



Examining the Economic Interaction between Liquidity and Firms' Financial Performance: Evidence from the Ghana Stock Exchange

**Joseph Antwi Baafi¹, John Kwame Duodu², Eric Effah Sarkodie¹
and Williams Kwasi Boachie^{1*}**

¹*Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development, Kumasi, Ghana.*

²*Royal Ann College of Health, Kumasi, Ghana.*

Authors' contributions

This work was carried out in collaboration among all authors. Author JKD designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors JAB and EES managed the analyses of the study. Author WKB managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JEMT/2020/v26i1030296

Editor(s):

(1) Kamarulzaman Ab. Aziz, Multimedia University, Malaysia.

Reviewers:

(1) Clévenot Mickaël, Université Sorbonne Paris Nord, France.

(2) S. Kalaiselvi, Vellalar College for Women, India.

(3) Thirumala Rao, Osmania University, India.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/63152>

Original Research Article

Received 17 September 2020

Accepted 22 November 2020

Published 14 December 2020

ABSTRACT

This study examined the economic interaction between liquidity and financial performance of manufacturing firms listed on Ghana Stock Exchange (GSE). Specifically, the study sought to examine the relationship between liquidity as measured by current ratio, quick ratio and cash ratio and firms' financial performance as measured by return as assets, return on equity and return on capital employed and determine the interactive effects on share value of firms. Data extracted from the audited and published annual reports of twenty-one (21) firms for the period 2008 to 2019 was used for the study. The study used correlation analysis for relationship and ANCOVA modeling for interactive effects. The study found that there was a weak positive statistically significant relationship between return on assets and measures of liquidity; there was a weak positive statistically insignificant relationship between return on equity and measures of liquidity; there was a

*Corresponding author: E-mail: jbantwi@uew.edu.gh;

weak negative statistically insignificant relationship between return on capital employed and measures of liquidity. The study also found positive effects of liquidity and performance on share value. However, the magnitude of interactive effect of liquidity and firm's performance was much higher than the single effects. Based on the findings, the study recommended among others that authorities in listed manufacturing firms in Ghana should try and maintain an ideal level of liquidity that can meet their firms' operational needs

Keywords: Liquidity; firm's financial performance; interactive effects.

1. INTRODUCTION

Firm liquidity is one of the foremost crucial issues within the field of corporate finance. Its fundamental aim is on capacity of establishments to meet short-term monetary commitments when they fall due, utilizing their short-term money related assets available [1]. Müller and Hettig [2] viewed liquidity as accessibility of cash and cash equivalents to meet short-run operational needs of firms. Resources like stocks and bonds are exceptionally fluid since they can be changed into cash within days [2]. However, huge resources such as properties, plants and equipment cannot be effortlessly changed into cash. As argued by Bhunia [3], an entity that is not proficient may be considered as unhealthy, but one possessing no liquidity will soon phase out. As a matter of fact, no firm can operate successfully without liquidity.

Firms are required to keep a certain level of liquidity to back their daily operations [4,5] and [6]. In other words, firms are to preserve a suitable amount of liquidity to meet their short-term financial obligations. This will make them sound and solvent, thereby gaining public confidence [4,5] and [6]. As postulated by Bolek & Wojciech [7], over funding results in extra costs primarily reflected within scope of storage and support costs. Also, overflow of cash, inventories and accounts receivables are abundance current resources that may lead to consequences of lost opportunities [7]. Contrarily, under financing may adversely induce incomes subsequently diminishing corporates' viability [7]. Put simply, liquidity position of firms should not be extremely high or too low. A well-managed level of liquidity, at a calculated risk, is therefore viewed as catalyst for better firms' performance [8].

According to KPMG [9] limiting corporates' cash conversion cycle discharges fluid resources that straight forwardly induce viability of entities. This

concept is widely applied to firm listed in various exchanges including Ghana. The operations of these firms entails investment in inventories, which is funded either through cash or trade credits; they use these trade credits as marketing tools to uphold or increase sales; thereby getting liquid resources to back their daily undertakings and any leftovers thereof, voted into marketable securities to gain returns. However, recent events happening on Ghana Stock Exchange point to the fact that, some entities are confronted with challenge of successfully overseeing their fluid resources to guarantee their progress. This situation is supported by recent delisting of Golden Web Ghana Ltd, Transaction Solutions Ghana Ltd, Pioneer Kitchenware Company Limited, Aluworks Ltd and Cocoa Processing Company (CPC) Ltd from the Ghana stock market. These entities might have been delisted because; they did not have a good liquidity position as a result of poor management of their liquid assets. This affirms assertion that, effective liquidity management leads to enhanced corporate worth, whilst a diminishing corporate viability is case of the opposite.

Closely linked to liquidity is a firm's financial performance. According to Akenga [10] financial performance is act of assessing outcomes of a corporate's strategies and actions in economic terms. As indicated by Basel Committee on Banking Supervision [11], resources of firms are viewed as considerably liquid if they can be effortlessly changed into cash without a reduction in their worth. In the same way, a market is viewed as liquid if those trading on it can defray their assets at costs that would not cause any damage to their finances. Profitability is enriched for entities that keep liquid resources, however, there is a point at which keeping of further liquid resources might hinder profitability. The entities must therefore strive to achieve the dual objective of liquidity and profitability by striking a balance between the two. Studies on liquidity and its impact on entities' viability have not been

conducted in an all-inclusive manner. This void is supported by limited empirical studies that mainly sought to concentrate on the non-financial sectors. For instance Ayu et al. [12], Mohd and Asif [13], Ejike and Agha [14] and Mehmet [15]. The aforesaid studies are limited in scope in that; they all failed to consider listed manufacturing entities in Ghana. This study was therefore conducted to help fill that gap.

