

Liquidity and Profitability Relationship: Analysis of KSE 100 Index Non-Financial Firms in Pakistan

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Abstract

The main objective of this study was to assess the impact of liquidity ratios on the profitability of the firms selected from KSE 100 index of Karachi stock exchange of Pakistan. Liquidity ratios included the current ratio (CR), cash conversion cycle (CCC), current liabilities to total assets (CLTA), quick ratio (QR), current assets to total assets (CATA) and operating cash flow (OPCF). Leverage and firm size were also included in the model as control variables. Profitability of firms was measured with the help of the financial ratios viz ROE, ROCE and ROA. Non-financial firms were considered as sample for this study. Five years data (2009-2013) for these companies was taken from their annual audited reports as these reports are audited by professionals and are considered as a reliable source of information. Multiple regression was used to estimate the impacts. The results show that liquidity variables viz CCC, QR and CLTA have negative effects on return on assets (ROA), but CR, CATA and OPCF have positive effects. Similarly, CR and OPCF have positive effects on return on equity (ROE) but all other liquidity variables viz CCC, QR, CATA, CLTA have negative effects. As regards the effects of liquidity variables on return on capital employed (ROCE), CR, CLTA and OPCF have positive effects, but CATA, CCC, and CR have negative effects.

Keywords

Liquidity Ratios, Return on Assets, Return on Capital Employed, Return on Equity.
Conflicts of Interests: Nil

Introduction

The term 'Liquidity' means the ability of an organization to realize the value of money and how easily and economically an asset can be transformed into cash. It refers to the transformation of assets into cash during the regular course of business and to have a regular, continual flow of cash required for payment of current liabilities as and when due and payable and also ensure accessibility of money for day-to-day company operations (Maness and Zietlow, 2005). It is closely related to the operational capital policy of the company. A low level of liquidity may increase the economic cost which in turn leads to failure to meet its obligations. The need for liquidity of current assets could not be over emphasized. The proficient management of liquidity is an essential part of overall financial management. Liquidity management considered as an important tool to measure the successful performance of businesses. Due to the close relationship of liquidity with the operations of a firm its analysis is very important to both the internal and external analysts (Bhunia, 2010). It can also become more competitive in the marketplace by maintaining the optimal level of liquidity. *Cash conversion cycle is considered as a useful tool to assess the liquidity position of any organization* (Moss and Stine, 1993).

Liquidity management requires that a firm must have a sufficient balance of cash and other working capital in the form of assets, receivables and inventories in order to meet the current liabilities when they become due. If the firm does not have sufficient levels of liquid assets, the operating hazard of the company can increase or decrease. Working capital represents the amount available to a business for day-to-day operations because it is considered as operating capital and lifeblood of the firm (Reddy and Patkar, 2004). Liquidity can also be defined as having enough cash to fulfill all current obligations when they fall due. Thus, the maintenance of working capital is necessary for firm's day-to-day operations. If liquid assets' level is too low, then a company may be unable to repay its current liabilities which may affect the company's operations. Therefore, the level of liquid assets should not be too low.

Profitability is considered as a measure of the companies' revenues and expenses. Profitability of a company is very important in cost-effective decision making. Investors, managers and financial analysts use it as a tool for measuring the management efficiency of the firm in order to make an investment in the firm (Saghafi, 1994). Profit generation is very necessary for every firm in order to survive and grow over a long era. Profit is considered as the definitive purpose of every organization and it will have no prospect if it fails to earn adequate profit. There are different profitability ratios that are used to measure the profitability of any company. The financial ratios are most commonly used to evaluate the profitability of firm and there exists a direct relationship among these ratios. Profitability ratios are used to assess the ability of the management to generate earnings from sales or the operations conducting within the organization.

