

CASH RESERVE RATIO, MONEY SUPPLY AND THE PROFITABILITY OF DEPOSIT MONEY BANKS IN NIGERIA

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ABSTRACT

This study examines the effect of cash reserve ratio and money supply on the profitability of DMBs in Nigeria. Data for the study were extracted from the annual reports and accounts of the DMBs for the study period (2002-2012). Descriptive statistics and regression analysis technique were used to analyse the data. The results reveals that cash reserve ratio has negative and insignificant impact on the earnings of DMBs in Nigeria. Money supply has a positive significant effect deposit money banks volume of loans and advances, interest rate and interest income. The study recommends that the CBN should redefine monetary policy instruments; Cash Reserve Ratio (CRR) by setting CRR at an equilibrium level in order to make more funds available to DMBs for advancing loan and investing in the economy for growth and development. In addition, the government through the CBN should set lending rate an optimum level as these would help to boost credit expansion, money supply and invariably returns and profitability of deposit money banks in Nigeria.

KEYWORDS: Cash Reserve Ratio, Earnings Per Share, Deposit Money Banks, Money Supply, Profitability

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1.0 INTRODUCTION

The banking sector performs the fundamental function of developing the financial system. There is no place in the world where banking sector is not regulated, even in countries that profess capitalism as their guiding economic principles. The banking sector as an imperative sector in the financial services industry desires to be reformed from time to time in order to improve its competitiveness and capability in recreating the essential role of financing investment. Somaye (2008) and Okpara, (2011) argued that reforms and policies in the banking sector are indispensable to ensure the protection of depositor's funds and intensify the financial system to stimulate growth of the economy. Cash Reserve Ratio (CRR) and Money Supply (M2) have become important monetary tools for regulating the lending capacity of Deposit Money Banks (DMBs) and controlling money supply in the economy.

Cash Reserve Ratio is the percentage of total deposits that DMBs are required to keep with Central Bank. Bijoy and Maud (2015) documented that CRR may have an impact on DMBs profitability. This is because central bank pays zero interest on the amount commercial banks keeps with them as cash reserve. Deposit money banks earn their

proceeds through lending of available funds at higher rates and paying lower rates of interest on deposits amount. An increase in CRR results in smaller amount of funds at disposal of DMBs, increase in interest rate, decrease in liquidity and profitability in the system and vice versa (Carvalho & Azevedo 2008 and Vargas et al. 2010). Flamini *et al.* (2009) and Athanasoglou *et al.* (2008) noted that Money supply is another macroeconomic variable that affect DMBs profitability.

Money supply (M2) or money stock is the sum of the monetary base available in an economy at a specific period of time. M2 is commonly defined as group of safe assets that households and businesses can use to make payments or to hold as short-term investments. Thus, it comprises of volume of currency in circulation and account balance. M2 data are recorded and published by the government or the central bank of the country. Private and Public sector analysts have long been monitoring the changes in money supply because of its impact on the inflation, price level, exchange rate, profitability, volumes of loans and advances and the business cycle. In a fractional reserve banking system, withdrawals of currency from commercial banks reduce reserves, and unless central bank supply additional amounts of currency, a contractional economy usually results in reducing the volume of money in circulation. Currency and bank reserves are sum together as the monetary base, also known as high-powered money. Central bank has the power to control the issue of both components. In recent years, researchers have begun to focus on the influence of CRR and M2 on profitability of commercial banks, notably, Prada (2008), Montoro and Moreno (2011), Khrawish (2011), Glocker and Towbin (2012b), Carrera and Vega (2012) and Ongore and Kusa (2013). An imperative area that is yet to be fully incorporated and considered by these studies is the effects of cash reserve ratio and money supply on banks profitability in Nigeria. This paper, therefore, seeks to fill this gap by examining the impact CRR and M2 on the profitability of DMBs in Nigeria. To accomplish this objective, the paper is divided into five sections, namely: introduction, literature review, methodology, results and discussions, and, finally, conclusion and recommendations.

2.0 LITERATURE REVIEW

This section reviews literature on the concept of cash reserve ratio, money supply and profitability. Empirical studies on CRR and M2 on profitability also form part of the section. The review of theory underpinning the study was also covered in the section.

