What Determines Cash Holding of Listed Deposit Money Banks? Evidence from Nigeria

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Abstract

The study examined the determinants of cash holdings by 12 deposit money banks in Nigeria using data that covered the 2008-2020 sample period. Panel data was sourced from the Nigerian Stock Exchange fact book, Annual financial statements, and cash flow reports of the selected banks. Econometric tools were employed to analyze such variables of interest as return on assets, asset tangibility, leverage, bank size and volume of deposits to assets. The empirical findings revealed that asset tangibility is a negative and an 'important factor in the determination of cash holding behaviour of deposit money banks in Nigeria. Return on assets does not have any significant relationship with cash holding; leverage has an insignificant positive impact on cash holdings; bank size has an insignificant negative relationship with cash holding; and volume of deposits to assets has a weak negative impact on deposit money banks' cash holding behaviour. The empirical outcome calls for stringent cash holding policies which ensures that as a bank increases its cash holding, it will in turn enhance the overall performance of the bank. Also, since asset tangibility is found to be major determinant of banks cash holding behavior, it follows that banks should hold more cash in order to increase tangible assets. Thus, there is need for a policy framework that will ensure that as bank increases its cash holding, its corresponding tangible assets would also be enhanced.

Keywords: cash holding behaviour, deposit money banks, return on asset, asset tangibility, leverage

1. Introduction

The decision to hold cash is a primary concern to the management of a firm as it is closely related to the firm's daily operations, investments, the financing behavior, dividend payments and other finance – related decisions (Byoun, 2011). Specifically, cash is an indispensable component and the most liquid assets on each firm's balance sheet, it is also an important requirement to ensure continued operations of every firm. Cash provides the firm with liquidity and it facilitates the payment of various types of obligations. Without adequate cash or liquid assets a firm will not be able to meet its obligations and hence will sooner than later be forced to declare bankruptcy consequently, firms have to determine the most appropriate level of cash holdings to improve their operating efficiency.

The importance of cash holding to a financial institution cannot be over emphasized because it creates a level of confidence on the financial institution, and whenever cash is not available, it takes away the freedom to react to drum-beat of the money/capital market (Ubesie, Okorie, & Nwachukwu, 2017). In other words, holding cash at its required quantity as and when needed makes the holder a King (Williams, 2012). Cash holding refers to cash or cash equivalent readily available for investment in physical assets and to distribute to investors (Gill & Shah, 2012). Cash equivalents are current assets, which can be converted into cash in a very short term and are thus characterized by a high degree of liquidity, they include treasury bills, certificates of deposits, banker's acceptances and other money market instruments. These securities have a low-risk, low- return profile (Ferreira & Vilela, 2004; Opler, Pinkowitz, Stulz, & Williamson, 1999; Ozkan & Ozkan, 2004).

A Deposit Money Bank (DMB) is an institution that deals in money and its substitutes (such as commercial papers, bill of exchange promissory notes treasury bills, etc.) and provides other financial services. Banks accept deposits from the surplus units of the society and make loans to the deficit units and derive a profit from the difference in the interest rates paid and charged respectively. Banks are critical to the national economy (Obringer, 2015). The primary function of banks is to put their account holders' money to use by lending it out to others who can then use it for their various business ventures (Benjamin, Yeboah, & Samuel, 2012). In the

banking sector, being liquid is crucial to the on-going viability of any bank as liquidity can have dramatic and rapid effects on even well capitalized banks. The issue of cash holding in banks is likened to banks liquidity which means the ease with which an asset can be turned to cash with certainty (Orji, 2014). A bank is considered to be liquid when it has sufficient cash and other short term financial instruments such as treasury bills, treasury certificates and call money in its port-folio, together with the ability to raise funds quickly from other sources (such as the capital market) for it to meet its payment obligation and other financial commitments as they fall due. Bank liquidity can be defined as the capacity of the bank to meet promptly its current obligations, that is, its customers demand (Cuale, 2014). Anyanwaokoro (2008) opines that for the operation of the firms to run smoothly, optimum level of liquidity within the firm should be maintained.

