IMPACT OF ELECTRONIC BANKING INSTRUMENTS ON MONETARY POLICY EFFICIENCY IN NIGERIA

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ABSTRACT:

The study examined the effects of electronic banking instruments on monetary policy efficiency in Nigeria. The quasi-experimental design was employed. The study employed secondary data in its analysis. Data used for the study were sourced from the Central Bank of Nigeria annual statistical bulletin 2013 and National Bureau of Statistics bulletin 2013. The study employed the Unit root and Granger Causality Test. The E-view 7.1 statistical software was employed for the study. The results showed that there was a unidirectional causality among the variables ATM & MPE, MOB & MPE as well as ISV & MPE. This reveals that the variables are necessary condition for achieving monetary policy efficiency.Hence, the alternative hypothesis that MPE granger causes ATM is accepted. Also, the alternative hypothesis that MPE grangers cause MOB is accepted and the alternative hypothesis that MPE granger causes ISV is accepted Bases on the above findings, the study recommends on the need to create more awareness to entice the unbanked public into the banking system.

KEYWORDS: Monetary Policy, Efficiency, Electronic

1.1 Background to the study:

Prior to the introduction of electronic banking in Nigeria, banking operations was manually done and this may have led to a slowdown in the settlement of transactions. Most banks then used only one or few analog computers in carrying out their transactions and this of course did not ameliorate the sluggish nature of banking transactions. Electronic banking is the use of computers and telecommunications to enable banking transactions to be done by computer or telephone instead of human interaction. The emergence of Internet, electronic commerce, communication technology and users' response to this technology has opened opportunity for many businesses including the financial institution. Adoption of electronic banking service delivery is fast gaining ground in Nigeria. It features include: automated teller machines (ATM), electronic fund transfers for retail purchases, automatic payroll deposits and bill payments or direct deposit of pay cheques into chequing or saving accounts. The Basel Committee defines e-banking as ". The provision of retail and small value banking products and services through electronic channels, such products and services can include deposit taking, lending, account management ,the provision of financial advice, electronic bill payment products and services such as electronic money.

The new information technology (IT) is turning into the most important factor in the future development

of banking, influencing banks' marketing and business strategies. The use of various forms of e-payments has grown significantly within and after the past decade. The electronic banking instruments or products like Automated Teller Machine (ATM), Mobile, internet (Web), and point of sales (POS) are the major e-payment instruments in Nigeria. The evidence is captured in the Central Bank Statistical bulletin published annually. All these are expected to give rise to higher volume of turnover with its attendant overall profitability to the banks. But sincerely speaking, there exit some problems militating against Nigerian banks from reaping the full benefit of e-banking. There is incessant system break down and inconsistence in services on the online connectivity. This has affected banks effectiveness and efficiency of operation with its attendant negative impact on their productivity and overall profitability. Similarly, banks are often faced with system redundancy due to rapid technological changes resulting to excessive costs hence, lower profitability. Again, the issue of insecurity and lack of privacy occasioned by the activities of hackers is another problem militating against the banks from milking the full benefit offered by e-banking. These could lead to financial and capital losses due to inaccurate processing of transactions, data privacy and confidentiality, unauthorized access or intrusion to financial institutions' systems and transaction, which will in turn, take a heavy toll on their profitability and overall e-banking service value on the intermediation efficiency of the Nigerian economy.

1.2 Objectives of the Study:

The objective of this study is to ascertain the impact of electronic banking instruments on monetary policy efficiency in Nigeria.

