Liquidity management and profitability. A case of listed banks in Ghana

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Abstract

The article is intended to uncover the connection between liquidity and profitability in such a way that each bank must preserve this link while undertaking its day-to-day operational activities. The investigation employed listed banks on the Ghana Stock Exchange from the dated 2008 - 2018. Two estimators namely the Ordinary Least Square (OLS) and the Generalized Method of Moments (GMM) were utilized. To add to existing literature, the liquidity parameters employed in this study exhibited a favorable and significant link with the dependent indicators except for quick ratio which exhibited an immaterial affiliation. In addition, a robustness assessment was employed adopting the three-stage least-squares and the findings were parallel to that of the other estimators employed. The above insights are vital as regulators concoct changing standards offering banks with an optimal degree of liquidity. Although it is widely accepted that, prior to the latest financial crisis, banks undervalued liquidity, and the trade - offs between sensitivity to liquidity fluctuations and the risk of maintaining lower-yielding liquid assets must also be weighed, as the latter will influence the capacity of banks augment earnings and expand credit.

Keywords: *Liquidity management, profitability, banks, Ghana*

1. Introduction

Banks' monitoring of liquidity is indispensable to fiscal policy advancement. By impacting the trade-off between financing and retaining cash assets, commercial banks affect credit-enabled funds' availability and influence the economy via this channel. Identifying how banks approach liquidity is, therefore, necessary to understand fiscal policy execution. Financial and economic frameworks, however, especially those used for monetary policy, a highly theoretical survey as to how banks control liquidity (Cetorell et al., 2010). It should be recounted that liquidity management lowers the bank's peril, eliminates not fulfilling its commitments on schedule or reduces its profitability.

This research aims to illustrate how liquidity management influences the viability of banking institutions in Ghana. To satisfy its short-term obligations, banks can establish that it should not experience a lack of or massive reserve liquidity. Owing to its intimate implication with a banks' daily operations, a liquidity analysis is of considerable interest to stakeholders both internally and externally (Carey, 1998). The dichotomy of liquidity management is to reach the ideal trade-off between profitability and liquidity (Bordeleau et al., 2010). This cannot be

neglected how relevant a proper liquidity risk management framework is for a bank's potential activities, guaranteeing its sustainability.

The financial industry's identity is volatile and vulnerable, and banking institutions are risk-managers since most bank capital is depositor cash. These investments are employed by banks to produce credit for their borrowers, and this necessitates an efficient allocation of the available capital, as the lender is obliged to fulfill the commitments of its customers and investors who wish to retrieve their deposits at any point in time. Hence, the financial institution ought to be capable of accommodating these mandates at any point.

The issue arises whenever a financial institution seems unable to fulfill the needs for liquidity, notably such unanticipated instances, significantly affecting its profitability level. Financial institutions must therefore strive to increase their profitability and, at the very same time, be ready to serve liquidity requirements by retaining a reasonable level of liquidity to strike a compromise with liquidity and profitability, even though liquidity and profitability are trade-offs. Hence the more capital is wrapped up in contingency planning to accommodate liquidity need, the comparatively low the bank's profitability. This analysis's key objective is to define and explain the effect of bank liquidity management on the profitability of the Ghanaian banking sector, taking into account the need to maintain the optimum balance for profitability and liquidity.

H_1: There is a negative affiliation between liquidity and bank performance as calculated by ROA.
H_2: There is a positive nexus between liquidity and bank performance as estimated by ROE.
H_3: There is a negative affiliation between liquidity and bank performance as measured by EPS.

2. Literature review

Liquidity is a bank's propensity to finance asset rises and fulfill commitments as due, mostly without inflicting unbearable losses. Liquidity management is also recognized as the principle of actual bills, as it concerns all credit creation and overall economic operation (Hosna, Manzura, Juanjuan, 2009). Baki et al. (2015) undertook a study on liquidity of Malaysian publicly traded firms for the period 2010 to 2012 utilizing nine hundred and twenty-three businesses. The current ratio, quick ratio, ratio of net assets to total liabilities, and ratio of interest coverage were the study parameters. The conclusion of the correlation suggests that the current ratio and cash flow ratio have an important and optimistic relationship. The test indicates a major difference between the current ratio and the cash flow ratio. Rashid (2018) examined the liquidity of UK retail firms for the period 2012 to 2016. The analyst adopted the current ratio, the ratio of inventory turnover, the ratio of receivables turnover and exchange payables, the quick ratio, the ratio of cash interest coverage and quality earnings and the ratio of cash to gain. The study revealed that the company may not have a funding crisis, but during the years 2012, 2013 and 2016 it had a rough time.

