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Trade off between Liquidity and Profitability

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Abstract

The study investigates the trade off between liquidity and profitability in the five sectors of Pakistan (Chemical, Fuel & Energy, Paper-Board & Products, Food (Sugar) Sector & Cement Sectors). The central objective is to understand the relationship between liquidity and Profitability in a profit driven Business to the nature and extent of the relationship between them. Further, to find the balance of the conflicting objectives of liquidity and profitability and to determine whether a functional relationship exists between Liquidity & Profitability and then estimate whether or not both reinforce each other or not.

Liquidity measures are Current, Quick, Interest Coverage, and Debt to Equity, Creditors, and Stock & Receivables Turnover while the profitability measure was the Return on Assets. Investigation and quantitative analysis methods were used for the study. Analysis is based on data extracted from BSA and the accounts of the companies for the relevant period. Correlation and Panel regression analysis, respectively, are employed to examine the nature and extent of the relationship between the variables and determine whether any cause and effect relationship between them.

An Econometric model of perceived functional relationship is specified, estimated and evaluated. Evaluation is based on relevant statistics of Panel regression result. The results show that all the measures of liquidity except Debtors Turnover and Debt to Equity Ratio are contributing positively towards the profitability of the firms. So all these things show that if the firm has sound liquidity, then it will ultimately lead towards the profitability because by this the company would be able to generate the spontaneous financing. However, the findings of this paper are based on a study conducted on the selected company only. Hence, the results are not generalizable to other companies. Secondly, the sample comprises the five sectors. Therefore, the results are valid for those Sectors only.

Key Words: Liquidity, Profitability, Relationship

1. Introduction

The relationship between liquidity and profitability has remained a source of disagreement among experts, researchers, professional financial analysts and even managements of profit- oriented businesses. Therefore,

views on the actual relative importance of each in business enterprises have continued to differ.

Liquidity is a basic thing to ensure that firms are able to meet its short-term obligations. The liquidity position in a company is measured based on the 'current ratio' and the 'quick ratio'. The current ratio establishes the relationship between current assets and current liabilities. Normally, a high current ratio is considered to be an indicator of the firm's ability to promptly meet its short term liabilities. The quick ratio establishes a relationship between quick or liquid assets and current liabilities. An asset is liquid if it can be converted into cash immediately or reasonably y soon without a loss of value. Low liquidity leads to the inability of a company to pay its creditors on time or honor its maturing obligations to suppliers of credit, services and goods. This could result in losses on account of non-availability of supplies and lead to possible insolvency. Also, the inability to meet the short term liabilities could affect the company's operations and in many cases it may affect its reputation as well. Inadequate cash or liquid assets on hand may force a company to miss the incentives given by the suppliers of credit, services, and goods as well. Loss of such incentives may result in higher cost of goods which in turn affects the profitability of the business. Every stakeholder has an interest in the liquidity position of a company. Suppliers of goods will check the liquidity of the company before selling goods on credit. Employees should also be concerned about the company's liquidity to know whether the company can meet its employee related obligations, i.e., salary, pension, provident fund, etc. Thus, a company needs to maintain adequate liquidity.

Profitability is a measure of the amount by which a company's revenues exceed its relevant expenses. Profitability ratios are used to evaluate the management's ability to create earnings from revenue-generating bases within the organization. The profitability position of a company is measured using the Return on Assets. Before proceeding, the study defines the variables in the following way.

Return on Assets (ROA)

An indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings. Calculated by dividing a company's annual earnings by its total assets, ROA is displayed as a percentage. Sometimes this is referred to as "Return on investment". The formula for return on assets is:

Net Income/ Total Assets

Current Ratio

A liquidity ratio that measures a company's ability to pay short-term obligations. It is also known as "liquidity ratio", "cash asset ratio" and "cash ratio". The Current Ratio formula is:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Quick Ratio

An indicator of a company's short-term liquidity. The quick ratio measures a company's ability to meet its short-term obligations with its most liquid assets. The higher the quick ratio, the better the position of the company. It is also known as the "acid-test ratio" or the "quick assets ratio".The quick ratio is calculated as:

$$\text{Quick Ratio} = \frac{\text{Current Assets- Inventories}}{\text{Current Liabilities}}$$

Debt to Equity Ratio

A measure of a company's financial leverage calculated by dividing its total liabilities by stockholders' equity. It indicates what proportion of equity and debt the company is using to finance its assets.

$$\text{Debt to Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Shareholder's Equity}}$$

Note: Sometimes only interest-bearing, long-term debt is used instead of total liabilities in the calculation. It is also known as the Personal Debt/Equity Ratio, this ratio can be applied to personal financial statements as well as corporate ones.