2.1 The Concept of Cash Reserve Ratio

Cash Reserve Ratio is the percentage of total deposits that DMBs are required to keep with central bank. Fama (1980) defined CRRs as taxes on the return on deposits both foreign and domestic on a bank balance sheet since other resources that have similar risks and returns do not have cash required reserves. Cash reserve ratio is a central bank regulation employed by most, but not all, of the world's central banks, to sets the require reserve percentage on specific customer deposits and each bank must keep money in vault cash with CBN. In Nigerian context, cash reserve requirement (CRR) are set at different percentage between the private and public sector fund from 2013 -2014 and was harmonised in 2015 (Central Bank of Nigeria press release through Communiqué No. 98 & 101). This is so in order to stimulate banks to be more proactive in performing their role of financial intermediation rather than depending much on government fund as their main source of deposit In most countries (as in Nigeria), the central bank is responsible for watching over the cash reserve ratio.

A number of economists have argued in support of eliminating CRRs since they contribute to the source of inefficiencies in the banking system. Fama (1983) argued CRRs were among the source of avoidable costs for

administration of DMBs services. Besides, the aim of price stability through changes in CRRs may possibly affect DMBs' additional remuneration by dropping the accessibility of loans that finance economic activity. From the above assertions it is possible for cash reserve requirement to increase the cost operation of deposit money banks (commercial banks) in Nigeria.

2.2 The Concept of Money Supply

Money supply is defined as the aggregate of all the money holdings of the members of the society and corporate organization. Money supply (M2) is the summation of currency in circulation, demand deposit, time deposit and saving deposit (Al-Qudah & Jaradat, 2013). Culbertson (1973) also established that the determinants of money supply include M1 and M2 and their constituents. This is in line with the CBN (2014) definition and many others developing countries while it varies in other countries for instance United Kingdom (UK) money supply is classified into M1, M2 and M₃ while in United States of America (USA) it include M1, M2, M3 and M4 . The M1 is a narrow measure of money supply, it is base on assumption of money as a medium of exchange and it comprise of “currencies in circulation outside the banks plus current accounts balances held in banks” = C+DD. The CBN (2014) defines M1 as currencies outside banking system plus demand deposits. M2 is defined as a broad measure of money supply. It includes time and savings deposits =C + DD for M1 +SD+TD for M2. The justification for adding time and savings deposits of deposit money banks is that they can be easily transformed into cash within the short period of time. M+ comprises of M1 and M2 plus deposits of finance houses and other financial institutions including merchant banks and similar institutions.

2.3 The Concept of Profitability

Profitability as defined by Rose (1999) is refers to the net income of the commercial bank where company's income exceeds its expenses. Income is earned from the activities of the commercial banks and expense is the cost of resources which are used to earn profit. Profitability is the main objective of the commercial banks. Deposit money banks cannot survive in the market for the long run without adequate profitability. Therefore evaluating past and current profitability and the factors affecting it is paramount. Comptroller (1998) and Ahmad (2003) reported that interest on loan is the largest constituent of income for Nigerian banks as evidenced from available data and movement from one interest regime to another could have some effects on the profitability of banks in the system. Igben (2009) documented that Earnings Per Share (EPS), Return on Assets (ROA), Return on Equity (ROE) and Return on Capital Employed (ROCE) are all proxies for profitability.

2.4 The Conceptual Framework of the Study

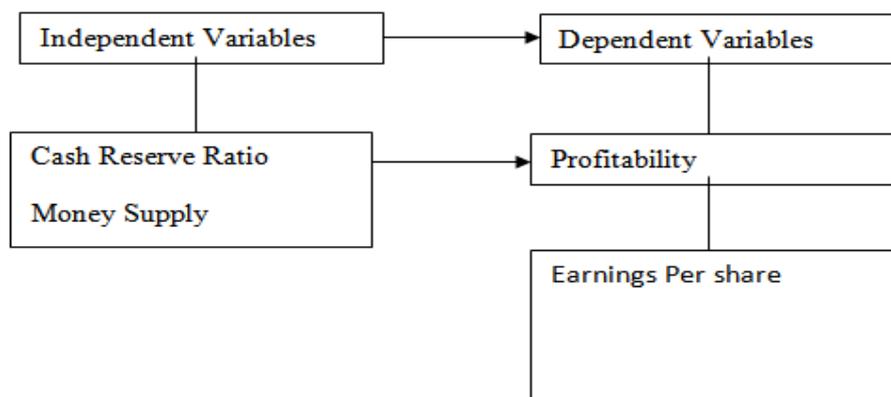


Figure 1

Figure 1 shows the conceptual model for the study. The dependent variable is profitability proxy by earnings per share while the independent variables are cash reserve ratio and money supply.