Rafiq Ahmad (2016) analyzed the relationship between liquidity and profitability of the Standard Chartered Bank of Pakistan for the period from 2004 to 2013. The researcher used the current ratio, quick ratio and working capital, and employed gross profit, net profit and return on capital employed as proxies for profitability. The outcome of the test indicates that the relationship between profitability and liquidity is favorable.

Megaladevi (2018) investigated the impact of liquidity on the efficacy of selected Indian enterprises for the dated 2008 to 2017. The outcome of the analysis reveals that current ratio and quick ratio are strongly affiliated to the return on the capital employed. The findings demonstrated that liquidity and profitability are closely linked, for the period 2010 to 2015. Felix and James (2018) focused on the influence of liquidity on the profitability of Kenyan manufacturing

companies. The study used the current ratio, the quick ratio, the cash ratio, the cash conversion and return on assets. The parameters had a considerably negligible consequences on profitability. Georgeta and Elena (2016) worked on the liquidity and profitability of the Romanian firms for the years 2015 to 2014. The researcher used return on assets, return on equity, quick ratio, current ratio, ratio of debt to equity, total ratio of assets to equity, cash conversion cycle, ratio of working capital to growth, effective tax rate. The outcome of the investigation revealed that liquidity has a substantial association with profitability.

Mohd and Asif (2016) published research on the impact of liquidity solvency and productivity on the Steel Authority of India Limited's profitability. The debt-to-equity ratio and the inventory turnover ratio have a considerable impact on the return on employed equity. Whereas the current ratio has a direct bearing on the return on investment, the debt equity ratio and the stock turnover ratio. For the period 2010 to 2012, Khaldun and Muda (2014) focused on the impact of profitability and liquidity on profit growth of the industrial firms. The study argued that the current ratio, quick ratio, cash ratio, gross profit ratio, return on assets and return on equity had statistically positive impact on profit growth.

Kumar Panigrahi et al. (2017) accessed the liquidity of the pharmaceutical industry from 2012 to 2016. To analyze the liquidity status of five chosen pharmaceutical firms, the study examined current ratio, quick ratios and cash ratios. There is very strong liquidity at Ajanta Pharma. In comparison, Biocon and Ajanta Pharma have greater liquidity. Amal et al. (2012) used data from the Amman Stock Exchange between 2002 and 2007 to analyze the variables that most affect the financial output of Jordanian insurance firms, studying 25 insurance enterprises. Leverage, liquidity, size, and the management competence index all have favorable predictive impact on the financial results of Jordanian insurance enterprises, according to the investigations.

Long-term and short-term stakeholders are also anxious with a company's equity because it shows the company's danger of not being able to cover debt service costs including interest and principal redemption. In the event of bankruptcy, a company with a lot of debt owes creditors less cover (Moyer, James, and William, 2006). Sidra and Attiya (2013) used corporate governance, management structure, capital structure, economic metrics, and risk control as independent variables to investigate financial performance determinants. From 2007 to 2011, 60 Pakistani corporate entities registered on the Karachi stock exchange were analyzed using fixed effects panel regression. According to their findings, the debt-to-equity ratio has a positive influence on business profitability, while long-term debt to total assets and short-term debt to total assets have detrimental effects. In addition, the relation between cash flows and firm output is explored in a study by Afrifa (2016). The results indicated that businesses with ample cash flows should invest in working capital, while enterprises with less cash flows should invest less to meet the standard of performance. The liquidity status of the pharmaceutical industry of Jordanian companies was investigated by Atieh (2014). The findings demonstrate that there is a disparity between the conventional balance sheet calculations and the cash flow ratios resulting from the cash flow statement. The effect of operational cash flows on the profitability of banks was analyzed by Ikechukwu et al. (2015). The study highlighted a strong correlation between operational cash flows and the profitability of Nigeria's banking sector. Using the MAIRCA hybrid model, Günay and Fatih (2020) investigated tourism companies registered in Borsa. They found that the most relevant factors in evaluating the financial performance of businesses are liquidity balances, cash to revenue, and cash to long-term debts. Albeit, quick ratio and cash ratio are positively linked with ROA (Priya and Nimalathasan, 2013; Ruziqa, 2013). Consistent with the outcome of Bagh et al, (2017). Abata and Migro (2016) explore the bank capital link as a metric of liquidity and