Interest Coverage Ratio

A ratio used to determine how easily a company can pay interest on outstanding debt. The interest coverage ratio is calculated by dividing a company's earnings before interest and taxes (EBIT) of one period by the company's interest expenses of the same period:

$$\text{Interest Coverage Ratio} = \frac{EBIT}{\text{Interest Expenses}}$$

Inventory Turnover

A ratio showing how many times a company's inventory is sold and replaced over a period. The days in the period can then be divided by the inventory turnover formula to calculate the days it takes to sell the inventory on hand or "inventory turnover days." It is calculated as:

$$\text{Inventory Turnover} = \frac{Sales}{\text{Inventory}}$$

Creditors Turnover

A short-term liquidity measure used to quantify the rate at which a company pays off its Suppliers. Accounts payable turnover ratio is calculated by taking the total purchases made from suppliers and dividing it by the average accounts payable amount during the same period.

$$\text{Accounts Payable Turnover} = \frac{\text{Total Supplier Purchase}}{\text{Average Accounts Payable}}$$

Debtors Turnover

An accounting measure used to quantify a firm's effectiveness in extending credit as well as collecting debts. The receivables turnover ratio is an activity ratio, measuring how efficiently a firm uses its assets. It is calculated as:

$$\text{Average Receivables Turnover} = \frac{\text{Net Credit Sales}}{\text{Average Accounts Receivables}}$$

Thus, a financial manager has to ensure, on one hand, that the firm has adequate cash to pay for its bills, has sufficient cash to make unexpected large purchases and cash reserve to meet emergencies, while on the other hand, he has to ensure that the funds of the firm are used so as to yield the highest return. This poses a dilemma of maintaining liquidity or profitability.

The liquidity and profitability goals conflict in most decisions which the finance manager makes. For example, if higher inventories are kept in anticipation of the increase in prices of raw materials, profitability goal is approached, but the liquidity of the firm is endangered. Similarly, the firm by following a liberal credit policy may be in a position to push up its sales, but its liquidity decreases. Similarly, there is a direct relationship between higher risk and higher return. A company taking higher risk could endanger its liquidity position. However, if a company has a higher return, it will increase its profitability. Consequently, a firm is required to maintain a balance between liquidity and profitability in the conduct of its day-to-day operations. Investments in current assets are inevitable to ensure delivery of goods or services to the ultimate customers. A proper management of the same could result in the desired impact on either profitability or liquidity. This suggests that a relationship exists between liquidity and profitability in a business organization.

This study analyses the liquidity and profitability ratios of 5 Sectors of Pakistan over an eleven- year period. The companies are selected from the Chemical, Fuel & Energy, Paper-Board & Products, and Food (Sugar) Sector & Cement Sectors. To understand the relationship between liquidity and Profitability in a profit driven Business. The study is structured into five sections. Following this introduction is section two which is a review of related literature. Section three discusses the methodology employed in carrying out the study. Section four dwells on analysis and discussion of results while the last section concludes the study and give recommendations capable of enhancing policy and investment decisions.

Significance of Chemical Sector:

The Study has chosen the Chemical Sector because:

- Chemical sector plays a fundamental role in the economic development of any nation.

  The global business of chemical forms the structure of the modern world. It converts essential raw materials into more than 70,000 various products, for industry as well as the goods to consumers that people depend on in their daily life.
- Pakistan's market for industrial chemicals is expanding gradually though it has a less- well developed commercial chemical industry than India.
- As was stated in the Pakistan trade policy 2010, "In order to address our strategic objective of product diversification for Pakistan's exports our government aims to provide a clear policy framework for the development of the chemical sector."
- Chemical industry in Pakistan is widespread, in the organized & unorganized sector.
- It has an approximation of investment in chemical sectors between Rs.550-600 billion.
- The chemical related imports constitute about 17% of the total import bill.

Significance of Food Sector

The study has chosen the Food Sector because:

- Being a labor-intensive, agriculture based country; it is no surprise that the food industry employs over 20 percent of the country's working population.
- Approximately 75% population consists of farmers, orchard men, cattle men, fishermen and others involved in the production of raw materials.
- Pakistan stands among the top ten citrus fruit producer in the world and amongst the top five in mango production.
- It is estimated that 30-40 % of the fruit goes to waste due to post harvest losses.