Studies on liquidity and financial performance have not taken into consideration the economic implication of the two concepts. Moreover, studies on liquidity and performance have concentrated on other countries.

The objectives of this study were in two fold. The first was to delved into the economic interaction between liquidity and firm's financial performance and to evaluate the degree of association. The second was to fill the research gap in this area of study using the Ghanaian context even though attention was still on the non-financial sector. Three main variables would be used as a measure of financial performance and liquidity are: Return on Assets (ROA), Return on Equity (ROE), Return on Capital Employed (ROCE) and Current ratio, Quick ratio and Cash ratio.

2. REVIEW OF LITERATURE

2.1 Concept of Liquidity

According to Junaidu and Aminu [16], liquidity is the amount of capital that is available for investment. As liquidity is required to meet financial obligations such as payroll and expenses, this is an important consideration for businesses and individuals. Many firm resources are considered liquid while others are deemed illiquid. Some types of liquidity in body corporates are cash balance in account, accounts receivables, inventories, overdraft arrangement with banks, marketable securities, factoring, inter-company deposits [17], money market mutual funds/liquid funds [18] and credit [19].

The level of liquidity held by firms is of utmost importance. Be that as it may, liquidity in overabundance of what is needed by establishments to fund their undertakings may be unproductive [20]. According to theory, there are a number of factors that affect the level of liquidity. These are nature and size of business, manufacturing cycle, business fluctuations, production policy, credit policy, growth and

expansion activities, operating efficiency and liquidity management.

2.2 Theories on Liquidity and Firms' Performance

This section presents some theories on liquidity management that guided the conduct of the study. According to Horne [21] working capital management, which is the backbone of liquidity management has limitations with respect to theoretical framework. Particularly, Smith [22] opined that the restricted common hypothesis which relates to working capital management comes from finance literature and centers on the association between risks and profitability. Prior studies have however upheld two theories that expound on liquidity management to include the Cash Conversion Cycle and the trade-off theories, even though other theories also exist.

2.2.1 Cash Conversion Cycle (CCC) theory

The CCC theory was proposed by Richards and Laughlin [23]. This theory incorporates both current assets and current liabilities. The authors devised this theory as part of a broader framework of analysis termed working capital cycle. According to Richards and Laughlin [23], the CCC theory is supreme to other forms of liquidity analysis that depend on segregation of working capital. The CCC can be viewed as duration between cash outlays that emerge during generation of outputs, and money inflows that arise from sale of those outputs, and collection of the accounts receivables [8]. According to Cagle et al. [24] the current ratio and its associates are most commonly utilized to evaluate entities' liquidity, but these measures do not consolidate element of time. Including the CCC to those conventional measures leads to a more proficient investigation about a corporate's liquidity position [24].

2.2.2 Trade-off theory

As indicated by Lamberg and Vålming [25] liquidity and profitability are the two means of working capital management (WCM), and relates to coordination of resources and obligation developments overtime. According to Saluja and Kumar [4], Puneet and Parmil [5] and Garcia-Teruel and Martinez-Solano [6], these two money related terms are at two ends of a straight line such that, developments towards one, naturally suggests developments absent

from the other. Dash and Hanuman [26] put it that, the common claim in literature centers around liquidity and profitability trade-off which postulates that, these two money related terms pose contrasting ends to an establishment. Therefore, pursuing one will result in the trade-off of the other.

2.2.3 Liquidity preference theory

The liquidity preference theory was proposed by Keynes [27] According to the theory, the demand for money as an asset depends on the interest foregone by not holding bonds. Keynes [27] argued that, interest rate cannot be a reward for saving, as such, if a person hoards his savings in cash, he will receive no interest. Keynes viewed money as the most liquid asset. The more quickly an asset is converted into money, the more liquid it is said to be. Under this theory, the demand for liquidity is determined by three motives; (1) transaction motive-where people prefer to have liquidity to assure basic transactions, (2) precautionary motive-where people prefer to have liquidity in the case of social unexpected problems that need unusual costs; and (3) speculative motive-where people retain liquidity to speculate that bond prices changes [27].

2.2.4 Shiftability theory

Shiftability is an approach to keep firms' liquid by supporting the shifting of assets. When entities are short of funds, they can sell their assets to more liquid entities [28] According to the Shiftability theory of liquidity, establishments maintain liquidity if they hold assets that are marketable [28,29]. During liquidity crisis, such assets are easily converted into cash. Thus, this theory contends that, the Shiftability of firms' assets is a basis for ensuring good liquidity management [28,29]. One weakness of this theory is that, in times of stress or crisis, the effectiveness of assets for liquid purposes goes away as there is no market for them [30].