efficiency, and argue that capital adequacy may be used to evaluate the degree of different factors projecting the performance of the bank. Obi and Okika (2017) analyze capital adequacy impact on firm performance utilizing the Pearson Correlation Coefficient, Multiple Regression Analysis, Variance Inflation Variables, Multicollinearity, Heteroskedasticity and Hausman test. Capital adequacy and financial results were found to be positively associated.

An investigation by Lartey et al. (2013) explores how financial institutions should approach their capital during an economic crisis. It displayed how firms offset credit lines with operational liquidity while still experiencing elevated credit deficits. AS a consequence, credit lines also minimized the effect of the financial downturn on business expenditure. Alshatti (2015) sought to determine the effects of liquidity risk on Jordanian commercial banks' profitability over the period 2005 to 2012. Thirteen banks were chosen to support their views on all Jordanian commercial banks. The outcome of this investigation is that cash management has an impact on profitability in Jordanian commercial banks as tested by ROE or ROA, where the effect of the quick ratio on profitability is favorable when measured by Return on equity. The researcher assumes that this adverse effect is due to the excessive level of underutilized deposit funds at Jordanian commercial banks. Aburime (2008) glanced at the liquidity control and efficiency of commercial banks in Nigeria. The analysis's key objectives are to find reasonable evidence of the extent to which aggressive cash management influences the profitability of banks and how banks may increase their market share. Findings of the study: financial institutions should not forfeit accurate and consistent liquidity regulation for operations and liquidity efficiency. Banks are obliged to preserve an optimum degree of liquidity to execute their contractual commitments to consumers or depositors and enhance earnings. Khaldun (2014) observed an impoverished relation between the current ratio and earnings growth of companies in the beverages sector, reported on the IDX for the duration 2010 to 2012. Felix and James (2018) utilized ROA as a profitability metric in Kenya's ANOVA article to assess cash management. The outcome of the research indicates that the current ratio has a meaningful effect on ROA. No substantial connection was noticed quick ratio and profitability. For the duration 2006-2011, Ismail (2016) discovered that liquidity (current ratio and cash conversion cycle) has a substantial positive relationship with financial performance (ROA) of 64 Pakistani non-financial entities.

Besides, strong liquidity management often demands an acceptable degree of liquidity that will equip banks to foretell the ratio of creditor funds that might be requested at a specific time and establish how to meet those requirements. Hence, it may ultimately be inferred that liquidity is negatively affiliated to bank profitability (Gu et al, 2020). The latter implies that, as liquidity rises, profitability lowers. This article attempts to the analysis by exploring the interaction between liquidity management and profitability of registered banks in Ghana in the period 2008-2017 by using contemporary progressions in dynamic panel econometrics. This study also used the two-step system Generalized Moment Method (GMM) and Ordinary Least Square Method (OLS) to provide new analytical validation on the subject. The continuation of this article is structured as follows. The literature review is constructed in Section 2. The research approach is outlined in section 3. The empirical findings and discussions are enclosed in section 4. Conclusion is addressed in section 5.

3. Data and Methods

The data is primarily employed from the Ghana Stock Exchange (GSE). From the audited financial statements of eight financial banks registered on the Ghana Stock Exchange (GSE) from

2008 until 2018. The other listed companies for which the requirement was not met were subsequently removed. The requirements included: (1) all the entities that were in operation during the study period; and (2) the entities that regularly made their annual reports available in Ghana.

Table 1: Measurement of variables

Variable	Measurement	Source
Dependent		
ROA	Net Income/ Total assets	Annual report
ROE	Net profit before tax/ shareholder's equity	Annual report
EPS	After tax profit / number of shares	Annual report
Independent		
Current ratio	current assets/ current liabilities	Annual report
Cash ratio	Cash and cash equivalence/current liabilities	Annual report
Quick ratio	current assets-inventories/ current liabilities	Annual report
Capital adequacy	Tier 1	Annual report
Cash flow ratio	Operating cash flows/current liabilities	Annual report

Method

To gauge the bonding between liquidity management and profitability of banks in Ghana. A general framework was developed.