Significance of Fuel & Energy Sector

The study has chosen the Fuel & Energy Sector because:

- Pakistan achieved gross domestic product (GDP) growth of 8.4 percent and in 2005/2006 the country had GDP growth of 6.6 percent.
- According to an impact assessment carried out for the European Commission, the levels of energy efficiency of coal-fired plants built have now increased to 46-49% efficiency rates, as compared to coal plants built before the 1990s (32-40%).
- However, at the same time gas is can reach 58-59% efficiency levels with the best available technology.

Meanwhile combined heat and power can offer efficiency rates of 80-90%.

Significance of Cement Sector

The study has chosen the Cement Sector because:

- In 1947, Pakistan had inherited four cement plants with a total capacity of 0.5 million tons.
- Some expansion took place in 1956–66 but could not keep pace with the economic development and the country had to resort to imports of cement in 1976–77 and continued to do so till 1994–95.
- The cement sector consisting of 27 plants is contributing above Rs 30 billion to the national exchequer in the form of taxes.
- The Cement sector of Pakistan has 23 players, operating 29 units, with a total production capacity of 44.8 million tons, divided into North and South.
- The overall capacity utilization of the sector, as per FY-10 dispatches is at 76%.
- The basic raw materials for cement include limestone (up to 80%), clay (up to 15%) and gypsum (5%), all of which are abundant in Pakistan making the basic raw material very cheaply available to cement manufacturers.

Significance of Paper, Board & Products

The study has chosen the Cement Sector because:

- The Plastic Industry registered a phenomenal growth during the last few years.
- The industry attracted 260 Billion Dollars of investment in Pakistan, almost half of which were in the form of FDI.
- All these things contribute towards an exceptional Export Growth by 35%.

2. Literature Review

In spite of such a great importance of liquidity-profitability trade-off, it is strange that so long it could not draw towards as much mindfulness of the researchers as it desires. A brief review of the different researchers' work is attempted to site in the following paragraphs.

Survey of working capital management shows that earlier research efforts attempted to develop the models for optimal liquidity and cash balances for the firms so that their liquidity will not get sacrificed. In this category Owolabi, S. A. (2011) has investigated the relationship between liquidity and profitability in selected quoted companies in Nigeria by using Correlation and regression analysis to examine the nature and extent of the relationship between the variables and determine whether any cause and effect relationship between them.

Similarly Dr. Amalendu Bhunia (2011) tried to identify the effectiveness of working capital in terms of short-term liquidity of the private sector steel companies in India and the results reveales that correlation and regression results are significantly positive. Thus, firm manger should concern on inventory and receivables in the purpose of creating shareholder wealth. So he emphasize that managers must focus on the inventory, receivables and payables for the purpose of managing the liquidity for a firm.

Amalendu Bhunia (2012) examined the impact of liquidity on profitability of the FMCG companies in India by using Normality test, descriptive statistics, correlation statistics and linear regressions and results show that there are relationships exist between variables of the liquidity management and profitability of the firm.

Profitability and Liquidity have been discussed and analyzed extensively in the literature because the immediate survival of a business depends on its liquidity, its long-term survival; growth and expansion depend on profitability. Thus, liquidity ensures short-term survival, and profitability ensures long-term survival. Both are, therefore, important for any company to survive.

Renato Schwambach Vieira (2010) analyzes the relationship between liquidity and profitability in a group of companies comprising the major airline carriers in the world between 2005 and 2008. The results show a significant positive correlation between liquidity and profitability in the short run, contradicting the main literature. For the medium run it was confirmed that the relationship is positive. It was observed that in almost 2/3 of the cases, companies with a bad indicator of profitability or liquidity faced a deterioration of the other indicator. Thus and equilibrium between liquidity and profitability seems to be a condition for financial stability over the medium run. Finally, it was observed that during the year of 2008 companies with a high liquidity indicator had a much better performance than the less liquid companies.

Similarly, Mihir Dash and Rani Hanuman proposed a goal programming model for working capital management. The results of the model suggest that working capital, and inventory in particular, should be streamlined to profitability. In particular, the relationship between different components of working capital, fixed assets, sales, and profits needs to be examined in greater depth and modeled accordingly to achieve the desired targets of profitability.

Farzaneh Nassirzadeh, conducted the research on Tehran Stock Exchange to study the relationship between traditional and modern indices of liquidity with profitability of companies and correlation between these indices

was also studied. The research findings show that there is a correlation between traditional and modern indices of liquidity, but this correlation is weak, suggesting that the information content of these ratios are different. Thus, it is recommended to use modern indices as complement.