2.3 Empirical Reviews on Liquidity and Firms' Performance

A number of researchers have conducted studies on liquidity and firm's performance. Raykov [31] conducted a study on 20 listed Bulgarian firms for the period 2007 to 2015. It was disclosed from the study that, after the year 2007, financial

managers in Bulgaria successfully isolated profitability from liquidity problems as the negative association between them was insignificant. The study also revealed long-term effect of liquidity on profitability indicators, but not vice-versa. In Pakistan, Syed et al. [32] conducted a research on some listed entities from 2004 to 2009. Through the regression analysis, the study revealed that, firm effect, industry effect and market share all had a significant influence on the profitability of the firms, as measured by ROA and ROE. Abubakar et al. [33] studied into the effect of firms' characteristics on the financial performance of listed insurance companies in Nigeria for the period 2007 to 2016. From the study's robust regression analysis, liquidity and age had a significantly negative impact on the financial performance of the companies. Again in Nigeria, Lyndon and Paymaster [34] studied five (5) food and beverage companies listed on the Nigeria Stock Exchange (NSE) for the period 2011 to 2015. From the results, Cash Ratio (CARAT) and Quick Ratio (QUIRA) had significantly positive relationship with the profitability (ROCE) of the firms. Also from the results, Cash Conversion Cycle had an insignificantly inverse relationship with the firms' ROCE.

Vintila and Nenu [35] conducted a study on listed Romanian Companies. Using correlation and multivariate regression analysis, the study found out a significantly negative relationship between liquidity and corporate financial performance. In Ethiopia, a study by Mengesha [36] on metal manufacturing companies established a significantly negative relationship between cash conversion cycle and profitability measures of the sampled firms. Durrah, et al. [37] researched on food industrial companies listed on the Amman Bursa for the period 2012-2014. From the study's results, there was no relationship between all the liquidity ratios and gross profit margin. However, there was a weak positive relationship between current ratio and each of the operating profit margins and the net profit margin.

Apuoyo [38] studied 19 quoted manufacturing firms in Nigeria and revealed that, profitability increased with the firms' size, gross working capital efficiency and with a lesser aggressiveness of asset management. The result supports Bardia [39] whose study disclosed a positive relationship between liquidity and profitability. The result also agrees with Uremadu et al. [40]. The finding was not consistent with

Majeed et al. [41] and Samilogu and Dermirgunes [42].

Alshatti [43] examined 13 selected commercial banks in Jordan. From the study's findings, quick ratio and investment ratio had a positive impact on the banks' profitability as measured by ROE, but a negative impact on capital and liquid assets ratio. Iqbal, Ahmad and Ria [44] researched on the relationship between working capital management and the profitability of firms listed on the Karachi Stock Exchange (KSE) in Pakistan. Findings of the study showed an inverse relationship between Cash Conversion Cycle (CCC) and the firms' profitability. Ben-Caleb et al. [45] conducted a study on 30 listed manufacturing companies in Nigeria. From the findings, current ratio and quick ratio had a positive impact on profitability, whilst cash conversion period had an inverse effect on the profitability of the companies.

A study conducted by Zygmunt [46] on Polish listed IT companies disclosed a positive association between receivable conversion period, inventory conversion period and corporate profitability. The study also established that, an increase in the days of accounts payable resulted in an increase in the profitability of the companies. In conclusion, liquidity had an association with the companies' profitability. Saleem and Rehman [47] studied Oil and Gas companies in Pakistan. From the results, liquidity had a positive relationship with profitability as measured by ROA, however, no association was found between liquidity and profitability as measured by ROE. Kirkham [48] conducted a study on 25 telecommunication companies in Australia. From the discoveries, traditional ratios had inappropriate decisions regarding liquidity because, the companies had inadequate liquid assets or cash flows.

All these literatures had two fundamental flaws. The first is that, an economic value was not put into the relationship between liquidity and firm's performance. The second is that, companies in Ghana were not considered in their studies. This study sought to fill these gaps in literature.

3. METHODOLOGY

3.1 Research Design

The quantitative research approach was adopted for this study. This approach was adopted because it provided the fundamental connection between empirical observation and mathematical

expression of quantitative relationships; its results was based on a sample that was representative of the entire population; and it could be replicated or repeated due to its high reliability [49].

3.2 Population and Sampling

All manufacturing establishments quoted on the Ghana Stock Exchange (GSE) formed the study's population. Currently, the total number of listed firms on the stock market totals forty-one (41). Out of this figure, manufacturing firms accounts for twenty-eight (28) representing 68.29% of the listed firms from 2008-2019. Because the study wanted to use a balanced data, the purposive sampling method was employed to make a sample out of the total population. The number of years in existence, technical suspension, unaudited financial records and incomplete financial statements were the factors or filters that were considered during the sampling process. Firms that failed in any of the above filters or factors did not form part of the sample. In all, seven firms were rejected as they failed in one or more of the factors that were considered for the sampling. The sample therefore totaled twenty-one (21) representing 75% of the target population. The sampled firms were Starwin Products Ltd, Ghana Oil Company Ltd, Total Petroleum Ghana Ltd, African Champion Industries Ltd, Benson Oil Palm Plantation Ltd, Fan Milk Ltd, Guinness Ghana Breweries Ltd, Mechanical Lloyd Company Ltd, Produce Buying Company Ltd, PZ Cussons Ghana Ltd, Sam Woode Ltd, Unilever Ghana Ltd, Camelot Ghana Ltd, Aluworks Ltd, Clydestone Ghana Ltd, Cocoa Processing Company Ltd, Anglogold Ashanti, Ayrton Drugs Ltd, Golden Star Ltd, Tullow Oil Ltd and Pioneer Kitchenware.