2.5 Review of Empirical Studies

This section covers the review of empirical evidences on CRR and profitability as well as on M2 and bank's profitability

2.5.1 Review of Empirical Studies on CRR and Profitability

A good number of researches focused on cash reserve requirements in developing economies and its impact on the profitability of banks. Uchendu (1995) studied the impact of monetary policies on the performance of Nigerian deposit banks. The study found out that the overriding factors effecting bank profitability are cash reserves ratio, interest rates, exchange rate, unit labor costs and bank structure. Ogunlewe (2001) also examine the monetary policy effects on bank's profitability, using data from Nigerian deposits money banks and discovered the factor affecting commercials banks profitability to include cash reserve requirement ratio, allowable credit growth, securities and exchange rate and stabilization. Aburime (2008) considered a sample of banks with 1255 workers observation on unbalanced panel data over the period of 1980-2006 to examine the macroeconomic determinants of bank profitability in Nigeria and discovered that monetary policy, actual interest rate, foreign exchange and inflation, are directly linked with banks' return. Uremadu (2012) reported a positive relationship between CRR and banks profitability. This position was confirmed by Akanbi and Ajagbe (2012) and Onoh (2017) among banks in Nigeria.

On the other hand, Tovar and Ocampo (2003) and Larrain and Cerda (2005) documented that increase in cash reserve requirements raise interest spreads and reduce bank profits. Punita and Somaiya (2006) carried out a study on the impact of monetary policy on the profitability of banks in India between 1995 and 2000. The study found out that bank rate, cash reserve system have negative and significant effect on the profitability of banks. Bokan (2009) in Croatia and Sarmiento (2008) and Prada (2012) in Colombia found that reserve requirements and money supply affect banks profitability. Abid and Lodhi (2015) reported that CRR taken as measure for Reserve Requirement has significant inverse relationship on banks' financial performance in Pakistan, which is measured by ROA and ROE. The reserve requirement ratio (RRR) of banks in Vietnam show negative relationship with profit (Nguyen, Vu & Le, 2017). Udeh (2015) documented that cash reserve ratio, has no significant impact on the profit before tax of Zenith Bank Plc, one of the leading DMBs in Nigeria. Cash reserve ratio have negative impact on bank lending and hence profitability of banks in Nepal (Dhungana, 2016).

2.5.2 Review of Empirical Studies M2

Money supply whether increase or decrease has a great impact on the economy in the sense that if the supply money is too high, it reduces the currency value and lead to a raise in the quantity of money that is not linked with equivalent raise in real output which ultimately lead to inflation. According to the monetarist, a raise in money supply in an economy causes a raise in general price level of goods and services which brings about inflation in the country Uzougu (1981). Bentum (2012) found that profitability of commercial banks in Ghana during the global financial rises is affected by M2. Money supply growth rate have a significant positive relationship with profitability of First Bank Nigeria Plc (Ayanda, Christopher & Mudashiru, 2013). Money supply has a positive and statistically significant impact on the return on assets of Sri Lanka commercial banks (Bandara, 2015). Obeidat (2016) and Aziz (2017) documented that money supply

has a positive and significantly impact on the profitability of Islamic banks in Jordanian and Malaysian economy. Money supply has positive and significant impact on the profitability measures of Jordanian's banks (Al-jarrah, Ziadat & El-Rimawa, n.d).

On the other hand, Sufian and Chong (2008) found that money supply has a negative relationship and do not significantly explain the variations in the profitability of Philippines. Kutsienyo (2011) and Nkegbe and Ustarz (2015) reported that money supply has a negative but significant impact on bank profitability in Ghana. Onoh (2017) confirmed this position for commercial banks in Nigeria. Ayodele (2014) found that money supply exert negative effect on commercial banks' loan and advances and profitability in Nigeria.