Mathias Bernard Baveld (2012) investigated how publicly listed firms in The Netherlands manage their working capital. The working capital policies of firms during the non-crisis period of 2004-2006 and during the Financial Crisis of 2008 and 2009 are compared. This comparison investigates whether companies have to change their non-crisis working capital policies when the economy is in a recession. The results indicate that in crisis periods, in the short run, firms don't need to change their working capital policy concerning accounts payables and inventory, if their goal is to enhance profit because during a crisis accounts receivables have a positive effect on a firm's profitability for the next year. On the long-term, benefits of aiding customers during crisis periods are likely to grow, because future sales will still be there.

David M. Mathuva (2010) conducted the study to check the impact of Working Capital management on firm's profitability by using a panel data for the periods 1993 to 2008. He used a sample of 30 firms which are listed on Narobi Stock Exchanges and found that management can create value for their shareholders by increasing inventory, reducing the number of days account receivables and by making late payments to their creditors. He also pointed out that firms can increase its profitability by shortening the cash conversion cycle.

Dr. Parmil Kumar (2012) found that there is a tradeoff between liquidity and profitability by taking 5 years data of Bharti Airtel Ltd, for the periods 2006 to 2011. He focuses on managing current assets and current liabilities so that it will have to make a good influence on profitability. The bottom line is to establish equilibrium between liquidity and profitability.

Yusuf Aminu (2012) investigated the relationship between liquidity and profitability for working capital management in Nigeria's manufacturing sector by using different liquidity and profitability ratios. He focused on balancing the liquidity profitability so that optimum management of working capital would obtain. Vivek Sharma (2011) did an analysis on liquidity, risk and profitability conditions of Maruti India Ltd by making rank correlation and report that company is earning good profit with moderate liquidity and high risk.

Dr. Amalendu Bhunia (2011) studies short term liquidity management perspective of working capital management of private sector steel companies in India by using panel data for the periods 1997 to 2006 and reports that there is a relationship between liquidity and profitability. He finds that firm manger should concern on inventory and receivables in the purpose of creating shareholder wealth.

Sebastian Ofumbia UREMADU (2012) studied working capital management, liquidity and corporate profitability among quoted firms in Nigeria from Productive Sector by using cross-sectional time series data covering 2005-2006. He takes all components of working capital as substitute of liquidity to measure their impact on profitability of Nigerian's firms. Mohamed Zaheeruddin, (2013) studied liquidity profitability tradeoff of multinational corporations by considering inventory management practices and finds that all multinational companies have to survive harder than the national corporations to meet the competitive era.

Qasim Saleem (2011) studied the impacts of liquidity ratios on profitability by using a panel data for the periods 2004 to 2009 of 26 firms which traded their securities on Karachi Stock Exchange. Nasruddin Zainudin (2006) has conducted a study on the liquidity profitability trade off to get evidence from Malaysian SMEs by using data extracted from the annual financial statements, from 1999 to 2003, of 145 SMEs in the manufacturing sector. The study focuses to find out the liquidity level to confirm that the liquidity level vary from industry to industry and even from one company to another depending on that company's size.

Abdul Raheman and Mohamed Nasr (2007) studied the impact of different components of working capital on firm's liquidity and profitability by taking the sample of 94 Pakistani companies listed on Karachi Stock Exchange from 1994 to 2004 and report a negative relationship between components of working capital and corporate profitability. Bordereau, E. and Graham, C. (2010) analyze the impact of liquid asset holdings on bank profitability for a sample of large U.S. and Canadian banks (1997 to 2009) and results indicate that profitability has been improved for banks (In US and Canada) that hold more liquid assets, however, there is a point at which holding further liquid assets diminishes a banks' profitability, all else equal.

Bourke (1989) finds some evidence of a positive relationship between liquid assets and bank profitability for 90 banks in Europe, North America and Australia from 1972 to 1981, while Molyneux and Thornton (1992) and Goddard, et al (2004) find mixed evidence of a negative relationship between the two variables for European banks in the late 1980s and mid-1990s, respectively. Mujere.M, and Younus.S (2009) finds that The statutory reserve requirements(SLR) and the high NSD certificate interest rates leads to higher interest rate spreads in the banking sector in Bangladesh. So its basically a financial puzzle and this study is an effort to solve that financial puzzle.

Research Hypotheses

On the basis of literature, the following hypotheses are operationalized as a basis for analysis and conclusion on the relationship between liquidity and profitability.

H1: There is a relationship between liquidity and profitability in a business organization.

H2: Liquidity and profitability affect each other in a business organization.

