Economic and Financial Review

Volume 33 | Number 2 Article 4

6-1995

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CBN ECONOMIC & FINANCIAL REVIEW, VOL. 33, NO. 2 156-170

MONETARY POLICY AND THE PERFORMANCE OF COMMERCIAL BANKS IN NIGERIA

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The purpose of this study is primarily to investigate the impact of monetary policy on the performance of the commercial banking industry in Nigeria. An analysis of the industry data showed a strong relationship between monetary policy instruments and commercial bank profitability measures, suggesting that appropriate monetary and banking policies are important factors to the continued stability and profitability of the commercial banking industry. More importantly, the evidence of oligopolistic competition in the commercial banking industry involving the three big commercial banks raises questions on their influence on effective transmission of monetary policy in Nigeria, role as financial intermediaries and the overall stability of the financial system in the event of a pronounced distress in any of them.

The commercial banking industry is involved in the business of providing financial services to the Nigerian economy. In playing this intermediation role, the sector acts as the main channel for the transmission of monetary policy in the economy and at the same time, earns income for its share holders[1]. The sector operates under the general guidelines provided by the monetary authority (the central bank). Thus, central bank's policy stance on money and the financial system affects commercial banking performance (Fisher, 1980). Adjusted net interest margin, return on assets (ROA) and return on equity (ROE) have been used by Wall (1987), and Goudreau and Whitehead (1989) as measures of commercial banking performance. Hunter and Timme (1990) additionally introduced labour utilization as another measure[2]. Babalola (1989) identified profitability and asset base as the traditional measures of bank performance in Nigeria. He further suggested the use of indices such as quality (procedures, policies and information technology) and quantity (number of installations and scope of products and services) of service in measuring bank performance.

These performance measures, as also observed by Babalola, are affected by the monetary authority's policy measures on interest rates (savings, time deposit, discount and lending), exchange rate, provisioning for bad and doubtful loans,

* The author, a Principal Economist in the Policy Intelligence Unit of the Research Department, acknowledges the research assistance provided by Mr. C. O. Okafo, (NYSC) and the co-operation of Mr. I. O. Oretuyi of the Banking Operation Department in obtaining part of the data used for the study. All views and omissions are, however, those of the author.

prudential guidelines, level and components of required reserves and liquidity ratio, capital adequacy and open market operations. Of those factors (including staff costs and certain service charges), only the loan volume (depending on the bank's free reserves) and staff costs are to some extent within the commercial bank's control. The rest are stipulated by the central bank. For instance, in 1994 Monetary and Credit Policy Guidelines, the Central Bank of Nigeria specified a minimum cash reserve requirement ratio (cash deposits with the CBN to total demand liabilities made up of demand, savings and time deposits) equal to 6.0 per cent; liquidity ratio of 30 per cent; a 12.0- 15.0 per cent savings and time deposit range; and a maximum of 21.0 per cent on lending rate, inclusive of all charges. Similarly, the exchange rate of the naira was fixed at 22.0 to the US dollar. Other monetary policy measures designed to guide the commercial banks in loan administration included percentage allocation of loans to government's priority sectors (agriculture, 18 per cent, manufacturing, 42 per cent and exports, 10 per cent), rural borrowers, and small-scale enterprises. The 1995 Monetary, Credit, Foreign Trade and Exchange Policy Guidelines retained most of theses policies but re-introduced the interbank foreign exchange market where the exchange rate of the naira is expected to be market determined in the form of Autonomous Foreign Exchange Market (AFEM). In addition, the CBN would only intervene in the market in response to its policy objectives. A 7.5 percentage point spread between the savings and lending rates was also prescribed in the guidelines. The CBN Decree 24, and Banks and Other Financial Institutions Decree (BOFID) 25, all of 1991, provide the umbrella laws governing the operations of the industry.