Understanding the key determinants of cash holdings of deposit money banks is considered important in finance because of their roles as financial intermediaries. A number studies have emerged with mixed results and conclusions and result on the determinants of cash holding across different countries. For example, studies by Gill and Shah (2012) for Canada, Ogundipe Salawu and Ogundipe (2012) for Nigeria, Zeljko and Nemanja (2013) for Republic of Serebia, Abbas and Samran (2013) for Germany, Muhammad, Norhani and Rokiah (2015) for Nigeria, Shaukat, Mishkat and Nazir (2016) for Pakistan, Ubesie et al. (2017) for Nigeria, respectively confirmed that firm size, cash flow, returns on asset, leverage and volume of deposit are determinants of the cash holdings decision of firms. However, other studies such as Afza and Adnaa (2007) for Pakistan, Drobetz and Gruinger (2007) for Switzerland, Uyar and Kuzey (2014) for Turkey, respectively showed that asset tangibility, dividend payment and networking capital do not determine cash holdings decision of firms. In view of these mixed findings, it is deem appropriate to empirically examine the relationship between the variables, using Nigerian-specific data in order to ascertain the specific factors that determine cash holdings behavior of firms, using in doing so, longer and more recent data set.

Furthermore, previous research work such as Yifan (2012), Abbas and Samran (2013), Kariuki, Namusonge and Orwa (2015), Muhammad et al. (2015), Chireka and Fakoya (2017) amongst others, employed Panel Regression Methodology. Other research work that employed Linear Regression, Ordinary Least Square and Multiple Regression include Gill and Shah (2012), Uyar and Kuzey (2014), Ubesi et al. (2017), Shaukat et al. (2016), respectively. Few studies employed the panel data econometric technique in their empirical analysis. However, in this study, the panel data technique was employed because the method is more appropriate and superior to the OLS or multiple regression technique due to its ability to deal with heterogeneity of cross sectional data as well as omitted variables.

In addition, it should be noted that previous studies such as Gill and Shah (2012), Ogundipe et al. (2012), Muhammad et al. (2015), Chireka and Fakoya (2017) amongst others, focused on firms in the non-financial sector, while only one study Ubesi et al. (2017) focused on the financial sector. It is these identified gaps in the known extant literature that this study sought to fill by conducting an investigation of the determinants of cash holdings of Deposit Money Banks in Nigeria, using panel data modeling techniques, which in addition to being more potentially more revealing, has the capacity to address problem of endogeneity, measurement problems and omitted variables.

To this end, the crux of this study is primarily to shed light on the key determinants of cash holding of deposit money banks in Nigeria, using such specific factors as return on asset, leverage, firm size, asset tangibility and volume of deposit. The analysis is conducted by utilizing these variables on the data of the selected banks, thus making the analysis within the context of bank specific variables possible. In doing this, we organize the remaining part of this study, following this introduction section as follows: Section two examines the methodology of the study. Section three presents the empirical results while section four discusses the research findings and provides some recommendations.

2. Method

This section discusses the methodology of the study. Issues relating to the choice of research design, population and sample size, sources of data, model specification, and estimation technique.

2.1 Population and Sample Size

The population of this study consists of the entire banking sector for a period of 13 years (2008-2020). The sample size of this study consists of twelve (12) of the Deposit Money Banks listed on the Nigerian Stock Exchange (NSE) as at December 2020. The sample size is of interest to the researcher because the Deposit Money Banks represent the greatest portion of the entire banking sector. The justification for the selected 12 banks is based on the fact that they are active top players in the Nigerian Stock Exchange.

2.2 Data Sources

The data were sourced from the Nigerian Stock Exchange Fact Book, the Annual Financial Statements and Cash flow Report of the selected banks. The data was collected on the research variables for the selected 12 banks quoted on the Nigerian Stock Exchange.