3. Methodology

This study employs Panel Regression to examine the nature and extent of the relationship between liquidity and profitability in the selected companies, and to determine whether any cause and effect relationship exists between the variables. Corporate liquidity is examined from two distinct dimensions: static or dynamic views (Lancaster et al., 1999; Farris and Hutchison, 2002; and Moss and Stine, 1993). The static view is based on commonly used traditional ratios, such as current ratio and quick ratio, calculated from the balance sheet amounts. These ratios measure liquidity at a given point in time. Dynamic view measures ongoing liquidity from the firm's operations as a dynamic measure of the time it takes a firm to go from cash outflow to cash inflow which is measured by cash conversion cycle.

However, this study examines liquidity from a comparative static dimension because the analysis is based on Panel data extracted from BSA and the accounts of the companies for the relevant period. The Correlation analysis technique is used to determine the nature and extent of the relationship, while Panel regression analysis technique is used to determine whether cause-and- effect relationship exists between liquidity and profitability.

The Time period of the study is from1998 to2010. The study uses the yearly cross sectional data,i.e. from the 5 most important sectors of Pakistani Economy and checks the changes in the Liquidity and Profitability positions of the firms in those sectors across the time and that will give rise to the creation of Panel Data and the study uses the yearly data for this study instead of using the daily or monthly data because if we go for that then there would be many variations in that because of the ever changing and dynamic environment of Pakistan's Government & Economy.

Econometric Model

Following Econometrics models were used to evaluate the results:

Equation for Panel Regression:

The basic Equation which we run without capturing any effect was

$$\mathbf{ROA = \beta 0 + \beta 1CR + \beta 2QR + \beta 3DER + \beta 4ICR + \beta 5ITR + \beta 6DTR + \beta 7CTR + B8FS} + \in_t$$

$\in_t$= unexplained variables or error term.

In this study **CR** = Current Ratio, **QR** = Quick Ratio, **SQR** = Super Quick Ratio, **ICR** = Interest Coverage Ratio, **ITR** = Inventory Turnover Ratio, **DTR** = Debtors Turnover Ratio, **CTR** = Creditors Turnover Ratio, **DER** = Debt to Equity Ratios will be taken as independent variables.

And **ROA** was taken as dependent Variable. Where**, β1, β2, β3, β4, β5, β6, β7, β8** are the linear parameters of the **ROA** line While the size of the firm was taken as Control Variable.

Equation showing Industrial Effect:

To capture the effect of Industry the study develops the four dummy Variables because in this study we have selected the five sectors and model becomes:

$$\mathbf{ROA=\beta0+ \beta2QR + \beta3DER + \beta4ICR + \beta5ITR + \beta6DTR + \beta7CTR+ \beta8FS + \beta9D1 + \beta10D2 + \beta11D3 + \beta12D4 + \in_t}$$

D1, D2, D3, D4 were taken as dummy variables.

Equation showing Time Effect:

Then to capture the effect of Time we have created 10 dummy variables because we have taken the data of 11 years and the equation becomes:

$$\mathbf{ROA=\beta0+ \beta1QR + \beta2DER + \beta3ICR + \beta4ITR + \beta5DTR + \beta6CTR+ \beta7FS + \beta8D01 + \beta9D02 + \beta10D03 + \beta11D04 + \beta12D05 + \beta13D06 + \beta14D07+ \beta15D08 + \beta16D09 + \beta17D10 + \in_t}$$

D01, D02, D03, D04, D05, D06, D07, D08, D09, D10 was taken as dummy variables.

Equation showing Combined Effect:

Then at the end, the study combines all the dummy variables with our explanatory variables and run the Panel Regression and regresses all of those on the dependent variable of ROA and check the Results after applying that Equation.

$$\mathbf{ROA=\beta0+ \beta1QR + \beta2DER + \beta3ICR + \beta4ITR + \beta5DTR + \beta6CTR+ 7D1 + \beta8D2 + \beta9D3 + \beta10D4 + \beta11D01 + \beta12D02 + \beta13D03 + \beta14D04 + \beta15D05 + \beta16D06 + \beta17D07+ \beta18D08 + \beta19D09 + \beta20D10 + \in_t}$$

D1, D2, D3, D4, D01, D02, D03, D04, D05, D06, D07, D08, D09, D10 were taken as dummy variables to capture the effect of Industry and Time as well.

Descriptive Statistics

The results show that all the variables are significant as the values of skewness is less than 1 for almost all the variables except Debt to Equity Ratio and Inventory Turnover, which shows the value greater than 2 and the results of Kurtosis are also less than 3 for all the variables except DER, DTR, ICR, and ITR & Creditors Turnover Ratios.