Cash management and profitability are very necessary to be considered by the management of every business to ensure the growth and survival of the business. The company's CFOs must have the ability to manage the trade-off between them. They have to make decisions regarding liquidity and profitability levels and are required to pay attention to liquidity and profitability in their daily operations (Ogundipe et al, 2012). Profitability cannot turn into liquidity. A business can become profitable without being liquid, but it is essential for every business to manage its liquidity in order to obtain optimal returns. According to the researchers, there is a relationship between profitability and liquidity. Therefore, the most important profitability measures are used to verify the influence of liquidity indicators on profitability ratios. The relationship between liquidity and profitability has made it one of the most important research topics in short-term financial management. It can be assumed that less risk is associated with the firm having more liquidity, but less profitable. Analysis of the structure of assets and liabilities can help the company to carry out a risk assessment. Effective cash management relies on managing working capital to minimize the inability risk to meet current obligations.

In these days, in the environment of intense competition, it is necessary for every organization to pay attention towards the issue of liquidity maintenance and its impact on the profitability of the companies in Pakistan. In light of this concept, it becomes significant to check single concept of the relationship between liquidity and profitability. Liquidity management plays an essential role to ensure the survival of any organization. Every organization should consider the impact of liquidity on profitability. Thus, it is the objective of this study to measure the impact of liquidity ratios on the profitability (ROCE, ROE, ROA) of non-financial firms selected from KSE-100 index of Pakistan.

Literature Review

Literature has provided a wide discussion on the basis of extensive analysis that immediate survival of a company depends upon lit liquidity, whereas, long term survival, expansion of a firm, and its growth solely depends upon profitability of the firm. Since, short term and long-term survivals depends upon liquidity and profitability respectively, therefore, both factors are much important for any firm. Glimer (1985) empirically tested the existence of an optimal level of liquid assets in a given industry. The motives behind his work was to indicate the risk level and find out the relationship among profitability, risk and current assets. The study results revealed that each and every firm should have an investment in the form of liquid assets which may vary over time. On the basis of his findings he concluded that due to increase in the level of liquid assets and reduction in the costs, the return initially increases. Jose *et al.* (1996) has investigated the association between cash conversion cycle and corporate return. For this purpose, they used both nonparametric and multiple regression analyses. The findings showed that aggressive working capital policies can achieve the most benefit in terms of ROA and ROE. The empirical results of this paper suggest that aggressive policies tend to enhance corporate returns. Eljelly (2004) empirically examined the relationship between liquidity and profitability on corporations of Saudi Arabia. He used CCC and CR for liquidity as exogenous variable and net operating profit for profitability as endogenous variable and based on a sample of 29 corporations, he found a significant negative effect of liquidity on the profitability.

Ekanem (2010) analyzed liquidity management in small firms. The study was based on semi-structured interviews and direct observation of selected companies. The findings of the study suggested that liquidity management is based on either past experience of the owners or influenced by norm of the specific industry. Ben-Caleb and Olubukunola (2013) revealed that a well-managed liquidity determines the profitability and growth of a firm. This study focused on liquidity and its impact on profitability of businesses in country of Nigeria. The study has taken a sample of 30 manufacturing firms from stock exchange of Nigeria. They investigated the impact of liquid ratio and current ratio on the profitability. This impact was found as positive. Kaur and Singh (2013) examined the impact of liquidity on profitability using 14 companies' sample from information technology sector of India. The findings of this study revealed a significant and negative impact of liquidity on profitability. This study recommended that firms can increase the profitability by efficiently managing liquidity. Priya and Nimalathan (2013) evaluated the relationship of liquidity management and profitability. They selected a sample of manufacturing firms of Sri Lanka, and took the data of five years for the period of 2008-2012 with the objective to examine the affect of changes in liquidity on the profitability. On the basis of regression analysis, results revealed that liquidity has significantly negative impact on the firms' profitability. Saleem and Rehman (2011) conducted a study on the oil and gas sector in Pakistan. Based on the results of this study there exist a significant impact of liquidity ratios on the return on equity as well as on the return of assets.