Several authors have investigated the monetary policy - commercial bank performance relationship. Knight (1970) studied the effects of Federal Reserve system policies on the banking system and found that the variation in free reserves has a pronounced effect on banks loan and investment expansion ability. Ituwe (1983) and Babalola (1989) in particular, Akingbade (1983) and Ojo (1994) have covered commercial banking performance in Nigeria in their study of certain aspects of the banking system. Ezeuduji (1994) highlighted the channels through which monetary policy affect the performance of the banking industry in Nigeria but did not provide empirical evidence on the impact of these policies nor their measurement.

A recent and more detailed attempt by Odufalu (1994) was aimed at analysing the effects of monetary policy on banks' profitability in Nigeria. He developed a bank profitability model in which the reduced form had profit before interest and tax as the dependent variable and average interest rate on savings and time deposits; prime lending rate for loans and advances; treasury bill rate (as the rate of return on investment); total deposits; liquidity ratio; cash ratio; and income as explanatory variables. Using pooled data for only twelve commercial banks for 1986 - 1990 period, he estimated the model by the method of ordinary least squares (OLS). The existence of multicollinearity between the cash and liquidity ratios could have necessitated his dropping the cash ratio. The rest of his results showed that total deposits, treasury

rate and lending rate positively and significantly affected the profitability of his sample banks while the deposit rate, liquidity ratio and income reduced their profitability. But for the wrong sign on income, all other variables had his expected signs. As he rightly acknowledged, the number of his samples (12) were small for an industry of 120 banks (commercial and merchant) for any meaningful inference to be made from the results. More importantly, the use of OLS in estimating pooled time series and cross-sectional data may lead to misleading results (Judge et al, 1988: pp. 420 - 496).

Thus, none of these studies provided a detailed and comprehensive empirical study of the effects of monetary policy on commercial banking in Nigeria. Consequently, this study sets out to bridge this gap. The effect of few large banks (concentration) will also be investigated. A clearer understanding of the relationship between monetary policy and commercial banks' performance is of immense help to the stability of the financial system and the overall performance of the economy. For presentation convenience, the rest of the paper is divided into three sections. Section I discusses the theoretical issues in commercial banking and derives a model for explaining the influence of monetary policies (such as interest and exchange rates), personnel costs and oligopolistic structure on the sector's operations. Section II presents the results of the study, while Section III concludes the paper.

I THEORETICAL ISSUES AND MODEL OF COMMERCIAL BANKING PERFORMANCE

This section reviews the theories of banking and derives a model which shows how commercial banking profitability (a major performance criterion) is affected by variation in monetary policy factors.

I. 1. Theoretical Issues

Because of its unique operating environment, a commercial bank maximises profit, subject to solvency and liquidity constraints[3]. These constraints are greatly influenced by a central bank's stance on monetary and banking policies. The portfolio management approach and statistical model (Meyer, 1986) as well as production function theory (Klien, 1971) have been used in the analysis of banking firm behaviour. Meyer (1986) dealt with the Real Bill or Commercial Loan Theory, Shiftability Theory, Anticipated Income Hypothesis, Liability Management Theory and Computer Model or Statistical Model. The Real Bill or Commercial Loan Theory states that banks should make short - term, self liquidating loans to finance the current production, transportation or storage of physical goods, either manufactured or agricultural. The Shiftability Theory states that the profitability, liquidity and solvency objectives of commercial banks will be met by allocating assets in the following order:

(i) Maintain the required or primary reserves. Cash and deposits at the Federal (Central Bank) yield no income, but bankers must make some sacrifice if they want to remain in business;

(ii) Acquire open market, short-term securities often called secondary reserves. The interest earned usually compensates for the reduction in liquidity brought about by smaller cash holdings;

(iii) Make customer, both consumer and business, loans. These assets tend to be more profitable. While they decrease liquidity , they also reduce the need for liquidity by tying depositors more closely to the bank. Generally, customer loans are more risky than open market securities and increase the likelihood of insolvency: and

(iv) Invest the remainder, if any, in open-market, long-term securities such as government bonds.