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Dev	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ROA	460	-32.90	49.70	6.4725	12.0025	.587	.114	1.239	.227
ROE	460	-73.71	110.35	12.2983	28.3963	.066	.114	1.198	.227
CR	460	.13	317.40	57.9659	74.1124	1.141	.114	.426	.227
QR	460	.00	307.40	50.7210	67.8717	1.306	.114	1.078	.227
DER	460	.00	614.60	78.4274	120.5401	2.104	.114	4.684	.227
ICR	460	-110.70	52.96	1.2191	15.4048	-2.935	.114	19.647	.227
ITR	460	.00	251.82	20.9564	41.3790	3.763	.114	15.190	.227
DTR	460	.00	59.32	8.9440	10.3456	1.680	.114	3.239	.227
CTR	460	.00	2.11	0.2598	0.3676	2.192	.114	5.641	.227
FS	460	2.23	11.65	7.8308	1.7110	-.320	.114	.272	.227

Correlation Matrix

The result of Correlation Matrix shows that there could be the mistake of Multicollinearity as all the Independent Variables shows the negative or simple positive relationship with one another.

While the Quick ratio is the only variable which shows almost perfect positive Correlation with the Current Ratio, so from there we thought that there could be that mistake of Multicollnearity. So to check that mistake in the next step we have taken the Current Ratio as Dependent Variable and then regress it over the rest of the independent variables and check the value of **R^2** after running the **Auxiliary Regression.**

	ROA	**ROE**	**CR**	**QR**	**DER**	**ICR**	**ITR**	**DTR**	**CTR**	**FS**
ROA	1	.884	.209	.180	-.114	.289	.020	-.099	.294	.167
ROE	.884	1	.189	.164	-.017	.242	.065	-.064	.162	.251
CR	.209	.189	1	.972*	.355	.342	-.107	.081	-.157	-.151
QR	.180	.164	0.972*	1	.350	.308	-.088	.086	-.256	-.128
DER	-.114	-.017	.355	.350	1	.112	.012	-.038	-.256	-.065
ICR	.289	.242	.342	.308	.112	1	.017	-.066	.094	.034
ITR	.020	.065	-.107	-.088	.012	.017	1	.070	-.226	.319
DTR	-.099	-.064	.081	.086	-.038	-.066	.070	1	.014	-.068

CTR	.294	.162	-.157	-.256	-.256	.094	-.226	.014	1	-.128
FS	.167	.251	-.151	-.128	-.065	.034	.319	-.068	-.128	1

Checking for Multicolinearity

Before checking the error of multicollinearity, the study runs the regression with the existing variables and then check the value of R^2 so that later it could be compared with the R^2 of that regression model, when CR is taken as Dependent variable.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.525[a]	.275	.263	10.30658	1.704

Since the results of Correlations show that there exists, an error of multicollineariy, to detect that error, Current ratio is taken as dependent variable and results show that regressor is in a linear combination of other regressor and it is affecting the other variables as well. So after applying the regression, the study reports R^2 of .956 that is greater than the first one which was .275. So from that it is pretty sure that there exists that problem so study exclude the current ratio from econometric model.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
2	978[a]	.956	.955	15.69306	1.317

Pannel Regression

After excluding the Current Ratio and running the regression, the study reports that all the variables CR, QR, ICR, IT and FS are significantly contributing towards the profitability of the firm and their coefficients Beta as statistically significant and F statistics are greater than the tabulated one so we will reject the null hypothesis that there is no correlation between the liquidity and profitability and they don't reinforce each other.

While the Debtors turn over and Debt to Equity ratios are the only variables which have the negative co efficient of betas showing that they are negatively contributing towards the profitability of the firms because when the DTR increased then the risk of the firm is also increased and that contributed negatively towards the profits of the firm by increasing the Required return by investors and ultimately the WACC and secondly when we tight the credit policy and start collecting our debtors with more speed then that leads towards the loss of sales and ultimately leading towards the decrease in the profitability. So that's why these

two ratios show the negative signs.

R^2 is .275 which shows that 27% of the variation in the ROA is brought by our explanatory variables. Further their VIF is also less than 2 for all the variables which shows that our results are quite significant.