2.6 Theoretical Framework of the Study

The Keynesian Theory was adapted to guide this study. In 1936, John Maynard Keynes published his "General Theory of Employment, Interest and Money" and initiated the Keynesian Revolution. Keynes maintained that monetary policy alone is ineffective in stimulating economic activity because it works through indirect interest rate mechanism. From the Keynesian mechanism, monetary policy works by influencing interest rate which influences investment decisions of financial institutions such as banks and the public and consequently, output and income via the multiplies process as contained in the works of Amacher and Ulbrich (1989), Gertler and Gilchrist (1991), Okpara, (2010) and Solomon (2013). Keynes posits that government had the responsibility to undertake actions to stabilize the economy and maintain full employment and economic growth, using fiscal policies. He therefore recommends a proper blend of monetary and fiscal policies as at some occasions, monetary policy could fail to achieve its objective (Onyemaechi, 2005). In simple terms, the monetary mechanism of Keynesians emphasizes the role of money, but involves an indirect linkage of money with aggregate demand via the interest rate as symbolically shown below: $\downarrow \text{OMO} \rightarrow \downarrow \text{R} \rightarrow \uparrow \text{MS} \rightarrow \downarrow \text{r} \rightarrow \text{I} \rightarrow \downarrow \text{GNP}$

Where, OMO = Open Market Operation R = Commercial Bank Reserve MS = Stock of Money r = Interest Rate
I = Investment GNP = Gross National Product

On a more analytical note, if the economy is initially at equilibrium and there is open market purchase of government securities by the Central Bank of Nigeria (CBN), this Open Market Operation (OMO) will increase the commercial banks reserve (R) and raise the bank reserves. The bank then operates to restore their desired ratio by extending new loans or by expanding bank credit in other ways. Such new loans create new demand deposits, thus increasing the money supply (MS). A rising money supply causes the general level of interest rate (r) to fall. The falling interest rates affects commercial bank performance and in turn stimulate investment given businessmen expected profit. The induced investment expenditure causes successive rounds of final demand spending by GNP to rise by a multiple of the initial change in investment. On the other hand, a fall in money supply according to Jhingan (2005) causes the general level of interest rate (R) to rise or increase thereby increasing the commercial banks profitability

3.0 METHODOLOGY

For the purpose of this study, the quantitative research design was used. Following the 2004 banking consolidation reform programmed of the Central Bank of Nigeria, the target population for this study consists of all the twenty one (21) deposit money banks in Nigeria. The data for the study was extracted from Central Bank of Nigeria (CBN) *Statistical Bulletin* and Annual report of DMBs for the period of eleven years spanning from 2002 - 2012. The variables of the study consist of the dependent and independent variables. Cash Reserve Ratio (CRR) measured as the percentage of the

total deposit of DMBs keep with the CBN and Money Supply (M2) measured as currencies in circulation outside the banks plus current accounts balances, time and savings deposits held in banks(M1 &M2) are the independent variables while banks profitability is dependent variable proxy earnings per share (EPS). Multiple regression analysis was employed to analysed the data with a view to determine the effect of CRR and M2 on banks profitability (EPS) in Nigeria. The ordinary least square (OLS) is express below.

$$EPS = \beta_0 + \beta_1 CRR_t + \beta_2 M2 + U_t \quad (1)$$

Where

β_0 is an Intercept/Constant

β_1, β_2 are parameters

EPS = Earnings Per Share

CRR_t = Cash Reserve Ratio

M2 = Money supply

U_t is the unobservable variable

4.0 RESULT AND DISCUSSIONS

This section presents the analysis and interpretation of result from the data generated from the annual reports and accounts of the DMBs in Nigeria and the *CBN Bulletin*. The OLS regression result is also explained in the section.