Anticipated Income Hypothesis states that the likelihood of loan repayments, which generate a cash flow that supplements bank liquidity, depends on the anticipated income of the borrower instead of the type of borrower or the use made of the funds. Liability Management Theory holds that banks could satisfy any liquidity need and short-run profit opportunity by issuing money market liabilities such as Certificate of Deposit (CDs). Another version of the theory states that money market bank liabilities should be used along with bank assets to meet liquidity needs. Finally, the Computer or Statistical Model of banking uses mathematical equations in describing the inter-relationship among bank assets, liabilities and income over time.

Klien (1971) looked at the theory of a banking firm from a microeconomic perspective where the production function of the firm (output) is transaction services, while capital and labour are the inputs. An alternative definition was provided by Shaffer (1993) who defined the dollar value of assets and the interest rate earned on the assets as the quantity and price of output, respectively, while labour and deposits are the input. Their input prices are annual wage rate (proxied by annual compensation per employee) and deposit interest rate.

The common feature of these theories is the need for banks to adjust their portfolio of assets and liabilities in order to meet their profitability objectives under the solvency and liquidity constraints. However, the degree of adjustment as earlier stated depends on the regulatory position of the monetary agency. Thus, the commercial banking profit function for the industry is influenced mainly by interest and exchange rate policies, credit availability (proxied by bank reserves), labour costs and policy stance on provisioning for non-performing loans. An increase in interest rates (lending and deposit rate) as well as their spread (Hancock, 1985) are expected to increase the profit rate as a high exchange rate premium would[4]. Similarly, a high excess bank reserves should also increase profitability by increasing the availability

of loanable and investment funds (Knight, 1970). Likewise, a rising unit labour cost could increase profits if the increase acts as an incentive for higher productivity.

Other factors affecting the performance of banking firms are size (Boyd and Runkle, 1993; Kilbride, Mcdonald and Miller, 1986; Francis, 1978; and Humphrey, 1987) and structure of the industry (Levy, 1984; and Whitehall, 1986) . Boyd et al state that modern intermediation theory predicts that larger banking firms will be less likely to fail and more cost-efficient than small firms. Their empirical results failed to confirm the "too big to fail" theory nor the economies of scale theory in banking firms. Additionally, the concentration ratio which measures the structure of the industry is expected to increase oligopolistic profit (Whitehall, 1986). Smirlock (1985) attempted an explanation of the effect of concentration on banking profitability. He specified a profit rate function explained by market share, concentration ratio and other variables expected to influence bank profitability such as total growth in market deposit, and total bank assets[5]. He estimated the profit rate using cross section data and found that market share and concentration ratio were individually significant in explaining bank profit rate. However, market share was more significant in explaining profitability than concentration ratio. The combination of the two variables in a single equation showed that only market share was significant (see his Table 1, pp 77) which led him to conclude that there was no relationship between bank profitability and concentration. A closer examination of his definition of market share and concentration ratio shows that the insignificance and wrong signs of concentration ratio could have resulted from multicollinearity. The results as reported actually indicated a significant relationship between bank profit rate and concentration. Another measure likely to impact on bank profitability is managerial ability proxied here by loan quality and measured by the ratio of provisioning for loan losses and total loans granted by the industry. It is expected that an increasing provisioning depicts inefficient management and a fall in bank profitability.

I.2 The Model

From the above discussions, the profit function of the commercial banking industry assumes the reduced form:

$$P = f(r, er, rv, cr, pl, w) \quad (1)$$

where

P = Bank performance measure (interest earnings as a ratio of total assets of commercial banks; return on assets (the ratio of gross profits to their total assets); and return on capital for the industry (the ratio of gross profits to industry paid-up capital);

r = interest rates (savings or lending or their spread);

er = exchange rate (official); parallel rate was not used (available only for the 1987 - 1993 period);

rv = Commercial banking system reserves

cr = concentration ratio used to measure the influence of the three big banks on industry, defined as the ratio of the assets of the three big banks to total sector assets;

pl = variable measuring efficiency, represented by the ratio of provision for loan losses to total loans and advances; and

w = unit labour costs (ratio of labour costs to number of employees).