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig.	Tolerance	VIF
(Constant)	-9.335	2.626		-3.554	.000		
QR	.056	.008	.319	6.718	.000	.711	1.406
DER	-.014	.004	-.140	-3.197	.001	.839	1.192
ICR	.121	.034	.156	3.582	.000	.846	1.182
ITR	.021	.013	.072	1.645	.101	.836	1.196
DTR	-.136	.047	-.117	-2.870	.004	.960	1.041
CTR	12.083	1.469	.370	8.225	.000	.792	1.263
FS	1.472	.302	.210	4.875	.000	.865	1.156

After considering the effect of Industry

Then after excluding the Current ratio, the study adds the 4 dummies to capture the effect of the industry as the study has taken the 5 sectors and after running the regression, the study finds that the previous values of Coefficients of Variables don't get change after adding dummies so that shows that our model is good.

Results report the value of R^2 is .397 which shows that almost 40% change in the ROA is explained by the change in these Explanatory variables. The results of all the variables in T statistics are also more than 1.97 except DTR and DER and D2 and D4 and the results of P values also shows the significant results i.e. less than .05.

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	-8.376	2.847		-2.942	.003
QR	.052	.008	.293	6.600	.000
DER	-.013	.004	-.126	-3.105	.002
ICR	.125	.031	.160	4.010	.000
ITR	.022	.012	.077	1.897	.058
DTR	-.242	.056	-.209	-4.313	.000

CTR	10.956	1.500	.336	7.306	.000
FS	1.537	.302	.219	5.091	.000
D1	-4.139	1.640	-.139	-2.523	.012
D2	7.385	1.588	.260	4.650	.000
D3	-3.260	1.746	-.118	-1.868	.062
D4	-1.010	2.014	-.032	-.502	.616

After capturing the Effect of Time

After that to capture the effect of the time we have created the ten dummies as we have taken the data of 11 years. After running the regression the again almost all the variables show the significant results except DTR and DER and D02, DO5, D08 and D09 and D10. R^2 becomes .382. And again DTR and DER are showing the negative beta coefficients.

	Unstandardized Coefficients		**Standardized Coefficients**		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	-13.138	3.187		-4.122	.000
QR	.071	.013	.401	5.566	.000
DER	-.007	.006	-.069	-1.190	.235
ICR	.154	.034	.197	4.532	.000
ITR	.014	.013	.047	1.036	.301
DTR	-.116	.047	-.100	-2.477	.014
CTR	12.233	1.519	.375	8.051	.000
FS	1.515	.298	.216	5.084	.000
D01	-1.997	3.167	-.050	-.630	.529
D02	.484	3.313	.012	.146	.884
D03	-1.232	2.983	-.029	-.413	.680
D04	2.350	3.051	.058	.770	.442
D05	1.083	2.883	.027	.375	.707
D06	9.211	2.309	.233	3.990	.000
D07	6.365	2.340	.155	2.720	.007
D08	3.341	2.339	.081	1.429	.154
D09	.519	2.375	.012	.219	.827
D10	1.350	2.375	.031	.568	.570

After capturing both the Effects of Industry & Time

Then in the last, the study combines all the dummies to capture both the effect of Industry and Time as well and report the following results. The model's R^2 is .442 which means 44% change in the ROA is explained by our explanatory variables and again DTR and DER shows the negative Beta coefficients

which means they are negatively contributing towards the Profitability of the firms and rests of the variables are contributing positively.

Dummies p values are also significant results, i.e. less than 0.05 except D02, D05, DO9 and D10 while their T values also shows significant results, i.e. greater than 1.97 except DTR, DER, D1, D03, and D09. Durbon Weston is 1.750 and F= 16.513 which is greater than tabulated figure (5.32) so we reject the entire null hypothesis and there exists a relationship between the liquidity and profitability and they reinforce each other.

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**t**	**Sig.**
(Constant)	-12.591	3.368		-3.739	.000
QR	.064	.012	.364	5.458	.000
DER	-.007	.005	-.068	-1.274	.203
ICR	.155	.031	.199	4.971	.000
ITR	.018	.012	.062	1.495	.136
DTR	-.194	.056	-.167	-3.459	.001
CTR	11.215	1.563	.344	7.177	.000
FS	1.662	.300	.237	5.546	.000
D1	-3.646	1.602	-.123	-2.275	.023
D2	7.219	1.556	.254	4.640	.000
D3	-2.840	1.720	-.103	-1.652	.099
D4	-1.959	1.981	-.062	-.989	.323
D01	-1.681	2.931	-.042	-.574	.566
D02	.757	3.052	.018	.248	.804
D03	-1.497	2.749	-.035	-.545	.586
D04	2.102	2.810	.052	.748	.455
D05	.898	2.656	.022	.338	.735
D06	8.303	2.139	.210	3.882	.000
D07	5.388	2.158	.131	2.497	.013
D08	2.717	2.145	.066	1.267	.206
D09	-.189	2.179	-.004	-.087	.931
D10	.576	2.176	.013	.265	.791