2.3 Data Analysis Techniques

The study adopted the fixed and random effects econometric analysis. The Hausman test was conducted to ascertain the particular method of data estimation in panel data analysis. The choice of this method is premised on the need to control for endogeneity and omitted variables in the period covered. Also, the correlation test, specifically Pearson correlation was applied to measure the degree of association among the variables under consideration. The E-view 9.0 Computer software was used in conducting the econometric procedures.

2.4 Model Specification

The model used in this study is closely related to the works of Ogundipe, Salawu and Ogundipe (2012) and modified by introducing such additional variables as asset tangibility and volume of deposit. The functional form of the model is given as;

$$CASH = f(LEV, FASSET, ROA, VDA, FSIZE) \tag{1}$$

Where,

CASH = Corporate cash holding (the ratio of total cash and cash equivalents to total assets)

LEV = Leverage (measured as the ratio of total debt to total assets)

FASSET = Asset tangibility

ROA = Return on asset (return on assets is measured as ratio of net income to total assets, proxy for profitability)

VDA = Volume of Deposit to Asset

FSIZE = Firm size (proxied by natural log of total assets)

In functional form, the equation 1 is further expressed as;

$$CASH_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 ASSET_{it} + \beta_3 ROA_{it} + \beta_4 VDA_{it} + \beta_5 FSIZE_{it} + \mu_{it} \tag{2}$$

Where, i refers to the bank and t to the year; β_0 is the constant term, $\beta_1 - \beta_5$ are the coefficients of the explanatory variables to be estimated and μ is the stochastic variable. The a priori expectations of the parameters are: $\beta_1 < 0$, $\beta_2 < 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 < 0$.

3. Empirical Results

This section presents the empirical results from the Pearson correlation test among the research variables; the Hausman test results and the Fixed Effects and Random Effects estimates.

3.1 Correlation Analysis

The matrix simple correlation coefficients presented on Table 1 reveal the existence and behavioural patterns in the data set. Correlation statistics are used to determine the initial direction of association between the variables in the specification. It also provides preliminary insight into the existence of the problem of multicollinearity among the explanatory variables. The results of the correlation tests are reported in Table 1.

Table 1. Pairwise correlation matrix

	CASH	LEV	ATANG	VDA	ROA	FSIZE
CASH	1.00000					
LEV	-0.04027	1.00000				
ATANG	-0.20473	0.42051	1.00000			
VDA	-0.03455	-0.02141	-0.19526	1.00000		
ROA	0.14057	-0.3557	-0.1898	-0.0375	1.00000	
FSIZE	0.09555	-0.21550	-0.60123	0.25371	0.13006	1.0000

Source: Extract form Eviews 9.0 (2021).

The results from Table 1 above show that the correlation between bank cash holding (CASH) and all but the total assets (TASSETS) variables are generally negative. In any case, the TASSETS variable has a rather weak

positive association with cash holdings. The coefficient of leverage (LEV) has a moderately weak correlation value (0.42) with assets tangibility (ATANG). On the other hand, assets tangibility (ATANG) has a strong negative correlation with bank size   (FSIZE). All the other variables are weakly correlated. The weak correlation coefficients are prima facie indications of the absence of multicolinearity among the explanatory variables in the model.

3.2 Hausman Test for Panel Effects

The standard test for the method of panel data analysis is the Hausman test for random effects. In a Hausman test, the null hypothesis is that the preferred model exhibits random effect as against the alternative that exhibits fixed effects (Green, 2008). It basically tests whether the error terms are correlated with the regressors, but the null hypothesis is that they are not. Since the biases in the pooled data could either come from cross sectional heterogeneity or time series (periodic) changes, the Hausman test (reported in Table 2) is conducted to determine the best effects model to be adopted. The Chi-square statistic value for the model is not significant. From the results, the statistic did not provide evidence against the null hypothesis that there is misspecification when the Random-effect (RE) model is employed for the estimates in values. Hence, the Random effect model is employed for the empirical analysis in this study.

Table 2. Hausman test for panel effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	8.992967	5	0.1093

Source: Extract form Eviews 9.0 (2021).

