ANWESH: International Journal of Management and Information Technology
10 (1) March 2025, 24-28
www.publishingindia.com/anwesh

The Effect of Liquidity and Leverage on Performance: A Study of BSE Listed Companies

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Abstract: The study represents an honest effort to investigate the effects of liquidity and leverage on Performance selected group of companies. The sample consists of thirteen companies from within energy sectors, mentioned on Bombay Stock Exchange. From 2009 to 2022, a fourteen-year span, data was collected from Capitaline database. The study considered Return on Assets Ratio (ROA) and Return on Equity Ratio (ROE) as the key financial performance indicators. Additionally, it considered Debt to Equity Ratio (DER), Current Ratio (CR), Long-Term Debt to Total Assets Ratio (LTDTA), and Quick Ratio (QR), as representation of Liquidity and Leverage variables respectively. To achieve the research objectives, various statistical tools including descriptive analysis, correlation and regression analysis were employed. The study's findings reveal that higher liquidity as indicated by strong current and quick ratios, is associated with improved returns on both assets (ROA) and equity (ROE). Conversely, excessive leverage, measured by a high debt-to-equity ratio, negatively impacts ROA and ROE.

Keywords: Firm performance, Leverage, Liquidity.

I. Introduction

Profitability is a fundamental and pivotal concept in business, serving as a cornerstone of a company's financial health and success. It essentially measures the substantial variance between a company's revenue and expenses, serving as a litmus test for its capacity to generate robust earnings. For any firm, regardless of its scale or industry, the maximization of profitability stands as a paramount and primary objective. Profits, in essence, not only ensure the complete survival of a company but also nurture its potential for vigorous growth, expansion and sustainable development. The symbol of a truly efficient and effective management team lies in its proficiency at obtaining profit from each aspect and gradation of its multifaceted business operations.

The financial trustworthiness, stability and reliability of a company's fiscal standing are considerations of utmost importance to an array of stakeholders. Among these stakeholders, creditors, both those with short-term and long-term vested interests, eagerly seek flawless assurance regarding the firm's steady ability to meet and discharge its involved financial obligations with firm precision. As for the owners of the company, their monetary investments, often substantial, center upon the expectation of a convincing and unbiased return on investment- a return that should ideally bear evidence to the prudence of their financial commitment. Meanwhile, the attentive and intelligent managers of the company harbor a keen interest in the meticulous evaluation of its operational efficiency, the linchpin in ensuring that the anticipated and projected return on investment manifests itself at the expected rate, yielding favorable returns. This subtle balance between owner expectations, operational efficiency and financial stability finds itself refined and captured within the realm of profitability ratios- a dynamic and multifaceted metric that unfailingly exposes the financial vitality, resilience and performance of the corporate entity.

There is another vital field within the domain of corporate finance i.e., liquidity. It is an essential and exceptional component of company's economic structure. Liquidity is a crucial concept of financial analysis, which represents company's competence to meet its short-term financial compulsions efficiently and without loss of significant value. It evaluates the effortlessness with which assets can be converted into cash and immediate liabilities can be settled. It is essential for the investors, creditors and management to understand a company's liquidity position as it directly impacts financial stability and risk management. The liquidity measures, such as the current ratio and liquidity ratio, help stakeholders evaluate whether a company possesses sufficient easily accessible resources to meet its near-term financial obligations, and also help in investment decision and strategic

planning. Eventually, the optimum balance of liquidity is essential for sustaining operations, responding to unforeseen financial challenges and pursuing growth opportunities in the dynamic world of finance.

Leverage is a critical concept in financial analysis that gauges how much a company uses debt or borrowed capital to finance its operation and investments. It plays a pivotal role in assessing a company's risk and return profile. Leverage magnifies both profits and losses ironic weapon for businesses. On one hand, when investments outperform borrowing costs, leverage may enhance shareholder returns. However, excessive leverage can increase financial risk, as the company has to meet interest and principal payments even in financial crisis. Therefore, it is vitally important to judge the company's leverage ratios such as debt-to-equity and interest coverage, which estimate its financial stability and ability to manage investment decisions, and assessing a company's long-term viability.

Liquidity and leverage both have significant impact on profitability. Therefore, balancing liquidity and leverage is very much crucial for augmenting profitability. A very high liquidity may result in idle cash which gives no returns, while excessive leverage can lead to financial instability and reduced profitability if the returns on borrowed capital fall short of expectations. In this investigation, an honest attempt was carried out to investigate effects of liquidity and leverage on chosen companies' profitability.