Abbas (2013) analyzed the impact of liquidity on the performance of sugar industry in Pakistan. The analysis was based on sugar sector of Pakistan for the period 2006-2011. The results of the study found that all variables are highly significant and showed both positive and negative relationships with profitability and also showed that sugar sector must pay attention on this issue

and focus on current assets and sales for betterment. Majeed *et al.* (2013) conducted a study to examine the relationship of cash conversion cycle and profitability of firms in Pakistan. The study was based on 32 randomly selected companies from the manufacturing sector of Pakistan for the period 2006-2010. Correlation and regression analysis were used to reveal the relationship. After analysis the study found that cash conversion cycle has a negative relationship with firms' performance and profitability. Thus, keeping in view the above literature, it seems appropriate to investigate the impact of liquidity ratios on the profitability of the firms. For measuring the liquidity, current ratio, quick ratio, cash conversion cycle, current liability to total assets, and current assets to total assets have been used as proxies. For measuring the profitability, ROA, ROE and ROCE have been used as proxies. Thus, conceptual framework of the study has been developed and given in Figure 1 below.

Conceptual Framework

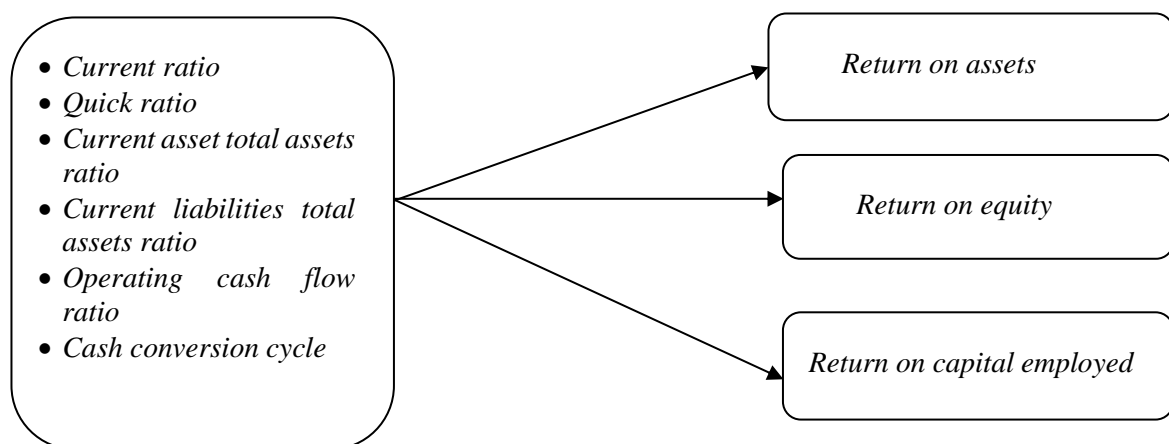


Figure 1. Conceptual Framework

Methodology

The objective of this study was to investigate the effect of liquidity on profitability of KSE 100 index non-financial companies of Pakistan. The variables used in this study are influenced by previous studies conducted by Priya and Nimalathasan, (2013), Eljelly, (2004), Saleem and Rehman, (2011), Ben and Olubukunola, (2013) and Kaur and silky, (2013). This study has based on a sample of non-financial firms for year 2009-2013. Services companies are not included in this study because of the non-availability of inventories. For analysis of the relationship between these two variables different liquidity and profitability ratios are used as independent and dependent variables. Profitability has been measured through return on equity (ROE), return on assets (ROA) and return on capital employed (ROCE). Thus, there will be the three separate regression models treating these profitability measures as dependent variables. Effect of liquidity on profitability has been measured through multiple regressions. The F-statistic has been used to study the significance of employed regression models, whereas t-test has been to study the significance of the effect of individual independent variable on profitability. Descriptive statistics, unit root test and panel data estimation techniques have also been used for ensuring the adequacy of the results. The E-views software has been used for data analysis.