3.3 Estimation Results

The empirical estimation of the determinants of cash holding in deposit money banks (DMBs) in Nigeria is carried out in this section. Although, the Hausman test has shown that the Random Effect (RE) estimates are more appropriate in the estimations, we also include the Fixed Effects (FE) estimates for the purpose of robustness checks. The result of the estimates of the initial model is presented in Table 3.

Table 3. Determinants of cash holding in DMB in Nigeria estimates

Variable	Fixed Effects			Random Effects		
	Coeff.	t-Stat.	Prob.	Coeff.	t-Stat.	Prob.
Constant	83.77662	1.601505	0.1117	33.7392	1.477292	0.1417
ROA	0.002899	0.010050	0.9920	0.35166	1.391850	0.1660
LEV	-0.020073	-0.381937	0.7031	0.05990	1.255303	0.2113
ATANG	0.052462	0.073566	0.9415	-1.49024	-2.439613	0.0159*
VDA	0.001838	1.993148	0.0484	-0.00024	-0.356611	0.7219
FSIZE	-7.734648	-1.393933	0.1658	-2.18093	-0.907745	0.3655
R-squared	0.401			0.050		
Adj. R-squared	0.269			0.019		
F-statistic	3.0380			2.6037		
Durbin-Watson	1.04			1.99		
Prob(F-stat)	0.00			0.01		

Source: Extract from Eviews 9.0 (2021); Note. * Sig. at 5% level.

On the basis of the Random Effect (RE) specification, the goodness of fit is not impressive, with the R squared value of 0.050, indicating that only about 5% of the systematic variations in banks' cash holding is explained by changes in the explanatory variables. The adjusted R-squared value of 0.019 is equally very low and it implies that the model has a weak explanatory power. However, given that the data set used is a panel, the adjusted R-squared obtained may not pose estimation threats to the results (Madalla, 1999; Woodridge, 2002). The F-value of 2.60 and haven passed the overall significance test at the 1% level; suggests that all the explanatory variables, though exhibits influence on cash holdings, but do not appear to be doing so to a large extent. Although it is disturbing that the model performed so poorly judging by the diagnostic statistics R^2 and Adjusted R^2 respectively, this does not invalidate this outcomes based on the statistical significance outcome of the model

generally.

From the empirical results in Table 3, the coefficients of tangible asset (ATANG), volume of deposit to total assets (VDA) and bank size (FSIZE) variables do not possess the expected signs. However, the signs of the coefficients of return on assets (ROA) and leverage (LEV) are in line with a priori expectations. The importance of each variable in the model is determined by evaluating their respective coefficients in terms of significance and signs (Greene, 2002; Iyoha, 2004). The coefficient of return on assets (ROA), proxy for bank profitability does not have any significant relationship with cash holding behaviour of banks. The variable failed the test of significance at the 5% significance level. Asset tangibility (TAN) has significant negative relationship with cash holding by the Deposit Money Banks. It passes the significance test at 5% significance level.

The coefficient of leverage (LEV) is positively signed but failed the test of statistical significance at 5% level of significance. On the other hand, the coefficient of the volume of deposits to assets (VDA) is negative but also failed the test of statistical significance at 5% level of significance.   Surprisingly, bank size (FSIZE) has an insignificant negative relationship with cash holding. It failed the test of significance at the 5 percent level of significance. The overall results obtained from the estimation of the model are effectively acceptable, given that the Durbin Watson statistic value of 1.99 is appropriate and it indicates the absence of autocorrelation in the model. Thus, the results are applicable for structural analysis and policy formulation.

4. Discussion of Findings

On the basis of the Random Effect (RE) results, return on assets (ROA), proxy for bank profitability was found to have an insignificant effect on cash holding. By implication, the level of banks' profitability does not determine the amount of cash that is held by banks. In other words, the fact that a bank is profitable does not translate to higher levels of cash holdings. This finding is not in line with those obtained by Kim, Mauer and Sherman (1998), Ubesie, Okorie, and Nwachukwu (2017), Muhammad, Norhani, and Rokiah (2015) who find significant positive relationship between profitability and cash holding.