II. Literature Review

Yuliyanti and Syarif [1] researched effects of leverage and liquidity on the firm value of retail companies of Indonesia. The study observed that liquidity (CR), activity (TATO) and leverage (DER) don't significantly affect company value in the IDX retail subsector from 2015-2020. Further, in same subsector and time frame, it was also claimed that profitability (NPM) significantly and favorably affects company value.

In Bauer's [2] study, an investigation was undertaken to explore correlation between firm's capital structure and performance. Bigger firms tended to utilize higher debt levels in their capital structure, in accordance to the study, which found a positive association between company size and leverage. Study also uncovered a positive correlation between firm size and leverage. Additionally, leverage showed a positive association with tax benefits. Conversely, non-debt tax shields, profitability and tangibility exhibited a negative correlation with leverage.

In Leon's [3] study, it was asserted that leverage exhibits a negative correlation with Return on Equity (ROE). Additionally, Leverage and ROA were shown to have a significant negative association.

Abor [4] revealed a noteworthy connection between financial leverage and profitability. His study illuminated that the utilization of short-term debt had a beneficial impact on company profitability. The research's findings indicated significant positive association between return on equity (ROE) and percentage of short-term debt to total assets. Moreover, analysis found significant positive association between ROE and ratio of total debt to total assets.

Mwangi and Birundu [5] investigated how capital structure affected small and medium-sized businesses' (SMEs') financial results. The research was carried out for duration of five years, considering 40 SMEs operating in Thika sub-county, Kenya. Investigation found no significant impact of assets turnover, capital structure, and assets tangibility on selected companies' financial performance.

In Saleem *et al.* [6], the primary objective was to examine impact of leverage on profitability of selected group of oil and gas companies operating in South Asian countries. Research indicated both operating and financial leverage have substantial and statistically significant impact on the profitability ratios of these companies.

Muritala [8] performed research to evaluate association between firm performance of capital structure, and selected companies in Nigeria. Study revealed that ROA is positively associated with asset turnover, size age and tangibility. In contrast to this study Salim and Yadav [7] revealed a negative correlation between ROA and Return on Equity while also identifying a positive correlation between Tobin's Q and financial leverage.

The study of Kothari and Sodha [9] aims to examine the connection between profitability and liquidity as well as impact of financial leverage and liquidity on financial performance of certain pharmaceutical companies. The findings indicate that a company's liquidity affects the firm's capital structure. However, the study did not reveal any significant influence of leverage on capital structure, and profitability.

III. Objective and Methodology

This study represents an honest attempt to explore relationship among liquidity, leverage, and the performance of selected companies belonging to energy sector listed on the Bombay Stock Exchange. The study considers data for a period of fourteen (14) years from 2009 to 2022 from thirteen (13) power generation companies. The data for study was gathered from 'CAPITALINE' database. To accomplish the objectives, the study considers Return on Equity (ROE) and Return on Assets (ROA) as dependent variables and Current Ratio (CR), Quick Ratio (QR), Debt Equity Ratio (DER) and Long-Term Debt to Total Assets (LTDTA) as independent variables.

Hypothesis

H_0: There is negative impact of Liquidity and Leverage on Firm Performance.

H_1: There is positive impact of Liquidity and Leverage on Firm Performance.

The research studies the relationships between liquidity, solvency and firm performance. The achieve the objectives,

diagnostic approach was established into Panel Regression Model, incorporating both fixed and random effects. Hausman test was utilized to select the appropriate model. The models are:

Return on Equity (ROE)

$$ROE_{it} = \alpha_0 + \alpha_1(CR)_{it} + \alpha_2(QR)_{it} + \alpha_3(DER)_{it} + \alpha_4(LTDTA)_{it} + \varepsilon_{it}$$

Return on Assets (ROA)

$$ROA_{it} = \beta_0 + \beta_1(CR)_{it} + \beta_2(QR)_{it} + \beta_3(DER)_{it} + \beta_4(LTDTA)_{it} + \varepsilon_{it}$$

Where,

ROE = Return on Equity

ROA = Return on Assets

DER = Debt – to- Equity Ratio

LTDTA = Long-Term Debt to Total Assets Ratio

$\boldsymbol{\varepsilon_{it}}$ = Error

α_0, β_0 = intercept

α_i, β_i = regression coefficients

Table I: Descriptive Statistics

	ROE	ROA	CR	QR	DER	LTDTA
Mean	14.96104	7.265165	0.985523	1.286306	0.686291	0.204757
Median	13.555	6.535	0.82	0.938113	0.505	0.17036
Minimum	1.4	0.42	0.3	0.151432	0	0
Maximum	34.91	19.4	2.87	5.959261	2.48	0.574998
Standard Deviation	6.158608	3.92215	0.523686	1.074692	0.651105	0.150407
Count	182	182	182	182	182	182

Source: Compiled through MS Excel.