The estimatable form of Equation 1 becomes:

$$P = a_0 + a_1 r + a_2 er + a_3 rv + a_4 cr + a_5 pl + a_6 w + e \quad (2)$$

where the 'a' s are coefficients to be estimated; and e is a normally distributed error term with zero mean and variance equal to o^2 It is expected that a_1, a_2, a_3, a_4; a_6 >0; while a_5 <0.

The influence of size on bank performance has been traditionally modeled by grouping banks based on asset sizes. Because of the short period of operation of most of the smaller sized banks which limited the use of separate time series analysis for banks of this asset type, size is modeled here by grouping banks into three categories: all commercial banks in the sample; the six banks in operation since 1970; and the three big commercial banks which have also been in operation since 1970. Thus, the impact of all bank sizes are taken into account. Under this scheme, each group's total profit rate becomes the dependent variable. The influence of size can be inferred by comparing the regression summary statistics for the different groups.

II. EMPIRICAL RESULTS AND ANALYSIS

II.1 Data Sources

Data used to compute bank performance measures were obtained from survey questionnaire returns completed by commercial banks from information contained in their published audited annual accounts covering 1970-1994. Because of the incomplete nature of the 1994 data, it was excluded from the analysis. Of the 60 commercial banks participating in the Bankers Clearing House in the CBN in December 1994 who received the questionnaire, 44 completed and returned the forms, giving a 73.3 per cent completion rate. The remaining data series were obtained from the Sta-

tistical Bulletin of the Central Bank of Nigeria, Volume 5, No 1, June 1994.

II. 2. Results

Equation 2 was estimated using the ordinary least squares method for the 1970-1993 period for the three groups (all banks, six banks and three banks). The results are shown in Tables 1 to 3. Generally, the three measures of profitability, namely, interest earnings, rate of return on assets and rate of return on capital, were explained by the monetary and firm policy variables. The performance of the equations degraded from an adjusted R-squared value of 0. 9223 for the interest return profit rate to 0. 6579 for the rate of return on capital. Similarly, the explanatory powers of the equations deteriorated from all bank, six bank to three bank category. The values of Durbin-Watson Statistics showed the existence of serial correlation in some of the specifications. The low standard errors of regression indicate that the coefficients were estimated with good precision. The behavior of the individual policy variables as inferred from their coefficient estimates are discussed below.

(i) Interest Rates

Interest rates (lending or savings) variation had a positive and significant relationship with all measures of profit rate as expected and in line with previous studies in the area (see for instance Hancock, 1985). The observed performance as reported for prime lending rate in Tables 1 to 3 cuts across the three groups of banks and by implication, different asset sizes. However, the influence of interest rates on commercial bank profits declined with alternative definitions of profit rate - rate of return on assets and rate of return on capital. The high proportion of interest earnings in commercial banks' profits could have been responsible for the high significance level of interest rates in explaining variations in the profit rate.

TABLE 1

ESTIMATES OF EQUATION 2 WITH INTEREST REVENUE PER TOTAL ASSETS AS THE PROFIT RATE (P)

VARIABLE	ALL BANKS	SIX BANKS	THREE BANKS
Constant	-0.0129	- 0. 01074	- 0. 0103
	(1.5686)	(1.30952)	(1.0035)
rl	0.00278	0.00175	0.00186
	(6.3793)	(4.0179)	(3.4038)
er	-0.00602	- 0.00439	- 0.0049
	(5.3210)	(3.8115)	(3.4662)
rv	3.927×10^{-6}	2.585×10^{-6}	3.334×10^{-6}
	(3.1273)	(2.0054)	(2.0866)
cr	0.011234	0.01827	0.0162
	(1.2292)	(2.0156)	(1.4072)
pl	0.15036	0.0867	0.2023
	(1.07314)	(0.5234)	(0.9862)
w	0.59296	0.3410	0.1327
	(1.6121)	(1.0823)	(0.3625)
Adj-R^2	0.9223	0.5421	0.3933
DW	2.7796	2.2156	1.6539
SER	0.00384	0.00388	0.0048
F	46.525	5.5385	3.4859