Profitability = f(Liquidity)………..…….1

Bank Profitability= (Return on asset, return on equity, earning per share)

f(Liquidity)= f(Current ratio, Cash ratio, Quick ratio, Capital adequacy, Cash flow ratio)

An econometric equation is derived from the above into Equation (2)

$$BP_{it} = \alpha + \beta_1 CR_{it} + \beta_2 CASR_{it} + \beta_3 QR_{it} + \beta_4 CAR_{it} + \beta_5 CFR_{it} + \varepsilon_i …………………………………………..……..2$$

In which BP stands for bank profitability as proxied by ROA, ROE and EPS, CR is current ratio , QR is quick ratio , CAR is capital adequacy ratio, (CFR) is cash flow ratio, α is the intercept, i and t represents firm and time individually, $\beta_1… \beta_4$ are the coefficients of the independent variables and ε is the error term.

Model

The investigation used the ordinary least square method (OLS) and the two-step generalized method of moments (GMM) to predict the impact of CR, QR, CAR, CFR and performance of banks. Amongst the most used empirical techniques employed in the arts and humanities is the OLS. This approach was used in the analysis as it is very applicable to the approximation of generalized linear mixed factor values employing a single or more parameters and therefore can determine the existence of a significant relationship amongst these variables. Another reason for applying this method was that the strength of the relationships between the prediction and the explanatory variables could be detected. Error estimates of input parameters will be given by the approach to implementing the OLS. As a consequence of these three common challenges, the bias is the chance of influential the direction of omitted variable bias (OVB) in a generalized multi - variate environment, that is an unresolved problem in mathematical modelling. Again, the possibility of adding any of the variables that were omitted, to minimize the bias of OLS estimators; and ultimately, the question of the likely link within the omission errors and the involvement of OLS estimators in the biased judgment (Deepankar, 2020). The study also employed the Generalized Moment Method (GMM) two-step system, as it is more capable of monitoring poor instrument problems (Arellano & Bover, 1995).

To capture endogeneity problems, the two-step GMM method was used, which can influence the magnitudes (Wintoki et al., 2012). The dilemma of endogeneity occurs where a variable that is not included in the method, tested or disregarded, is related to a variable that is embedded into the study model. In this analysis, the endogeneity problem of the untestable parameter solved by the GMM is the problem of omitted bias of variables, which is the current challenge in the OLS forecasts. One explanation of excluded biases may be that analysts determine the legitimacy of a construct without addressing certain relevant variables. To detect this problem, dynamic panel data statistical methods (GMM) use lags of the dependent variables as explanatory variables and are classified as "internal instruments" (Roodman, 2009). The lagging values of the independent variables as instruments in the system are acceptable when all criteria are satisfied (Reed 2015). The criteria is that the independent variables are exogenous and the autocorrelation of the error term is lacking. Moreover, as a system, it synchronizes mathematical models at both level and first difference, using considerable cross-sectional data and few measurements of time-series (N >T). In addition to the above considerations, the instruments for the level predictions are the lagging variations of the regressors. In addition, extra duration specifications are required for the reliability of the enhanced instruments. The first differences in the equation of the regressors are uncorrelated with the firm specific results. The GMM estimator is recommended because it is connected with the Hansen J-statistic diagnostic tests to check the validity and reliability of the study instruments. Lastly, to determine both the first and second order serial autocorrelation, the Arellano-Bond test is conducted.

The two-step dynamic panel-data assessment model was employed for the investigation, as stated below.

$$\Delta Yit = \alpha + \delta Y_{i,\ t-1} + \beta_1 Xit + \gamma t + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \ (3)$$

Where Yit denotes the shift in bank profitability as measured by ROA, ROE, and EPS, i denotes a bank, and t denotes a time interval, (i, t–1) was used to describe bank lag. At any given moment, the explanatory variables CUR, CR, CAR, and CF were defined as Xit. The coefficient of the independent variables is described by. The time fixed effects are spread uniformly over all of the t-banks. The disruption is described by the letter t. The relational condition on the explanatory variable is analyzed by the coefficient. The following equation was taken from equation (2).

