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Corporate Liquidity Management and its Impact on Profitability of Listed Firms in Ghana

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Abstract:
Liquidity management is a crucial aspect of corporate financial management due to its ability to predict the health of firms. The main objective of this study was to analyze the relationship between liquidity management and profitability. This study was necessary because effectively managed liquidity does not only provide confidence for managers; it also provides assurance for providers of funds and other stakeholders that their interests are not being compromised. 20 companies were sampled for this study from the Ghana Stock Exchange (GSE). The study used quantitative approach to answer the research questions. Pearson Correlation and Multiple Regression were used to analyze the data.
Results from the Correlation analysis and Multiple Regression showed that liquidity management is negatively related with profitability; which conforms to findings of other studies. However, Cash Ratio is positively related with profitability. It was also revealed that leverage has no relationship with liquidity management.

Keywords: Liquidity management, Cash conversion Cycle, Working Capital, Liquid Assets, Listed Firms in Ghana

1. Introduction

Financial managers have two major issues to grapple with; the dilemma of maintaining adequate liquidity to avoid financial embarrassment arising from inability to meet maturing obligations and risk of insolvency. Another involves making appropriate levels of profit such that providers of capital will be adequately compensated. One obvious thing is that, a firm can continue to operate without making profit. However, a firm without adequate liquidity is bound to face bankruptcy as happened in the case of Lehman Brothers (Azadinamin, 2013). This makes the management of liquidity a vital element in the operations of the firm (Jamaica, 1996).

The aftermath of global financial crisis of 2007-2009 considered by economists to be the worst financial crisis after the great depression of the 1930s Aiginger (2010); Eigner & Umlauft (2015) and Taylor (2009), has caught the attention of many Finance and Accounting practitioners. Many studies have been done on the liquidity management of companies in order to avoid the recurrence of such crisis and its untold effect on the global economy (Azadinamin, 2013). Firms in Ghana are said to be reliant on internal liquidity financing rather than debt financing Isshaq (2009a). The peculiar nature of the economy therefore requires that firms pay particular attention to the management of liquidity. In his study, Isshaq (2009a) posited that companies listed on the Ghana Stock Exchange are actively engaged in liquidity management contrary to the position of Bruinshoofd & Kool (2004). They observed that corporations do not actively manage liquidity holdings and largely adopt passive liquidity management strategies.

Ghana's economy is one of the fastest growing on the African continent and among the best investment destinations in sub-Saharan Africa (Aryee et al., 2011). As the economy continues to expand with more new companies getting listed on the Stock Exchange, there is the need for studies which will provide insight to the management of organizations and to provide information for stakeholders to make informed decisions. However, there are no much studies in the area of firm liquidity management and how it impacts on profitability, especially in non-financial institutions which constitute larger percentage of firms listed on the Ghana stock Exchange. In addition, the few studies available such as Lartey et al. (2013) and Ware (2015) have mixed conclusions.

This study sought to fill the gap by assessing the liquidity management practices of these firms and how those practices also affect their profit generating ability.

The objectives of the study were to (1) analyze the relationship between liquidity management and profitability of listed non-financial firms in Ghana; (2) evaluate the extent to which liquidity and profitability relationship differ across different economic sectors.

To solve the problem identified, the study sought to answer the following questions: (1) is there a statistically significant relationship between liquidity and profitability of listed non-financial firms in Ghana; (2) how does the liquidity profitability relationship differ in different economic sectors?

To achieve these objectives, the remainder of the paper is categorized as follows; the next section reviews the relevant literature on the theoretical and empirical work on liquidity and cash management and its impact on firm profitability. Section three looks at the appropriate methodology and describes the sample for data collection. The fourth section contains detailed description and analysis of the data as well as detailed discussion of the results. The fifth section juxtaposes the finding with practice and puts forward the managerial implications of the study and the last section concludes the study.

2. Literature Review

Liquidity management involves all the processes in the acquisition and use of cash and cash equivalents to ensure that the firm is able to meet its financial obligations on time (Pike et al., 2009). Thus, efficient management of liquidity from a broader perspective and narrower perspective are equally important for the profitability and sustainability of the firm (Eljiely, 2004). This is because a more liquid firm is less likely to experience financial distress (Ross et al., 2010). Effective liquidity management enables the firm to achieve a short-term solvency and greater value in short notice liquidation (Myers & Rajan, 1998).

Notwithstanding the general significance of corporate liquidity holding, there are factors which determine the amount of liquid assets a firm is able to hold at any point in time (Bruinshoofd & Kool, 2004). This is done by considering the trade-off between returns earned on the cash and marketable securities and the possible risk of losing suppliers and customers (Van Horne & Wachowicz, 2006).