2.1 Literature Review/ Theoretical Underpinning:

2.1.1 Monetary Policy Efficiency:

The efficiency and reliability of a country's financial institutions facilitate the ability of her monetary authority in bringing a sound and stable financial system hence, the provision of an enabling environment for customers to make payments continued to form the basis of any well functioning financial system. The Central Bank uses its operational target over which it has deterministic control to influence the intermediate target (broad money) which eventually affects the ultimate targets (inflation and output). In setting its targets, the CBN considers an information set that is feed into by contemporaneous and lagged values of real Gross Domestic Product (GDP), real investment prices, real wages, labour productivity, fiscal operations and balance of payments performance, among others. Depending on the relative importance attached to the various information elements, the CBN sets its target parameters for its quantity based nominal anchor and its price based anchors. The bank generally implements its monetary policy programmes using the market based and rule based techniques. When implementing monetary policy using the rule based technique, the CBN uses direct instruments like selective credit controls, direct regulation of interest rates and moral suasion. While indirect instruments like the Open Market Operation (OMO), discount rate and the reserve requirements are used when implementing monetary policy programmes using the market based approach. Since its inception, the CBN has implemented monetary policy using various combinations of these two techniques with more or less emphasis on the one.

Despite the empirical evidence found for the efficacy of monetary policy with market based techniques, the effectiveness or otherwise of monetary policy during this era is still an issue in debate. Though we take a position on this issue at the conclusion of the work, we recognize that monetary policy in Nigeria is confronted with several challenges. Some of them include; fiscal dominance and non synchronization of fiscal and monetary policies, the existence of a large informal sector, debt and liquidity overhang, data inconsistencies and lateness, and the cash in hand nature of the economy. These peculiar characteristics of the economy place a special emphasis on the dynamism of monetary policy in Nigeria.

2.1.2 Empirical Literature:

In the bid to aligned with global developments and improve the quality of its service delivery, banks in Nigeria have no doubt invested much on technology and extension adopted electronic and Telecommunication networks for delivering a wide range of value added products and services. They have in the last few years transformed from manual to automated systems. Hernado et al. (2006) examined the impact of the adoption of a transactional web site on financial performance using a sample of 72 Spanish commercial banks over the period of 1994-2002 and found a positive impact on profitability. According to James (2012) Using Statistical Package for Social Sciences (SPSS) to investigate the acceptance of E-banking in Nigeria. His findings showed that acceptance of e-banking in Nigeria are significantly influenced by Age, Educational Background, Income, and Perceived Benefits. Perceived Ease of Use, Perceived Risk and Perceived Enjoyment. Ayo et al (2010) reviewed the state of e-banking implementation in Nigeria and evaluated the influence of trust on the adoption of e-payment using an extended technology acceptance model (TAM); found that e-banking was increasingly adopted by Nigerian banks.

Palley (2001) used time series data to investigate the determinants of the adoption and influence of e-commerce involving 90% of the retail banks in Kenya. They found out that there was a drastic shift in the importance attached to some e-banking drivers between years 2005 and 2009. Olatokun and Igbindi (2009) used diffusion of innovation (DOI) theory to investigate the adoption of Automatic Teller Machines in Nigeria. They found out that the constraints Relative Advantage, Complexity, Observability, Compatibility, and Trainability were positively related to attitude to the use of ATM cards in Nigeria. Al sukka (2005) examined the effect of electronic banking on bank's profitability in Jordan. The population of the study included all working banks in Jordan which have sites on the internet for the periods of 1999-2004. The result from the data analysis that was gathered from the study instrument (questionnaire) showed that there is a correlation with statistical significance between electronic banking and banks profitability. Showing a negative effect in profitability in the short run and a positive effect in profitability in the long run. Thus, managers and banks employees in the area prefer their banks to expand their electronic operation in servicing customer but not converting all banks to total electronic banks. Morufu and Taibat (2012) attempted to fill this gap by identifying and estimating the impact of the adaptation of a transactional web site on financial performances using a sample of 72 Deposit Money banks in Spain over the period 1994-2002. The analysis of the sample is based on several financial performance ratios. These financial ratios measure business activity as a percentage of average total assets and profitability. The results showed that the impact of transactional web adoption on banks performance is significant. The adoption of the internet as a delivery channel involves a gradual reduction in overhead expenses. This effect is statistically significant after one and half year after adoption. The cost reduction translates into an improvement in banks profitability, which becomes significant after one and half year in terms of return on assets (ROA) and after three years in terms of return on equity (ROE). Lassan, Marolis and Lassar (2005) investigated the impact of internet banking on banks profitability. Their analysis covered thirteen (13) banks that have adopted online banking in Turkey between 1996 and 2005. Using the approach of Hernando and Nieto (2007) and by using specific and macroeconomic control variables; they investigated the impact of internet banking on the return on assets (ROA) and return on equity (ROE). The results of the findings show that internet banking starts contributing to banks return on equity (ROE) with a time lag of two years.

