into profits. (*Return on Equity ROE*, n.d.)

The formula is calculated as:

Return on Equity = Net Income / Shareholders' Equity

Return on Capital Employed (ROCE)

This ratio analyzes the amount of profit the management is able to earn on the capital employed in the firm. Return on Capital Employed in the most preferred ratio by the investors to check whether the entity is fit to invest in or not. The estimate tells investors how much the dollar will earn per dollar of their investment. Return on Capital Employed is considered a measure of long-term profit as it shows that assets are more efficient while considering long-term financing. This is why ROCE is a much more effective measure than a return on equity for long-term corporate evaluation.(*Return on Capital Employed ROCE* , n.d.)

The formula is calculated as:

Return on Capital Employed = Net Operating Profit / Employed Capital

Earnings Before Interest and Taxes (EBIT)

This ratio is the profitability indicator that examines the performance of the business's core activities without taking into account the influence of capital structure and tax charges on profit. Before net income, it is one of the last subtotals on the income statement. Operating margin can also calculated by dividing the EBIT by sales revenue (*EBIT - Earnings Before Interest & Taxes*, n.d.). The formula can be calculated as:

EBIT = Net Income + Interest + Taxes

Profit Before Tax (PBT)

This is the profit immediate before payment of taxes, but after including all operating and indirect expenses. This is also known as Earning Before Tax (EBT), or pre-tax profit. This gives the company's stakeholders a clear understanding of how much profit it is earning before paying taxes. It is one of the key performance matrices for the organization that discusses profitability. EBIT and PBT differs from each other by only one factor i.e., interest. PBT accounts interest , EBIT doesn't account for interest (*Profit Before Tax (PBT)* , n.d.).

The formula can be calculated as:

Profit Before Tax = Revenue – Expenses (Exclusive of the Tax Expense)

Net Profit Margin

This financial ratio illustrates how much of a company's revenue is converted into profit. It is a strong indicator of company's performance talking about its profitability. It is quantified as a percentage. A higher net profit margin ratio states that an organization is selling its goods and services a higher price and is able to cover its expenses easily. Whereas the low net profit margin states an uneconomical cost structure of the company, or poor pricing strategy. High costs (expenses), ineffective management, or a poor pricing strategy can contribute to a company's low net profit margin. This is crucial key indicator that an investors take into account before making the investing decision (*Net Profit Margin*, n.d.). The formula can be calculated as:

Net Profit Margin = Net Profit / Total Revenue * 100

Liquidity Ratios

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Liquidity ratios are a type of financial indicator that assesses a debtor's capacity to repay existing debt commitments without raising external capital. Liquidity ratios use variables such as the current ratio, quick ratio, and operational cash flow ratio to assess a company's capacity to meet debt obligations and margin of safety.

Current Ratio (CR)

This ratio is used to determine the firm's capacity to cover its current liabilities and costs. The ratio is calculated as:

Current Ratio = Current Assets / Current Liabilities

Quick Ratio (QR)

The quick ratio measures a company's ability to meet short-term liabilities with its most liquid assets and acts as a sign of its short-term liquidity situation. The ratio is calculated as:

Quick Ratio = Quick Assets / Current Liabilities

Quick Assets = Cash + Cash Equivalents + Marketable Securities + Net Accounts Receivable

The most liquid current assets that are readily convertible to cash are referred to as quick assets.

Literature Review

Al Nimer et al., (2015)investigated how liquidity affects the return on assets (ROA) as a way to quantify the relationship between liquidity and profitability. This study was conducted on the fifteen financial institutions for the period 2005-2011. The researcher took Quick Ratio as the predictor variable to study its impact on the Return on Assets as being response variable. The researcher used simple regression analysis as the analysis and validation tool. The study concluded that the Return on Asset is significantly influenced by the Quick Ratio.

Safdar et al., (2016) conducted research on the sugar industry to analyze what among the profitability and liquidity matters the most. This study investigated and analyzed the liquidity and profitability trade off. The study considered the means of “Return on Assets, Return on Equity, Return on Capital Employed” as the measures of profitability. The means of “Current Ratio, Quick Ratio, Absolute Liquid Ratio, Current Assets Turnover Ratio, Inventory Turnover Ratio, Average collection period” were taken as the representative of liquidity. The study considered 5-year data for the study. Analysis was done using “reliability analysis, descriptive analysis, multiple regression analysis, correlation and test of significance to test the causal linkage between liquidity and profitability”. The study discovered a significant association between profitability and liquidity. The study suggested that the management can improve the profitability by intelligently investing the liquid assets.