The degree of leverage in the firm has been found to play a significant role in determining the amount of liquidity (Gill & Mathur, 2011). This assertion has been corroborated by Goel et al., (2015) that there is a significant relationship between operating liquidity and financial leverage.
However, the effect of leverage on corporate liquidity holdings has been disputed by Isshaq (2009b) in his study on determinants of corporate liquidity holding in Ghanaian listed firms. This was attributed to the immature development levels of the financial market in the country. This is because, according to Myers & Majluf (1984) firms which suffer from larger information asymmetry problems are likely to secure 'financial slack' to avoid the need of raising external funds.

Apart from leverage, many other factors have been found to determine the amount of liquidity likely to be held by a firm. Scholars such as Barad (2010); Eljiely (2004); Emery et al., (2007); Isshaq, (2009b); Keown et al., (2004) and Van Horne & Wachowicz (2006) have argued that one or more of several factors such as (1) nature of business, (2) seasonality of business, (3) production policies, (4) size of firm, (5) period of operating cycle, (6) credit availability and purchasing time (7) fluctuating business activities affect the amount of liquidity a firm is likely to hold. With this insight, the question that remains is what approach can be adopted by a firm in order to maintain adequate level of liquidity?

One such approach is working capital management. Working capital is the firm's total investment in current assets (Keown et al., 2004). Gross working capital is the overall investment of the firm in current assets such as cash, marketable securities, receivables and inventory Keown et al., (2004) and Van Horne & Wachowicz (2006); whereas Net working capital is the difference between a firm's current assets and current liabilities (Moyer et al., 2008). Management of working capital involves the administration of the firm's current assets (Van Horne & Wachowicz, 2006).

The process also involves effective forecasting and controlling all the inflows and outflows (Van Horne & Wachowicz, 2006). Therefore a firm which wants to maintain high level of financial liquidity must possess large amount of cash and highly liquid assets and small amount of short-term liabilities (Bolek & Wiliński, 2012). Inability to   keep adequate amount of cash to meet unforeseen eventualities may lead to the firm facing financial embarrassment (Whalen, 1966). This assertion confirms the earlier proposition of Keynes (1936) in his famous study "General Theory of Employment, Interest, and Money".

Traditionally, liquidity of firms has been analyzed using such indicators as current and quick or acid test ratios (Eljiely, 2004). However, these ratios have over the years come under intense criticism for not being appropriate basis of measuring liquidity (Gitman, 1974; Richards & Laughlin, 1980). In the study of Eljiely (2004); Finnerty (1993) is quoted as saying that "the traditional liquidity ratios such as current and quick ratios both include liquid financial assets and operating assets which are tied up in operations and hence not useful". Similarly, Richards & Laughlin (1980) believes that both current and quick ratios are static nature and are therefore inadequate to be used in measuring future cash flows and liquidity. It has also been argued that current ratio is a crude measure since it fails to recognize the liquidity of the individual components of the current assets (Van Horne & Wachowicz, 2006).

Due to the deficiencies in the traditional liquidity measures, scholars such as Gitman (1974) and Richards & Laughlin (1980) have advocated for the use of cash conversion cycle as appropriate measure of liquidity instead of the traditional ratios. Cash conversion cycle is believed to be a better measure for both liquidity and profitability (Bolek & Wiliński, 2012). In their study of 22,000 public companies in USA, Hutchison et al., (2007) showed a significant correlation between shorter cash conversion cycle and profitability for 75% of the firms.
These assertions have been corroborated by (Bolek & Wiliński, 2012; Garanina & Petrova, 2015; Lin et al., 2014; Lyroudi &

Lazaridis, 2000; Lyroudi & McCarty, 1993). However, Van Horne & Wachowicz (2006) stressed that, the use of cash conversion cycle measure of liquidity must be done with care. According to them, on the surface, it would seem that a relatively short cash cycle would be a sign of good management; however, because this measure reflects both operating and financing decisions of the firm, mismanagement in one or both of these decision areas might be overlooked.

The two goals of profitability and liquidity frequently conflict with one another and that, whenever a firm attempts to produce the high level profitability out of the components of the working capital it creates liquidity problems (Pass & Pike, 1987; Shin & Soenen, 1998). At the same time, over-concentration on liquidity can water down profits. Managing liquidity and profitability therefore means establishing the best possible trade-off between the profitability of the net current assets employed and the ability to pay current liabilities as they fall due (Van Horne & Wachowicz, 2006). To achieve this, there should be a clearly defined risk policy to determine the optimum amount of liquidity (Pass & Pike, 1987). This assertion has been corroborated by Van Horne & Wachowicz (2006) pointing out that; the optimal level of each current asset (cash, marketable securities, receivables, and inventory) will be determined by management's attitude to the trade-off between profitability and risk.

A study by Lartey et al., (2013) on the relationship between liquidity and profitability of listed banks in Ghana for the period from 2005 – 2010 showed that there is a weak positive relationship between the banks liquidity and profitability. Similarly, Alshatti (2015) showed that there is a strong positive relationship between liquidity and profitability as confirmed by Duncan et al., (2015) in their study of listed banks on Kenyan Stock Exchange. The same results was obtained recently by Bassey et al., (2016) in sample of banks on the Nigerian Stock Exchange.