$$\Delta ROA = \alpha + \beta_0 ROA_{i,\ t-1} + \beta_1 CUR_{it} + \beta_2 CR_{it} + \beta_3\ QR_{it} + \beta_4 CAR_{it} + \beta_5 CF_{it} + \gamma t + \varepsilon t \dots\dots\dots\dots\ (4)$$
$$\Delta ROE = \alpha + \beta_0 ROA_{i,\ t-1} + \beta_1 CUR_{it} + \beta_2 CR_{it} + \beta_3\ QR_{it} + \beta_4 CAR_{it} + \beta_5 CF_{it} + \gamma t + \varepsilon t \dots\dots\dots\dots\ (5)$$
$$\Delta EPS = \alpha + \beta_0 ROA_{i,\ t-1} + \beta_1 CUR_{it} + \beta_2 CR_{it} + \beta_3\ QR_{it} + \beta_4 CAR_{it} + \beta_5 CF_{it} + \gamma t + \varepsilon t \dots\dots\dots\dots\ (6)$$

ROA denotes return on assets, CUR represents Current ratio, QR represent quick ratio, CAR as Capital adequacy ratio, CF represent cashflow and εt represents individual disturbance. The study theory estimates the nexus between liquidity and banks' profitability, and therefore the calculated coefficient supports the model above.

4. Results and discussions

Using the mean, standard deviation, minimum, maximum, skewness, and kurtosis, this section reveals the characteristics of the article variables. The mean of the study dependent variable, Return of Assets (ROA), return on equity and earnings per share is 0.004, 0.485 and 3.542 while their lowest and highest values is   0.016, -5.649, 1.677 and 0.766, 2.025, 6.118 respectively. Current ratio and cash ratio revealed a standard deviation of 0.820 and 0.935 respectively. The mean quick ratio is 0. 458.Capital adequacy ratio exhibited a skewness and kurtosis 7.025 and 15.394. The cashflow ratio had a mean of 2.039, standard deviation of 0.516, and a minimum and maximum value of 6.511 and 21.077 respectively.

Table 2: Descriptive statistics

	Mean	Std dev.	Min	Max	Skewness	Kurtosis
ROA	0.004	0.235	0.016	0.766	0.850	5.100
ROE	0.485	0.874	-5.649	2.025	0.672	124.876
EPS	3.542	6.414	1.677	6.118	2.045	15.394
CR	0.849	0.820	0.049	0.573	3.305	-0.420
CASR	1.647	0.935	2.509	4.601	0.190	1.995
QR	0.458	1.430	0.049	6.118	3.445	5.955
CAR	8.932	0.671	0.191	0.648	7.025	15.394
CFR	2.039	0.516	6.511	21.077	0.845	1.088
Obs.	80	80	80	80	80	80

Correlation result

The relations of the explanatory variables are indicated in this section. In general, the relationship between the dependent variables Return of Assets (ROA), Return on assets and earning per share exhibited a positive association with QR, CAR, CFR. Return on assets and earnings per share mutually showed a positive affiliation with CR contrary to ROE which had a positive association with CR. In addition, ROA and EPS's negative nexus with CASR was revealed by the study.

Table 3: Correlational Analysis

	ROA	ROE	EPS	CR	CASR	QR	CAR	CFR
ROA	1.00	-	-					
ROE	-	1.000	-					
EPS	-	-	1.000					
CR	0.261	-0.368	0.524	1.000				
	0.013	0000	0.447					
CASR	-0.145	0.004	-1.192	0.456	1.000			
	0.000	0.051	0.000	0.000				
QR	0.482	0.152	0.354	0.384	0.498	1.000		
	0.016	0.000	0.000	0.005	0.000			
CAR	0.142	0.628	0.239	0.009	0.218	0.047	1.000	
	0.043	0.000	0.000	0.745	0.029	0.000		
CFR	0.283	0.408	0.031	0.400	0.337	-0.133	0.291	1.000
	0.000	0.000	0.000	0.061	0.005	0.154	0.000	

Test for multicollinearity

Multicollinearity exists when two or more independent variables in the regression model are correlated. Using the VIF tool to measure and compute how much the variance is inflated, if VIF = 1, then there is no multicollinearity. Outcome from this table vividly reflects the absence of multicollinearity. The rule of thumb was that, a variable with variance inflation factor more than 5 (VIF>5) or a degree of tolerance less than 0.2 (1/VIF < 0.2), with the mean VIF of 1.39 implies that, all the variables were fit and reliable to be employed together in the model.