Note: **t statistics under coefficient estimates.**

TABLE 2

ESTIMATES OF EQUATION 2 WITH RETURN ON ASSETS AS THE PROFIT RATE (P)

VARIABLE	ALL BANKS	SIX BANKS	THREE BANKS
Constant	-0.0074	-0. 0086	-0. 0074
	(1.4242)	(2.2849)	(1.9316)
rl	0.0008	0.0005	0.0004
	(3.9082)	(3.6872)	(3.0974)
er	-0.0015	-0.0008	-0.0007
	(3.6695)	(3.2174)	(2.6807)
cr	0.0227	0.0269	0.0247
	(3.8198)	(6.2584)	(5.5799)
pl	0.0214	0.0528	0.0924
	(0.2362)	(0.6783)	(1.2124)
w	0. 6295	0.2900	0.2436
	(2.7980)	(2.1363)	(1.8768)
Adj-R^2	0.7645	0.6656	0.6391
DW	1.3467	1.5169	1.2426
SER	0.0025	0.0018	0.0018
F	15.935	10.157	9.1493

Note: t statistics under coefficient estimates; rv was dropped because of insignificance.

(ii) **Exchange Rate**

According to inference drawn from the regression results, changes in the official exchange rates unexpectedly diminish commercial bank profits. This is contrary to the generally held view that earnings from foreign exchange transactions resulting from exchange rate policy sustained most of the new breed commercial banks. It

should be noted, however, that the sub-period during the exchange rate deregulation was short for any meaningful time series analysis. An analysis of the share of commercial banks' earnings from foreign exchange operations shows that the share was high during the period the naira was perceived to be overvalued and large scale importation was effected through the commercial banks. The share, as well as the volume of imports through the banks, however, declined as the naira exchange rate was depreciating during the era of deregulation. This phenomenon could be responsible for the observed inverse relationship between exchange rate and the profit measures.

TABLE 3

ESTIMATES OF EQUATION 2 WITH RETURN ON CAPITAL AS THE PROFIT RATE (P)

VARIABLE	ALL BANKS	SIX BANKS	THREE BANKS
Constant	-0.3132	-0. 37784	-0. 3352
	(1.5282)	(2.1986)	(2. 1513)
rl	0.02794	0.0180	0.0173
	(2.5435)	(1.9463)	(2.0645)
er	-0.1331	-0.0884	-0.0851
	(4.6567)	(3.6176)	(3.8692)
rv	7.427×10^{-5}	5.623×10^{-5}	6.134×10^{-5}
	(2.3373)	(2.0742)	(2.5761)
cr	0.7344	0.9124	0.8230
	(3.2306)	(4.7718)	(4. 7423)
w	32.6457	21.1873	17.5427
	(3.7935)	(3.2046)	(3.1209)
Adj-R^2	0.6665	0.6579	0.6452
DW	0.9950	0.9786	0.9620
SER	0.0980	0.0826	0.0749
F	10.196	9.850	9.367

Note: t statistics under coefficient estimates; p1 was not significant and so was dropped from the equations.

(iii) Bank Reserves

The impact of reserves on profits was positive and significant for the interest earnings and rate of return on capital measures. This is expected as higher level of reserves (excess reserves, net of reserve requirements) increases the amount of loanable funds on which banks can extend and earn higher profits. The result was however not significant when return on assets was used as the profit rate measure.

(iv) Oligopolistic Market Power - The Influence of the Three Big Banks

The influence of oligopolistic competition on commercial bank profitability, as measured by the concentration ratio, was positive and significant in explaining bank profitability in most of the specifications. Thus, the result provides clear evidence of the existence of oligopoly power in the Nigerian commercial banking industry. In other words, the three big banks wield a considerable influence in the Nigerian retail banking industry.

(v) Managerial Efficiency

The provisioning for loan losses as a ratio of total loans and advances was used to capture banks ability to reduce losses and enhance profitability. The results were positive but not significant in all the specifications.