However, a study conducted by Eljiely (2004) on a sample of listed companies in Saudi Arabia from 1996 – 2000 showed that there is a significant negative relationship between profitability and liquidity. The measures of liquidity employed by the study were current ratio (CR) and cash gap or the cash conversion cycle (CCC). The study however revealed that the effect of liquidity on profitability was much evident in the cash gap variable (CCC) than the CR. The study by Saleem & Rehman (2011) in the oil and gas companies of Pakistan also showed a significant negative relationship. All the liquidity variables correlated negatively with Return on Investment (ROI) and Return on Assets (ROA) except Return on Equity (ROE). Contrary to these findings, Owolabi & Obida (2012) found a rather positive relationship between liquidity and profitability in the manufacturing sector of Nigeria. This they concluded was consistent with a similar study of the Indian auto mobile companies. The study used Debtors Collection Period (DCP), Creditor Payment Period (CPP) and CCC as measures of liquidity. On the other hand, ROE, ROA and ROI were used as measures of profitability.

The researcher however, does not agree with the separate use of DCP and CPP as liquidity measures since the two variables are already included the computation of CCC. In a similar manner, a study conducted by Nandi (2012) in India showed that, of the four positive regression coefficients on all the other liquidity variables, only the working capital turnover ratio (WCTR) was significant at 10% level which indicates that there is a significant influence of this measure of liquidity management on the profitability of the company. Bolek & Wiliński (2012) also indicated in their study of 44 constructions companies on the Warsaw Stock Exchange that there is a statistically significant relationship between liquidity measures and profitability.

Similar to the study of Eljiely (2004), a study by Priya & Nimalathasan (2013) in the manufacturing sector of Sri Lanka showed a negative relationship between liquidity and profitability.

Contrary to all the above Ware (2015) showed in the study of listed firms in Ghana that there is no statistically significant relationship between liquidity management and profitability. This study, like that of Owolabi & Obida (2012), used Average Collection Period, Average Payables Period and Cash Conversion Cycle as liquidity measures. The sample for this study was made up of all the 33 listed firms in Ghana including banking and other financial institutions. This results is deviation from the work of Lartey et al., (2013) in the banking sector of Ghana.

3. Methodology

The study adopted the liquidity preference theory by Keynes (1936) from the perspectives of Baumol (1952) "the transaction demand for cash" as well as Whalen (1966) "the precautionary demand for cash". In his work, Baumol (1952) explains that the stock of cash as the holder's inventory of the medium of exchange and like an inventory of commodity, cash (liquid asset) is held because it can be given up at the appropriate moment, serving then as its possessor's part of the bargain in an exchange. The model therefore shows how necessary it is for a firm to at any point in time hold some assets in the form of cash or its equivalent to be able to meet transaction needs. The model by Whalen (1966) is taken from the definition by Keynes (1936) precautionary cash balance, which is to provide for contingencies requiring sudden expenditure for unforeseen opportunities or advantageous purchases.

Considering the funding behavior of listed firms in Ghana as found by Isshaq (2009b), the study explored the Pecking Order Model put forward by Myers (1984). According to this model firms prefer internal funding over external funding. The theory stresses that, asymmetric information creates the possibility of a different sort of cost. Thus, if firms rely highly on external financing and at a point it is unable to issue debt or equity funds it will end up throwing away a positive NPV investment. This cost is avoided if the firm can retain enough internally-generated cash to cover its positive-NPV investment opportunities.

The theory is relevant to this study as it places emphasis on internal liquidity management to allow for firms to take advantage of investment opportunities with internally generated funds. In a study by Adebiyi (2012) Van Horne is cited as suggesting that management of organizations makes use of pecking order in financing their investments because the method affords management the advantage of using retained earnings which, first makes management to avoid the scrutiny of suppliers of capital and floatation costs. The study keenly assessed the situation in the Ghanaian context.

4. Conceptual Framework

The following conceptual framework was designed to find out the extent to which the listed firms in Ghana are managing their short-term liquidity. It also explores how the industry characteristics of the individual firms and their sizes affect their approach to liquidity management. The author also considers that leverage could affect the liquidity management of the firms. Finally, the study looked at the possible effect of liquidity management on profitability of the firms. The figure below gives a pictorial view of the conceptual framework.
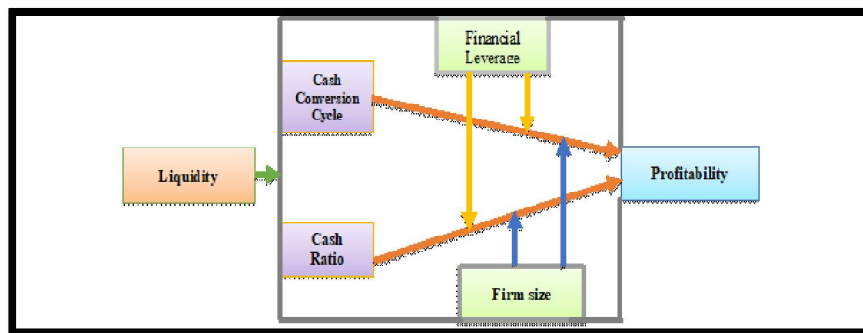