Data and Sample

There were almost 70 non-financial firms included in KSE 100 index companies. Data for all firms was not available; therefore, on the basis of the availability of data 62 companies have been taken as a sample. Data for these companies was taken from their annual audited

reports as these reports are audited by professionals and are considered as a reliable source of information. Help was also taken from some other sources like publications of SBP (State Bank of Pakistan) and KSE (Karachi Stock Exchange).

Variables

Literature has evidenced that several financial ratios measure the liquidity of the firms. Thus, this study has included cash conversion cycle (CCC), quick ratio (QR), current assets to total assets ratio (CATA), current ratio (CR), operating cash flow ratio (OPCF) and current liabilities to total assets ratio (CLTA). These ratios have been used as exogenous variables in the model. For measuring the profitability, three ratios viz return on capital employed (ROCE), return on equity (ROE) and return on assets (ROA) have been used. these three ratios have been considered as endogenous variables in three different models explained in the Results section. Firm size (FS) and leverage (LV) are used as control variables.

Results and Discussion

This section elaborates the outcomes of the investigation. It also explains the results of unit root test and the relationship between dependent and independent variables through panel data estimation techniques. Here ROA, ROE and ROCE act as dependent variables and CR, QR, CATA, CLTA, OPCF and CCC act as independent variables and FS and LV act as control variables.

Descriptive Statistics

Descriptive statistics for all the proxies used for Liquidity and profitability of the selected firms have been computed and given in the Table 1. The descriptive statistics show the maximum, minimum, mean and standard deviation of the variables for the period 2009-2013. The criteria used for measuring profitability, including return on assets, return on equity return on capital employed averaged 0.08, 0.22 and 0.17 respectively. Similarly, mean values of liquidity ratios are also shown in the Table. The mean value of CCC is 119.78, followed by the mean value of CR as 1.78, of QR as 1.23, of CATA as 0.50, of CLTA as 0.36 and of OPCF as 0.45. The standard deviation of the variables represents the dispersion of data from the mean.

Table 1: Descriptive Statistics Results

Variables	Observations	Mean	Median	Maximum	Minimum	Std. Dev
ROA	310	0.084095	0.071581	0.405037	-0.241566	0.090831
ROE	310	0.224616	0.183680	12.84366	-1.359059	0.765923
ROCE	310	0.171153	0.218040	1.403428	-9.115403	0.617873
CCC	310	119.7819	56.69472	864.663	-219.7581	536.7988
CR	310	1.781117	1.276708	13.40971	0.038968	1.615796
QR	310	1.229767	0.948251	10.73340	-2.280160	1.364605
CATA	310	0.501288	0.470560	5.864147	0.001355	0.384861
CLTA	310	0.358287	0.334740	1.096464	0.026856	0.202194
OPCF	310	0.453720	0.248083	8.912930	-3.965373	0.982458

Figure 2 elaborates the situation of profitability ratios during the time period of 2009-2013. There is more stability in ROA, and more variation in ROE. The situation of ROCE is in-between the other two ratios.

As regards the exhibition of liquidity ratios graphically, all those have been shown in the Figures 3 and 4. We can observe from these figures that there is much variation in CCC, however, all other ratios are showing more stability in their behaviors.