IV. Analysis and Interpretation

Outcomes of descriptive analysis indicates that mean ROE approximately 14.96%, indicates that on average companies generate a return of 14.96% on their equity. The minimum (1.4) ROE and maximum (34.91) ROE indicates a wide range of performance among the companies. The companies generate 7.27% return on their assets. The average current ratio of 0.99 indicates that for every unit of current liabilities, companies' current assets are nearly equal to 1 unit. The average quick ratio of 1.29 denotes that the companies have more than enough quick assets to cover their current liabilities. The mean debt-to-equity ratio is approximately 0.69 indicating that on average companies have a moderate level of debt with respect to its equity. The minimum debt-to-equity ratio is 0, indicating that some companies have no debt while the maximum is 2.48. The companies have low level of long-term debt in relation to their total assets.

Table II: Correlation Analysis

	ROE	ROA	CR	QR	DER	LTDTA
ROE	1					
ROA	0.73	1				
CR	0.02	0.24	1			
QR	-0.05	0.27	0.71	1		
DER	-0.19	-0.66	-0.26	-0.31	1	
LTDTA	-0.16	-0.42	-0.17	-0.11	0.65	1

Source: Compiled through MS Excel.

The correlation matrix indicates that ROE and ROA have substantial positive relationshipof 0.731. ROE has very low degree of negative correlation with QR (-0.056), DER (-0.196) and LTDTA (-0.163) while negligible positive relationship with CR (0.027). ROA has a significant negative relationship with DER (-0.668) and moderate degree of negative correlation with LTDTA (-0.429). ROA has low degree of correlation with CR (0.241) and QR (0.274). Current ratio and quick ratio both are negatively correlated with DER and LTDTA. DER has strong positive correlation with LTDTA.

Table III: Multicollinearity Test

	Coefficients	t Stat	P-Value	VIF
Intercept	16.7896	13.290	2.1E-	
CR	1.35613	1.1018	0.2720	2.0652
QR	-1.20118	-1.950	0.0526	2.1768
DER	-2.0316	-2.117	0.0356	1.9404
LTDTA	-1.102	-0.27	0.783	1.796

Source: Compiled through MS Excel.

To mitigate potential bias in the regression models caused by multicollinearity, this study incorporates multicollinearity tests. Table III displays results of these tests. This is observed from findings that all Variance Inflation Factor (VIF) values are below 5, indicating that the selection of variables is sound, and multicollinearity is not a concern.

Table IV: Diagnostic Test

Redundant Fixed Effects-Likelihood Ratio Test (F-Test)						
	ROE MODEL			ROA MODEL		
Effect Test	Statistics	d.f.	Prob.	Statistics	d.f.	Prob.
Cross-section F	13.30015	(12,165)	0.0000	19.223597	(12,165)	0.0000
Cross-section Chi-Square	123.151	12	0.0000	159.18964	12	0.0000
Hausman Test						
	ROE MODEL			ROA MODEL		
Test Summary	Chi. Sq. Statistics	Chi. Sq. d.f.	Prob.	Chi. Sq. Statistics	Chi. Sq. d.f.	Prob.
Cross-section random	11.02045	4	0.0263	3.82628	4	0.4300

Source: Eviews 9 software output.

In this research study, an evaluation was conducted to select the suitable regression model between Pooled Ordinary Least Square (POLS) and Fixed Effect Model (FEM). To make this decision, Redundant Fixed Effects-Likelihood Ratio was employed. Test findings showed that both p-values associated with the cross-section F-statistics and the cross-section chi-square statistic were less than 0.05 for both regression models. Consequently, null hypothesis has been rejected for both regression analysis. Consequently, fixed effect model was chosen as the preferred model and it was employed with the dependent variables being ROE and ROA.