Figure 1: Conceptual Framework
Source; Author

4.1. Hypotheses

The study looked at the impact of a firm's liquidity management on its profitability. A previous study on banks and other financial institutions showed a significant positive relationship (Lartey et al., 2013). However, based on prior studies by Eljiely (2004); Garanina & Petrova (2015); Kirkham (2012) and Majanga (2015) this relationship is expected to be negative. The first hypothesis is therefore as follows:

4.1.1. Hypotheses 1

There is a possible negative relationship between liquidity measures CCC, and CR and profitability measure ROA of listed non-financial firms in Ghana. That is, a firm which holds excessive liquid assets is likely to sacrifice its profitability.

The amount of liquidity held by a firm is influenced by the characteristics of the particular industry as noted by Moyer et al., (2008) and Ross et al., (2010) and the size Eljiely (2004). It presuppose therefore that firms size and industry characteristics affect profit and hence the relationship between profitability and liquidity. The study categorized the firms into different sectors. The purpose was to find the perceived relationship between liquidity and profitability in each of the economics sectors. The second hypothesis is as follows:

4.1.2. Hypotheses 2

The relationship between liquidity and profitability is likely to be different in different economic sectors. The size of a firm is also expected to affect the relationship.

The next hypothesis looks at how leverage affects a firm's liquidity holding. Firms with access to an efficient financial market may hold lower amount of liquid assets Myers & Majluf (1984). Also, firms in Ghana rely heavily on internally generated funds instead of debt Isshaq (2009b). The study look at how leverage affects the liquidity and profitability relationship.

4.1.3. Hypothesis 3

The relationship between liquidity and profitability is likely to be affected by the extent of leverage of the selected firms.

4.2. Study Sample and Data Collection

The sample for this study consist 20 non-financial firms listed on the GSE. In total, there are 35 companies listed on the GSE. However, this study sampled 20 companies excluding banks and other financial institutions due to the peculiar nature of operations relating to money and financial management; and used their financial information for analysis of the variables. Financial information from the GSE were deemed very much appropriate for this study since they meet all necessary requirements for publication and serve as reliable document for all stakeholders. The categorization of listed non-financial firms is shown in the table below:

Economic Sector	Area of Operation	Sample Total
Service	Energy	2
	Information Technology	1
Total		3
Manufacturing	Industrial	5
	Pharmaceutical	2
	Consumer Staple	8
Total		15
Mining	Gold	1
	Oil Exploration	1
Total		2
Grand Total		20

Table 1: Categorization of the Sampled Listed Firms

This financial information (in the form of financial statements) provides the most authoritative information on annual reports of all the listed companies. Financial ratio analysis was computed to gather the necessary information for all the variables in the study.

4.3. Measurement of Dependent and Independent Variables

In this study, the dependent variable is Profitability and the independent variables Liquidity. CCC, CR and Operating Cash Flow Ratio (OCFR) were employed as liquidity measures. On the other hand, ROA was used as profitability measure. Bearing in mind that variables other the individual liquidity and profitability variables are likely to affect the possible relationship, the study employed Financial Leverage Ratio (FLR), firm size (calculated using Logarithm of total assets LOGTA) as control variables.

4.4. Model Specification

The following regression model as developed by Eljiely (2004) was deemed appropriate for the study to establish a possible relationship between the chosen liquidity measures and profitability.

$$NOI = \beta_0 + \beta_1 CR + \beta_2 CGS + \beta_3 LOGTA + \varepsilon \qquad (i)$$

Where: NOI is net operating income, CR is current ratio, CGS is the Cash Gap in days which is the same as cash conversion cycle (CCC), LOGTA is the logarithm of total assets and ε is the random component of the research model.

However, as in the case of Garanina & Petrova (2015) the model has been modified in order to suit the study hypotheses as shown below:

General Regression Equation for Hypotheses 1, 2 and 3

$$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 OCFR_{it} + \beta_3 CR_{it} + \beta_4 FLR_{it} + \beta_5 LOGTA_{it} + \varepsilon \qquad (ii)$$

Where: ROA – Return on Asset of firm i at time t
CCC – Cash Conversion Cycle
OCFR – Operating Cash Flow Ratio
CR – Cash Ratio
FLR – Financial Leverage Ratio
LOGTA – Natural Logarithm of total assets (as measure of size of the firm)