Malik et al., (2016) studied the trade-off between liquid and profitability among the financial institutions. The study considered the financial data of twenty-two private sector banks for the period 2009-2013. In the study profitability ratios viz., Return on Assets, Return on Equity, Return on Investment were taken as the explained variables whereas liquidity ratios viz., Current Ratio, Quick Ratio, Liquidity Ratio were chosen as the explanatory variables. The researcher formed the models and used Ordinary Least Square (OSL) technique for the analysis and validation of the research. The study found a negative association between profitability ratio and liquidity ratio and arrived at this conclusion.

Madushanka & Jathurika, (2018) sought to determine the influence of liquidity on the profitability of Sri Lankan manufacturing firms. The research was carried out on 15 manufacturing enterprises whose financial data was collected over a 5-year period. The study took “Return on Asset & Return on Equity” as the measure of profitability as the predicted variable. The predictor variables were the “Current Ratio and the Quick Ratio” as the representative of the liquidity. The study was analyzed and validated using the correlation and regression analysis. The results of the studies revealed that liquidity ratios, particularly the Quick Ratio, had a favorable or significant and considerable influence on the firm's profitability.

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Mohanty, (2018) investigated and looked into the correlation between liquidity and profitability of small and medium enterprises (SMEs) for which the researcher conducted the correlation analysis. Financial data of "28 Bombay Stock Exchange listed small and medium enterprises (SMEs)" for a period of 5-year was taken for the analysis. The intent of this study was to examine the influence of liquidity management on the profitability of SMEs, for which a regression analysis was carried out. The researcher took "Current Ratio, Quick Ratio, Cash Ratio" as the manipulated variables as being the representative of the Liquidity management. Net Profit Ratio (NPR), Return on Capital Employed (ROCE), Return on Assets (ROA) were taking as the measured variables being the profitability indicators of the SMEs. The correlation analysis showed a negative relationship between profitability and liquidity. Further pooled regression results showed that liquidity had a considerable influence on profitability.

Objective

To analyze the impact of liquidity on profitability performance of selected Sugar companies in India.

Null Hypothesis under test

H01:CR and QR is not affecting ROA
H02:CR and QR is not affecting ROE
H03:CR and QR is not affecting ROCE
H04:CR and QR is not affecting EBIT
H05:CR and QR is not affecting PBT
H06:CR and QR is not affecting Net Profit Margin

Research Methodology

This study adopts a quantitative explanatory approach. The sugar companies of India are selected for the study. This study analyses the financial ratios representing profitability and liquidity of 36 sugar companies. The sample selection is done based on the availability of data and listed in Bombay Stock Exchange (BSE). In the present study, secondary data from the annual statements of the selected sugar companies for the period 2018-2022 is taken. The required data was collected from Bombay Stock Exchange (BSE), Moneycontrol website, & official sites of companies.

Financial ratios were chosen as the representative measure of the performance of companies. The study analyses profitability and liquidity ratios. Current Ratio, Quick Ratio are taken as liquidity measures. Return of Assets (ROA) annual %, Return on Equity (ROE) annual %, Return on Capital Employed (ROCE) annual %, Earnings Before Interest and Taxes (EBIT) annual Margin %, Profit Before Tax (PBT) annual Margin %, Net Profit Margin annual % are taken as profitability measures.

Profitability indicators are implemented as dependent variables and liquidity indicators are independent variables for the present study. The dependent and independent variables are analyses and validated using descriptive statistics and correlation models. Panel regression analysis is used to find out cause and effect relationship between the independent and dependent variables. The study has developed the following six models to test the hypothesis.

Model 1.:RoAit=0+1CRit+2QRit+ut
Model 2.:RoEit=0+1CRit+2QRit+ut
Model 3.:RoCEit=0+1CRit+2QRit+ut
Model 4.:EBITit=0+1CRit+2QRit+ut
Model 5.:PBTit=0+1CRit+2QRit+ut
Model 6.:Net Profit Marginit=0+1CRit+2QRit+ut

Where,RoAit: Return on Assets of sugar companies i (i = 1, 2, 3,….,36) at a time t (t = 1, 2 …, 5 years)
RoEit: Return on Equity of sugar companies i (i = 1, 2, 3,….,36) at a time t (t = 1, 2 …, 5 years)
RoCEit: Return on Capital Employed of sugar companies i (i = 1, 2, 3,….,36) at a time t (t = 1, 2 …, 5 years)