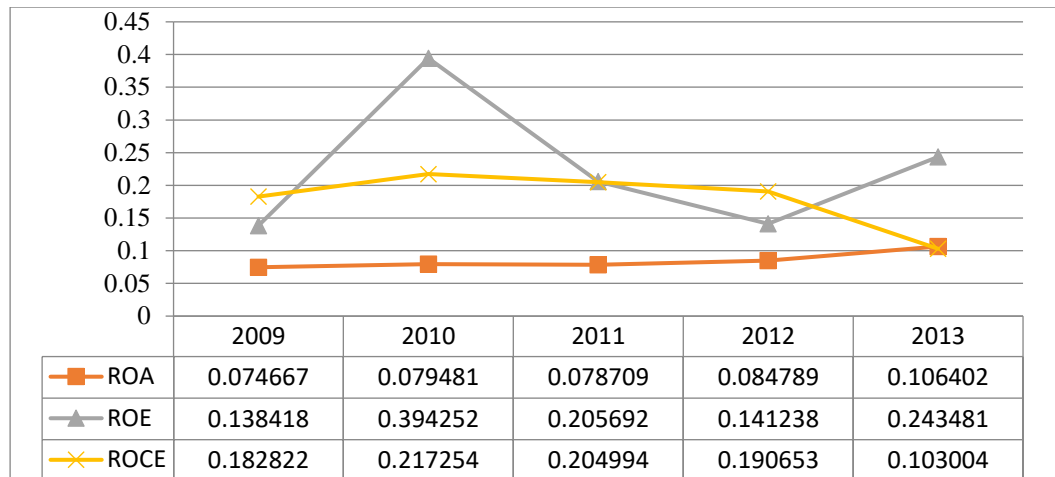


Figure 1: Year-wise status of Profitability of firms (ROA, ROE, ROCE)

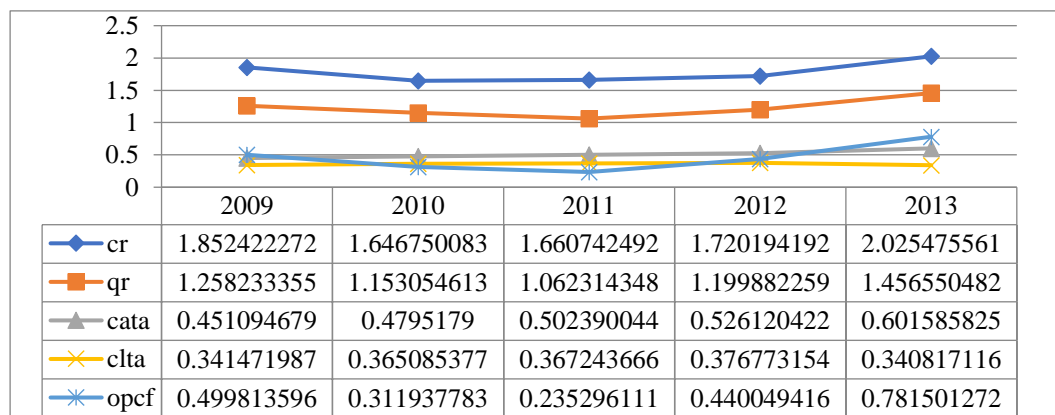


Figure 2: Year-wise status of Liquidity Ratios

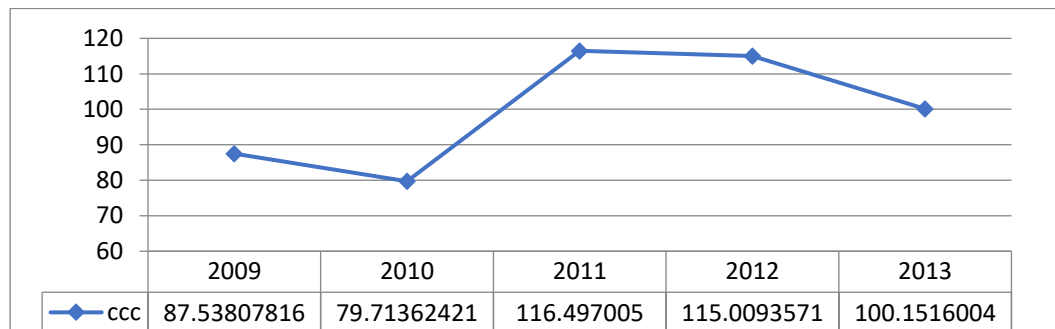


Figure 3: Year-wise status of Liquidity Ratio (CCC)

Regression model analysis

Since, we have three different measures of profitability, therefore, the study is based on three different models to measure the effects of liquidity ratios on profitability ratios. Said models as well as their analysis have been presented in the following sections.