4.5. Presentation of Results

An initial correlation analysis showed that there exist multi-collinearity between the OCFR and CR used as measures of liquidity. To avoid possible misleading results, the OCFR was dropped from the general equation. The revised general regression equation is as follows;

$$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CR_{it} + \beta_3 FLR_{it} + \beta_4 LOGTA_{it} + \varepsilon \qquad (iii)$$

Descriptive Statistics					
Variables	N	Minimum	Maximum	Mean	Std. Deviation
ROA	200	-.701	.588	.06278	.141735
CCC	200	-459.475	336.024	7.82251	142.012693
CR	200	.002	4.772	.30873	.581231
FLR	200	.013	55.086	3.12447	6.557773
LOGTA	200	12.686	24.576	17.75256	2.577597
Valid N (listwise)	200				

Table 2: Descriptive Statistics

Table 2 above provides a summary of descriptive statistics of the variables used in the study. From the table, ROA which is the profitability measure and the dependent variable has a mean value of 6.2% for the ten year period from 2006 to 2015. The CCC which is a liquidity measure showed a mean value of 7.82 days. CR is the measures of liquidity which

looks at the extent to which available cash and cash equivalents are able to cover the entire financial obligations of the firm. The mean value of the CR is 0.31. This means that on average, the firms' cash and cash equivalents can cover only up to 31%. It can be deduced from the table that the mean value of FLR is 3.21 which translates to about 300%. It should however be noted that this result is due to extremely high values reported by one of the companies which depends excessively on external borrowing.

4.6. Correlation Analysis

Results from the correlation analysis as shown in a table below indicate that all the independent variables used for the study have significant correlation with the dependent variable; ROA. Thus, CCC has a significant negative correlation with ROA ($r = -0.438$, $p = 0.002$). The CR on the other hand has a significant positive correlation with ROA ($r = 0.567$, $p = 0.000$). The FLR and LOGTA which are the control variables for the study also showed weak and moderate correlations respectively, with ROA.

Correlations		ROA	CCC	CR	FLR	LOGTA
ROA	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	200				
CCC	Pearson Correlation	-.438**	1			
	Sig. (2-tailed)	.002				
	N	200	200			
CR	Pearson Correlation	.567**	.084	1		
	Sig. (2-tailed)	.000	.532			
	N	200	200	200		
FLR	Pearson Correlation	-.269**	.003	-.052	1	
	Sig. (2-tailed)	.005	.981	.756		
	N	200	200	200	200	
LOGTA	Pearson Correlation	.543**	.146	.163	.016	1
	Sig. (2-tailed)	.001	.076	.112	.853	
	N	200	200	200	200	200

Table 3: Pearson Correlation Coefficient Matrix
**. Correlation Is Significant at the 0.01 Level (2-Tailed)

FLR has a weak negative correlation of ($r = -0.269$, $p = 0.005$) whereas LOGTA which represents size of firm showed a positive correlation of ($r = 0.543$, $p = 0.001$). However, there was no correlation among the independent variables themselves. This means that the variable can give reliable results when used in the regression analysis.

4.7. Multiple Regression Analysis

In order to be convinced about the results emanating from the study, it was necessary to measure the relationship in different ways as shown by the conceptual framework. For this reason, the general regression equation was further broken down to allow for different stages of measurement. First, a link was drawn between liquidity variables and profitability. This was to give evidence of the link without a control variable. Secondly, each of the control variables was introduced separately to see their individual effect on the relationship. Finally the control variables were introduced at the same time in the equation to find their combined effect on the relationship. The revised equations for this purpose are shown below:

$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CR_{it} + \varepsilon$ (iv)

$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CR_{it} + \beta_3 FLR_{it} + \varepsilon$ (v)

$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CR_{it} + \beta_3 LOGTA_{it} + \varepsilon$ (vi)

$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 CR_{it} + \beta_3 FLR_{it} + \beta_4 LOGTA_{it} + \varepsilon$ (vii)

5. Results from the Pooled Sample

The results from model 1 indicate R of 0.452 and R-Square of 0.204. This model expresses a relationship between liquidity variables (CCC and CR) and profitability variable (ROA) without many control variable. It shows therefore that without controlling for any other variables, the model explained 20% of the variations in the dependent variable ROA.
Summary of results from the Models

Model Summary				
Models	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.452a	.204	.182	.128732
2	.611a	.373	.351	.114335
3	.607a	.368	.348	.113877
4	.616a	.379	.362	.114344

Table 4
a. *Predictors: (Constant), FLR, CCC, LOGTA, CR*

Model 2 also indicates R of 0.610 and R-Square of 0.373, meaning that the model explains 37.3% of the variations in the dependent variable. Model 3 produced R figure of 0.607 and R-Square of 0.368 indicating 36.8% whereas Model 4 produced R figure of 0.612 and R-Square of 0.379 indicating 37.9%.

5.1. Regression Results

The regression equations produced coefficients as shown in a below. The first equation which sought to depict the relationship between liquidity and profitability without controlling for any variable is indicated by the results in model 1.