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EBITit: Earnings Before Interest and Taxes of sugar companies i (i = 1, 2, 3,….,36) at a time t (t = 1, 2 …, 5 years)
PBTit: Profit Before Taxes of sugar companies i (i = 1, 2, 3,….,36) at a time t (t = 1, 2 …, 5 years)
Net Profit Marginit: Net Profit Margin of sugar companies i (i = 1, 2, 3,….,36) at a time t (t = 1, 2 …, 5 years)

0 is intercept, 1 and 2 are regression coefficient and ut is an error term which is independently normally distributed with mean zero and variance 2.
CR: Current ratio, QR: Quick Ratio.

Data Analysis

1. Descriptive Statistics of Profitability and Liquidity Indicator

Table 1. Descriptive Statistics

Serial No.		N	Minimum	Maximum	Mean	St D
1	RoA	180	-45.57	93.94	1.9298	10
2	RoE	180	-659.24	190.21	-6.7237	78
3	RoCE	180	-309.08	232.45	5.9472	46
4	EBIT	180	-58.10	29.07	5.5945	11
5	PBT	180	-84.20	146.85	2.0640	17
6	Net Profit Margin	180	-51.79	176.83	1.7362	17
7	Current Ratio	180	.20	4.00	1.0761	.6
8	Quick Ratio	180	.10	2.00	.3672	.3

The study has determined descriptive statistics of all the profitability and liquidity indicators. It is shown in Table 1. indicates that the mean value of Current Ratio is 1.0761 with minimum .20and maximum 4.00and standard deviation of .63. In case of Quick Ratio, standard deviation is .35 with mean value of .36, minimum of .10 and maximum of 2.00.
The descriptive statistics regarding profitability indicators showed in Table 1 indicates that the mean or average value of ROA is1.92with minimum value of-45.57and maximum value of 93.94with 10.05 standard deviation while mean value of ROE is -6.72with the standard deviation of 78.61also the minimum value and the maximum values are -659.24 and 190.21 respectively. In case of ROCE the minimum and the maximum values are -309.08 and 232.45 on the other hand the mean is 5.94 and standard deviation is 46.78. Furthermore, EBIT has shown the minimum value of -58.10 and the standard deviation of 11.15. Maximum value of EBIT is 29.07 with the mean value of EBIT is 5.59. The minimum and maximum values of PBT are -84.20 and 146.85 respectively, whereas the mean and standard deviation showed the value 5.59 and 11.15 respectively. In case of Net Profit Margin, the values of mean and standard deviation are 1.73 and 17.46 respectively with the minimum value of -51.79 and the maximum value of 176.83.

2. Correlation Analysis of Profitability and Liquidity Indicator

Table 2. Correlation Analysis of Profitability and Liquidity Indicator

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		RoA	RoE	RoCE	EBIT	P
RoA	Pearson Correlation	1	.398**	.122	.109	.9
	Sig. (2-tailed)		.000	.102	.146	.0
RoE	Pearson Correlation	.398**	1	.168*	.139	.4
	Sig. (2-tailed)	.000		.024	.063	.0
RoCE	Pearson Correlation	.122	.168*	1	.378**	.1
	Sig. (2-tailed)	.102	.024		.000	.0
EBIT	Pearson Correlation	.109	.139	.378**	1	.2
	Sig. (2-tailed)	.146	.063	.000		.0
PBT	Pearson Correlation	.911**	.441**	.137	.236**	1
	Sig. (2-tailed)	.000	.000	.066	.001	
Net Profit Margin	Pearson Correlation	.948**	.420**	.086	.081	.9
	Sig. (2-tailed)	.000	.000	.253	.279	.0
Current Ratio	Pearson Correlation	.275**	.204**	.208**	.499**	.3
	Sig. (2-tailed)	.000	.006	.005	.000	.0
Quick Ratio	Pearson Correlation	.120	.082	.057	.284**	.1
	Sig. (2-tailed)	.107	.272	.445	.000	.0
**. Correlation is significant at the 0.01 level (2-tailed).						
*. Correlation is significant at the 0.05 level (2-tailed).						