Hogarth, Kolodinsky and Gabor (2008) employing a survey of 407 bank customers in 33 organizations in Kano State of Nigeria studied the effects of availability of electronic banking facilities among other factors. Their study reveals that the availability of electronic banking facilities such as ATM, online banking and telephone banking do not have significant influence on customer's bank choice decision. Putrevu (2012) using descriptive survey to ascertain the origin of technology and information difference between man and woman. He found out that difference in information processing exists between men and women and as such both genders will have different rate of technology acceptance. Aburine (2008) used cluster sampling technique to study the impact of electronic banking in Nigerian banking system. He found out that a

bank has an effective electronic banking system which has improved its customer's relationship and satisfaction.

Dafe (2012) used ordinary least square of multiple regressions to investigate cashless banking in Nigeria and its implications on the economy. He found out that cashless banking will boost the economy on the long run. Wada (2006) used Statistical Package for Social Sciences (SPSS) to investigate the acceptance of E-banking in Nigeria. The result showed that acceptance of e-banking in Nigeria is significantly influenced by Age, Educational Background, Income, Perceived Benefits, Perceived Ease of Use, Perceived Risk and Perceived Enjoyment. Gertison (2008) used qualitative survey to ascertain the influence of communication source and mode on consumer adoption of technological innovations in Nigeria. They discovered the older the adopters the lower the rate of technology adoption. Daniel (2012) used consumer acceptance theory to investigate customers perception of security indicators in online banking Sites in Benin, Nigeria. He found out that Security Indicators (SI) are not very effective at alerting and shielding users from revealing sensitive information to fool e-banking sites in Nigeria.

Mathew (2009) used diffusion innovation theory to investigate the Consumer Payment Choices: Paper, Plastics or Electrons. He found out that increases in income and education also elicit a positive effect on adoption of electronic banking, regardless of the technology. On the other hand, the impacts of other demographic characteristics on adoption are less clear'. Madueme (2010) used consumer acceptance theory to determine online banking acceptance. He found out that attitude towards online banking and its usage is significantly affected by Prior Computer Experience, Prior Technological Experience, Personal Banking Experience and Reference Group Influence .Wada (2006) used descriptive survey to examine regulating internet banking in Nigeria, problem and challenges. He found out that Internet banking in Nigeria is slowly been embraced by customers because Internet practice in Nigeria has been abused by cyber fraudsters who use real and deceptive banking websites to fool users' and set their sensitive information and funds. Recent empirical studies such as Akinlo (2007) attempted to estimate the cashless and monetary economy in US by employing Bayesian estimation techniques. The data set, which was split into two parts, ranged from first quarter 1964 to third quarter 2009. Whilst treating GDP deflator, output per capita and real wages as observable, its findings suggest that interest rate policy was passive in the monetary but active in the cashless economy. According to Sanusi (2009), volatilities in output and inflation declined due to observed loss in the predictive power of money in a monetary economy. A similar conclusion was also reached by Nnana(2001). Morufu and Taibat (2012) used qualitative survey to ascertain banker's perceptions of electronic banking in Nigeria. The results suggest that bankers in Nigeria perceive electronic banking as a tool for minimizing inconvenience, reducing transaction costs, altering customers queuing pattern and saving customers banking time.

2.1.3 Electronic Banking and Robustness of Banking Performance in Nigeria:

The study by Nnanna (2001), proxy performance using return on asset (ROA) and return on equity (ROE). However, it is important to note that firms' profitability is not the only performance indicator of an organization. Thus, studies like that of Olorunsegun (2010) and some others have identified performance in a different perspective; productivity, increase in sales, cost reduction, competitiveness, efficiency and effectiveness. Base on the above, the study makes a conclusion that performance of a business can be measured with any of these; profitability ratios, growth rates and profit margins. Consequently, the study measures banks' performance using return on assets (ROA) which is consistent with that of Akinlo (2010). This profitability measure checks the managerial efficiency in the usage of the business assets to turn over and make profit.