Model 1: Return on assets (ROA) and liquidity

$$ROA_{it} = C + \beta_1 (CCC_{it}) + \beta_2 (CR_{it}) + \beta_3 (QR_{it}) + \beta_4 (CATAR_{it}) + \beta_5 (CLTAR_{it}) + \beta_6 (OPCF_{it}) + \beta_7 (LV_{it}) + \beta_8 (FS_{it}) + \varepsilon_{it}$$

In this model ROA is used as endogenous variable and liquidity ratios like CCC, CR, CLTA, CATA etc. are used as independent variables. This model has been analyzed and the results are presented in the Table given below.

Table 2: Effects of Liquidity Variables (ratios) on ROA

Variables	Coefficient	SE	T	p-value
C	-0.160677	0.268588	-0.598230	0.5503
CCC	-4.163101	6.761306	-6.156488	0.0000*
CR	0.080094	0.021187	3.780281	0.0002*
QR	-0.013442	0.004982	-2.698142	0.0075*
CATA	0.048857	0.012524	3.901121	0.0001*
CLTA	-0.271216	0.037464	-7.239431	0.0000*
OPCF	0.012681	0.003708	3.419872	0.0007*
FS	0.031308	0.026222	1.193947	0.2337
LV	0.000375	0.000526	0.712331	0.4770
R²	0.828410	Adjusted R²		0.779078
F	16.79248	p-value (F)		0.000000
Durbin-Watson statistic 1.805179				

Note: * indicates the significance at 1% level

The Table 3 shows the results of the multiple regression model estimated under the concept of fixed effects model. The adjusted R² is 0.78. This indicates that the model has the ability to explain about 78% of the variation in the explained variable and that the R² value is 0.83, indicating the model's ability to explain the relationship between the endogenous and exogenous variables around 83%. Additionally, the table shows that the F-value was 16.79248 with a very small p-value of (0.000); it revealed the significance of the overall model. The Durbin-Watson statistic of 1.8 indicates no issue of autocorrelation.

The impacts of independent variables on the profitability measured through ROA are shown in the above Table 3. We can observe from this table that CR, CATA, and OPCF have statistically significant positive effects on the profitability (ROA) followed by the significantly negative effects of CCC, QR and CLTA. The impact of CR is 0.08. It means unit increase in CR causes 0.08 exact increase in ROA. Similarly, unit increases in CATA and OPCF causes 0.049 and 0.013 exact increases in ROA respectively. As regards the negative effects, unit increases in CCC, QR and CLTA cause exact decrease of 4.16, 0.013 and 0.27 respectively.

When we go to the literature, and check the previous literature, we observe that results of CCC are consistent with the studies done by Wang (2002), Vijayakumar (2011) and Samiloglu and Demirgunes (2008). The positive relationship between CR and profitability measured by ROA are consistent with Manyo and Ogakwu (2013) and Chukwunweike & Ehiedu, (2014). These results are also in accordance with the results of Lyroudi and Mc Carti (1992) and Kamath (1989). The results of QR having impact on ROA are consistent with the result of Lyroudi *et al.* (1999) who also finds out the same relationship. Similarly, the results of CATA are in accordance to the results of Kaur and Silky (2013), Kaur and Singh (2013), Alam *et al.* (2011) and Mohammad and Saad (2010). The results of CLTA are consistent with Mohammad and Saad (2010); the results of OPCF are in accordance to the findings of Priya and Nimalathan (2013).