3.3 Data Source

Secondary statistics sourced from the published financial statements of chosen businesses for the period 2008 to 2019 was adopted for the study. The annual reports comprised of the comprehensive income statement, statement of financial position, statement of cash flows, statement of changes in equity and notes to the accounts. Ratios relating to the firms' liquidity and financial performance were then computed from the annual reports using various measurements or formulas outlined for the study. In this study, validity was censured by gathering information from the right source. Also, only annual reports audited by authorized Certified

Chartered Accountants were considered for the study. To further guarantee the soundness and correctness of the final outcomes, data collection and calculation process was triple checked.

liquidity was proxied by Current Ratio (CR), Quick Ratio and the Cash Ratio (CAR). Table 1 presents a summary of the study variables and their measurements.

3.4 Variables and their Measurements

3.5 Conceptual Framework

The study used three measures of financial performance and three measures of liquidity. Financial performance was surrogated by Return on Assets (ROA), Return on Equity (ROE) and Return on Capital Employed (ROCE), whilst

In order to comprehensively explore the relationship between liquidity and the financial performance of listed manufacturing firms in Ghana, the following frameworks were proposed.

Table 1. Measurement of study variables

Variables	Proxy	Measurement	Source
Return on Assets (ROA)	Financial Performance	Net Income/Total Assets	Annual Reports
Return on Equity (ROE)	Financial Performance	Net Income/Total Equity	Annual Reports
Return on Capital Employed (ROCE)	Financial Performance	Net Income/Capital Employed	Annual Reports
Current Ratio	Liquidity	Total Current Assets/Total Current Liabilities	Annual Reports
Quick Ratio	Liquidity	Quick Assets/ Total Current Liabilities	Annual Reports
Cash Ratio	Liquidity	(Cash and Cash Equivalents + Marketable Securities)/ Total Current Liabilities	Annual Reports

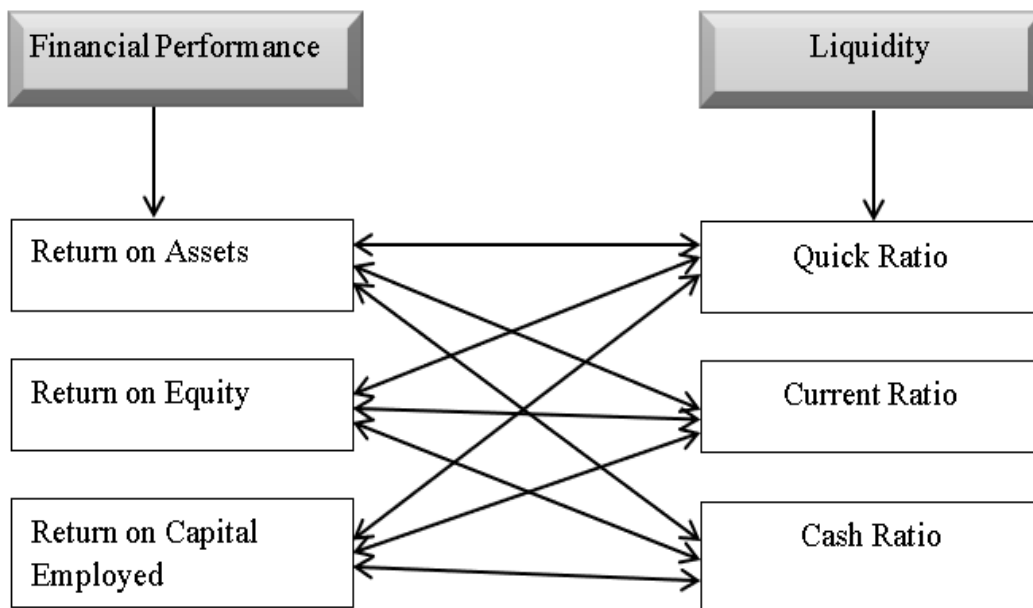


Fig. 1. Conceptual framework

3.6 Data Analysis

The study adopted both descriptive and inferential techniques of data analysis. The descriptive analysis covered the mean, standard deviation, skewness, kurtosis, range and the minimum and maximum values of the variables; whilst the correlational analysis covered the bivariate associations between the variables of concern. Diagnostics test such as stationarity was undertaken to check for the stationarity or otherwise of the panel data. All the data analysis was conducted through the STATA version 15 software packages.

3.6.1 Model specification

To analyze the economic relationship between liquidity and firms performance, the study adopted Analyses of Covariance (ANCOVA) model. The ANCOVA model rests on ANOVA model that has a general linear model with continuous outcome variable and two or more predictor variables. The authors considered an increase or decrease in share value as an economic interpretation of the interaction between firms' liquidity and performance. Generally, the model is specified as

$$SV = f(L, FP, L_FP) \quad (1)$$

Where $SV =$ share value, $L =$ liquidity, $FP =$ firm's performance, $L_FP =$ interaction between liquidity and firm's performance.