Milind (2005) reported that transaction with internet banking does not have a significant impact on performance and risk profile. Thus, concluded that internet banking has not proved to be a performance enhancing tool in major credit unions in Australia. Akinlo(2010) analyzed the effect of e-banking on bank

performance in Nigeria. He found that e- banking has positively and significantly impacted on return on equity while e-banking did not impact on return on assets. Similarly, Olajide (2012) claimed that e-banking has led to increase customer satisfaction, improved operational efficiency, reduced transaction time, better competitive edge, reduced running cost and ushered in swift response in service delivery. In his research, Hesse (2007) investigated the impact of e banking on the profitability of Pakistani banks. Their findings reveal that e-banking has increased the profitability of banks, hence enabling them to meet their costs and earn profits in short span of time. Also, the illiteracy of customers is not regarded as a major impediment in provision of their products. Furthermore, Olorunsegun (2010) found that bank has an effective e-banking system which has improved its customers' satisfaction, by critical appraisal of e-banking in unity bank.

3.1 Methods of Study:

The research design for this study is analytical. Descriptive research is that research which specifies the nature of a given phenomenal. This implies a systemic explanation of a situation while quantitative analysis involves the use of dependent and independent variables in a multiple regression model. The study is basically time series base. Data adopted in the study were generated from the Central Bank of Nigeria quarterly reports and briefs. The data included are those on (the monetary policy efficiency of the economy) which is the ratio of currency outside banks to broad money supply (MPE=COB/M2), this reflect the impact of the use of electronic forms of payment as well as banking habits, The Automated teller machine service value service (ATM), the Point of sales service value (POS), the Mobile service value (MOB) and Internet service value (INTS)

3.1.1Estimation Techniques:

This study employs econometric model to examine the effect of electronic instruments on financial intermediation efficiency in Nigeria. The Pairwise Granger Causality Tests was the econometric tool used for the analysis. The primary model showing the relationship among Automated teller machine service value, mobile service value, internet service and banking efficiency in Nigeria is specified thus:

3.1.2 Model Specification:

Based on the assumption of intermediation efficiency as stated above we may therefore specify the equation below:

COB/M2 = F (ATM, POS, MOB, ISV) ……. …. . . ..(3.1)

The above equation is modified and transposed to reflect an intermediation efficiency model as follows:

$MPE = b0 + b_1 ATM + b_2 MOB + b_3 ISV + Ut$ ……. (3.2)

Where: b0 is the constant term, b_1, b_2, and b_3 are the slope parameters, "t" is the time trend, and "**U**" is the random error term. On the apriori, it is expected that; $b_1>0$, $b_2>0$, $b2>0$ $b_3>0$. MPE=COB/M2 which represents ratio of currency outside banks to broad money supply, reflecting the impact of the use of electronic forms of payment as well as banking habits. (Intermediation efficiency of the Nigerian economy), ATM=automated teller machine service value, MOB=mobile service value and ISV=internet service value.

3.1.3 Unit Root Test:

This involves testing the order of integration of the individual series under consideration. The unit root test used in this paper is the Augmented Dickey-Fuller (ADF). Augmented Dickey-Fuller test relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favor of the alternative hypotheses of

stationarity. The tests are conducted with and without a deterministic trend (t) for each of the series. The general form of ADF is estimated by the following regression:

$$\Delta^{yt} = \alpha^{0} + \alpha^{1} y^{t-1} + \Sigma^{\alpha\Delta y}_{i} + U^{t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3.4)$$

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \Sigma\alpha_1 \Delta y_i + \delta_t + U_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3.5)$$

Where: y is a time series, t is a linear time trend, Δ is the first difference operator, α_0 is a constant, n is the optimum number of lags in the independent variables and U is random error term