Table 4: Test for multicollinearity

	VIF	1/VIF
CR	1.53	0.653
CASR	1.51	0.532
QR	1.66	0.967
CAR	1.03	0.660
CFR	1.24	0.704
Mean VIF	1.39	

Regression result

The purpose of the article was to test the affiliation that exits between liquidity and profitability of banks in Ghana. To investigate the connection, three hypotheses was developed. The article then selected variables that explained both the endogenous and exogenous contrast of the research. These variables are tested with econometric regression model of GMM and OLS.

Table 5: Regression analysis

	ROA				ROE				EPS			
	GMM		OLS		GMM		OLS		GMM		OLS	
Variable	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.	Coef	Prob.
L1	0.344	0.022	-	-	0.065	0.000	-	-	0.732	0.506	-	-
CR	-0.483	0.052	0.128	0.003	0.252	0.073	0.325	0.000	-0.354	0.000	0.440	0.062
CASR	0.624	0.091	0.352	0.048	0.168	0.036	0.221	0.042	0.157	0.002	0.523	0.000
QR	0.175	0.000	0.118	0.005	0.487	0.008	0.459	0.055	0.214	0.000	0.198	0.012
CAR	0.237	0.032	0.454	0.030	0.532	0.050	0.271	0.000	0.185	0.000	0.311	0.000
CFR	0.446	0.000	0.121	0.052	0.189	0.000	0.593	0.048	0.103	0.016	0.184	0.020

***, **;* means significance level at 1%, 5%, and 10% respectively

H1: There is a negative affiliation between liquidity and bank performance as calculated by ROA. When return on asset was proxied as profitability, it exhibited a positive nexus with all the study parameters (CASR, QR, CAR, CFR) under both estimators. Except CR which had a negative and positive coefficient under the GMM and the OLS estimator respectively. CR, CAR was significant

at 5% while QR and CFR were significant at the 1% level under the GMM estimator. The outcomes of the research findings indicate that the GMM regression were not in support of the studies in Pakistan by Ismail (2016) whose investigation found that liquidity (current ratio and the cash conversion cycle) have significant positive impact on profitability (ROA) of the 64 Pakistani non-financial firms for the period of 2006-2011. However, the GMM regression results support that of Ashifa et al (2015). The findings of the article employing both GMM and OLS are in support of the investigations by Basuki et al., (2012) in Indonesia whose studies the affiliation between cash ratio and return on assets of registered companies for the period 2007-2011. In other studies, Lase et al., (2020) investigated the relationship that exits between quick ratio and return on assets of registered companies on the Indonesia Stock Market for the period 2015-2018. The outcomes indicated that quick ratio accounted for 8.8% of the total return of assets and had a significant favorable influence on the registered companies. The finding of this article agrees with the current findings of the is research. In testing the association between capital adequacy ratio and the return on assets, both regression results confirmed studies in Palestine. Khaled (2020) study on the influence of liquidity management on the profitability of banks for the period 2008-2018. The article findings indicated that capital adequacy ratio had a favorable significant nexus with ROA. Finally, cash flow as a liquidity variable to test the effect on return on assets was positive and significant. Rahman and Sharma (2020) investigated the management of cash flow for industrial and manufacturing firms listed on the Saudi Arabia. The findings of their article indicated that cash flow has a favorable and significant nexus with return on assets.

H2: There is a positive nexus between liquidity and bank performance as measured by ROE.

Nonetheless, ROE exhibited a positive nexus with all the independent parameters with only CASR being significant at the 5% level under both methods. Ahmad et al. (2016) employing the OLS estimator on the impact of liquidity on profitability of banks in Pakistan for the period 2010-2015. The article results indicated that banks in registered banks current ratio had a positive and a significant association with the profitability of the banks as calculated by ROE. The current study relationship between cash ratio and return of equity contradict the findings of Qasim and Ramiz (2011) whose analysis from the use of OLS regression results produced a negative and insignificant association. In terms of quick ratio, Qasim and Ramiz (2011) investigations on the association between quick and return on equity indicated a favorable connection. This supports the finding findings of this current research. In testing the affiliation between capital adequacy ratio and return on equity, the article concluded a similar result by Radhe and Pratikshya (2017) whose investigation on 20 Nepalese commercial banks through 2009-10 to 2014-15 produced a positive and a significant association. In Indonesia Suarmi and Gede (2017) analysis of 28 banks registered on the Stock Market for the period 201-2016, employing the path model of Amos software shown that capital adequacy of the banks was significant and positively associated with return on equity.