Models	Ind. Var.	Coefficients	Std. Error	t	Sig
1	Constant	-.489	.163	-3.295	.000
	CCC	-.069	.198	-1.086	.014
	CR	.287	.095	3.183	.002
2	Constant	-.073	.219	-.586	.776
	CCC	-.145	.048	-1.981	.051
	CR	.378	.097	3.892	.001
	FLR	-.042	.126	-.565	.558
3	Constant	-.061	.183	-.368	.625
	CCC	-.125	.043	-1.942	.044
	CR	.355	.098	5.928	.001
	LOGTA	.339	.096	4.791	.001
4	Constant	-.082	.287	-.384	.691
	CCC	-.123	.041	-1.813	.052
	CR	.357	.089	.752	.001
	FLR	-.041	.143	-.689	.038
	LOGTA	.259	.074	3.678	.002

Table 5: Regression Results from the Pooled Sample
a. Dependent Variable: ROA
b. Predictors: (Constant) FLR, CCC, CR, LOGTA

The results showed that there is a significant negative relationship between CCC of the firms and their ROA (β =-0.069, t =-1.086, p = 0.014<0.05). However, CR which looks at the extent to which the firms' available cash and marketable securities can offset their maturing short-term obligations showed a positive relationship with ROA. Thus (β = 0.287, t = 3.183, p = 0.002 < 0.05). In model 2, FLR was introduced as a control variable. The results showed a strong R value of 0.611 and R-Square of 0.373 and a *p*-value of 0.00 indicating significance of the model. The regression coefficient, like model 1 showed a significant negative relationship between CCC and ROA as well a significant positive relationship between CR and ROA. However, the negative relationship found between FLR and ROA could not be substantiated statistically, since its *p*-value of 0.558, is above the 0.05 level of significance.

The model 3 also introduced size of the firm represented by LOGTA of the firms. LOGTA was used instead of natural logarithm of total sales (LOGS) due to multi-collinearity found between the LOGS and the other variables. Again in this relationship, CCC showed a significant negative (β = -0.125, t = -1.942, p = 0.044< 0.05). CR also maintained its positive relationship with ROA as in the previous two models with a *p*-value of 0.00. It also came to light that size of the firm, like the CR, has a significant positive relationship with profitability. From the coefficient table above, the LOGTA showed a Beta coefficient of 0.339 and p-value of 0.01. The model 4 sought to unravel the overall effect of the two controlling variables on the liquidity and profitability relationships identified in the earlier 3 models. The outcome of this analysis was not much different from the outcomes of the earlier ones, except for the FLR which depicted a significant negative relationship with profitability which was statistically significant at *p*-value of 0.038.

It is important to note that, the level of tolerance for all the variables as shown in the collinearity statistics is acceptable. The Variable Inflation Factor (VIF) also provides additional information on collinearity of the independent variables. When this measure is used, variables are said to be collinear when they have VIF exceeding 10. It can be observed from the collinearity statistic that none of the variables have a VIF that is closer to 10. This confirms the collinearity results depicted by the correlation matrix above.

5.2. Results from Sectorial Analysis

The firms were categorized into three main sectors, namely; manufacturing, mining and exploration as well as service/retail. Results shown in tables below were obtained from the general regression model for the study. The results again indicate that the data used for the analysis fits the model as evidenced by the R-Square values in the model summary below.

Model Summary				
Sectors	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
Manufacturing	.594a	.353	.322	.116761
Mining	.713a	.509	.378	.070533
Service/Retail	.799a	.638	.580	.097034

Table 6: Model Summary for sectorial analysis
Predictors: (Constant), FLR, CCC, LOGTA, CR

The regression coefficients in the table below show that, in the manufacturing sector, the results were not different from the overall picture portrayed by the pooled sample.

Sectors	**Ind. Var.**	**Coefficients**	**Std. Error**	**t**	**Sig**
Manufacturing	Constant	-.473	.180	-3.958	.000
	CCC	-.168	.056	-3.169	.002
	CR	.087	.261	4.158	.000
	FLR	-.093	.279	-1.777	.017
	LOGTA	.354	.090	4.266	.000
Mining	Constant	-.078	.423	-.185	.856
	CCC	-.665	.178	-2.938	.010
	CR	.576	.156	2.603	.020
	FLR	.013	.048	.060	.953
	LOGTA	-.002	.007	-.012	.991
Service	Constant	-.117	.158	-.741	.465
	CCC	.384	.103	2.356	.027
	CR	.347	.094	2.833	.009
	FLR	-.237	.064	-1.802	.084
	LOGTA	.187	.051	1.140	.265

Table 7: Regression Results from Sectorial Analysis
a. Dependent Variable: ROA
b. Predictors: (Constant) FLR, CCC, CR, LOGTA