Having defined L as CR , QR , CAR and FP as ROE , ROA and $ROCE$, equation 1 would be written as

$$SV = f(CR, QR, CAR, ROE, ROA, ROCE, L_FP) \quad (2)$$

The reason why ANCOVA has a inbuilt covariate(s) is to minimize or reduce within-group error variance. One important assumption of ANCOVA is the independence of covariate and treatment effect; homogeneity of regression slopes. Specifically, the model is stated as

$$SV = \alpha_1 + \alpha_2 CR + \alpha_3 QR + \alpha_4 CAR + \alpha_5 ROE + \alpha_6 ROA + \alpha_7 ROCE + \alpha_8 L_FP + \delta_{ij} \quad (3)$$

Where $\delta =$ error term. Simplifying the above equation we have

$$SV = \alpha_1 + \alpha_2 L + \alpha_2 FP + \alpha_8 L_FP + \delta_{ij} \quad (4)$$

4. FINDINGS AND DISCUSSION

4.1 Descriptive Analysis of Study Variables

Descriptive statistics on the study variables are displayed in Table 2. From the table, ROA had a mean value of -0.022103 and a standard deviation of 0.430925. This implies, data values of ROA deviated from both sides of the mean by 0.430925, implying, the data values were not too widely dispersed from the average. The maximum and minimum values of ROA were 0.765600 and -5.648700 respectively, leading to a range of 6.414300. The ROA distribution was negatively skewed with a coefficient of -10.81179. This shows that, the left tail of the ROA distribution was longer than that of the right tail. In other words, a large portion of the ROA distribution fell on the right side of the normal curve. The kurtosis coefficient of 140.2683 implies, the ROA distribution was not normally distributed.

Return on equity of the studied entities had an average value of -0.411278 and a standard deviation of 5.900882. This is an indication that, the data values of ROE deviated from both sides of the mean by 5.900882, implying, the ROE data values were a bit widely dispersed from the mean. The maximum and minimum values of ROE were 12.89510 and -80.69237 respectively, leading to a range of 93.58747. The ROE distribution was negatively skewed with a coefficient of -12.24260. This shows that, the left tail of the ROE distribution was longer than that of the right tail. In other words, a greater portion of the ROE distribution fell on the right side of the normal curve.

Table 2. Descriptive statistics on study variables

Statistic	ROA	ROE	ROCE	CR	CAR	QR
Mean	-0.022103	-0.411278	0.130993	1.400961	0.366283	0.886495
Maximum	0.765600	12.89510	12.89510	9.806464	7.856043	6.228633
Minimum	-5.648700	-80.69237	-1.670316	0.000000	-0.225846	0.000000
Range	6.414300	93.58747	14.565416	9.806464	8.081889	6.228633
Std. Dev.	0.430925	5.900882	0.992246	1.449907	0.804803	1.016199
Skewness	-10.81179	-12.24260	10.40743	2.984189	5.587498	2.968977
Kurtosis	140.2683	165.5447	132.9356	13.22626	43.59520	12.99206

Source: Authors computation, 2020

Further, ROCE had a mean value of 0.130993 and a standard deviation of 0.992246. This indicates that, data values of ROCE deviated from both sides of the mean by 0.992246, implying, the ROCE data values were not too widely dispersed from the average. The maximum and minimum values of ROCE were 12.89510 and -1.670316 respectively, leading to a range of 14.565416. The ROCE distribution was positively skewed with a coefficient of 10.40743. This shows that, the right tail of the ROCE distribution was longer than that of the left tail.

Current Ratio (CR) of the sampled firms had a mean value of 1.400961 and a standard deviation of 1.449907. This means, the distribution for CR deviated from both sides of the average by 1.449907, implying, the data values of CR were a bit widely dispersed from the average. The CR distribution was positively skewed with a coefficient of 2.984189. This is an indication that, the right tail of the CR distribution was longer than that of the left tail. In other words, a large portion of the CR distribution fell on the left side of the normal curve.

Additionally, CAR had a mean value of 0.366283 and a standard deviation of 0.804803. This implies, data values of CAR deviated from both sides of the mean by 0.804803, implying, the data values were not too widely dispersed from the average. Finally, QR had a mean value of 0.886495 and a standard deviation of 1.016199. This is an indication that, the data values of QR deviated from both sides of the mean by 1.016199, implying, the QR data values were a bit widely dispersed from the mean. The maximum and minimum values of QR were 6.228633 and 0.000000 respectively, leading to a range of 6.228633. The QR distribution was positively skewed with a coefficient of 2.968977. This shows that, the right tail of the QR distribution was longer than that of the left tail. In

other words, a greater portion of the QR distribution fell on the left right side of the normal curve.

4.2 Tests of Stationarity

Stationarity test on the study variables are depicted in Table 3. From the results, ROA, ROE, ROCE and CAR were stationary at levels, whilst CR and QR were stationary at first difference.

4.3 Relationship between Liquidity and Firms' Financial Performance (ROA)

The findings of the relationship between liquidity and firm's performance as measured by correlation coefficients are displayed in Table 4. The coefficients of association between return on assets and current ratio, quick ratio and cash ratio are 0.213, 0.0201 and 0.146. These show a positive but weak relationship. These are statistically significant coefficient. The coefficient between return on equity and current ratio, quick ratio and cash ratio are 0.039, 0.062 and 0.031 respectively. These also show a positive but weak association. These coefficients are not statistically significant. The coefficient between return on capital employed and current ratio, quick ratio and cash ratio are 0.031, 0.044 and 0.048 respectively. The coefficients are weak, negative and not statistically significant.

The coefficient between return on assets and current ratio, quick ratio and cash ratio indicates that return in assets is positively related to variables used in measuring liquidity. The finding is in line with Omesa [50] and Syed [51] but contrast Abubakar, Sulaiman and Haruna [33] and Akhwale [52]. The possible explanation for this phenomenon may be due to the time lag between converting returns into liquid assets.