FS and LV which are used as control variables also show a positive but insignificant relationship with return on assets. These results are also consistent with Manyo and Ogakwu, (2013), Kaur & Singh, (2013), Vural *et al.*, (2012), Gill and Mathur, (2010), Gill, (2011) and Sharma and Kumar, (2011). Mondal & Ghosh (2012) enlightened that there is positive association between ROA and firm size. And elaborated that higher value of ROA would help the firm to improve their infrastructures. That is reason behind that both variables are positively associated. Leverage also has a positive influence on profitability and consistent with the results of Subramaniam and Anandasayanan (2013).

Model 2: Return on equity (ROE) and liquidity

$$ROE_{it} = C + \beta_1(CCC_{it}) + \beta_2(CR_{it}) + \beta_3(QR_{it}) + \beta_4(CATAR_{it}) + \beta_5(CLTAR_{it}) + \beta_6(OPCF_{it}) + \beta_7(LV_{it}) + \beta_8(FS_{it}) + \varepsilon_{it}$$

This model is used to estimate the relationship of ROE with firms' liquidity. After analysis, the results have been presented in the Table 4 below, and discussed afterward.

Table 3: Effects of Liquidity Variables on ROE

Variables	Coefficient	SE	T	p-value
Constant	-0.538248	1.181557	-0.455541	0.6493
CCC	-9.089441	3.609189	-2.518416	0.0127**
CR	0.181427	0.107548	1.686943	0.0934***
QR	-0.040637	0.024335	-1.669900	0.0967***
CATA	-0.056749	0.071556	-0.793066	0.4288
CLTA	-0.171844	0.185789	-0.924941	0.3563
FS	0.108541	0.115304	0.941341	0.3478
LV	-0.156614	0.003347	-46.79523	0.0000*
OPCF	0.016349	0.021890	0.746900	0.4561
R ²	0.923759	Adj. R ²	0.893607	
F	30.63683	p-value (F)	0.000000	
Durbin-Watson statistic		2.285489		

Note: ***, ** indicate the significance at 10% and 5% level respectively

Model 2 has measured the effects of liquidity ratios on profitability measured through ROE. Both of the values of R² and adjusted R² are sufficiently large i.e., more than 0.89, and indicate the hypothesized model sufficiently explains the relationships between the exogenous and endogenous variables. The value of Durbin-Watson also suggests that there is no issue of autocorrelation. The very small value of p-value for F statistic indicates that, overall, the relationship between the ROE and exogenous variables is statistically significant.

All the effects of liquidity ratios on ROE, measured through the Model 2 are presented in the Table 4. We can observe the significance of the results from this table. It is observed that CC, QR, CATA, and CLTA have negative effects of ROE, however, only the effects of CC and QR are statistically significant. The other two results of CATA and CLTA are not significant. The other two variables viz CR and OPCF have positive effects, however, only the effect of CR is significant. Thus, there are only three results significant which are CCC, CR and QR. Further, these results indicate that unit increase in CR causes 0.18 increase in ROE, whereas unit increases in CCC and QR cause 9.09 and 0.04 decreases in ROE respectively.

As regards the consistency of the results with the published literature, the CCC results are consistent with the findings of Azam and Haider (2011), Wang (2002), Shin and Soenen (1998) and Jose *et al.* (1996); findings of this study for OPCF are in accordance to the results obtained by Priya and Nimalathan (2013); the results obtained for QR are consistent with Lyroudi *et al.* (1999). FS and LV used as control variables, also have insignificant effects on ROE.

Model 3: Return on capital employed (ROCE) and liquidity

$$ROCE_{it} = C + \beta_1(CCC_{it}) + \beta_2(CR_{it}) + \beta_3(QR_{it}) + \beta_4(CATAR_{it}) + \beta_5(CLTAR_{it}) + \beta_6(OPCF_{it}) + \beta_7(LV_{it}) + \beta_8(FS_{it}) + \varepsilon_{it}$$

ROCE is known as the important ratio used for the measurement of the management performance with respect to the capital invested in the business, unlike ROA, which measures profitability in relation to total assets. The following results show the relationship between ROCE and liquidity.