Asset tangibility was found to have a significant negative relationship with cash holding by the Deposit Money Banks. This means that, asset tangibility is an 'important factor to be considered in the determination of cash holding behavior of deposit money banks in Nigeria. A unit increase in asset tangibility decreases cash holdings by 1.49 in DMBs. This result is in line with the view expressed by Keeley (1990) that a firm with high fraction of plant and equipment (tangible assets) as the asset base made the debt choice more likely and influences firm's performance and cash holding. On the other hand, this finding agrees with those obtained by Drobetz and Grüninger (2007) who found the existence of a significant positive relationship between asset tangibility and bank cash holding.

Leverage was found to have a positive insignificant effect on cash holding. This implies that the level of debt employed by banks does not significantly affect their cash holding behaviour. On the other hand, the volume of deposits to assets had a negative insignificant impact on cash holding. This indicates that volume of deposits is not a significant determinant of cash holding behavior by DMBs in Nigeria. This finding agrees with those obtained by Gill and Shah (2012) who finds a positive relationship between leverage and cash holding. It however disagrees with those obtained by Ferreira and Vilela (2004), Ozkan and Ozkan (2004), Afza and Adnan (2007) who find negative relationship between leverage and cash holding.

Surprisingly, bank size was found to have an insignificant negative relationship with cash holding. It implies that bank size is not significant in determining banks' cash holding behaviour. Thus, cash holding by banks could be as a result of tangible asset and other inherent factors rather than "size". Indeed, it is seen that 1% increase in bank size reduces cash holding by 2.18% though insignificant. This finding agrees with those obtained by Kim, Mauer, and Sherman (1998), Drobetz and Grüninger (2007), Ferreira and Vilela (2004). It however, disagrees with those obtained by Gill and Shah (2012) who obtained a positive relationship between firm size and cash holdings.

The literature on cash holdings has significantly increased since the 2008 financial crisis, indicating relevant stakeholders concerns regarding cash holdings behaviour of firms not only in Nigeria but elsewhere. Considering the relevance of cash holdings to the banking sector, the study specifically investigated within the Nigerian context, using banks-specific data, the determinants of cash holdings behavior of 12 Deposit Money Banks using data that covered the 13 years period (2008 to 2020).

The implications of the empirical evidence obtained in this study for policy are somewhat straightforward. The level of cash holdings of the Deposit Money Banks in Nigeria is significantly affected by the level of asset tangibility among the sampled banks. Accordingly, policies that are designed to encourage increased asset tangibility are likely to be more beneficial than detrimental to the banks and need to be explored and pursued by

the banks management, who in this wise are the policy makers. This, however, has further implications for such policy formulation regarding cash flow activities in relation to its returns. Much of it is desirable to such policies that are capable of encouraging higher returns to shareholders. In other words, the costs and benefits of increasing asset tangibility as a strategy for boosting cash holdings decision need to be considered and weighted consciously by bank management in order to be sure that only right policy option is adopted.

The empirical finding with respect to the impact of volume of deposit to asset on cash holdings, calls for policy option that are designed to give a boost to the level of cash availability in the bank, since liquidity is of essence to every bank. This calls, for example, for reasonable deposit rate of interest payable, such that has the tendency to encourage more cash deposit than assets, since a low saving interest rate reduces the willingness to deposit surplus funds in the bank. In other words, reduction in assets in relation to the cash and cash equivalent deposits has the tendency to dampen the cash holding behavior among its resultant consequences.

The empirical findings with respect to the other variables such as leverage and firm size, though both indicate insignificant impact on cash holdings behavior of banks. This calls for policy strategies that are capable of mitigating the impact of financing options in relation to the capital structure of the banks. This should be done taking cognizance of the need to avoid reverting to the artificially over-valued shares of the firms which results from raising excessive debt capital which warrants leverage in order to gain tax shield. However, the nature of banks capital does not really give room for this scenario.

Acknowledgments

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