Table 3. Stationarity test results

Variable	Levin-Lin-Chu (Statistic)	Harris-Tzavalis (Statistic)
Return on Assets	-4.7917*	-13.0511*
Return on Equity	-4.0556*	-14.4729*
Return on Capital Employed	-6.0569*	-13.4650*
Current Ratio	-9.6395**	-12.3504**
Quick Ratio	-10.8944**	-12.9662**
Cash Ratio	-11.2087*	-8.1893*

** implies stationarity at first difference, whilst * denotes stationarity at level form

Table 4. Relationship between liquidity and firm's performance

		Return on Assets	Return on Equity	Return on Capital Employed	Current Ratio	Quick Ratio	Cash Ratio
Return on Assets	Pearson Correlation	1	.032	-.002	.213**	.201**	.146*
	Sig. (2-tailed)		.617	.977	.001	.001	.021
	N	252	252	252	252	252	252
Return on Equity	Pearson Correlation	.032	1	-.008	.039	.062	.031
	Sig. (2-tailed)	.617		.904	.541	.325	.627
	N	252	252	252	252	252	252
Return on Capital Employed	Pearson Correlation	-.002	-.008	1	-.031	-.044	-.048
	Sig. (2-tailed)	.977	.904		.626	.490	.451
	N	252	252	252	252	252	252
Current Ratio	Pearson Correlation	.213**	.039	-.031	1	.959**	.803**
	Sig. (2-tailed)	.001	.541	.626		.000	.000
	N	252	252	252	252	252	252
Quick Ratio	Pearson Correlation	.201**	.062	-.044	.959**	1	.822**
	Sig. (2-tailed)	.001	.325	.490	.000		.000
	N	252	252	252	252	252	252
Cash Ratio	Pearson Correlation	.146*	.031	-.048	.803**	.822**	1
	Sig. (2-tailed)	.021	.627	.451	.000	.000	
	N	252	252	252	252	252	252

** . Correlation is significant at the 0.01 level (2-tailed); * . Correlation is significant at the 0.05 level (2-tailed)

Table 5. Estimates of interaction of firm's performance and liquidity

Dependent Variables: Share Value

Variables	α	Standard Error	t	Significance
Intercept	1.350	5.080	0.266	0.792
Firm's Performance	23.650	8.799	2.688	0.010**
Liquidity	21.860	8.789	2.487	0.091**
Firm's Performance*Liquidity	27.650	8.798	3.143	0.003**

** Significant at 0.10 percent level

The relationship between return on equity and current ratio, quick ratio and cash ratio make an economic interpretation very difficult. Apart from the fact that the association is very small, it does not mathematically make sense. We could therefore conclude that there is no real association among the variables. This may also be due to the fact that it is almost very difficult to convert gains made from equity in liquidity. Firms may want to keep a lot of liquid because returns on equity are not easily convertible to liquid for operations. This finding is in line with Bordeleau, et al. [53], Maak [54] and Waithaka [55]

The relationship between return on capital employed and current ratio, quick ratio and cash ratio means that as firms employ more capital, the liquidity outflows are larger than liquidity inflows. This is understandable because returns on capital employed are mostly not realized in the immediate stages of acquisition. Employers may take time to learn new capital and thus their return in the first few years may be low. After sometime, as employers become use to the new capital, returns begins to increase. Therefore, we should have seen a positive relationship. But the negative sign indicates the frequency of change in capital employed. As employers have learned the process of the capital employed and are getting conversant with it, another superior capital is brought in, and employers have to go back to the bottom of the learning curve. This finding is in line with Junaidu and Aminu [16], and Durrah et al. [37]

4.4 Economic Relationship between Liquidity and Firm's Performance

The findings on the economic interaction between liquidity and firm's performance are displayed in Table 5. The table indicates that firm's performance and liquidity individually has a positive and significant effect on share value. That is, as firms are able to maintain the right level of liquidity, share values increases. Again, as firm's performance increase, share value also increases. The interactions effects of firm's

performance and liquidity also point to a much clearly picture. As firm's performance and liquidity takes a positive turn in its interactive effects, share value also increases. Let's note that the entire coefficients are statistically significant at 10 percent level with the exception of the intercept parameter.

Another point to note is the magnitude of effects indicative from the α coefficient. The coefficient of firm's performance and liquidity are 23.650 and 21.860 respectively. But the coefficient of interaction is 27.650. This shows the economic value if liquidity and performance interact properly. The effect on share value is much higher than if we allow the two to work separately. Policy makers should therefore consider the issues of liquidity and performance very seriously when dealing with share values.

5. FINDINGS AND CONCLUSION

The coefficients of association between return on assets and current ratio, quick ratio and cash ratio are 0.213, 0.020 and 0.146. These show a positive but weak relationship. The coefficient between return on equity and current ratio, quick ratio and cash ratio are 0.039, 0.062 and 0.031 respectively. These also show a positive but weak association. The coefficient between return on capital employed and current ratio, quick ratio and cash ratio are 0.031, 0.044 and 0.048 respectively. The coefficients are weak, negative and not statistically significant. The study also found that firm's performance and liquidity have a positive impact on share value. The interactive effects between liquidity and firm's performance also have a positive impact on share value even though the magnitude of effect for the interaction is higher than for individual component.