H3: There is a negative nexus between liquidity and bank performance as measured by EPS.

All the independent parameters were positively linked with the dependent variable, EPS, with the exception of CR-EPS nexus revealed under the GMM method. Again, all the coefficients were significant at the 1percent level under the GMM method except CFR which was at the 5 percent level. The article analysis of current ratio with earnings per share confirms the investigations of Ahmad et al. (2016) whose study in Pakistan produced a positive connection between current ratio and earnings per share of banks for the period 2010-2015. Again, the findings of this article regression results for GMM and OLS are not in support of Afolabi and Williams (2019) whose study in Nigeria concluded a negative affiliation between quick ratio and earnings per share of deposit money banks. Similar, findings were indicated in the research of Priya and Nimalathasan (2013). However, Chnar Abdullah Rashid (2018) investigation on liquidity of UK retail firms for the period of 2012 to 2016. The studies quick ratio was positive and significant with earnings per share. Khalaf and mari'e hasan (2011) conducted a study in Jordan on 40 enterprises registered in Amman stock market for the period 2000-2009. The findings indicated that cash flow had a favorable and a significant nexus impact on EPS. Their study confirms the results of the current research.

Table 6: Diagnostic test.

Test	Statistics		Prob.	
AR (1)	z = -1.46		0.090	
AR (2)	z = 0.01		0.715	
Sargan test	chi2(8) = 112.25		0.000	
Hansen test	chi2(8) = 0.00		1.000	
Observations	Instruments	Prob > F	Number of groups	Obs. Per group: avg.
80	7	0.000	8	5

In addition, this investigation applies a diagnostic test to the analysis to validate the feasibility of the GMM model of the two-step system. The AR (1) test denies the null hypothesis from the study that 1st Order Serial Autocorrelation did not occur. To add to this, no proof of the 2nd Order Serial relationship is found by the AR (2) test. Nonetheless, the cross-section of instruments, as advocated

by Roodman (2009), stimulates inequality with the final test bias and is capable of decreasing the validity of the Hansen J-test. Similarly, the number of lags used in the current analysis is reduced to one, using the "collapsed option" method represented in Stata by Roodman (2009). Based on the Hansen test of over-identifying restraint, the null hypothesis was rejected, demonstrating that the instruments are significant. In a nut shell, this study as well dismisses the erroneous assumption of the discrepancy in Hansen heterogeneity test. Both regression methods record a Prob > F value of 0.0000, indicating model fitness.

Table 7: Robustness check

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CR	0.241	0.014	1.369	0.019
CASR	0.455	0.023	0.921	0.000
QR	0.188	0.017	0.156	0.241
CAR	0.106	0.011	0.201	0.007
CFR	0.382	0.022	1.513	0.029

A robustness check was conducted using the two stage least-squares estimator on ROA. The results are consistent with the OLS and the two-stage GMM estimator.

Conclusion

A solvent bank has enough liquid reserves and capital on hand, as well as the potential to easily collect funds from other markets, to fulfill its payment requirements and outstanding debts on time. Despite the mechanisms instituted to secure depositors and other public interests, the number of bank pressure and defaults in Ghana's banking sector has been on the rise. This is attributed to a greater risk of bank collapse, poorer profitability, and a bulk charge against earnings as a result of inadequate credit and liquidity risk control. As a result, in order for a bank to be competitive and successful, strategic credit and liquidity strategies and policies must be established and fully executed. The tools for implementing these policies effectively would be based on the bank's principles and goal, its overall credit risk policy, and the credit policies used to achieve the bank's financial priorities and objectives, as well as its growth opportunities. The advancement of banking technology, which will allow the bank to improve its decision-making pace while lowering the cost of managing banking risk, is inextricably linked to the successful management of credit and liquidity risks. In terms of contribution and profitability, the implementation of these

banking innovations that minimize operational costs and risk management costs would eventually result in higher profits and returns for the bank.

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