In the manufacturing sector, all the independent variables were found to have significant relationship with profitability. Both CCC and FLR have significant negative relationship with ROA (β = -0.168, t = -3.169, p = 0.002 < 0.05), (β = -0.093, t = -1.777, p = 0.017 < 0.05). On the other hand, CR and LOGTA also have significant positive relationship with ROA (β = 0.087, t = 4.158, p = 0.000 < 0.05), (β = 0.354, t = 4.266, p = 0.000 < 0.05). However, in the mining and exploration sector, only CCC and CR were found to have significant relationship with ROA. Thus, CCC being negative (β = -0.665, t = -2.938, p = 0.010 < 0.05), and CR being positive (β = 0.576, t = 2.603, p = 0.020 < 0.05). FLR in this sector had a positive relationship whereas LOGTA showed negative relationship. However, both were insignificant; (β = 0.013, t = 0.060, p = 0.953 > 0.05) and (β = -0.002, t = -0.012, p = 0.991 > 0.05). Results from the service/retail deviated a bit from the pooled sample results as well as results from both manufacturing and mining sectors. Thus, in this sector the CCC was found to be positively related with ROA (β = 0.384, t = 2.356, p = 0.027 < 0.05). CR also has a positive relationship with ROA (β = 0.347, t = 2.833, p = 0.009< 0.05). Also, FLR has a negative relationship with ROA (β = -0.237, t = -1.803, p = 0.084 > 0.05), whereas LOGTA has negative relationship with ROA (β = 0.187, t = 1.140, p = 0.265 > 0.05) but both outcomes cannot be substantiated statistically.

5. Discussion of Results

Results from Pearson correlation analysis showed that all the variables for the study were significantly associated with profitability measure (ROA). CCC showed a significant moderate relationship (r = -0.438, p = 0.002 < 0.01), indicating that a higher CCC will lead to lower ROA and vice versa. CR on the other hand showed a significant positive correlation (r = 0.567, p = 0.000 < 0.01), indicating that when a firm has adequate amount of cash and cash equivalent to meet its maturing obligations it can increase its profit. This is true because ability to honour obligations will enable the firm to gain trade discounts which in turn will help reduce production cost (cost of sales) to be able to reduce prices so as to sell more. Financial leverage was also found to be negatively correlated with ROA, (r = -0.269, p = 0.005 < 0.01), even though the relationship was weak. Firm size (LOGTA) was also found to be positively correlated with ROA, (r = 0.543, p = 0.001 < 0.01). However, none of the independent variables correlated with each other. This means that the third hypotheses for this study which supposed that, there is a possible significant relationship between financial leverage and liquidity cannot be

substantiated and is therefore rejected. This confirms the earlier findings of Lyroudi & Lazaridis (2000), which concluded that there is no linear relationship between financial leverage and CCC.

The various relationships became more apparent in the multiple regression analysis as shown in the table above. In all the scenario models used, CCC was found to be negatively related to ROA, whereas CR showed a significant positive relationship. In the pooled sample, the models produced R^2 of 0.204, 0.373, 0.368 and 0.379 for model 1, 2, 3 and 4 respectively. R^2 of 0.204 for the first model appears relatively low. However, considering the fact that profit of a company can be determined by several factors such as price, competition, demand for the product, advertising, economies of scale, state of the economy etc.; 20% of liquidity is significant and cannot be ignored. The models also showed F-statistics as follows; 11.019, 16.054, 22.492 and 16.542 for 1, 2, 3 and 4 respectively indicating significance and reliability of the results.

The negative relationship found in this study agrees with the works of Bolek & Wiliński (2012); Eljiely (2004); Saleem & Rehman (2011) and Ware (2015) who found a negative but insignificant relationship between CCC and ROI, ROA and ROE respectively. However, unlike their case, CCC in this study showed a rather significant relationship with ROA. This results is in line with the findings of Garanina & Petrova (2015) who found significant negative relationship with return on net operating assets (RNOA). This means that CCC and ROA are inversely related. This results is contrary to the works of Lyroudi & Lazaridis (2000); Nandi (2012) and Owolabi & Obida (2012) who found a rather significant positive relationship between ROI and NPM. The findings therefore confirm the first hypotheses for this study, which proposed that there is likely to be negative relationship between liquidity and profitability. CR on the other hand, showed a significant positive relationship with ROA. This variable has not been tested by most studies the researcher came across. However considering the significance of effective cash management as an aspect of the overall liquidity management, the cash ratio is an appropriate measure to test.

Significance of the relationship as revealed by this study shows that firms must pay particular attention to their cash holdings to ensure that appropriate level of cash and cash equivalents are available at all times to meet maturing obligations. As the study reveals, this will help improve the profit situation of the firm. The results however, fail to resonate with the second hypotheses for the study which proposed that there is inverse relationship between liquidity and profitability. The study also revealed a negative relationship between FLR and profitability. This relationship was significant only in the general model but not in the second model which excluded firm size. It was also evident that firm size measured by LOGTA has a significant positive relation with profitability, indicating that large firms are likely to report higher profit than the smaller ones. This results also agrees with the findings of Garanina & Petrova (2015). On the contrary, Bolek & Wiliński (2012) showed that size of a firm has positive but insignificant relationship with profitability. The study by Eljiely (2004) also showed that the size effect is only significant in the individual sectors but not in the pooled sample. This finding is also contrary to Ware (2015) who concluded that size of the firm has no significant effect on profitability.