The study examined the economic interactions between liquidity and firms' financial performance as measured by ROA, ROE and ROCE. Based on the findings, the study concludes that liquidity proxied by cash ratio (CAR) and quick ratio (QR) have a weak positive insignificant association

with ROA and ROE. The relationship between liquidity and ROCE was rather negative but not significant. The study also found that firm's performance and liquidity have positive effects on share value and the interaction between performance and liquidity also has positive effects. However, the magnitude for the interactive effects is much higher than that of single effects.

6. POLICY RECOMMENDATIONS

Based on the findings, the study recommends that authorities in listed manufacturing firms in Ghana should try and maintain an ideal level of liquidity that can meet their firms' operational needs. Excess liquidity, if any, should be channel to viable investments to help boost the firms' viability. Additionally, authorities should advance their liquidity management strategies by identifying, measuring, monitoring and controlling liquidity risks in the entities. In addition, all other factors that affect liquidity management in the firms should be identified, and strategies developed to minimize their effects. Finally, attention should be given to the interaction effects of liquidity and performance to help increase firm's share value and profitability.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Christopoulos AG, Dokas IG, Mantzaris DH. The estimation of corporate liquidity management using artificial neural networks. *International Journal of Financial Engineering and Risk Management*. 2013;1(2):193-210.
2. Müller GJ, Hettig T. Fiscal policy coordination in currency unions at the effective lower bound. *Journal of International Economics*. 2018;115:80-98.
3. Bhunia A. A trend analysis of liquidity management efficiency in selected private sector Indian steel industry. *International Journal of Research in Commerce and Management*. 2010;1(3): 213.
4. Saluja P, Kumar P. Liquidity and profitability trade-off: A study on Airtel Bharti Limited. *International Journal of Advanced Research in Management and Social Sciences*. 2012;1(3):77-84.
5. Puneet S, Parmil K. Liquidity and Profitability Trade-off. *International Journal of Advanced Research in Management and Social Science*. 2012;1(3):77 - 84.
6. Garcia TPJ, Martinez SP. Effects of working capital management on SME profitability. *International Journal of Managerial Finance*. 2007;3(2):164 – 177.
7. Bolek M, Wojciech W. The influence of liquidity on profitability of polish construction sector companies. *Financial Internet Quarterly*. 2011;1.
8. Orshi TS. Impact of liquidity management on the financial performance of listed food and beverages companies in Nigeria; 2016. DOI:10.13140/RG.2.2.2767280644
9. KPMG. Working Capital Management Survey: How European Companies Manage Their Working Capital, KPMG International; 2005.
10. Akenga G. Effect of liquidity on financial performance of firms listed at the Nairobi Securities Exchange, Kenya. *International Journal of Science and Research (IJSR)*. 2017;6(7):279-285.
11. Basel Committee on Banking Supervision. The liquidity coverage ratio and liquidity risk monitoring tools. Bank of International Settlement; 2013.
12. Ayu M, Zuraida, Mulia S. The influence of liquidity, profitability and leverage on profit management and its impact on company value in manufacturing company listed on Indonesia Stock Exchange year 2011-2015. *International Journal of Managerial Studies and Research (IJMSR)*. 2018;6(1): 8-14.
13. Mohd Y, Asif P. Impact of liquidity, solvency and efficiency on profitability of steel authority of India limited. *International Journal of Research in Management, Economics and Commerce*. 2018;06(09): 25-31.
14. EJike SI, Agha NC. Impact of operating liquidity on profitability of pharmaceutical firms in Nigeria. *International Journal of Academic Research in Accounting, Finance and Management Sciences*. 2018; 8(3):73-82.
15. Mehmet A, Mehmet İ. Determining the impact of financial characteristics on firm profitability: An empirical analysis on Borsa Istanbul Energy Firms. *WSEAS Transactions on Business and Economics*. 2018;15:547-559.