Following this, the study applied the Hausman test to decide between FEM and REM. Hausman test results yielded p-value of 0.0263 for the model with ROE as dependent variable and a p-value of 0.4300 for model having ROA as dependent variable. The p-value (0.0263) of model ROE do not exceed the commonly used significance threshold of 0.05, there is insufficient evidence to accept the null hypothesis in favor of alternative hypothesis. Therefore, FEM has been choosen for the model with ROE as dependent variable. The Hausman test for ROA model suggests to select Random Effect Model as its p-value (0.430) exceeds level of significance of 0.05, Consequently, there is not enough data to rule out alternative hypothesis and reject null hypothesis. Therefore, Random Effect Model was chosen for additional evaluation for the ROA model.

Table V: Regression Analysis

Variable	ROE			ROA		
Model Selected	Fixed Effects Model			Random Effects Model		
	Coefficient	t-Statistics	Prob.	Coefficient	t-Statistics	Prob.
C	17.71392	11.70144	0.0000	9.213482	9.783177	0.0000
CR	3.255913	2.587675**	0.0105	2.26736	4.177978***	0.0000
QR	-1.35586	-1.97502**	0.0499	-0.55605	-1.90064*	0.0590
DER	-8.62645	-6.55228***	0.0000	-4.28274	-7.88210***	0.0000
LTDTA	8.315483	1.807129*	0.0726	-2.58059	-1.31963	0.18887
R^2	0.522813			0.432269		
Adjusted R^2	0.476541			0.419438		

Note: *=significant at 10% level; **=significant at 5% level; ***=significant at 1% level.Source: Eviews 9 software output.

Model 1

The fixed effects model regression results recommend that selected independent variables have varying degrees of influence on dependent variable, ROE. The current ratio (CR) exhibits a positive correlation of 3.26, indicating that an increase in the current ratio correlates with an increase in ROE, a relationship that is statistically significant at the 5% level. The debt-to-equity ratio (DER) exhibits a negative coefficient of -8.63, indicating that increased debt relative to equity correlates with diminished ROE, a relationship that is statistically significant at the 5% level. The quick ratio (QR) adversely affects ROE, with a coefficient of -1.36, indicating that a decline in the quick ratio correlates with a fall in ROE, a relationship that is statistically significant at the 0.05 level. The LTDTA does not exhibit a statistically significant effect on ROE, with a p-value of 0.0726. The R-squared value of 0.52 signifies that it accounts for nearly 52% of the variation in ROE, while the adjusted R-squared

value of 0.48 indicates that this model explains a substantial portion of the variability, taking into account the number of predictors.

Model 2

The random effects model demonstrates various significant associations between independent variables and the dependent variable (ROA). Current ratio (CR) exhibits a positive relationship with ROA with a coefficient of 2.26736 and a t-statistic of 4.177978, suggesting that an increase in current ratio is related to significant increase in ROA. Debt to Equity ratio has a negative effect on ROA, with a coefficient of -4.28274 and a t-statistic of -7.88210, implying that higher levels of debt relative to equity lead to lower ROA. Quick ratio (QR) also negatively affects ROA but is only marginally significant (p-value = 0.059). The LTDTA does not appear to have statistically significant effect on ROA. Overall, the model has an R-squared value of 0.432269, suggesting that these variables collectively explain 43.23% of the variance in ROA and the adjusted R-squared is 0.419438, indicating a good fit for the model.

V. Conclusion

Model 1 focuses on return on equity (ROE), the results suggest that liquidity and leverage have substantial influence on selected companies' financial performance throughout the research period. Specifically, the positive coefficient for the current ratio (CR) indicates that higher liquidity, as determined by CR tends to result in higher ROE. Conversely, the negative coefficient for the debt-to-equity ratio (DER) suggest that higher leverage represents by DER, is associated with lower ROE. Additionally, the negative impact of the quick ratio on ROE emphasizes the importance of maintaining adequate liquidity to achieve higher ROE. However, no statistically significant impact of LTDTA on ROE. However, in model 2, the CR have positive effect on ROA, indicating that higher liquidity is related to improved asset efficiency. Conversely, the debt-to-equity ratio (DER) negatively impacts ROA, emphasizing the adverse effect of higher leverage on asset performance. Although, quick ratio negatively influences ROA.

Considering the above findings from both the models, it is clear that maintaining a balanced level of liquidity is important for enhancing both ROA and ROE. Excessive leverage, as demonstrated by high DER, negatively affects both measures of financial performance. Therefore, companies should be cautious when taking on additional debt relative to equity, as it may lead to diminished profitability. It is essential for organizations to achieve stability between these factors to achieve their financial performance objectives.

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