Table 1: Descriptive Statistics

	EPS	CRR	M2
Mean	0.334271	-3.03878	8.502592
Median	0.576613	-2.99573	8.542354
Maximum	0.688135	-2.07944	9.539312
Minimum	-0.248461	-4.60517	7.317186
Std. Dev.	0.394136	0.863369	0.804552
Skewness	-0.577070	-0.61223	-0.148201
Kurtosis	1.456594	2.184728	1.474309
Jarque-Bera	1.702316	0.991815	1.107145
Probability	0.426920	0.609018	0.574892
Sum	3.676984	-33.4266	93.52851
Sum sq. Dev.	1.553429	7.454056	6.473034
Observations	231	231	231

Source: Generated by the Author From the Data Extracted From the Annual Reports and Accounts of DMBs and CBN Bulletin, 2016

The descriptive statistics is presented in Table 1 where minimum, maximum, mean, median, Skewness, Kurtosis, Jarque-Bera, Probability, sum, Sum Sq. Dev and standard deviation of the data for the variables used in the study are described. The minimum and maximum values of CRR are -4.60517 and -2.07944 with an average of -3.03878. EPS and M2, vary from a minimum of -0.248461 and 7.317186 and maximum of 0.688135 and 9.539312 with an average of 0.334271 and 8.502592 respectively. All the variables are negatively skewed and the probability levels for all the variables at 5% are insignificant.

Table 2: Regression Results

Dependent Variable	Indept. Variable	Coefficient	T-Statistic	Prob.	F-Statistic	Prob.	R ²	Adjusted R ²	Durbin-Watson Statistic
EARNING PER SHARE (EPS)	CRR	-0.068386	-7.112141	0.2843	33.21592	0.00013	0.893	0.865649	1.27914
	M2	0.424444	6.637336	0.0002					
	C	-3.482411	1.95782	0.0001					

Source: Generated by the Author from the Data Extracted From the Annual Reports and Accounts of DMBs and CBN Bulletin, 2016

Table 2 presents the OLS result for the dependent and independent variables. The probability of F-statistics is 33.22 with a P-value of 0.0001. This suggests that the model is suitable for the study, as the value is less than 1%. R² of 0.89 indicates that 89% of the variation in the dependent variable (EPS) is jointly explained by the changes in the independent variables (CRR and M2). This position is confirmed by Adj R² of 0.87, which signifies that, after adjusting for error term, 87% of the changes in EPS of the sampled banks are jointly explained by the changes in CRR and M2 while the remaining by other factors not captured in the model.

From Table 2, there is negative and insignificant relationship between cash reserve ratio and Earnings Per Share. The coefficient of Cash Reserve Ratio is -0.068386, which implies that one percent increase in Cash Reserve Ratio will reduce the Earnings Per Share by 6.8 percent in negative direction. The null hypothesis which states that Cash Reserve Ratio has no significant effect on the profitability of DMB cannot be rejected. This is in line with Udeh (2015), Dhungana (2016) and Nguyen, Vu and Le (2017) but contrary to Uremadu (2012), Akanbi and Ajagbe (2012) and Onoh (2017).

Similarly, Table 2 also reveals a positive and significant relationship between Money Supply and Earnings Per Share at 5% degree of significant. The coefficient of Broad Money Supply is 0.424444 which implies that one percent increase in Broad Money Supply will increase the Earnings Per Share by 42.44 percent. The null hypothesis which states that Money Supply has no significant effect on the profitability of DMB is rejected. The finding is in line with Prada (2012) and Sarmiento (2008), Bokan (2009), Bandara (2015), Obeidat (2016) and Aziz (2017) that documented that money supply has a positive impact on profitability of banks but contrary to Kutsienyo (2011), Nkegbe and Ustarz (2015) and Onoh (2017) reported that money supply has a negative but significant impact on bank profitability

5.0 CONCLUSIONS AND RECOMMENDATIONS

The findings of the study show that change in profitability of DMBs in Nigeria is influenced by CRR and M2. The study concludes that cash reserve ratio has negative and insignificant impact on the earnings of DMBs in Nigeria. Money supply has a positive significant effect on deposit money banks volume of loans and advances, interest rate and interest income. The study recommends that the CBN should redefine monetary policy instruments (CRR) by setting CRR at an equilibrium level in order to make more funds available to DMBs for advancing loan and investing in the economy for growth and development. In addition, the Nigerian government through the CBN should set lending rate at an optimum level as these would help to boost credit expansion, money supply and invariably returns and profitability of deposit money banks in Nigeria.

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