16. Junaidu MK, Aminu A. An evaluation of the impact of liquidity on the profitability of Nigerian Banks. *Research Journal's Journal of Management*. 2014;2(7):1-10.
17. Larry MW, Christopher JS. Long-term assets. Ventus Publishing ApS; 2009.
18. Peavler R. Calculate liquidity position using financial ratio analysis. *The Balance Small Business*; 2019.
19. Downes J, Goodman JE. Dictionary of finance & investment terms. Barons Financial Guides; 2003.
20. Owolabi SA, Obida SS. Liquidity management and corporate profitability: A case study of selected manufacturing companies listed on the Nigerian Stock Exchange. *Business Management Dynamics*. 2012;2(2):10-25.
21. Horne JC. *Financial Management and Policy*, (4th edition), Prentice-Hall, Englewood Cliffs, NJ; 1977.
22. Smith K. Profitability versus Liquidity Tradeoffs in Working Capital Management, New York, St. Paul: West Publishing Company; 1980.
23. Richards VD, Laughlin EJ. A cash conversion cycle approach to liquidity analysis. *Finance Manager*. 1980;9:32-38.
24. Cagle CS, Campbell SN, Jones KT. Analyzing liquidity using the cash conversion cycle; 2013. Available: <http://journalofaccountancy.com/issues/2013/may/20126764.html>
25. Lamberg S, Vålming S. Impact of Liquidity Management on Profitability: A study of the adaption of liquidity strategies in a financial crisis; 2009.
26. Dash M, Hanuman R. A liquidity-profitability trade-off model for working capital management; 2008. Available: <http://ssrn.com/abstract=1408722>
27. Keynes JM. The general theory of employment, interest and money (1936). *The Collected Writings of John Maynard Keynes*. 1964;7:1971-9.
28. Bhattacharya H. Banking strategy, credit appraisal, and lending decisions: A risk-return framework. Oxford University Press; 2011.
29. Morton WA. Liquidity and solvency. *The American Economic Review*. 1939;29(2): 272–285.
30. Prochnow HV. Bank liquidity and the new doctrine of anticipated income. *The Journal of Finance*. 1949;4(4):298–314. DOI:10.1111/j.1540-6261.1949.tb02358.x
31. Raykov E. The liquidity-profitability trade-off in Bulgaria in terms of the changed financial management functions during crisis. *Management*. 2017;22(1):135-156.
32. Syed AR, Farooq MS, Nadeem K. Firm and industry effects on firm profitability: An empirical analysis of KSE. *International Research Journal of Finance and Economics*, MPRA Paper No. 36797; 2011. Available: <https://mpra.ub.uni-muenchen.de/36797/>
33. Abubakar A, Sulaiman I, Haruna. Effect of firms characteristics on financial performance of listed insurance companies in Nigeria. *African Journal of History and Archaeology*. 2018;3:1.
34. Lyndon ME, Paymaster FB. Liquidity management and profitability: A study of selected food and beverage companies in Nigeria. *International Journal of Management Sciences*. 2016;7(4):217-225.
35. Vintilă G, Nenu EA. Liquidity and profitability analysis on the Romanian listed companies. *Journal of Eastern Europe Research in Business & Economics*. 2016;1-8.
36. Mengesha W. Impact of working capital management on firms' performance: The case of selected metal manufacturing companies in Addis Ababa, Ethiopia. *Jimma University College of Business and Economics Department of Accounting and Finance*; 2014.
37. Durrah O, Rahman AAA, Jamil SA, Ghafeer NA. Exploring the relationship between liquidity ratios and indicators of financial performance: An analytical study on food industrial companies listed in Amman Bursa. *International Journal of Economics and Financial Issues*. 2016;6(2).
38. Apuoyo BO. The relationship between working capital management policies and profitability for companies quoted at the NSE (Unpublished MBA project). University of Nairobi, Kenya; 2010.
39. Bardia SC. Liquidity management: A case study of steel authority of India Ltd. *The Management Accountant, ICWAI, Kolkata*. 2004;463 – 467.
40. Uremadu SO, Egbide BC, Enyi PE. Working capital management, liquidity among quoted firms in Nigeria evidence from productive sector. *International Journal of Academic Research in*

- Accounting, Finance and Management Sciences. 2012;2(1):80-97.
41. Majeed S, Makki MA, Saleem S, Aziz T. The relationship of cash conversion cycle and profitability of firms: An empirical investigation of Pakistan firms. *Journal of Emerging Issues in Economics, Finance and Banking*. 2013;1(1):35-51.
42. Samiloglu F, Demirgunes K. The effect of working capital management on firm profitability: Evidence from Turkey. *International Journal of Applied Economics and Finance*. 2008;2(1):44-50.
43. Alshatti AS. The effect of the liquidity management on profitability in the Jordanian commercial banks. *International Journal of Business and Management*. 2015;10:62-72.
44. Iqbal N, Ahmad N, Ria Z. The relationship between working capital management and profitability: Evidence from Pakistan. *International Letters of Social and Humanistic Sciences*. 2014;20:14-25.
45. Ben-Caleb E, Olubukunola U, Uwuigbe U. Liquidity management and profitability of manufacturing companies in Nigeria. *IOSR Journal of Business and Management*. 2013;9(1):13-21.
46. Zygmunt J. Does liquidity impact on profitability? *Conference of Informatics and Management Sciences*. 2013;247-251.
47. Saleem Q, Rehman RU. Impacts of liquidity ratios on profitability. *Interdisciplinary Journal of Research in Business*. 2011;1:95-98.
48. Kirkham R. Liquidity analysis using cash flow ratios and traditional ratios: The telecommunications sector in Australia. *Journal of New Business Ideas & Trends*. 2012;10:1-13.
49. McNabb DE. *Research methods in public administration and nonprofit management: Quantitative and qualitative approaches* (2nd ed.). Armonk, NY: M.E. Sharpe; 2008.
50. Omesa JN. Effect of liquidity on the financial performance of financial institutions listed in the Nairobi Securities Exchange (MBA Thesis). University of Nairobi, Kenya; 2015.
51. Syed A. Impact of liquidity and management efficiency on profitability: An empirical study of selected power distribution utilities in India. *Journal of Entrepreneurship, Business and Economics*. 2015;3(1):31-49.
52. Akhwale EF. Relationship between liquidity and profitability of companies listed at the Nairobi Securities Exchange. Unpublished MBA Project, University of Nairobi; 2014
53. Bordeleau E, Crawford A, Graham C. Regulatory constraints on bank leverage: Issues and lessons from the Canadian experience, Bank of Canada Discussion. 2009;15.
54. Maaka Z. Relationship between the liquidity risk and financial performance of commercial banks in Kenya (Unpublished MBA Project). University of Nairobi, Kenya; 2013.
55. Waithaka A. The relationship between working capital management practices and financial performance of agricultural companies listed at the Nairobi Securities Exchange (Unpublished MBA Research Project). University of Nairobi, Kenya; 2012.

© 2020 Baafi et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/63152>