(vi) Staff Emolument (costs)

From a production function point of view, an increase in the factors of production is expected to increase output for a given level of technology. Consequently, a higher staff expenditure especially in the banking industry, which is service oriented, would increase profits as confirmed by the results. Specifically, the regression results imply that high staff compensation could cause high productivity which translates into high profits.

(vii) Effect of Size

The effect of size on bank profitability was measured indirectly by the disaggregation of the samples into two - those in operation during the study period (1970-1993) and the three big banks that controls most of the assets of the commercial banking industry. Besides, the whole sample was used as another group. In effect, three asset sizes resulted from the exercise. All explanatory variables maintained the same sign across bank sizes. Similarly, variables that were significant generally remained so across the bank groups. The explanatory powers of the equations tended to

decline as the disaggregation increased as reflected in the R - Squared estimate. Hence, when the influence of size is judged by considering summary statistics, there is appreciable effect of size on bank performance. On the other hand, the individual policy variables did not show much change in significance levels.

III SUMMARY AND CONCLUSION

The study started by introducing the concepts of commercial banking performance, namely, net interest margin, rate of return on assets and capital. Furthermore, the paper discussed key monetary policy variables and other factors that affect the performance measures among which are interest rates, exchange rates, bank reserves, concentration ratio, provisioning for bad and doubtful loans, staff compensation and size of bank.

Three major strands of theory of the banking firm were identified; one dealing more with portfolio management and the other dealing with statistical models (Meyer). The third was by Klien which emphasised the production function approach. Taking into consideration of the literature and some other theoretical underpinnings, a profit function explained by interest rate, exchange rate, bank reserves, concentration ratio, managerial efficiency and productivity was proposed by the study. In addition, the impact of size was estimated by breaking the commercial banks into three groups: all sample banks, six banks and three banks.

An ordinary least squares estimate of the function showed that interest rate variation is a major source of changes in commercial bank performance, however defined. Other factors having positive effect on commercial bank profitability included bank reserves, oligopolistic market power of the three big commercial banks in Nigeria and staff remuneration. Exchange rate changes had negative effect on bank performance, while managerial efficiency had no clear influence. The impact of size was not quite pronounced but for the degradation of summary statistics in some cases.

Overall, the study found considerable link between commercial bank performance and monetary policy as was also reported in the literature. By implication, stable and realistic monetary and banking policies are therefore necessary for a profitable commercial banking industry in Nigeria. Another issue worthy of concern is the policy implications of the existence of a strong oligopoly in the commercial banking industry in Nigeria. Opinions have varied over time on the detrimental effects of oligopolists in markets. In recent times, some schools of thought think that strong oligopolies at the national level are infact necessary for effective global competition. The question in the meantime is, do the present structure of the commercial banking industry hamper or aid the transmission of monetary policy and the operations of the commercial banking industry in Nigeria?

NOTES

1. Monetary policy is used here to include monetary, credit, banking and other related policies that affect commercial banks.

2.
   (i) Adjusted net interest margin is the difference between interest revenue and expense (net of loan - loss provisions and dividing the result by the bank's net interest - earning assets;

   (ii) Return on Assets (ROA) is the ratio of a bank's net income and its average assets. It gauges how well a bank's management uses the firm's assets;

   (iii) Return on Equity (ROE) is the ratio of a bank's net income and its total equity.

3. Meyer (1986) defines solvency as the state of a bank when assets exceed liability. The solvency constraint, implies that banks sacrifice short run profit by reducing risk taking and increasing net worth in order to be in business. He also defines the liquidity constraint to mean that a bank must be able to meet depositors withdrawals and legitimate loan requests immediately and continuously without incurring sizeable costs.

4. Hancock quoted Samuelson as saying that "The banking system as a whole is immeasurably helped rather than hindered by an increase in interest rates."

5. He identified rate of return on equity, capital and assets as measures of profit rate, while the market share of a bank was defined as the ratio of its total deposits to total banking system deposit. He also defined market concentration as the ratio of the three bank deposit to banking system deposit.

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