3.1.4 Granger Causality Test:

The last step is to identify the causal relationship in the variables. Variable A is said to Granger cause variable B, if the lags of A can improve a forecast for variable B. In a VAR model, the null hypothesis that variable A does not Granger cause variable B, if all the coefficients on the lags of variable A are zero in the equation for variable B. For instance the VAR model in the bivariate framework for MPE and ATM is given by

$$MPE_t = \lambda_o + \sum_{i=1} \alpha 1i MPEt{-}il{+}ri{=}1{+} \sum_{i=1} \beta 1i ATMt{-}il{+}ri{=}1{+}e_1 \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3.6)$$

$$ATMt = \lambda_o + \sum_{i=1}^{m} \alpha_2 i ATMt{-}il{+}ri{=}1{+} \sum_{i=1}^{m} \beta 2i MPEt{-}il{+}ri{=}1{+}e_2 \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3.7)$$

Where: MPE is financial intermediation efficiency, ATM is Automated teller machine service,/is the optimum lag order, m is the order of integration, α and β are the coefficients of MPE and ATM and e_1 and e_2 are the error terms. From the equation 3.6, the null assumption is that ATM does not granger cause MPE if the beta value is zero i.e if H0: β1=0 (ATM⇏MPE). In equation 3.7 the null assumption is that MPE does not granger cause ATM if H0: β2=0 (MPE⇏ATM).

4.1 Results and Discussion:

The study utilized times series data relating to the variables under study (dependent and explanatory variables). The study considered a time series data made up of quarterly data of 2008-2011.The data was sourced from the quarterly reports and briefs of the Central Bank of Nigeria.

Table II: Unit Root Test (Augmented Dickey Fuller)

Variables	ADF Test		Critical Value			Order of integration
			1% critical Value	5% Critical Value	10% critical value	
MPE	-7.1543		-4.4613	-3.2695	-2.7822	I(4)= 4th Diff.
ATM	-20.631		-4.2207	-3.1801	-2.7349	I(3)= 3rd Diff.
MOB	-8.505		-4.2207	-3.1801	-2.7349	I(3)= 3rd Diff.
ISV	-4.2658		-4.2207	-3.1801	-2.7349	I(3) = 3rd Diff..

Source: *Author's computation*

The Augmented Dickey Fuller Test of stationarity is essential to stabilize the data and determine the long run equilibrium relationship among the variables under consideration. Thus, the unit root test results presented in table I show that the variables were stationary at various orders. Although, all the variables were not stationary at their levels but they were stationary when differenced. Thus, ATM, MOB and ISV were stationary of order three while MPE was stationary of order four.

Table II: Granger Causality Test of MPE on ATM, MOB and ISV

Direction of Causality	No of Obs.	F-Value	Prob	Decision
(ATM) → (MPE)	12	0.84572	0.57839	**Reject Ho**
(MPE) → (ATM)	12	6.96506	0.07135	Accept Ho
(MOB) → (MPE)	12	0.71231	0.63569	**Reject Ho**
(MPE) → (MOB)	12	12.0897	0.03406	Accept Ho
(ISV) → (MPE)	12	4.81761	0.11361	Accept HO
(MPE) → (ISV)	12	2.31735	0.25792	**Reject Ho**

Source: *Computed Result (E-View 7.1) from Appendix VI*

Note: → means does not granger cause and MPE, ATM, MOB and ISV as earlier defined

Granger causality test help us to detect the direction of effect between the dependent and the independent variables. Having subjected the variables to the various level at which they were stationary, the granger test then follow.

The results presented on table II above showed that there was a unidirectional causality among the variables ATM & MPE, MOB & MPE as well as ISV & MPE. This reveals that the variables are necessary condition for achieving financial efficiency. Hence, the alternative hypothesis that MPE granger causes ATM is accepted. Also, the alternative hypothesis that MPE grangers cause MOB is accepted and the alternative hypothesis that MPE granger causes ISV is accepted.

4.2 Conclusion and Recommendations:

The results showed that e banking has impacted greatly on the monetary efficiency of the Nigerian economy but there is need for monetary authority of the government to strengthening the e payments instruments of transactions as well as creating the enabling environment for it to function optimally There is also the need to create more awareness to entice the unbanked public into the banking system.

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