The second objective of this study was to find out the effect of liquidity on profitability in the various economic sectors. To determine this, the firm were regrouped into three major economic sectors; manufacturing, mining/exploration and service/retail. In the sartorial analysis, CCC showed a significant negative relationship ($\beta = -0.168$, t = -3.169, p = 0.002 < 0.05) and CR showed positive significant relationships ($\beta = 0.087$, t = 4.158, p = 0.000 < 0.05); as in the pooled sample for the manufacturing and mining/exploration sectors. This results is consistent with that of Priya & Nimalathasan (2013) who studied the effect of liquidity on profitability in the manufacturing sector of Sri Lanka.

However, in the service/retail sector, both CCC and CR were found to be positively related to ROA, and these results were statistically significant. Also, FLR and LOGTA were found to be significantly related to ROA only in the manufacturing sector but insignificant in the mining/exploration and service/retail sectors. In the case of LOGTA, a similar results was found by Garanina & Petrova (2015). It could therefore be said that, the effect is so significant in the pooled sample due to the fact that manufacturing companies constitute the majority of firms in this study. The fourth hypotheses can therefore be accepted, in that the effect of liquidity on profitability differs across the various economic sectors. This also agrees with finding of Eljiely (2004) and Garanina & Petrova (2015).

The third objective was to find out the effect of liquidity on profitability. The results showed that there is a statistically significant effect of liquidity management on profitability. However, the direction of the effect was not the same for the two components used to measure liquidity. Whereas CCC showed a significant negative effect on ROA, the CR in all cases indicated a rather significant positive effect. Therefore, the second hypothesis is rejected on the basis of lack of unanimity in the findings from the components of liquidity. In answering the second question, liquidity management has significant effect on profitability; however the effect is not the same for both components of liquidity.

Moreover, results from Pearson correlation analysis showed that financial leverage has no significant effect on liquidity. The third hypothesis is therefore rejected.

The impact of liquidity management on profitability as found in the second objective was revealed to be different in the manufacturing, mining/exploration and service/retail sectors. This result satisfies the third objective for this study which sought to know how the effect of liquidity on profitability appears in different economic sectors. In satisfaction of the fourth hypotheses, firm size was also found to significantly affect profitability in the pooled sample but the effect was significant for only the manufacturing sector in the sartorial analysis.

6. Implications of the Study

The study confirmed other previous studies that there is a significant relationship between liquidity management and firm profitability. The negative relationship between CCC and ROA as indicated by this study means that, the longer the CCC, the lower the profit a firm is able to generate. That is, longer CCC in the long run leads to deteriorated relationship

with suppliers and a potential increase in cost of production thereby reducing the firms' profit.

Moreover, the significant positive relationship found between CR and ROA also means that the higher the CR, the higher the chances for the firm to generate more profit. This confirms the results from the negative CCC, in that; higher CR means the firm has enough cash and cash equivalent to settle all its maturing obligations. This will in turn lead to improved relationship with suppliers allowing them to grant more discounts to the firm and to help reduce cost of production. Higher CR also means that the firm does not delay in the payment of employee salaries. This can also lead to the employees being motivated to work hard and avoid waste, thereby increasing productivity and associated profit. Suppliers of funds will also be enthused to receive their returns in the form of interest on time and will be motivated to give more.

Proponents of liquidity and profitability trade-off believe that, the more liquid a firm is, the less profitable it will be. However, this study seems to deviate from that notion, in that; when the firm invests much of its highly liquid resources in short-term marketable securities, it will also generate returns which contribute to profit. It will also enable the firm to be able to get hold of cash to make pressing payments at short notice. As stated by Bolek & Wiliński (2012) a firm which wants to maintain high level of financial liquidity must possess large amount of cash and highly liquid assets and small share of short-term liabilities.

The study therefore should be the basis for other researchers and practitioners to take a second look at the concept of liquidity management.

7. Recommendation for Managers

In addition, based on the negative relationship found between liquidity and profitability, it is recommended that management of the firms take steps to ensure that CCC figures do not go beyond certain limits. This is because, unreasonably high values of CCC leads to lower profit and lower values leads to higher profit. Therefore, in order to achieve higher profits firm should ensure that they meet their short-term obligations to satisfy their stakeholders especially suppliers goods and services, suppliers of funds and employees.

Moreover, as a result of the positive relationship found between liquidity (CR) and profitability (ROA), firms should ensure that they keep appropriate levels of cash and cash equivalents. Doing so has the potential to give confidence to stakeholders and helps to achieve high levels of profit.

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