Industrial Effect:

Equation for Paper Board & Products

ROA = -8.38 + 0.05QR - 0.01DER + 0.12ICR + 0.02ITR - 0.24DTR + 10.96CTR + 1.54FS

Equation for Food Sector

ROA = -12.52 + 0.05QR - 0.01DER + 0.12ICR + 0.02ITR - 0.24DTR + 10.96CTR + 1.54FS

Equation for Chemical Sector

ROA = -0.99 + 0.05QR - 0.01DER + 0.12ICR + 0.02ITR - 0.24DTR + 10.96CTR + 1.54FS

Equation for Cement Sector

ROA = -11.64 + 0.05QR - 0.01DER + 0.12ICR + 0.02ITR - 0.24DTR + 10.96CTR + 1.54FS

Equation for Fuel & Energy Sector

ROA = -9.39 + 0.05QR - 0.01DER + 0.12ICR + 0.02ITR - 0.24DTR + 10.96CTR + 1.54F

Time Effect:

Equation for Year 2001

ROA = -15.14 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2002

ROA = -12.65 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2003

ROA = -14.37 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2004

ROA = -10.79 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2005

ROA = -12.06 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2006

ROA = -3.93 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2007

ROA = -6.77 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2008

ROA = -9.80 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2009

ROA = -12.62 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2010

ROA = -11.79 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Equation for Year 2011

ROA = -13.14 + 0.07QR - 0.01DER + 0.15ICR + 0.01ITR - 0.12DTR + 12.23CTR + 1.52FS

Ramsey Reset

The study started with 8 variables and end up with 7, it seems appropriate to check whether the estimated model is correctly specified. So Ramsey's Regression Specification Error Test is a good measure to check the misspecification of the estimated model. After running regression our F Statistics Results are .6791 which should be greater than .05 so that shows that our model is not misspesified.

Omitted Variables: Squares of fitted values			
	Value	**Df**	**Probability**
t-statistic	0.414009	451	0.6791
F-statistic	0.171403	(1, 451)	0.6791
Likelihood ratio	0.17479	1	0.6759

Conclusion

Working capital management is an important part in firm financial management decisions. The optimization of working capital management is could be achieved by firm that manage the tradeoff between profitability and liquidity. The purpose of this study is to investigate the liquidity management efficiency and liquidity-profitability relationship. The results of this study found that correlation and regression results are significantly positive associated to the firm profitability. All of our variables i.e. Inventory Turnover, Creditors Turnover, Quick Ratio, interest Coverage Ratio, Firm Size are contributing positively towards the profitability of the firm which are measured by Return on Assets Ratio while the 2 Ratios i.e. Debt to Equity and Debtors Turnover are negatively correlated to ROA because when the element of Debt is increased in the Capital Structure of a company then the Risk of the Firm is also increased which ultimately leads towards the increased Weighted Average Cost of the Capital (WACC) and when DTR increases that means firm's tight their credit policy and that leads towards the decreased sales and ultimately decreased profitability of the firm. Thus, firm manger should concern on inventory and receivables in the purpose of creating shareholder wealth.

Suggestions and Recommendations

In order to solve the problems relating to the study of liquidity management, a lot of modifications are necessary. Some of the recommendations have been made.

- Overall inventory management is required to be progressed by way of proper application of inventory control system, such as, **EOQ, JIT, ABC analysis,** etc. and improvement of their sales management so as to reduce stock piling of finished goods.
- Panel Regression indicates that there is a high relationship exists between liquidity and profitability.

- On the whole, receivable management is not good in most of the companies. Solution to the enormous problem of receivables management, an effective professional coordination between sales, production and finance departments is called for. On time billing, timely reminders to defaulting customers and immediate action should be ensured. The investment in loans and advances should be minimized to the extent possible as this ratio ultimately leads towards the decreased profitability of the firms.
- Firms should focus on the Spontaneous Financing instead of focusing on the Debt which is cost free.
- The firm should not increase their collection process to that extent that it leads towards the lost sales as it directly affects the profitability of the firms. So a balance should be there.

Limitations of the Study

The study suffers from certain limitations which are mentioned below.

- As the study is purely based on the companies taken from the selected 5 sectors, so the results of the study are only indicative and not conclusive.
- Accounting ratios used in the study are taken from BSA; no complications would be there if study directly uses the data from the annual reports of the companies.

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