Table 4: Effects of Liquidity Variables on ROCE

Variable	Coefficient	SE	T	p-value
C	-3.002737	1.551458	-1.935429	0.0541***
CCC	-1.444531	3.906052	-0.369819	0.7118
CR	0.511346	0.122385	4.178158	0.0000*
QR	-0.032450	0.028778	-1.127576	0.2606
CATA	-1.677561	0.072342	-23.18939	0.0000*
CLTA	0.640982	0.216404	2.961965	0.0034*
OPCF	0.001878	0.021418	0.087678	0.9302
LV	0.005188	0.003039	1.707406	0.0890***
FS	0.364982	0.151469	2.409612	0.0167**
R ²	0.876272	Adj. R ²		0.840700
F	24.63382	p-value (F)		0.000000
Durbin-Watson statistic		1.837618		

Note: *, *** indicate the significance at 1%, and 10% level respectively

Model 3 has measured the impacts of different liquidity ratios on the ROCE. The values of R² and adjusted R² are higher than 0.84 and indicate that hypothesized model comprehensively explain the relationships between ROCE and different measures of liquidity. The value of Durbin-Watson is 1.838 which indicates no issue of the autocorrelation. The high value of F-statistic and its smaller p-value indicate that the model measures the relationships that are significant.

As regard the effects of different liquidity ratios on ROCE, we can observe these effects from the table 5. We see that CCC, QR and CATA have negative effects on ROCE. Among these, only the effect of CATA is statistically significant. Other two effects are not significant. The other variables viz CR, CLTA and OPCF have positive effects on ROCE. Among these, only the effects of CR and CLTA are statistically significant. It means, the effects of CR, CATA and CLTA are significant ones. The controlled variables FS and Leverage have also significantly positive effects on ROCE. Furthermore, unit increases in CR and CLTA cause exactly 0.51 and 0.64 increases in ROCE, but unit increase in CATA decreases the ROCE by 1.68.

As regards the consistency of the results with the published literature, the results for CCC are consistent with Ben-Caleb and Olubukunola (2013) and Bhunia and Brahma (2011); the results for CR are in accordance to the findings of Amalendu and Sri (2001); the findings of CATA and CLTA are consistent with the results of Kaur and Silky (2013). The results of FS and Leverage are also in accordance to the results of Ben-Caleb and Olubukunola (2013).

Conclusions and Recommendations

This study has examined the effects of different liquidity ratios on the profitability of the non-financial firms selected from Karachi stock exchange of Pakistan. Data was collected from audited annual reports of the respective firms for the period of 5 years from 2009 to 2013. In this study, ROCE, ROE and ROA are used as endogenous variables being measures of profitability and CR, CCC, QR, OPCF, CLTA and CATA i.e., financial ratios have been used as exogenous variables. Thus, results show that liquidity ratios have a negative effect on the profitability of non-financial companies listed in the KSE 100 index. These negative relationships of liquidity with profitability of companies listed in the Pakistan KSE 100 index suggests that Companies can increase profitability by decreasing their investment in liquid assets.

The results of the relationship between liquidity and profitability as measured by return on equity (ROE) also show the negative relationship to some extent as measured by CCC and other variables like quick ratio, CATA and CLTA. Further analysis shows that firm size has positive relationship with ROE and leverage shows negative relation with ROE. Further on

the basis of the analysis of liquidity with other profitability measure like ROCE also shows the negative relationship. The results also show that liquidity measures such as cash conversion cycle, quick ratio and current assets to total assets ratio shows the negative relationship with return on equity. FS and LV which are used as control variable shows a positive and significant relationship with return on capital employed at 5% and 10 % level of significance respectively.

Through the findings of the study, it is highly recommended that firms listed in KSE 100 index non-financial companies of Pakistan should have to improve the liquidity and maintain the optimal level of liquidity in order to gain the maximum returns and for growth and survival. Firms should have to make the rational credit policy and increase the cash flows from their operation in order to get the profitability.

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