Result of correlation analysis in Table 2. observe that ROA is significantly correlated with Current Ratio with correlation coefficient.275 and corresponding p value .000 which is < .05 (level of significance) but not significantly correlated with Quick Ratio with correlation coefficient of .120 with corresponding p value .107 which is > .05 (level of significance). Similarly, ROE is significantly correlated with Current Ratio with correlation coefficient .204 and corresponding p value .006 which is < .05 (level of significance) but not

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significantly correlated with Quick Ratio with correlation coefficient .082 and corresponding p value .272 which is > .05 (level of significance). In the similar way ROCE is significantly correlated with Current Ratio with correlation coefficient .208 and corresponding p value .005 which is < .05 (level of significance) but not significantly correlated with Quick Ratio with correlation coefficient .057 and corresponding p value .445 which is > .05 (level of significance). EBIT is significantly correlated with both Current Ratio and Quick Ratio with correlation coefficient .499 and .284 respectively with corresponding p value .000 and .000 respectively which is < .05 (level of significance). Whereas, PBT is significantly correlated with Current Ratio and but not with Quick Ratio with correlation coefficient .312 and .144 respectively with corresponding p value .000 and .054respectively. Similar is the case with Net Profit Margin as it is also significantly correlated with Current Ratio and not with Quick Ratio with correlation coefficient .242 and .105 respectively with corresponding p value .001 and .161 respectively.

3. Panel Regression Analysis of Profitability and Liquidity Indicator

Regression analysis is used to find out cause and effect relationship between one dependent and several independent variables.

Model 1.:RoAit=0+1CRit+2QRit+ut

Table 3 Regression Coefficient of Model 1

Variable	Coefficient Estimate	Std. Error	t-value	Pr(>|t|)	Status
(Intercept)	4.0124	1.6087	-2.4942	0.01781	*
Current Ratio	8.6765	2.1821	3.9761	0.00036	***
Quick Ratio	-9.2441	3.9568	-2.3363	0.02570	*
R-Squared:0.35554, Adj. R-Squared: 0.31648					
F-statistic: 9.10293 on 2 and 33 DF, p-value: 0.00071073					

The Table 3 shows the summary of panel regression model 1.Firstly,the study performed analysis of variance to test the null hypothesisH01:1= 2=0 against the alternate hypothesis H11:Atleast one i is significant.Study obtained F-statistics 9.10293 with p values 0.00071073 which is less than 0.05 (level of significance).That means independent variable is contributing significantly in the model. The individual regression coefficients, t value and corresponding p values are mentioned in the table and study find that current ratio and quick ratio both are contributing significantly in this model. The study finds that Current ratio is positively affecting and Quick Ratio is negatively affecting ROA.

Model 2.:RoEit=0+1CRit+2QRit+ut

Table 4 Regression Coefficient of Model 2

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Variable	Coefficient Estimate	Std. Error	t-value	Pr(>|t|)	Status
(Intercept)	-45.516	11.233	-4.0521	0.0002902	***
Current Ratio	61.336	15.237	4.0255	0.0003129	***
Quick Ratio	-74.101	27.628	-2.6821	0.0113388	*
R-Squared:0.34328, Adj. R-Squared: 0.30347					
F-statistic: 8.62468 on 2 and 33 DF, p-value: 0.00097012					

The Table 4 shows the summary of panel regression model 2. Firstly, the study performed analysis of variance to test the null hypothesis H02:1= 2=0 against the alternate hypothesis H12:Atleast one i is significant.The study obtained F-statistics 8.62468 with p values 0.00097012 which is less than 0.05 (level of significance). That means independent variable is contributing significantly in the model. The individual regression coefficients, t value and corresponding p values are mentioned in the table and the study finds that current ratio and quick ratio both are contributing significantly in this model. Study also finds that Current ratio is positively affecting and Quick Ratio is negatively affecting ROE.

Model 3.:RoCEit=0+1CRit+2QRit+ut

Table 5 Regression Coefficient of Model 3

Variable	Coefficient Estimate	Std. Error	t-value	Pr(>|t|)	Status
(Intercept)	-19.510	11.339	-1.7206	0.09469	
Current Ratio	39.903	15.381	2.5943	0.01403	*
Quick Ratio	-47.608	27.890	-1.7070	0.09721	
R-Squared:0.1794, Adj. R-Squared: 0.12966					
F-statistic: 3.60714 on 2 and 33 DF, p-value: 0.038301					

The Table 5 shows the summary of panel regression model 3. Firstly, the study performed analysis of variance to test the null hypothesis H03:1= 2=0 against the alternate hypothesis H13:Atleast one i is significant.The study obtained F-statistics 3.60714 with p values 0.038301 which is less than 0.05 (level of significance). It can be seen that only one independent variable i.e., Current Ratio is contributing significantly in the model. The individual regression coefficients, t value and corresponding p values are mentioned in the table and the study also finds that Current ratio is positively and Quick Ratio is negatively affecting ROCE.

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Model 4.:EBITit=0+1CRit+2QRit+ut

Table 6 Regression Coefficient of Model 4

Variable	Coefficient Estimate	Std. Error	t-value	Pr(>|t|)	Status
(Intercept)	-7.1698	2.8202	-2.5423	0.0158896	*
Current Ratio	15.9549	3.8255	4.1707	0.0002067	***
Quick Ratio	-11.9952	6.9365	-1.7293	0.0931035	
R-Squared:0.43689, Adj. R-Squared: 0.40276					
F-statistic: 12.8013 on 2 and 33 DF, p-value: 7.671e-05					

The Table 6 shows the summary of panel regression model 4. Firstly, the study performed analysis of variance to test the null hypothesis H04:1= 2=0 against the alternate hypothesis H14:Atleast one i is significant.The study obtained F-statistics 12.8013 with p values 7.671e-05 which is greater than 0.05 (level of significance). It can be seen that only one independent variable i.e., Current Ratio is contributing significantly in the model. The individual regression coefficients, t value and corresponding p values are mentioned in the table and the study also finds that Current ratio is positively affecting and Quick Ratio is negatively affecting EBIT.

Model 5.:PBTit=0+1CRit+2QRit+ut

Table 7 Regression Coefficient of Model 5

Variable	Coefficient Estimate	Std. Error	t-value	Pr(>|t|)	Status
(Intercept)	-10.3275	2.3897	-4.3216	0.0001339	***
Current Ratio	17.3374	3.2416	5.3485	6.596e-06	***
Quick Ratio	-17.0617	5.8777	-2.9028	0.0065456	**
R-Squared:0.5135, Adj. R-Squared: 0.48401					
F-statistic: 17.4156 on 2 and 33 DF, p-value: 6.8689e-06					

The Table 7 shows the summary of panel regression model 5. Firstly, the study performed analysis of variance to test the null hypothesis H05:1= 2=0 against the alternate hypothesis H15:Atleast one i is significant.The study obtained F-statistics 17.4156 with p values 6.8689e-06 which is greater than 0.05 (level of significance). It can be seen that both independent variables i.e., Current Ratio and Quick Ratio are contributing significantly in the model. The individual regression coefficients, t value and corresponding p values are mentioned in the

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table and the study also finds that Current ratio is positively affecting and Quick Ratio is negatively affecting PBT.

Model 6.:Net Profit Marginit=0+1CRit+2QRit+ut

Table 8 Regression Coefficient of Model 6

Variable	Coefficient Estimate	Std. Error	t-value	Pr(>|t|)	Status
(Intercept)	-7.3830	2.4432	-3.0219	0.0048273	**
Current Ratio	13.1988	3.3140	3.9827	0.0003534	***
Quick Ratio	-13.8448	6.0092	-2.3039	0.0276613	*
R-Squared:0.35876, Adj. R-Squared: 0.3199					
F-statistic: 9.23144 on 2 and 33 DF, p-value: 0.00065438					
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1					

Table 8 shows the summary of panel regression model 6. Firstly, the study performed analysis of variance to test the null hypothesis H06:1= 2=0 against the alternate hypothesis H16:Atleast one i is significant.The study obtained F-statistics 9.23144 with p values 0.00065438 which is less than 0.05 (level of significance). It can be seen that both independent variables Current Ratio and Quick Ratio are contributing significantly in the model. The individual regression coefficients, t value and corresponding p values are mentioned in the table and the study finds that Current ratio is positively affecting and Quick Ratio is negatively affecting Net Profit Margin.

Conclusion

The present paper was aimed at investigating the influence of liquidity on returns. The study was conducted on the BSE Listed sugar companies. A sample of 36 sugar companies for the period of 5 years starting from 2018 to 2022 was examined. The data was analysed using correlation and panel regression modelling to study the cause-and-effect relationship between the profitability and liquidity indicators.

The result of correlation analysis showed a significant correlation between the liquidity and profitability. Especially the Current Ratio is seen to be significantly correlated with all the profitability indicators but Quick Ratio is found to be significantly correlated only with EBIT. Furthermore, the panel regression analysis showed that Current ratio is contributing significantly in each model. Quick Ratio was not found to be significantly contributing in the panel regression model 3 and 4.

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